

CHAPTER 7

DEVELOPMENT OF NATIONAL ECONOMY IN THE CONTEXT OF INFORMATION AND DIGITALIZATION PROCESSES

Trokhymets O. I.

Holovko O. P.

Berezhniuk I. H.

INTRODUCTION

The digitization of modern society's demands for state mechanisms of the national economy makes it dependent on the level of access to information technologies. Economic processes on a national scale are one of the drivers of change in public administration. In order to ensure the ability to better interact with business and citizens of Ukraine, a new type of communication – e-governance – is being created. When implementing changes through information technology, the needs of all segments of the population of Ukraine and their economic activity should be taken into account.

The growing role of information technology requires the creation of a more efficient mechanism for managing the national economy of Ukraine by enhancing the ability to provide various services online, which helps to reduce the resource consumption of information. The system of electronic control of state mechanisms operates on such principles as:

- 1) social – involves transformation into more effective public relations, which is to motivate society to be more active;
- 2) organizational – facilitating the establishment of communication between the hierarchical link of state bodies, which has the effect of reducing economic costs;
- 3) presentation – overcoming the bureaucratic mechanism, creating more flexible forms of cooperation between the state and society;
- 4) public relations – the use of analytical and predictive tools to address economic, political and social aspects, implementing it for public purposes;
- 5) exemplary – receiving tools in the exercise of their rights and freedoms by society in general^{1,2}.

¹ Kolesnichenko, I.M. (2014). Rozvytok elektronnoho uriaduvannia v Ukraini: instytutionalnyi aspekt [E-Government Development in Ukraine: Institutional Aspect]. *Biznes Inform*, no 3, pp. 52–57.

Therefore, in order to stabilize the state of affairs, it is necessary to take into account all the diversity of the functioning of the country in such aspects as: economy, legislative framework and society. We need to draw our attention to The Concept of development of e-services in Ukraine, which is based on the principles of introduction of electronic services in Ukraine, such as: 1) consumer orientation; 2) access; 3) security; 4) reduction of bureaucracy; 5) databases of electronic information; 6) transparency; 7) efficiency; 8) flexibility of technologies^{3,4}.

The main obstacles in the way of digitization are high price range, multilevel of transaction services, contradictory regulatory framework, lack of human resources, scarce financial resources of the state. According to experts, the Ukrainian national economy, which suffers crisis, should receive all the money in the conditions of the budget deficit according to the mentioned expenditure items⁵.

7.1. Digitalization of national economy development

Due to the introduction of information and communication technologies (ICT), economic processes become centralized and create opportunities for efficient use of the information received. Technologies are gradually beginning to affect not only economic processes, but in general everything that is happening in the country. Integrating, information and communication technologies can affect the national economy in partially or totally, all will depend on the economic mechanisms of the national economy. Intensification through information and communication technologies in the economic processes of the national economy influences social and economic, technological, legal and cultural phenomena. Global informatization influences the globalization of the national economy and facilitates rapid access to the economic sectors through various economic instruments that have been virtualized into the

² Perevozkyin Yu. Elektronnoye pravitelstvo. Chast I: Chto. gde. pochem? [E-government. Part I: What, where, how much?]. URL: http://pc.uz/publish/doc/text38817_elektronnoe_pravitelstvo_chast_i_chno_gde_pochem (accessed: 23.04.2019).

³ Nosatov, I.K. (2017). Didzhitalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409.

⁴ Nosatov, I.K. (2017). Shliakhy rozvytku informatsiinykh tekhnolohii v konteksti stratehichnoi rozbudovy natsionalnoi ekonomiky [Ways of information technology development in the context of strategic development of national economy]. Naukovyi visnyk Khersonskoho derzhavnoho universytetu. Seriia "Ekonomichni nauky". Vyp. 22-2. Ch. 2, pp. 160–164.

⁵ Nosatov, I.K. (2017). Didzhitalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409.

information and communication environment. However, involvement of state institutions is required to correct actions on the integration of information and communication technologies^{6,7}.

Digitization is a transformation of relations in the socio-economic and socio-political processes of the national economy, accompanied by changes in all spheres of life in the country. Information technologies make it possible to increase efficiency and cause competition in all sectors of the country, to activate the processes of modernization in all economic and technological processes within the national economy. The traits of today are the public's demand for digital innovations and their use, especially in economic processes; transforming information channels for everyone involved in the economic processes of the national economy, information technologies provide their users with the opportunity to receive relevant information.

However, the development of information technology is too fast, so systems integrating technology into economic processes should be flexible about further modernization. Without innovation, the development of economic processes within the national economy will lose its competitive edge over global trends. Changes in information technology are accelerating exponentially, with the emergence of new digital platforms and devices that can affect relationships in economic processes. The main challenge for economic operators within the national economy is the impact of digital change, including the loss of control over customer relationships, increased competition and the threat of significant costs of infrastructure upgrades to interact with suppliers, partners, employees, and customers. A well-known point is a structured approach to assessing the digital maturity of a particular economic process in order to integrate new information technologies, as well as the overall interest of all parties in this integration.

To understand the challenges ahead, business entities within the national economy must develop a systematic approach and rethink their participation in the economic processes of the national economy. The convenience of using information technology is to reduce costs and accelerate interaction between all participants in the economic process.

⁶ Nosatov, I.K. (2017). Didzhitalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409.

⁷ Nosatov, I.K. (2017). Shliakhy rozvytku informatsiinykh tekhnolohii v konteksti stratehichnoi rozbudovy natsionalnoi ekonomiky [Ways of information technology development in the context of strategic development of national economy]. Naukovi visnyk Khersonskoho derzhavnoho universytetu. Seriia "Ekonomichni nauky". Vyp. 22-2. Ch. 2, pp. 160–164.

They should focus on ensuring uninterrupted rapid access to information channels that can be provided through new information technologies^{8,9}.

In order to implement this approach, flexible approaches are required, which means the use of the latest technologies, for example, for testing and staff training. Currently, information technology is rapidly expanding its information storage and delivery capacity, making digital infrastructure more efficient. One of the new areas of information technology in the future will be tools such as electronic paper that can change the future of printing and other sectors of the Ukrainian economy. The prevalence of digital channels of information, new platforms and devices are the hallmarks of the fourth generation that characterize the emergence of a new digital world¹⁰.

Most business entities are already developing measures in response to the challenge of digital change as they transition from a transaction to an “interactive” relationship with their customers. Also, part of the economic processes is being actively transformed, which should be described as after-sales service. In order to succeed in the digital world, we need to be responsible and responsive, adjusting our economic development models to new economic processes within the national economy.

This aspect requires an understanding of new perspectives available outside of traditional markets. The process of digitization offers a great opportunity to transform economic processes and activate new approaches in economic processes of the national economy.

It is necessary to distinguish the main directions of implementation of information technologies in economic processes:

- implementation of information technology to enhance potential business models (the use of automated services to expand the current services of economic entities, which reduces the cost of service and reduces the waiting time for the service itself);

- business models within the framework of information technology implementation (new non-manual services, as well as expansion of new information channels);

⁸ Nosatov, I.K. (2017). Didzhytalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409.

⁹ Nosatov, I.K. (2017). Shliakhy rozvytku informatsiinykh tekhnolohii v konteksti stratehichnoi rozbudovy natsionalnoi ekonomiky [Ways of information technology development in the context of strategic development of national economy]. Naukovyi visnyk Khersonskoho derzhavnogo universytetu. Seriia “Ekonomichni nauky”. Vyp. 22-2. Ch. 2, pp. 160–164

¹⁰ Nosatov, I.K. (2017). Didzhytalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409.

– development of a new business model or its complete change (revenue generation through the introduction of information technology through new distribution channels for economic entities).

We outline the main income models due to the active development of information technologies in the economic processes of the national economy:

1. Transaction. Traditional products that are produced and sold from one user to another through new distribution channels.

2. The power of leasing. Power is monetized in the form of human time, the presence of a machine or assets; companies can manage power through demand forecasting, customer orders and sales.

3. Licensing. Technology, brand or intangible assets licensed for periods of time that reflect the value of the original invention.

4. Subscription. The products / services that can be obtained through a subscription are usually for a certain period of time.

5. Commission. Virtual agents receive commissions (or margins) from services or selling goods to buyers, while virtual agents are scalable digital platforms.

6. Advertising. The use of media in the Internet to enhance the position of a product / service sold through electronic media.

Two factors were particularly important for the information economy. First, transparency in economic approaches has become the standard, and candidates now have access to inside information and expertise. Second, the talent competition has intensified as a result of the active introduction of information technology into economic processes and their key role in optimizing and growing economic performance. Now the publicity of economic processes is as important as their effectiveness. The implementation of this aspect in the economic activity of the subjects should be transparent and in all socio-economic relations^{11,12}.

Considering the growing role of information technology, attention should be paid to digital culture, namely its components, such as:

1. Communication. Continuous exchange of information between all participants in the economic process through new digital communication

¹¹ Nosatov, I.K. (2017). Didzhytalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409.

¹² Nosatov, I.K. (2017). Shliakhy rozvytku informatsiinykh tekhnolohii v konteksti stratehichnoi rozbudovy natsionalnoi ekonomiky [Ways of information technology development in the context of strategic development of national economy]. Naukovi visnyk Khersonskoho derzhavnoho universytetu. Seriiia “Ekonomichni nauky”. Vyp. 22-2. Ch. 2, pp. 160–164.

channels (eg, social media, blogs, wikis, forums, shared mailboxes, webcasts and videos). All participants in the economic process should focus on honest and open conversation. Companies should also consider using the communication log as a form of communication with their staff.

2. Management. Managers need to manage cultural change. Management must abandon people's creativity and employ hidden methodologies such as hackathons and design thinking. Companies need to take digital immersion courses for leadership in order to develop digital literacy¹³.

3. Visibility of change. For this reason, manuals for employees should be developed; consider the use of visualizations; change staff development paths.

4. Continuous monitoring of changes. Use tools that can track changes, such as through questioning / feedback and performance monitoring.

Today, most participants in the economic space of the national economy understand the dependency on information innovation and introduce their innovative technologies. For example, every business entity has its own website, its marketing strategy within the virtual space. Digitizing all processes is a step-by-step change that requires detailing each action due to rapid changes in information technology.

In the process of integration and use of information and communication technology the chain: “Ideology – Methodology – Technology” changes to “Methodology – Technology”. The basic values are completely offset, the tasks and goals that need to be fulfilled come first. Technologies can affect all branches of the economic process in the national economy, they should include production, marketing, sales, price characteristics, inventory management, data collection and processing, accounting and financial management^{14,15}. In today's context, information can be obtained in real-time, increasing opportunities to attract international resources for investment, accelerating capital movements and optimizing macroeconomic policies pursued at all levels of government.

¹³ Nosatov, I.K. (2017). Didzhytalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409.

¹⁴ Baranov, A., Dziuba, S. (2009). Poniattia elektronnoho uriaduvannia v Ukraini [The concept of e-governance in Ukraine]. Hromadska rada pry Derzhavnomu komiteti informatyzatsii Ukraina, hromady. orh. “Tsentr initsiatyv elektronnoho uriaduvannia”, mizhnarodnyi. Fundatsiia “Vidrodzhennia”. 2009. URL: <http://dki.org.ua/files/Concept-E-Government.doc> (accessed: 15.05.2019).

¹⁵ Preparer l'entree de la France dans la societe del'information. Programme d'action gouvernemental. URL: <http://www.epractice.-eu/document/2893> (accessed: 27.04.2019).

The level of spending on ICT is a reflection of the effect in the economic result of the national economy: 1) an increase in the country's GDP due to the emergence of a new item in the GDP structure; 2) immediate receipt of important information in economic processes; 3) adjustment of production costs due to the introduction of new software; 4) increasing the level of transparency in economic processes involving the authorities. The use of ICT, first of all, acts as a structuring tool and contributes to the empirical synthesis of economic facts¹⁶.

Simplification of economic processes at national level through the integration of ICT should be based on:

- 1) the existing scientific and technical base and the possibilities for its improvement;
- 2) mechanisms to facilitate the introduction of new ICTs;
- 3) a social environment that facilitates the implementation of ICT;
- 4) the level of openness of the national economy.

The main vector of ICT development should be the information society as a medium of implementation of new technologies in the economic processes of the national economy. In order to shape and launch new technologies, the goals of the ICT itself and the economic process in which the technology is implemented must be summarized. In practice, ICT is actively used in data analysis to identify, model and autonomize the economic process¹⁷. Ukraine's national economy is at a crossroads: becoming a commodity state or a technological state, although we have the potential to develop the technological sphere, especially ICT, but their share in the national economy of Ukraine is small. Ukraine should use the expertise of such countries as India, Ireland, South Korea, Malaysia, Taiwan, China, Singapore, Finland, Israel to bridge the digital divide by developing a strategy based on analytical data, taking into account the successful experience of implementing strategies in other countries^{18,19}.

Information and communication technologies are a factor in the intensification of economic processes and affect their regulation. In

¹⁶ Marchenko, V.V. (2016). Modernizatsiia mekhanizmu elektronnoho uriaduvannia v orhanakh vykonavchoi vlady v Ukraini [Modernization of eGovernment Mechanism in Executive Bodies in Ukraine]. *Naukovi visnyk publicnoho ta pryvatnoho prava: zb. nauk. pr.* URL: <http://www.nvppp.in.ua/vip/2016/3/34.pdf> (accessed: 25.05.2019).

¹⁷ Hlobalnaia nytyatyva po preodoleniu ynfarmatsyonnoho neravenstva [The Global Initiative to bridge the digital divide] (UNO). URL: <http://www.e-government.ru/pub/pravo/985430332.html> (accessed: 06.04.2019).

¹⁸ Blazhiievska, N., Bereza, T. Elektronnyi uriad ta informatyzatsiia orhaniv derzhavnoi vlady [Electronic Government and Informatization of Public Authorities]. URL: <http://www.pravo.org.ua/word/50.dos> (accessed: 15.05.2019).

¹⁹ Hlobalnaia nytyatyva po preodoleniu ynfarmatsyonnoho neravenstva [The Global Initiative to bridge the digital divide] (UNO). URL: <http://www.e-government.ru/pub/pravo/985430332.html> (accessed: 06.04.2019).

particular, conditions are created for the further growth of economic indicators of the national economy, but it is necessary to understand the complexity of the introduction of information and communication technologies in the tactical and strategic vision of the development of Ukraine, in particular its economic potential.

7.2. Areas of development of the national economy in the conditions taking into account the use of ICT

In 2011, Ukraine joined the OGP initiative to introduce standards of openness and transparency of government action, which can have a positive impact on the economic performance of Ukraine's national economy. If the Government of Ukraine's initiatives are implemented through information technology, a single system will be created that will include all authorities, which will enhance information sharing. It is also necessary to include in this system such elements of state and commercial activities of the national economy as e-democracy, e-government, e-services, e-commerce²⁰.

The economic component of information technology is the accumulation of knowledge, which restraint is almost impossible to influence in today's environment. An essential indicator of information technology for the national economy is the level of recovery: information technology generations change every 3-5 years. It is thanks to the knowledge that is accumulated and actively used in information technologies that the capacity of adaptation systems to the external and internal factors of the national economy is increased²¹.

²⁰ Blazhiievska, N., Bereza, T. Elektronnyi uriad ta informatyzatsiia orhaniv derzhavnoi vldy [Electronic Government and Informatization of Public Authorities]. URL: <http://www.pravo.org.ua/word/50.dos> (accessed: 15.05.2019); Hlobalnaia ynytsyatyva po preodoleniu ynformatsyonnoho neravenstva [The Global Initiative to bridge the digital divide] (UNO). URL: <http://www.e-government.ru/pub/pravo/985430332.html> (accessed: 06.04.2019); Zghurovskyi, M.Z., Yakymenko, Yu.I., Tymofiev, V.I. (2002). Informatiini merezhevi tekhnologii v nauksi i osviti [Information network technologies in science and education]. Systemni doslidzhennia ta informatiini tekhnologii, no 3, pp. 43–56; Kolesnichenko, I.M. (2014). Rozvytok elektronnoho uriaduvannia v Ukraini: instytutsionalnyi aspekt [E-Government Development in Ukraine: Institutional Aspect]. Biznes Inform, no 3, pp. 52–57; Smolinskyi, V., Khomka, V. (2012). Kompiuterni tekhnologii yak chynnyk pidvyshchennia innovatsiinoho potentsialu ahrarnykh pidpriemstv [Computer technology as a factor in increasing the innovative potential of agricultural enterprises]. Naukovyi visnyk NLTU Ukrainy. Vyp. 22.7, pp. 355–360; Silenko, A. (2007). Informatiini tekhnologii – novyi impuls dlia poshuku paradyhmy maibutnoho suspilstva [Information technology is a new impetus for the paradigm of the future society]. Politychnyi menedzhment. No 3, pp. 96–112.

²¹ Blazhiievska, N., Bereza, T. Elektronnyi uriad ta informatyzatsiia orhaniv derzhavnoi vldy [Electronic Government and Informatization of Public Authorities]. URL: <http://www.pravo.org.ua/word/50.dos> (accessed: 15.05.2019); Danylian, O.H., Dzoban, O.P. (2012). Dosvid stvorennia elektronnoho uriadu u Frantsii ta mozhlyvosti yoho vykorystannia v Ukraini [Experience in establishing eGovernment in France and how it can be used in Ukraine]. Hileia : nauk. visn. Kyiv. Vyp. 58. No. 3, pp. 669–674; Pokhylo, I.D. (2016). Svitovyi dosvid vprovadzhennia e-urriaduvannia [Worldwide

According to international experience, electronic government implies e-government. Some scientists believe that this is communication between public authorities and citizens through the Internet. Others interpret it as providing online administrative services to public authorities. In our opinion, e-government provides for the presence of all these components.

The leading countries in the integration of e-government are the United States, Denmark, Canada, Finland, Australia. Many countries have plans to develop information technology in e-governance. For example, India relies on the development of knowledge, information systems, information and communication technologies in government processes. In the integration of information technology into government, countries such as Canada (68%) and the United States (62%) occupy the first place; Denmark and Singapore – 56% each; Australia, France, Japan – 55% each, but in Portugal these services account for 34%, in the Republic of South Africa – 22%, Brazil – 17%²².

Digitization of economic processes and national economy acts (Fig. 1) as an implementation of measures to change relations between economic entities, the state and citizens of Ukraine.

Significantly increasing the importance of the principles that implement digitization in the economic processes of the national economy of Ukraine, since they depend on the level of collaboration of all participants in this process. However, one should not forget about the presence of factors (characteristics of the information sector of the national economy, state mechanisms) and obstacles that may arise in the transformation of economic processes by information technologies that form the basis of the national economy of Ukraine.

experience in implementing e-governance]. Instytut sotsialno-humanitarnykh nauk VNTU. URL: <https://conferences.vntu.edu.ua/index.php/e-democracy/edemocracy2016/paper/viewFile/1714/1399> (accessed: 23.04.2019); Preparer l'entree de la France dans la societe del'information. Programme d'action gouvernemental. URL: <http://www.epractice.eu/document/2893> (accessed: 27.04.2019).

²² Danylian, O.H., Dzoban, O.P. (2012). Dosvid stvorennia elektronnoho uriadu u Frantsii ta mozhyvosti yoho vykorystannia v Ukraini [Experience in establishing eGovernment in France and how it can be used in Ukraine]. Hileia : nauk. visn. Kyiv. Vyp. 58. No. 3, pp. 669–674; Elektronnyi uriad Frantsii: kilka harnykh prykladiv [The eGovernment of France: some good examples]. URL: <http://idcorner.org/2005/03/18/e-government-infranceseveral-good-architecture-principles-and-one-oddiy/> (accessed: 25.05.2019); Nosatov, I.K. (2017). Didzhytalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409; Osoblyvosti dii elektronnoho uriadu [Features of eGovernment]. URL: <http://www.epractice.eu/resource/730> (accessed: 23.04.2019); Foray D., Ark B. Van. Smart Specialisation in a truly integrated research area is the key to attracting more R&D to Europe. Knowledge Economists Policy Brief. 2007. No 1 (European Commission, Brussels); Preparer l'entree de la France dans la societe del'information. Programme d'action gouvernemental. URL: <http://www.epractice.eu/document/2893> (accessed: 27.04.2019).

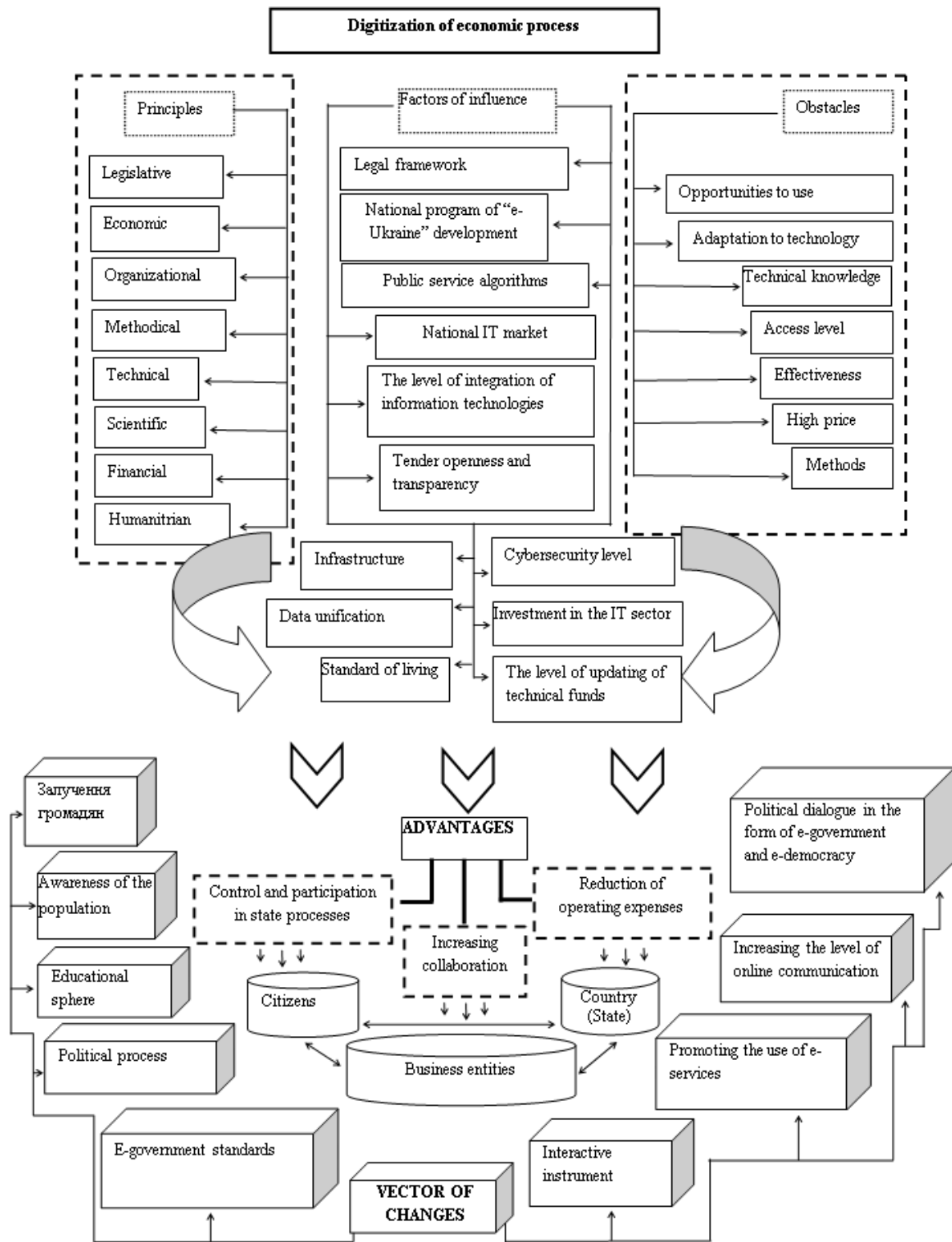


Fig. 1. Digitization of the economic process²³

²³ Nosatov, I.K. (2017). Didzhytalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. Menedzhment KhKhI stolittia: hlobalizatsiini vykylyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon, pp. 401–409; Nosatov, I.K. (2017). Shliakhy rozvytku informatsiinykh tekhnolohii v konteksti stratehichnoi rozbudovy natsionalnoi ekonomiky [Ways

The main advantages of digitization are more effective involvement of citizens in control and participation in economic processes of the national economy, increased collaboration between the state, citizens and business entities and reduction of operating expenses, which will significantly affect the state budget of the state through the use of funds for other urgent needs.

Therefore, the main vector of change will be the following: awareness of the population, activation of civic participation in state-building processes, educational sphere, political process, active use of e-services, increased level of communication, changes in approaches to democratic dialogue between all participants of economic processes of the national economy through the use of tools digitization.

According to the digital agenda, the main trends of economic processes of:

1. Data that is the main source of competitiveness. Collecting, describing, storing and processing data allow to obtain the proper information for optimal economic relations, to establish socio-economic and socio-political relations. The main access to the data is through the Internet, many data are open.

The main obstacles to the development of this trend in the economic processes of the national economy are: lack of a system of rules, regulations, standards for the collection, classification, storage and use of data (national, regional, sectoral and other levels); problems of protection of intellectual property; data protection issues, cybersecurity risks; lack of competencies in data management (digital skills), relevant education, professions, etc.

Opportunities for Ukraine: development of a new branch of the economy, new jobs; creating a base for the development of other industries and the “digital” economy; the emergence of an effective management tool; creation of an environment that prevents corruption as a phenomenon²⁴.

2. Development of the “Internet of Things” sphere. This trend is characterized by the interaction between physical objects or devices that have sensors, as well as software that enables them to work and communicate on the Internet. The approach based on the concept of the Internet of Things provides an opportunity to increase socio-economic and

of information technology development in the context of strategic development of national economy]. *Naukovyi visnyk Khersonskoho derzhavnoho universytetu. Seriya “Ekonomichni nauky”*. Vyp. 22-2. Ch. 2, pp. 160–164.

²⁴ Tsyfrova adzhenda Ukrainy – 2020 [Digital Agenda of Ukraine – 2020]. URL: <https://uccr.org.ua/uploads/files/58e78ee3c3922.pdf> (accessed: 23.04.2019).

socio-political indicators of life of Ukrainian citizens, as well as to optimize the work of the public service, utilities and reduce production costs. An estimated estimate of devices working with the Internet will be 30 billion devices by 2020, with a global investment of 24 trillion USD²⁵.

This fact testifies to the creation of a new market for products and services through the active use of artificial intelligence and machine learning, as the ability to use new tools in business processes and measure new workforce in the near future is increasing.

The main obstacles hindering the development of the Internet of Things:

- lack of information on the latest technologies that will help reduce costs and increase efficiency; low R&D, development, innovation, and existing startups are, in most cases, focused solely on foreign markets in terms of commercialization and jurisdiction;

- low level of adaptation of modern education to modern inquiries as a result of specialists and engineers in the field of “Internet of things”.

The opportunities created by the new sphere of the Internet of Things within the national economy include: improving the efficiency of the SME sector, etc.; incremental transformational innovations, development of relevant world-class products by Ukrainian companies; increase of efficiency of production, business organization, logistics, transport²⁶.

3. Digitalization or digital transformation. The transformation of modern economic processes and the transition from the industrial economy to the information are taking place. These processes of transformation of economic processes within the national economy form new essence and purpose of values (for example, Uber, Airbnb, digital banking, etc.). The active use of outsourcing services when developing new products and business services, manufacturing and rapid prototyping gives small companies the opportunity to develop new products and compete with large companies. Transformation processes have shifted centers of innovation from large companies to small ones.

The main barriers to the development of economic processes in the context of digital transformation: lack of government support and adequate infrastructure to develop innovative businesses and entrepreneurship; the lack of a clear vector of national systems development and infrastructure

²⁵ Tsyfrova adzhenda Ukrainy – 2020 [Digital Agenda of Ukraine – 2020]. URL: <https://ucci.org.ua/uploads/files/58e78ee3c3922.pdf> (accessed: 23.04.2019).

²⁶ Tsyfrova adzhenda Ukrainy – 2020 [Digital Agenda of Ukraine – 2020]. URL: <https://ucci.org.ua/uploads/files/58e78ee3c3922.pdf> (accessed: 23.04.2019).

support for the digital transformation of the national economy; lack of mechanisms to stimulate and motivate the development of innovation, in particular in small and medium-sized enterprises.

The opportunities created by this trend for Ukraine: improving the competitiveness of the economic sectors; development of digital economy, labor market, etc.; the emergence of new industries (cross-platform with digital industry); the spread of innovative entrepreneurship.

4. Dissemination of business models built on the ideology of a shared economy. Economic processes are changing their approaches as a result of new economic relationships with the integration of information technology. Due to the use of “shared” sites, it is possible to quickly implement and commercialize ideas in material and technical constraints available to most companies.

Trendy opportunities for Ukraine: easy start-up of new businesses as it does not require large start-up costs; development of service models, impact on the efficiency and competitiveness of Ukrainian business without significant investment; opportunities for business beginners; rapid launch of commercial Internet projects, creation of new marketplace, expansion of consumption markets of Ukrainian products, services and labor resources, commercial globalization²⁷.

5. Virtualization of physical infrastructure IT-systems and transition to service models. With the boom of intellectualization, it is possible to reduce the capital cost of creating digital infrastructure using “cloud services” of technology and software-defined architecture. This technology makes it possible to use computing capabilities and services by paying only for this service. Cloud service clients have full access to certain services time they paid; all information is protected on a technological basis.

Opportunities for Ukraine: Businesses, enterprises, government agencies and citizens have the ability to quickly and cheaply deploy the necessary digital infrastructure and take advantage of the digital world; effectively build the country's digital infrastructure as a basis for the digital economy²⁸.

In order to develop the national economy with the help of information technologies it is also necessary to focus efforts on the following areas of cooperation:

²⁷ Tsyfrova adzhenda Ukrainy – 2020 [Digital Agenda of Ukraine – 2020]. URL: <https://ucco.org.ua/uploads/files/58e78ee3c3922.pdf> (accessed: 23.04.2019).

²⁸ Tsyfrova adzhenda Ukrainy – 2020 [Digital Agenda of Ukraine – 2020]. URL: <https://ucco.org.ua/uploads/files/58e78ee3c3922.pdf> (accessed: 23.04.2019).

1. Interoperability and eServices. It is important to become an active participant in the EU Interoperability Solutions for European Public Administrations 2 (ISA2) program, e-CODEX, e-Invoicing projects and the Single Digital Gateway initiative. At present, economic relations within the framework of electronic interaction between state information resources and the development of interoperability are a major challenge for all participants in the informatization of socio-economic and socio-political relations. A positive indicator of state participation in European programs is the CMU resolution “Some Issues of Electronic Interaction of State Electronic Information Resources” aimed at integrating systems of electronic interaction between public authorities, electronic systems and resources and providing access to full interaction in accordance with EU requirements, and namely European Interoperability Framework 2.0. Active participation in ISA2, e-CODEX and e-Invoicing will provide an opportunity to meet the modern requirements of the European Union (formats, standards, regulations, technical solutions) and accelerate the country's European integration.

2. Electronic eID identification, introduction of new eIDAS regulations, international electronic identification and authentication, active participation in the EU Stork 2.0 project. The development of secure accessible and convenient electronic identification is the primary purpose of the introduction of electronic e-commerce services. It will also help accelerate the development of a new economy through the introduction of information technology. The Secure idenTity acrOss project boRders linKed 2.0 (Stork 2.0) provides an opportunity to create a single EU-wide e-authentication and authentication environment. The project aims at creating standards, formats, identifiers, etc. for the integration of interoperable electronic identification tools, in particular in the fields of e-medicine, e-public services, e-banking, and the development of EU Digital Single Market, implementation of cross-border interaction.

3. Open Data. In January 2016, the first version of the state web portal data.gov.ua was launched to provide a roadmap approved in February 2016 and for 41 tasks in 5 directions. It provides an opportunity to develop an EU open data policy, the only high standards for open data²⁹.

Information technologies create great opportunities for the national economy and enable the improvement of various economic processes.

²⁹ Tsyfrova adzhenda Ukrainy – 2020 [Digital Agenda of Ukraine – 2020]. URL: <https://ucci.org.ua/uploads/files/58e78ee3c3922.pdf> (accessed: 23.04.2019).

Information technologies change relationships in different sectors of the economy and stimulate their convergence. As a key to economic growth, information technology enhances the potential for investment in innovation and new technology.

CONCLUSIONS

Today, the economic state of the country is characterized by the response of the information society to the change and improvement of the information industry, which should include the telecommunications, computer, electronic, audiovisual and other areas, which are inherent in technological convergence. Right now, the information industry is affecting all sectors of the national economy and the state's overall competitiveness with respect to other national economies.

Thus, the main components that can affect the functioning of the virtual space within the national economy are development strategies, business management models, tools for improving efficiency and flexibility, information infrastructure, new services, increasing customer loyalty and regulatory policies for Internet service providers. The information industry was the first to experience the emergence of a crisis in the economy, leading various companies to modernize information technology and reduce jobs.

In the economic space of the state, only those companies that actively implemented information technology remained, thus increasing the company's ability to work effectively in the economic environment of the national economy. The main elements that have increased efficiency in the economic environment of the state have been developed strategy, flexible model of enterprise management and carefully planned processes of major activities. Also, do not forget about information technology, where the use of multi-component information systems has become the main effective tool.

Every day, the competitive environment in the economic space of Ukraine is growing due to the widespread increase in the tools of all subjects of economic activity of information technologies. The emergence of the digital economy opens up new opportunities to computerize all sectors of the economy and ensure their competitiveness.

The new economy must focus on competition in the future, the ability to create new products or services with high quality and lower cost. Digitization of new products and services, e-business and electronic means, payments are the keys to success. The national economy of Ukraine is in

the fourth stage of its development – the digital economy. On the basis of the formed strategy in the form of a model the components that are of permanent importance for the effective involvement of human resources as the main element of determining the effectiveness of actions of the private and public sectors on the national economy of Ukraine, implementing information technologies in all economic processes.

The dominant principle is the basis of digitization in the economic processes of the national economy, since they depend on the level of collaboration of all participants in this process. The obstacles that may arise in the process of transformation of economic processes under the influence of information technologies can change the basis of the national economy of Ukraine.

It was found that the state of the information technology market is flexible and differentiated and is influenced by many factors. Big changes in information technologies are accompanied by transformation processes in the Ukrainian economy.

REFERENCES

1. Baranov, A., Dziuba, S. (2009). Poniattia elektronnoho uriaduvannia v Ukraini [The concept of e-governance in Ukraine]. Hromadska rada pry Derzhavnomu komiteti informatyzatsii Ukraina, hromady. orh. “Tsentri initsiatyv elektronnoho uriaduvannia”, mizhnarodnyi. Fundatsiia “Vidrodzhennia”. 2009. URL: <http://dki.org.ua/files/Concept-E-Government.doc> (accessed: 15.05.2019).
2. Blazhiievska, N., Bereza, T. Elektronnyi uriad ta informatyzatsiia orhaniv derzhavnoi vlady [Electronic Government and Informatization of Public Authorities]. URL: <http://www.pravo.org.ua/word/50.dos> (accessed: 15.05.2019).
3. Hlobalnaia ynytsyatyva po preodoleniu ynformatsyonnoho neravenstva [The Global Initiative to bridge the digital divide] (UNO). URL: <http://www.e-government.ru/pub/pravo/985430332.html> (accessed: 06.04.2019).
4. Danylian, O.H., Dzoban, O.P. (2012). Dosvid stvorennia elektronnoho uriadu u Frantsii ta mozhlyvosti yoho vykorystannia v Ukraini [Experience in establishing eGovernment in France and how it can be used in Ukraine]. *Hileia : nauk. visn. Kyiv*. Vyp. 58. No. 3, pp. 669–674.
5. Elektronnyi uriad Frantsii: kilka harnykh prykladiv [The eGovernment of France: some good examples]. URL: <http://idcorner.org/>

2005/03/18/e-government-infranceseveral-good-architecture-principles-and-one-oddity/ (accessed: 25.05.2019).

6. Zghurovskiy, M.Z., Yakymenko, Yu.I., Tymofieiev, V.I. (2002). Informatsiini merezhevi tekhnolohii v nauksi i osviti [Information network technologies in science and education]. *Systemni doslidzhennia ta informatsiini tekhnolohii*, no 3, pp. 43–56.

7. Kolesnichenko, I.M. (2014). Rozvytok elektronnoho uriaduvannia v Ukraini: instytutsionalnyi aspect [E-Government Development in Ukraine: Institutional Aspect]. *Biznes Inform*, no 3, pp. 52–57.

8. Koliadenko, S.V. (2016). Tsyfrova ekonomika: peredumovy ta etapy stanovlennia v Ukraini i u sviti [The Digital Economy: Prerequisites and Stages of Formation in Ukraine and in the World]. *Ekonomika. Finansy. Menedzhment: aktualni pytannia nauky i praktyky*, no 6, pp. 105–112.

9. Marchenko, V.V. (2016). Modernizatsiia mekhanizmu elektronnoho uriaduvannia v orhanakh vykonavchoi vlady v Ukraini [Modernization of eGovernment Mechanism in Executive Bodies in Ukraine]. *Naukovyi visnyk publicznego ta pryvatnoho prava: zb. nauk. pr.* URL: <http://www.nvppp.in.ua/vip/2016/3/34.pdf> (accessed: 25.05.2019).

10. Nosatov, I.K. (2017). Didzhytalizatsiia upravlinnia za umov zmin natsionalnoi ekonomiky Ukrainy v hlobalizatsiinykh protsesakh [Management digitization in the context of changes in the national economy of Ukraine in globalization processes]. *Menedzhment KhKhI stolittia: hlobalizatsiini vyklyky : monohrafiia / za red. I.A. Markinoi. Poltava : Simon*, pp. 401–409.

11. Nosatov, I.K. (2017). Shliakhy rozvytku informatsiinykh tekhnolohii v konteksti stratehichnoi rozbudovy natsionalnoi ekonomiky [Ways of information technology development in the context of strategic development of national economy]. *Naukovyi visnyk Khersonskoho derzhavnoho universytetu. Seriiia "Ekonomichni nauky". Vyp. 22-2. Ch. 2*, pp. 160–164.

12. Osoblyvosti dii elektronnoho uriadu [Features of eGovernment]. URL: <http://www.epractice.eu/resource/730> (accessed: 23.04.2019).

13. Perevozkyn Yu. Elektronnoye pravitelstvo. Chast I: Chto. gde. pochem? [E-government. Part I: What, where, how much?]. URL: http://pc.uz/publish/doc/text38817_elektronnoe_pravitelstvo_chast_i_cho_gde_pochem (accessed: 23.04.2019).

14. Pokhylo, I.D. (2016). Svitovyi dosvid vprovadzhennia e-uriaduvannia [Worldwide experience in implementing e-governance].

Institut sotsialno-humanitarnykh nauk VNTU. URL: <https://conferences.vntu.edu.ua/index.php/e-democracy/edemocracy2016/paper/viewFile/1714/1399> (accessed: 23.04.2019).

15. Smolinskyi, V., Khomka, V. (2012). Kompiuterni tekhnolohii yak chynnyk pidvyshchennia innovatsiinoho potentsialu ahrarnykh pidpryiemstv [Computer technology as a factor in increasing the innovative potential of agricultural enterprises]. *Naukovyi visnyk NLTU Ukrainy*. Vyp. 22.7, pp. 355–360.

16. Silenko, A. (2007). Informatsiini tekhnolohii – novyi impuls dlia poshuku paradyhmy maibutnoho suspilstva [Information technology is a new impetus for the paradigm of the future society]. *Politychnyi menedzhment*. No 3, pp. 96–112.

17. Tsyfrova adzhenda Ukrainy – 2020 [Digital Agenda of Ukraine – 2020]. URL: <https://ucci.org.ua/uploads/files/58e78ee3c3922.pdf> (accessed: 23.04.2019).

18. Foray D., Ark B. Van. Smart Specialisation in a truly integrated research area is the key to attracting more R&D to Europe. *Knowledge Economists Policy Brief*. 2007. No 1 (European Commission, Brussels).

19. Preparer l'entree de la France dans la societe dell'information. Programme d'action gouvernemental. URL: <http://www.epractice.eu/document/2893> (accessed: 27.04.2019).

Information about the author:

Trokhymets O. I.

Doctor of Economics, Professor,
Professor at the Department of National Economy,
Marketing and International Economic Relations,
Classic Private University, Ukraine

Holovko O. P.

Senior Research Scholar,
Department of Macroeconomics and Public Administration,
Black Sea Research Institute
of Economy and Innovation, Ukraine

Berezhniuk I. H.

Doctor of Economic Sciences, Professor,
University of Customs and Finance, Ukraine