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**ADAPTATION OF EUROPEAN PRACTICES IN MANAGING
DIGITIZATION OF THE UKRAINIAN ECONOMY TO COMMON
EUROPEAN STANDARDS**

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ABSTRACT

In today's unstable conditions of development, digitization is one of the key megatrends in the development of society, covering its various aspects. The development of society today is impossible without digitization, which plays a key role in the transformation of various aspects of human life. Digital technologies affect all spheres of life, including the economy, education, medicine, communications and culture. They provide access to information and the ability to communicate at any time and from any place, promoting global connectivity and knowledge sharing.

Digital innovations contribute to more efficient management of resources, increased productivity and convenience for citizens. They also stimulate economic growth by creating new opportunities for business and entrepreneurship. On the other hand, digitization raises a number of challenges, such as issues of data privacy, cyber security and the digital division of the population. Therefore, it is important to consider digitization as a complex process that requires a balanced approach and the participation of all stakeholders. It is possible to emphasize that digitization is an integral part of modern society, which opens up new opportunities, but requires careful study and regulation to maximize its benefits and reduce risks.

KEYWORDS

Digitization, digital technologies, global connectivity, innovations, economic growth, data privacy, cyber security.

The relevance of the development of digitization in the modern world is determined by the need to adapt to the rapidly changing digital environment and the maximization of its potential for economic, social and technological progress. Digital technologies are penetrating all areas of life, from business and education to medicine and manufacturing, transforming the way we interact and work. In today's Ukraine, digitization acquires its own characteristics. Digitization in the conditions of war acquires special importance and becomes a key factor in managing crisis situations and ensuring security. In today's world, where information technology penetrates all spheres of life, the digital infrastructure becomes vulnerable to attacks and cyber threats. Russian aggressors actively use cyber

attacks, disinformation and data manipulation to achieve their goals. Digital tools are used as a means of surveillance, espionage, and propaganda. In such conditions, security and protection of information systems become critical tasks for our country. Digitization can also play an important role in wartime recovery and coordination. It allows to ensure more effective communication, coordination of humanitarian aid, and to increase the level of accounting and monitoring of military actions.

Therefore, after Russia's military attack on Ukraine, digitization became not only an important means of ensuring security and information protection, but also a powerful tool for coordination and effective operations in crisis and complex conditions for our country.

The growing importance of digital transformation stems from its potential to improve productivity, innovation and competitiveness. Digital tools enable businesses to use data more efficiently, automate processes, and create new products and services. In addition, digital technologies promote the growth of global communication and collaboration, which helps to solve complex global problems.

Due to the growing importance of digital transformation, academic research and practical applications of digital technologies are becoming key areas of development. The relevance of the development of digitization lies in the need to understand and effectively use its opportunities to achieve economic growth, innovation and improve the quality of life of people around the world.

Digital technologies penetrate into the everyday life of people, affecting various spheres of professional activity and recreation, as well as becoming a necessary component of communication, cognition and socialization. Currently, it is difficult to predict how long-term this megatrend and how intensive its further development will be. However, it is safe to say that digitization, which has become one of the phenomena of the 21st century, remains a strong catalyst for progress, which promotes changes both in the field of technology and in the fields of consciousness and social dynamics of society. The expansion of the concept of digitization to various spheres of the economy and other aspects of social activity takes place within the paradigm of the "Fourth industrial revolution" or "Industry 4.0", which is considered as a new technological breakthrough.

The growing role of digital technologies in all spheres of life requires the creation of universal norms and standards that ensure effective interaction and solving problems related to digital transformation. Adaptation to European standards implies not only compliance with technical requirements, but also consideration of ethical, legal and socio-cultural aspects. Ensuring compatibility with European standards becomes a crucial step for promoting trade and investment, encourages mutual understanding and cooperation between countries and regions. It also helps ensure the protection of consumer rights and data privacy. Adaptation to European standards also increases competitiveness and stimulates innovation. It contributes to the creation of a favorable environment for the development of new technologies and their effective introduction on the market.

Therefore, the adaptation of digitization to European standards is necessary to ensure safety, efficiency and competitiveness in the conditions of a rapidly changing digital world. Therefore, there is a need to conduct an analysis of digitization problems in the context of adapting the digitization management practices of the Ukrainian economy to common European standards.

Analysis of the latest research and publications testify to the growing importance and spread of digitization every year. Taking into account the significant practical value of implementing the digital economy in the country, many domestic and foreign scientists are actively researching this phenomenon.

Many scientists from various fields are researching digitization and its impact on various aspects of society. Some of them specialize in the economic aspects of digital transformation, examining its impact on labor markets, entrepreneurship and the financial system. Other scientists examine the social implications of the digital economy, such as changes in communication, education and culture. There are also researchers who focus on the technological aspects of digitization, studying new technologies and their possibilities.

Among the leading foreign scientists engaged in digitization research, it is possible to name:

- Erik Brynjolfsson and Andrew McAfee, who study the impact of information technology on the economy and society. The scientist insisted that new technologies improve society, despite rising unemployment and falling wages [1];
- Judit Schulze – specializes in studying the impact of digital transformation on education and training;
- Michael Kasper – researches the role of information technologies in the formation of new economic models.

Analysis of scientific works by Michael Schrage, in the field of development and functioning of the digital economy [2, 3] reflects the impact of digitization on the efficiency of the economic system as a whole, as well as the identification of mechanisms and consequences of this impact on the sustainable development of individual countries, regions and enterprises. The book "Rethinking the Value of Customers in a Digital Economy" by M. Schrage [2] considers important aspects of interaction with customers in the digital economy. It is likely to include an analysis of how digital technologies are changing the ways businesses interact with their customers and how they evaluate and understand the value of their customers. According to the authors' conclusions, the digitization process should not be an end goal for enterprises, regions or states, but only serve as a tool for achieving the goal of sustainable development. These scientists, among many others, contribute significantly to the development of scientific understanding of digitization and its consequences.

N. Negroponte [4] is an American scientist, a pioneer in the field of computer science and information technology. He is known as the founder and former head of the Media

Lab of the Massachusetts Institute of Technology, one of the most influential research centers in the field of technology. Negroponte has played a significant role in defining the future and development of the information society and advancing ideas about how technology can change the way we live, work and communicate. He used the term "digital economy" for the first time in 1995. N. Negroponte described the advantages of using new information and communication technologies as a factor in the formation of a new economy.

The book "The Digital Economy: Promise and Peril in the Age of Networked Intelligence" by D. Tapscott [5] is one of the important works in the field of digital economy. In this book, the author examines the impact of digital technologies on the economy, business and society as a whole. Tapscott explores various aspects of the digital economy, including the benefits and threats it brings. He examines the role of the Internet, computers, networking, and other digital technologies in shaping a new type of economy based on knowledge and networking. The author [5] also draws attention to the problems of data privacy, security and ethics that arise in connection with the development of the digital economy. He discusses the ways to enable society to take advantage of the digital economy while minimizing the risks and negative consequences. The book "The Digital Economy" is an important source for understanding modern trends in the development of the economy and society in the conditions of digital transformation.

Among domestic researchers, it is possible to single out T. Baigarin [6], S. Bashlai [7], S. Korol [8], I. Tokmakova [9], D. Shatokhin [9], M. Rudenko, A. Cherep [10–13] and others, who analyze issues of digitization, development of the digital economy, and transformation of all sectors of the economy in the context of globalization and modern changes. Let's consider the opinion of T. Baigarin to be appropriate, who emphasizes that digital changes in the business sphere are recognized as an integral part of progress in the international economic arena. The rapid development of technologies and deep processes of globalization of the world economy push the participants of traditional businesses to adapt their activities to modern, digital realities of the market [6].

The group of economists [14] determines that one of the key features of the digital economy is a direct connection with the traditional economy, which provides access to the necessary goods and services at the appropriate time. The advantages of this approach are the quick receiving of the necessary goods or services, the reduction of costs for the end consumer due to the decrease of the number of intermediaries and the simplification of the process of finding suppliers and buyers.

It is impossible not to agree with the opinion of scientists [8] regarding the process of digitization of the economy of Ukraine, which is that this process requires support from the state, leads to the redistribution of tasks in the enterprise and the interaction between people and information technologies, and also requires the possession of digital skills and constant professional growth.

At the same time, the issue of digitization in the context of the adaptation of management practices of digitization of the economy of Ukraine to common European standards is not sufficiently studied.

Despite the difficult economic conditions, the war, the complications of many international processes, Ukraine is actively working on integration into the European economic space. Adaptation of management practices to European standards helps to ensure the compatibility and interaction of the Ukrainian economy with European partners. The use of European digitization management standards helps to increase the competitiveness of Ukrainian enterprises on the European and world markets. The application of European digitization management standards in Ukraine will make the country more attractive to foreign investors, who see compliance with European standards as a guarantee of stability and effective management. The implementation of European management standards will contribute to increasing the efficiency, transparency and openness of management processes in all spheres of the economy. Therefore, the adaptation of digitization management practices to European standards is an important step for the Ukrainian economy in an open and competitive global market environment.

Digitization is becoming increasingly important in today's world with diverse perspectives and needs. Digital technologies allow to automate processes, optimize resources and reduce costs. They enable tasks to be completed faster and more efficiently, allowing companies and governments to increase their productivity. Digital technologies make information and services more accessible to the public. They allow faster and more convenient access to various services and resources, which helps to improve the quality of life. Digital technologies provide new opportunities for innovation and development. They enable the creation of new products, services and business models that can accelerate economic development and stimulate competition. In today's world, digitalization is becoming a key factor in competitiveness for companies, countries and institutions. Those who adapt to digital technologies in time have the opportunity to increase their efficiency and ability to attract and retain customers. Therefore, digitalization is an important process that affects all spheres of life and activity of society. It not only improves efficiency and competitiveness, but also creates new opportunities for development and innovation.

Digitization, or digitalization, is the process of converting ordinary materials, such as paper documents or analog records, into a digital format that can be easily processed and stored on computers. This process enables the rapid exchange of data and information over the Internet, contributing to greater convenience and connectivity in our daily lives. New opportunities for learning, working and communicating are constantly opening up in the digital world, changing the way we live and interact.

The concept of "digitization" means the transition to modern models and methods of action based on information technologies. As examples, it is possible to name

communication using video communication and instant messengers, the implementation of the idea of a "smart city", and the transition to electronic document management. Citizens are increasingly using the Internet for online consultations with specialists and making purchases.

Digitization is the process of introducing digital technologies in order to improve the life of a person, society and the state [15].

In a general sense, digitization is considered as a process of transition to digital business and digital transformation, which includes the creation of new, digital streams of income and offers [16].

The concept of "digitization" can be considered in a narrow and general sense. Digitization means converting analog systems, processes, and services into digital format using digital technologies. This results in improved efficiency, convenience and accessibility.

The process of digitization is accompanied by the transformation of economic processes, which includes the robotization of the production of goods and services of mass use, as well as the emergence of new factories for to create products for the individual requests of specific consumers. According to experts, in the near future about half of the goods and services on the consumer and investment markets will become completely or relatively "new smart" [9].

The digital economy is characterized as an innovation-oriented economy based on the implementation of advanced information and communication technologies in all spheres of the country's economic activity. In this regard, it is about the potential of the digital economy in terms of increasing the efficiency and competitiveness of modern enterprises [17].

Bill Gates, a well-known entrepreneur, considers digitization as an opportunity for companies to adapt to the environment, identify competitor problems and consumer needs, and respond to them at the appropriate time. In general, digitization is considered as a strategic process of implementing digital technologies to optimize processes, improve efficiency and create new opportunities in various areas of life [18].

In his studies, Professor B. van Ark [19] draws attention to an important aspect of digitization, which arouses the interest of the scientific community. He notes that the conditions of digitization lead to the rapid digitizing of data and information, but the growth of the overall productivity of economic systems has limited results. This is an important aspect, but most researchers focus on the long-term impact of digitization processes. Therefore, on a short-term basis, it is difficult to observe a sudden increase in the productivity of both individual economic entities and general economic systems. C. Elding and R. Morris [20] consider the digitization process through the prism of the impact of technologies on the main economic indicators, such as competition, productivity, employment and interaction with institutions and management. Scientific research led by A. Cherep [10] indicates that a significant feature of the process of

digital transformation of the Ukrainian economy is the uneven application of information technologies in various industries. The highest level of use of these technologies is observed in Ukrainian companies providing financial, educational and communication services, as well as in logistics companies. In these branches of Ukraine's economy, the use of information technologies meets international standards. However, in other sectors of the economy, the intensity of automation, robotics and digital application is low. The researcher points out that if this level remains unchanged, it will significantly affect the productivity of Ukrainian enterprises through indicators of labor, production and sale of products. Therefore, the main strategic task for Ukrainian companies is the implementation of innovative information technologies that will ensure competitiveness on domestic and foreign markets.

Digital transformation is a key perspective for the development of the Ukrainian economy, which is aimed at stimulating business and the population to actively use information and communication technologies as more effective, high-quality, economical and fast [21]. Digital economy acts as a scientific direction that researches the possibilities of using modern digital technologies for managing economic systems. Within this direction, the use of information technologies enables modeling, research and organization of management processes in economic systems, which contributes to the revolutionary renewal of approaches to business and the economic sector.

The emergence of the digital economy opens up wide opportunities for positive changes, especially when all industries are combined into a single system. The transition to the digital age leads to significant changes in traditional approaches to business, management and marketing. It is important to note that digital transformation has many benefits for national economic progress. Innovative technologies, smart developments and other advances in the digital sphere can significantly improve the quality of service and solve problems in various areas of business. Digital transformation involves the full integration of digital technologies into all aspects of economic life, leading to radical changes. The digitization of the economy enables the optimization of business processes and the development of new products and services using various technologies, such as the Internet of Things, virtual reality, cloud services and artificial intelligence.

The expansion of the idea of digital transformation to various spheres of social life and the establishment of global management priorities on this basis began to take place in the context of the idea of the "fourth industrial revolution", also known as industry 4.0, which is considered as a new technological direction. Despite the innovative nature of this approach in industrial and social relations, the roots of digital transformation can be traced back to past attempts to create an ideal society. The concept of "digitization" can be interpreted in a narrow sense as the process of transforming information into a digital format, and in a broad sense – as a global trend in modern world development. It is important to note that the main goal of digitization is the transformation of existing

sectors of the economy and the emergence of new ones, as well as the transformation of various aspects of life into new, more efficient and modern forms. The digital economy is based on information, communication and digital technologies, and its rapid development is already affecting the traditional economy, changing it from a resource-using economy to a resource-generating economy. The digital society, including the digital economy, represents a modern trend that significantly transforms the structure of professional management in society and requires urgent preparation for these changes. Let's agree with the point of view of researchers who believe that it will be beneficial for Ukraine to use electronic services at all stages of service provision in the context of its desire to join the European Union. This includes the provision of information (direct notification of government or administrative services), one-way interaction (the ability for the user to receive an electronic form of the document), two-way interaction (the ability to process the electronic form of the document, including identification) and conducting transactions [22].

The conducted survey of experts (**Fig. 3.1**) regarding the identification of the main problems and obstacles to the development of digitization of the economy of Ukraine proves that the lowest level is "corruption and bureaucracy" (32 %) and "low level of digital literacy" (31 %): (from left to right) insufficient infrastructure and access to the Internet, lack of qualified personnel, lack of appropriate legislation, corruption and bureaucracy, low level of digital literacy.

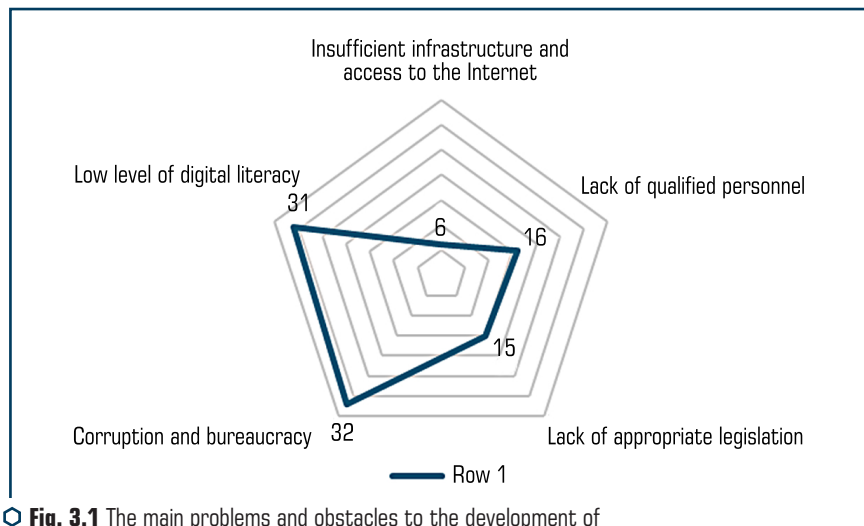


Fig. 3.1 The main problems and obstacles to the development of digitization of the economy of Ukraine

Corruption and bureaucracy are serious obstacles to digitization in Ukraine (**Fig. 3.2**).

According to **Fig. 3.2** it can also be noted that corruption complicates the implementation of digital technologies, as it promotes collusion and unfair practices. Bureaucratic obstacles can also lead to implicit restrictions on access to markets and opportunities for innovation.

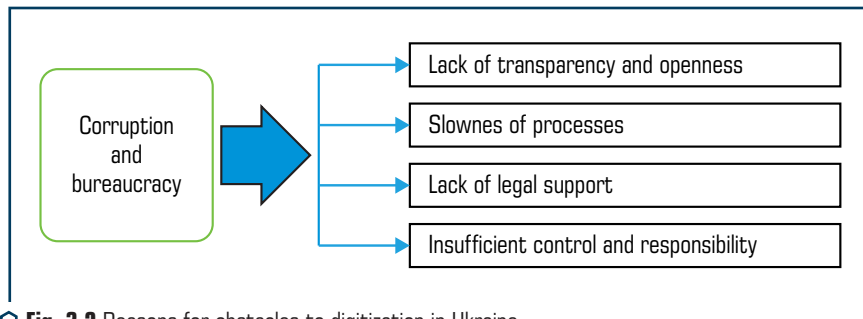


Fig. 3.2 Reasons for obstacles to digitization in Ukraine

Bureaucratic procedures and long permitting times can slow down the implementation and development of digital projects. This negatively affects the competitiveness and efficiency of the business.

Lack of legal support: Insufficient clarity and lack of legal regulation can make it difficult to deploy digital initiatives and create instability in the business environment.

Corruption and bureaucracy can lead to the loss of funds and insufficient control over the implementation of projects, which has a negative impact on the development of the economy and society.

For successful digitization in Ukraine, it is necessary to implement effective corruption control mechanisms, simplify bureaucratic processes, ensure transparency and openness in government and business, as well as create incentives for innovation and development of digital technologies.

Among the neighboring countries, Ukraine is even more ahead of Russia in 2023. Russia, which lost 2 points this year, now has 26 points and is in 141st place in the world list. On the other hand, the indicators of Belarus, which lost 2 points this year, are also decreasing. Although Belarus is still ahead of Ukraine, it has a tendency to decrease in the corruption perception index (**Fig. 3.3**).

Ukraine's western neighbors show different trends. Romania's indicators remained stable (46 points, 63rd place), while Poland lost another 1 point, but remains one of the leaders among the countries close to Ukraine, with 54 points and ranked 47th. Poland now shares this place with Slovakia, which added 1 point and also got 54 points.

Moldova, like Ukraine, added 3 points, overtook Hungary, which allowed them to share 76th place with 42 points.

World leaders and outsiders according to the Corruption Perceptions Index in 2023 remain practically unchanged. The high level was recorded in Denmark, which got 90 points, followed by Finland with 87 points, New Zealand with 85 points and Norway with 84 points. As for outsiders, the situation remains stable. Somalia lost 1 point and kept the last position, ranked 180th with 11 points. South Sudan and Syria, with 13 points each, were previously ranked 177; this year they were joined by Venezuela, also with a score of 13 [23].

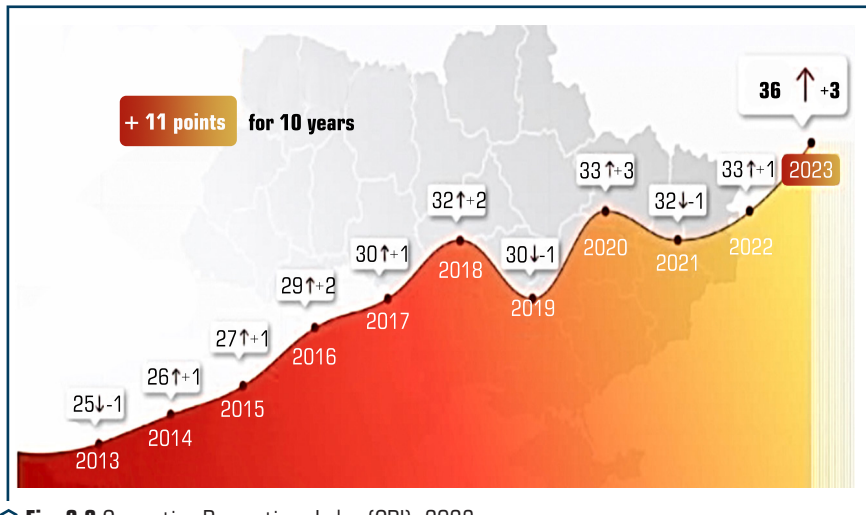


Fig. 3.3 Corruption Perceptions Index (CPI), 2023

Experts determined that insufficient infrastructure and access to the Internet negatively affects the development of digitization in the country. Many regions of Ukraine have limited access to high-speed Internet and low-quality communication, which makes it difficult to implement digital technologies.

According to the annual report Global Digital Overview, as of the beginning of 2023, 5.16 billion people used the Internet, which is approximately 64 % of the Earth's population. At the same time, 78.3 % of the urban population are Internet users, and only 45.8 % among the rural population [24].

During the war, it became necessary to provide shelter with high-speed Internet and Wi-Fi access in social institutions, in particular in kindergartens, schools and hospitals. The average value of the indicator is 0.632 out of a possible 1 (Fig. 3.4).

As of the end of 2023, 3 regions became leaders in this indicator: Kharkiv [0.926], Poltava [0.917] and Ternopil [0.916].

The following positions are occupied by Lviv [0.914], Dnipropetrovsk [0.902] and Volyn [0.870] regions.

As for the regions with the lowest indicators, Kherson [0.179], Sumy [0.173] and Donetsk [0.118] stand out among them.

In general, access to the Internet is provided on average for 71.0 % of shelters in secondary education institutions, for 67.0 % of shelters in kindergartens and for 57.0 % of health care institutions [25].

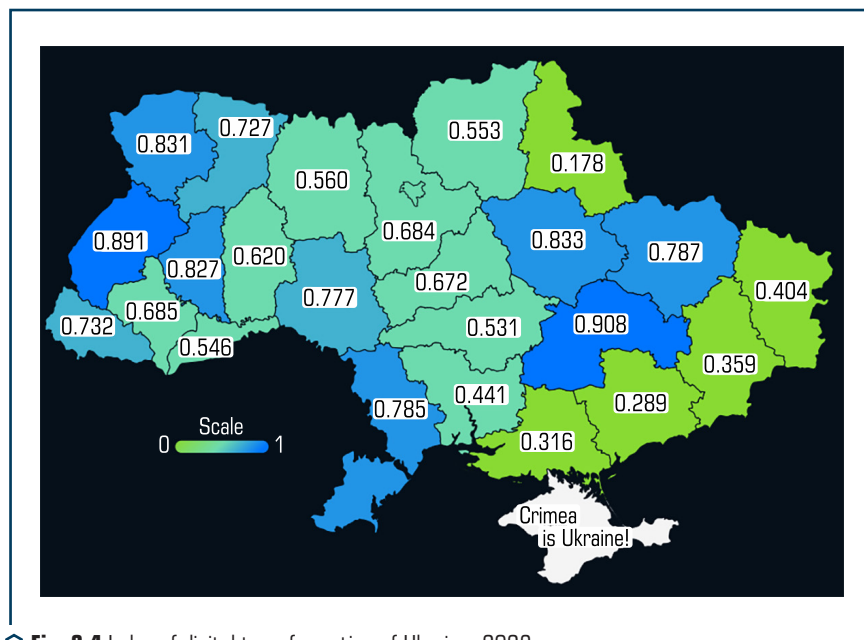


Fig. 3.4 Index of digital transformation of Ukraine, 2023
Source: [25]

The level of digital literacy in Ukraine is below the "basic level" mark (53 %), 15.1 % do not have digital skills at all, 37.9 % of Ukrainians aged 18–70 have skills below the basic level (**Fig. 3.5**) [26].

The relevance of learning digital skills in Ukraine is 47.4 % by age (**Fig. 3.6**)

Analysis of the number of appliances in one household indicates a sufficient indicator, that is, one unit of appliances per household member (**Fig. 3.7**).

PART 3. PROSPECTS FOR THE IMPLEMENTATION OF EUROPEAN PRACTICES OF
THE ECONOMY DIGITIZATION IN THE PANDEMIC COVID-19 AND THE RUSSIAN-UKRAINIAN WAR

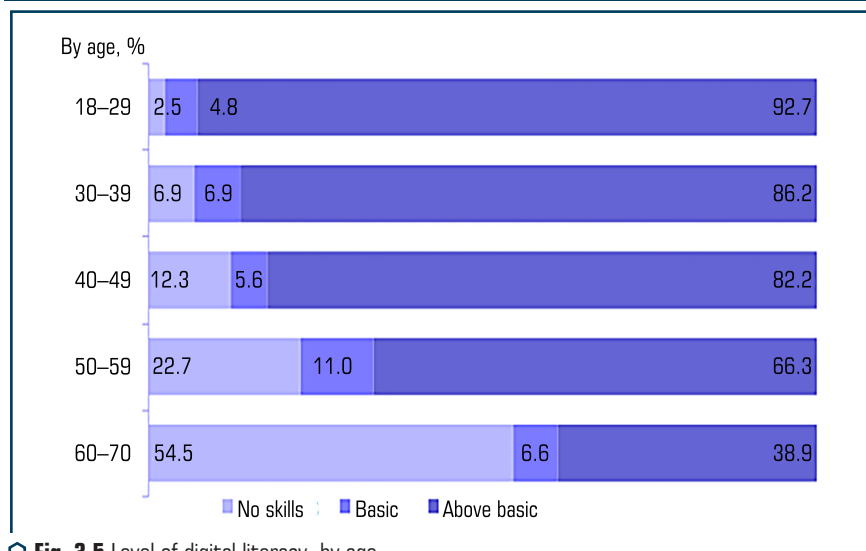


Fig. 3.5 Level of digital literacy, by age

Source: [26]

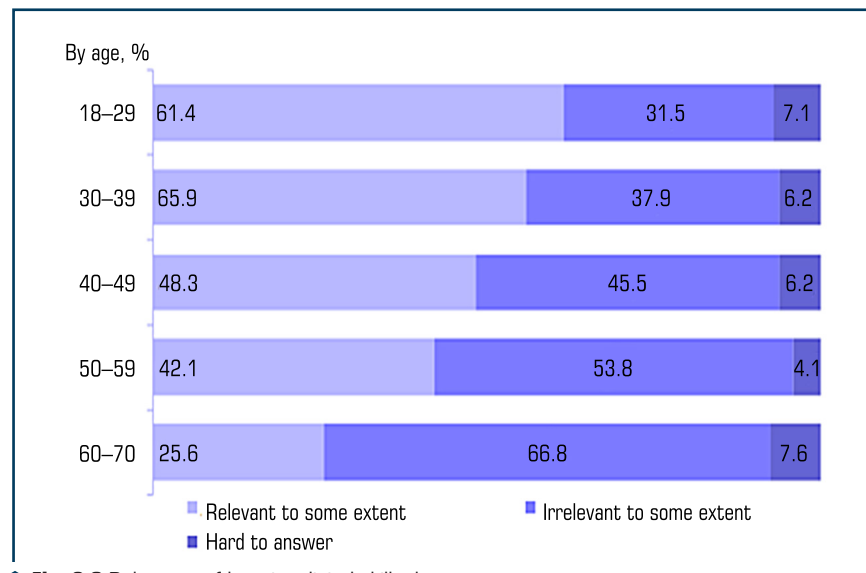


Fig. 3.6 Relevance of learning digital skills, by age

Source: [26]

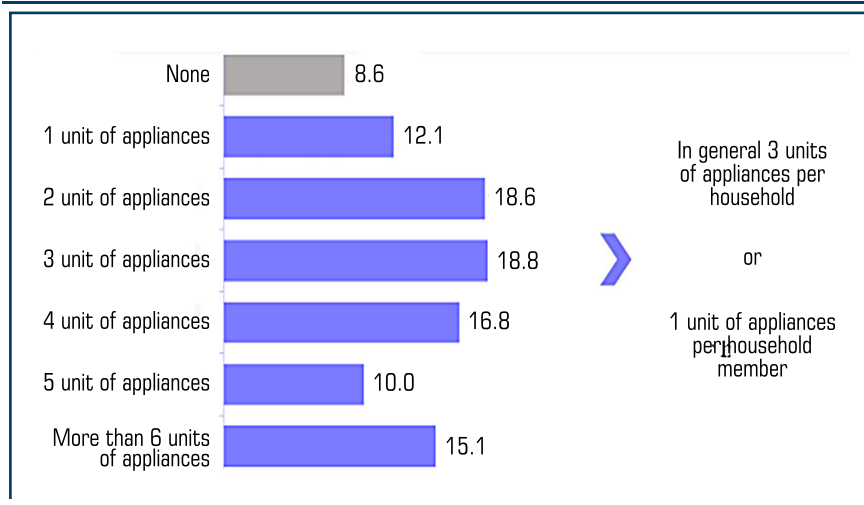


Fig. 3.7 The total number of appliances in one household, according to the survey
Source: [26]

Therefore, the level of digital literacy is insufficient in Ukraine, the low level of digital literacy is a serious problem that can complicate the development of Ukraine in the modern world.

Let's identify possible ways to improve digital literacy (**Table 3.2**).

Table 3.2 Ways to improve digital literacy in Ukraine

Direction	Characteristic
1	2
A large-scale educational campaign	Development and implementation of a national program to increase the level of digital literacy, which covers all segments of the population
	Conducting information campaigns in mass media, social networks and public space to popularize the importance of digital literacy
Inclusion in educational programs	Development and implementation of specialized courses on digital literacy in comprehensive secondary and higher educational institutions
	Supporting initiatives to include elements of digital literacy in all subjects of the syllabus

● **Table 3.2** Ways to improve digital literacy in Ukraine

1	2
Teacher training	Organization of trainings and seminars for teachers on the use of modern technologies and methods of teaching digital literacy
Access to the Internet and technologies	Expanding access to the Internet and computers in rural areas and less developed regions
	Development of programs to support low-income families in purchasing technologies
Partnership with the private sector	Involvement of private companies in the implementation of digital literacy programs through sponsorship, technical support and other forms of cooperation
Self-education and self-study	Creation and support of online platforms for self-education on digital literacy
	Promotion of available online resources and courses for self-study of digital literacy
Evaluation and monitoring	Conducting regular research and monitoring the level of digital literacy to determine the effectiveness of measures and the need to adjust strategies

These measures can contribute to increasing the level of digital literacy in Ukraine and help the population to use technology more effectively in all spheres of life.

According to a study by IT Research Ukraine, the number of specialists in the field of information technologies in Ukraine increased to 307 thousand in 2023, which is approximately 8 % more than in the previous year. The average salary in the information technology industry is 2,630 USD, which is 270 USD more than in 2022 [27].

The share of IT in the gross domestic product of Ukraine is 4.9 %, and the contribution of the IT industry to the total gross added value is 5.5 billion USD (**Table 3.3**).

The export of Ukrainian IT services in 2023 amounted to 6.7 billion USD, which is 8.4 % less than in 2022, when it reached a record 7.3 billion USD, reports ain.ua, referring to the report of the National Bank of Ukraine. During the 12 months of last year, the average export amount of Ukrainian IT services amounted to 560 million USD per month, which is almost 9.3 % less than in 2022. The main partner countries of Ukraine traditionally include the USA, Malta, Great Britain, Cyprus and Israel.

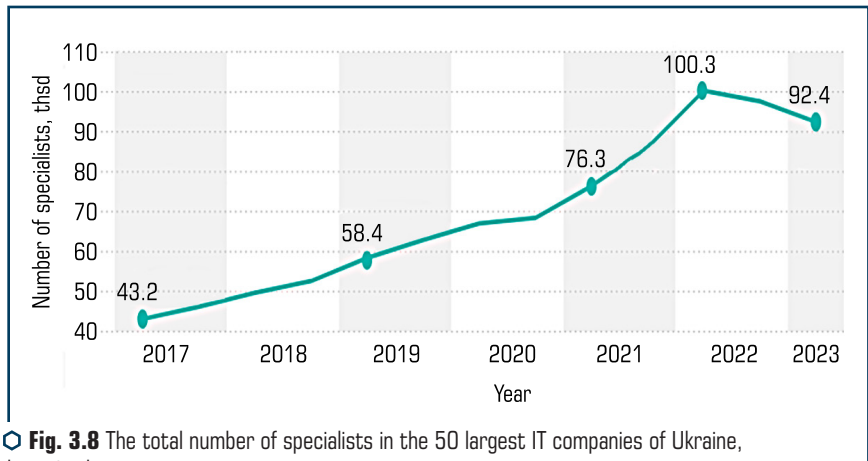
As of the beginning of July 2023, the Top 50 IT companies of Ukraine had 86,254 specialists (**Fig. 3.8**). EPAM remained the leader, but within six months the number of employees in this company decreased by more than 1,100 people. The same losses were noted in the company SoftServe, which occupies the second place in the rating.

The rating also included new companies Metinvest Digital and Netpeak Group, each of which has more than 800 employees. At the same time, Andersen, WIX and Dev.Pro were excluded from the rating.

◆ **Table 3.3** The volume of IT services exports in 2022–2023

Country	The volume of export of IT services		
	2022	2023	Deviation, +/-
USA	2973	2677	–296
Malta	581	567	–14
Great Britain	693	535	–158
Cyprus	314	362	48
Israel	347	275	–72
Germany	286	274	–12
Poland	122	162	40
Netherlands	146	132	–14

Source: [27]



◆ **Fig. 3.8** The total number of specialists in the 50 largest IT companies of Ukraine, dynamics by year

Source: [28]

In the second half of 2023, IT companies actively expanded their presence by opening new offices. At least 27 companies have taken this step. Poltava has become the most popular city in Ukraine, five new offices of IT companies have opened there. In addition, IT companies chose Odesa, Kyiv, Kharkiv, Lviv, Cherkasy, Kropyvnytskyi, Uzhhorod, Ternopil, Ivano-Frankivsk and Chernivtsi.

However, more and more new offices of Ukrainian IT companies are opening outside the country. Poland, Romania, Colombia, India, Portugal and Spain are the leaders among the selected locations.

According to experts, the most common directions in the IT industry are the following, as shown in **Table 3.4**.

◆ **Table 3.4** The most common directions in the field of IT

Direction	Characteristic
Electronic commerce	Development of online stores, software to conduct operations and transactions over the Internet and other aspects
Fintech	Optimization of financial services of companies
Development of mobile applications	Creation of applications for smartphones on the Android and iOS platforms
Media	
Technologies in health care	Development of software to improve the quality of medical services
Game development	Development of games for various platforms, including mobile devices, PCs, consoles, and others

The Digital Europe programme, which was launched by the European Union in 2021 in response to the COVID-19 pandemic, is an important example of the implementation and adaptation of European experience to improve the digital transformation of the economy. The main goal of this program is the development of advanced digital skills, the introduction of digital tools into the business sphere, the development of digital infrastructure and the provision of digital services for citizens and authorities.

Ukraine's participation in the "Digital Europe" program represents a significant step in promoting the digital transformation of the economy, especially in the context of integration with the European Union. The main goal of this program is to achieve two strategic goals of the EU: "green transformation" and digital transformation, as well as strengthening sustainability and strategic autonomy. It should be noted that this program is one of the most influential sources of funding to which Ukraine already has access.

Ukraine joined the "Digital Europe" program until 2027, which provides for financing the digital transformation of European countries in various sectors. The main goal of the program is to accelerate the recovery of the economy and its digital transformation. Participation in this program will help bring Ukraine closer to the EU's Single Digital Market. The total fund of the program is 7.5 billion EUR, of which approximately 6 billion EUR are intended to finance various projects available to Ukraine.

In total, there are four main areas in which financing can be obtained for Ukraine (**Table 3.5**).

● **Table 3.5** The main directions in which it is possible to receive funding under the Digital Europe programme

High performance computing	Artificial intelligence, data and cloud services	Digital skills	Use of digital technologies in the economy and society
2,2 billion EUR	2,1 billion EUR	580 billion EUR	1,1 billion EUR
projects that compute large amounts of data for economic, health care, or defense industry solutions may be submitted	projects that create products based on artificial intelligence to facilitate the work of enterprises, state administrations or research institutions can be submitted	projects that create opportunities to acquire new IT skills may be submitted	projects that introduce digitization in business or in the field of e-government, health care, environment, education and culture, Smart City technologies can be submitted

Source: [30]

The project "Ukraine 2030E – a country with a developed digital economy" developed by the Ukrainian Institute for the Future envisages the achievement of the following indicators:

- the share of the digital economy in the total GDP of Ukraine in 2030 will be 65 %;
- 99.9 % of Ukrainian households will have broadband Internet access;
- the territory of Ukraine will be 100 % covered by 4G–5G networks;
- mobile Internet technologies will cover 99 % of all highways and railways and 95 % of rural areas;
- 99.9 % of citizens will have digital identification (citizen-card, Mobile ID) and technical abilities to use trust services and other services [29].

The European CEF funding program, launched on October 12, 2022, opens the opportunity for domestic mobile operators and Internet providers to participate in the competition and join the implementation of strategic networks. These networks will contribute

to improving the quality of communication between Ukraine and EU countries, in particular with the help of submarine cable systems, satellite infrastructure and connection to Internet hotspots. Currently, the funds for the modernization and construction of digital infrastructure, strengthening of cyber defense, as well as the development of new digital technologies are coming through the UNITED24 platform. In particular, as part of the memorandum signed between the Ministry of Digital Transformation of Ukraine and Kyivstar, the telecommunications operator has already transferred 150 million hryvnias for digitalization [31].

The expansion of the program "E-Government to ensure openness of government and community participation" (EGAP), financed by the "Eastern Europe" Foundation and the "Innovabridge" Foundation from Switzerland, provides for an increase in EGAP funding by 15 million Swiss francs for the development of new digital services and services. During the Ukrainian Recovery Conference 2022 in Lugano in July 2022, the Ministry of Digital Transformation of Ukraine and the Swiss Agency for Development and Cooperation (SDC) signed an agreement on cooperation in the field of digital transformation. This agreement provides support for the development of the Diya portal and application, the Diya.Digital Education platform, as well as the automation of the business registration process in Ukraine. These measures will contribute to the country's integration into the European digital community [32].

Additional support for Ukraine's economy is provided through the purchase of military bonds through the "Diya" application with up to 16 % guaranteed profit. As of October 25, 2022, Ukrainians have already purchased 70,000 military bonds worth almost 70 million UAH, which contributes to the victory of Ukraine.

The "eOselya" program uses testing through the "Diya" application with special lending rates – 3 % for certain categories and 7 % for others. This allows citizens affected by the invasion of the Russian Federation and employees of the health care, education and science sectors to get the opportunity to purchase new housing.

With the support of the EU4DigitalUA program, national legislation is being adapted to the standards of the European Union in the fields of electronic identification and electronic trust services. Participants of the Ministry of Digital Transformation, the State Service for Special Communications and Information Protection, the State Enterprise "Diya" and the National Bank of Ukraine participated in the Forum on trust services in Berlin, where the intermediate results of the implementation of the eIDAS node and the development of the electronic wallet EU Digital ID Wallet were presented. Representatives of the European Commission highly appreciated these achievements.

In order to accelerate Ukraine's integration into the EU's Single Digital Market and coordination of the legislation with European norms in the fields of electronic identification and electronic trust services, as well as the creation of a national body for assessing compliance, the Verkhovna Rada of Ukraine is studying a draft law on mutual recognition

of qualified electronic trust services and the implementation of the legislation of the European Union in the field of electronic identification [33].

It is important to support Ukraine both during the conflict and after its end, contributing to the restoration and modernization of the country's Internet networks. During the meeting in Davos, the Ministry of Digital Transformation of Ukraine and the management of Nokia reached an agreement on cooperation in the direction of digitization, joint development of telecommunications infrastructure and integration of Ukraine in the international telecommunications market, as well as on strengthening the power of Internet networks. Since the beginning of the military actions in Ukraine, Nokia has transferred 1,770 WiFi access points, which provide Internet access to schools, and another 3,230 such points are planned to be transferred in the near future. In addition, the company also provides expert support for the implementation of solutions for smart cities and the development of data centers [34].

Strengthening of cyber security in Ukraine, aimed at countering cyber threats from the Russian Federation, mainly focuses on information and communication systems of government structures and on objects of critical information infrastructure.

In October 2022, Ukraine joined the cyber security month organized by the US and the EU as part of the UA30 cyber reform to draw public attention to cyber security and create a full-fledged cyber defense ecosystem. The Ministry of Digital Transformation, together with the company FAVBET Tech, is forming its own cyber army and organizing cyber troops, which are already effectively attacking the enemy's IT infrastructure around the clock. After the introduction of changes to the Tax Code, FAVBET Tech plans to introduce new payment methods in the seven most popular virtual currencies. In order to protect state information resources and objects of critical information infrastructure, a corresponding draft law was submitted to the Verkhovna Rada of Ukraine [35].

Implementation of the planned measures will contribute to the development of the digital transformation of the economy, which will ensure the stability and flexibility of the national state and its introduction to the international digital environment on strategic principles. Activation of relevant processes can contribute to attracting funding from the EU program "Digital Europe" and the funding program for connecting the internal network to global digital gateways. This will allow to increase the digital potential of Ukrainian companies, their structural modernization and ensure stability in the post-conflict period [32].

With the support of Google and UNESCO, the Ministry of Digital Transformation of Ukraine, together with the Ministry of Education and Science of Ukraine, continued the "Laptop for every teacher" initiative, thanks to which 50,000 new Chromebooks were delivered to educational institutions – this will allow teachers not to interrupt the educational process and stay in touch with students [36].

The adaptation of European practices for managing the digitization of the Ukrainian economy to common European standards is an important task in the context of the mod-

ernization and development of the Ukrainian economy. To achieve this goal, it is necessary to implement a number of measures in the **Table 3.6**.

● **Table 3.6** Adaptation of European practices for managing the digitization of Ukraine's economy to common European standards

Directions	Characteristics
Harmonization of legislation	Ukraine should bring its legislation in the field of digitalization into compliance with European standards. This applies to aspects such as data protection, e-identification, the digital market, etc.
Infrastructure development	It is necessary to ensure the appropriate level of infrastructure for digital development, in particular, fast and reliable communication networks, access to the Internet, development of digital platforms and services
Stimulation of innovations	The government should actively support innovative projects and start-ups in the field of digitization, provide financial and infrastructure support, and promote cooperation between business, higher education institutions and state bodies
Development of personnel potential	It is necessary to ensure the appropriate level of qualification of specialists in the field of digitization by improving the quality of education and training of specialists
Cooperation with the European Union and other countries	The Government of Ukraine should actively cooperate with European partners, using the mechanisms of cooperation and exchange of experience to implement the best practices of digitization management
Encouraging digital transformation in all areas of the economy	It is important to create incentives for businesses and citizens to actively participate in digital transformation, for example by providing tax benefits, simplifying procedures for online business registration, etc.

The implementation of these measures will help Ukraine to increase the competitiveness of its economy, attract investments and ensure sustainable development in the context of global digital trends.

Lack of qualified personnel: the lack of qualified specialists in the field of information technologies and the digital economy hinders the implementation of innovations and the development of digital projects.

Insufficient legal framework and lack of regulatory norms in the field of digitization can inhibit the development of the digital economy and create legal ambiguities for

business [37]. A high level of corruption and a large number of bureaucratic obstacles can complicate the development of the digital economy and investment in digital projects. Lack of awareness and skills in the use of digital technologies among the population and enterprises can inhibit the development of the digital economy [38]. To overcome these problems, it is necessary to improve communication infrastructure, provide qualified education and training in the field of IT, develop and implement effective legislation, fight corruption and simplify business procedures, as well as promote digital literacy among the population.

Let's list the main laws of Ukraine that regulate aspects of digitization of the economy (**Table 3.7**).

◆ **Table 3.7** The main laws of Ukraine regulating aspects of digitization of the economy

Law	Characteristics
Law "About Electronic Documents and Electronic Document Management"	Establishes rules for the creation, exchange, storage and use of electronic documents, as well as regulates interaction with state authorities and organizations in the field of electronic document circulation
Law "About Protection of Personal Data"	Determines the rules of collection, storage, use and protection of personal data of citizens of Ukraine and other persons staying on its territory in electronic systems
Law "About Electronic Document Management and Amendments to Certain Legislative Acts of Ukraine Regarding the Use of Electronic Technologies"	Regulates the procedures for the exchange of electronic documents between business participants and state bodies
Law "About Electronic Interbank Payments"	Determines the rules for making electronic payments between banks and other financial institutions
Law "About Digital Transformation"	Determines the general principles of digital transformation of various sectors of the economy and stimulates the development of innovations and digital technologies

These laws establish the legal foundation for the development of the digital economy in Ukraine and regulate important aspects of digitization in various spheres of activity (**Table 3.8**).

Each of these laws is important for the regulation of the digital economy and the development of information technologies in Ukraine.

Despite the martial law, the process of digital transformation and the development of the digital economy in Ukraine continue and are actively developing. Work is underway

to create an appropriate institutional foundation for these processes and create favorable conditions for innovations in the field of management. Ukraine's participation in the "Digital Europe" program, aimed to accelerate economic recovery and digital transformation of each of the participating countries, plays a significant role in this. The study confirms the need for investment in the development and creation of digital platforms for business in the conditions of the digital economy. Particularly important areas of business management in this context are collaboration and convergence, cyber security, digital competence and the development of digital skills.

● **Table 3.8** Laws of Ukraine regulating important aspects of digitization in various spheres of activity

Law	Characteristics
About electronic communications [39]	This law regulates issues related to electronic means of communication, information transmission, protection of personal data, Internet services, etc. It contains regulations aimed at creating favorable conditions for the development of electronic communication services and ensuring the rights of individual and corporate users
About the National Informatization Program [40]	Establishes the main principles of formation and implementation of the national policy in the field of informatization of Ukraine, promotes the development of the information society, ensures the creation and development of the information infrastructure and other aspects of the country's informatization
About state support for the development of the software industry [41]	Creates legal conditions for the development of the Ukrainian software industry, promotes the creation of a favorable environment for the development of innovative technologies and support for Ukrainian IT companies
About electronic documents and electronic document circulation [42]	Establishes the legal basis for the creation, circulation and storage of electronic documents, regulates the use of electronic document circulation in state bodies and enterprises
About electronic commerce [43]	The law defines the legal basis of e-commerce in Ukraine, establishes the rules of electronic trading, liability for violations of legislation in the field of e-commerce and other important aspects of this industry

There is no doubt that by implementing best practices and management standards with digital transformation, Ukraine has the opportunity to improve its economic infrastructure and increase its competitiveness at the international level.

An important step is the adoption and implementation of standards that meet the requirements of European management practices. This will contribute to increasing the efficiency, transparency and stability of digital economy management processes. In general, the development and implementation of a strategy for adapting European digital transformation management practices in Ukraine is a step towards achieving international standards and ensuring sustainable and innovative development of the country's economy.

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