

The system of economic processes in conjunction with digital technology

Akimov S.S.

Orenburg State University

Federal Scientific Center for Biological Systems and Agrotechnologies of the Russian Academy of Sciences

Orenburg, Russia

sergey_akimov_work@mail.ru

Abstract — The aim of this work is to display the structure of economic processes in their relationship with digital technologies. The study provides a literature review and analysis of economic processes and their transformation in connection with the development of digital technologies and the transition to a digital economy. It is shown that a number of economic processes underwent significant changes in the transition to a digital economy. The paper displays the key digital technologies and their impact on specific economic processes at the enterprise level, among which external processes are highlighted, namely marketing research, investing and attracting investment capital, advertising, organization of settlements with customers, delivery of goods, as well as accounting policies and analysis performance indicators, production processes, and management. Digital technologies are represented by communications, data storage, and protection technologies, their analysis, and control technologies.

Keywords — economic processes, digital technologies, process interconnection system

I. INTRODUCTION

The development of the digital economy today is one of the priority tasks and has priority not only in Russia but also in the world. The rapid growth of information and network technologies left a peculiar imprint on the global development of society, opening up unprecedented prospects. The widespread use of digital technology has allowed us to discover completely new forms of relationships, among which economic relations are quite significant.

The digital economy, having arisen only a few years ago, has become not only a means of realizing relations between economic entities, but also a system for assessing the development of global and local economies and their compliance with the current technological level.

Speaking in a similar role, the digital economy turns out to be a kind of state development level, making it possible to assess the place of each of the countries in the global digitalization of economic relations. The degree of assessment of the digitalization of the economy can be defined as the penetration of digital technologies into economic processes. However, before conducting the assessment, it is necessary to reflect the interconnected structure of economic processes and digital technologies.

Therefore, the aim of this work is to display the structure of economic processes in their relationship with digital technologies.

II. MATERIALS AND METHODS

The basis of this study is content analysis, made in the form of a review of literature on this topic. Preference was given to both domestic and foreign researchers in the field of the development of the digital economy and the transformation of economic processes. The methods of formal logic made it possible to identify the key points displayed by the authors in their works, and visualizing the results in the form of the final scheme of the developed system allows us to more clearly display the totality of the studies.

III. RESULTS AND DISCUSSIONS

At the beginning of the study, we turn to those authors who examined various economic processes through the prism of digital technology.

Y.A. Kuznetsov, V.I. Perova, D.S. Semikov called the main factor in the development of the digital economy the dynamics of the application of information and communication technologies, the analysis of which they put in the foreground [9]. In their work, the evaluation criteria are regional indicators of infocommunication: use of the Internet in organizations; organizations having a website; the number of personal computers per 100 employees; information and communication technology costs; the use of electronic document management in organizations.

A different approach is formulated by V.P. Kupriyanovsky et al. [11]. In its work, based on the use of digital technology in the UK, the key aspects of which were the costs of science, education and information technology plan. Moreover, it is noted that “in this sector, the organizations mentioned above have already managed to create good conditions for the implementation of roadmaps (plans) of innovations, an open and competitive market, a good copyright regime, a strong business and legal environment” [11].

L.I. Malyavkina does a broad review of information systems and technologies of the digital economy based on the transformation process [12]. The paper notes that the companies of the future include “mobile, fast-growing businesses with a flexible structure, focused on realizing their key competencies through the use of advanced digital technologies and platforms” [12]. Among the key technologies named artificial intelligence, machine learning, big data, cloud technology and many others.

A fairly similar opinion in her work expresses Ya.V. Trofimova [17]. Studying modern technologies of minimizing losses in the field of insurance, the author points out the

importance of personalizing sales, where on-line technologies, contextual search and artificial intelligence methods are of paramount importance, ensuring the maximum satisfaction of each client's needs. At the same time, there is a noticeable transition from niche strategies to more global ones, which reflects both globalization and the deglobalization of the digital economy.

Characterization of key digital technologies from the point of view of state tasks is given in the work of M.S. Sozykina [15]. In her work, it is noted that for the time being, "... leading fundamental research aimed at developing and developing methods for the formation of highly intelligent digital platforms, technologies for accumulating knowledge and enhancing the level of competence of intelligent systems, methods, and technologies of artificial intelligence, as well as goal-setting methods when choosing in intelligent systems of new goals of behavior"[15].

Foreign authors can observe similar trends. For example, in the work of M. Anand three key directions are formulated in the development of modern digital enterprises, which have on their own basis data analytics based on knowledge bases and artificial intelligence [2].

N. Lane notes in his work that currently, in anticipation of a new round of development, there is an increase in the economic value of data and activities for their support, indicating that it is the support technologies that are the key technologies for the development of a new, digital form of the economy [4].

C. Fuchs says that information and communication technologies are not only the main aspect of the development of the digital economy, but also a means of measuring it, offering to evaluate the contribution of each specific technology to the economy of different countries [3].

Thus, the review, on the one hand, shows the fragmentation of approaches to the relationship of the development of digital technologies with economic processes, but on the other hand provides the basis for the development of a comprehensive system that takes into account the overall development of digital technologies. However, a significant drawback is the fact that the criteria for evaluating the development system of the digital economy also remain a debatable issue [1].

Next, we will consider in more detail individual economic processes and their transformation in connection with the transition to a digital economy.

Digitalization of the economy was marked by the emergence of new types of advertising, distributed through new communication technologies, previously inaccessible. This includes contextual advertising, SEO tools, newsletters, targeting and much more. These technologies allow both to significantly expand the reach of the audience, and to choose the most suitable set of products [10].

One of the first directions in the development of digital technologies in the field of economics was settlements with counterparties in electronic mode. Simplification of the settlement procedure leads to instant execution of transactions, and a database system that allows you to perform various checks of counterparties by searching for information in the relevant registers for unreliability, ensures high security of electronic settlements [19].

One of the key tasks of each enterprise organizing its work in accordance with tax legislation, as well as necessary for

investors and management, is accounting. Accounting technologies in the transition to the digital economy have also undergone significant changes. Obviously, the inevitable digitalization of all accounting processes of an enterprise should, first of all, be aimed at creating adaptive information support for management processes that could be able to tune to the rapidly changing needs of the external environment. Support for management processes should occur when using modern technology tools and data processing methods [18].

The conditions for the transition to the digital economy gave an impetus to the development of all key business areas. O.A. Afanasyev, considering marketing problems in the new conditions, touched the elements of its digitalization [8]. In particular, communication channels such as content marketing, social networks, and mobile commerce technologies have recently become the foundations of marketing preferences. All these channels are based on new technological solutions based on digital technologies.

A significant amount of modern digital technologies in the field of enterprise economics is considered in the work of N.Yu. Surova and S.A. Bezdelova [16]. In particular, using a rating score and logical analysis methods, these authors identified various digital technologies that have a key influence in assessing the activities of an enterprise, among which are analysis and storage of data, their protection, control and communication technologies [16].

The key moment in the work of any enterprise is its production processes. Currently, the most significant elements of the digital economy in production processes are the development and implementation of cyberphysical systems that have an inseparable connection between the computing and physical elements within them with integrated technology for interaction between them and the environment, which minimizes human participation in production processes [14]. It should be noted that in the development of the digital economy, which is based on knowledge and high technologies, the goals and strategies of the production activities of business entities are significantly changing [13]. Losing sight of strategies aimed at obtaining an intermediate, quick profit, the first place in the digital economy is maximization of the production of the total added value of goods, among which the technologies focused on lean manufacturing occupy a key place [7].

Management issues in the digital economy are also not neglected. The opinion of scientists is inclined to the fact that in the era of global digital development, the control system will become cognitive [5]. The key features in cognitive management is the continuity of the learning process, through the use of accumulated experience, and its application in various economic situations.

Investment processes in the modern world, with the development of global digital technologies, have undergone significant changes, receiving new impulses for development. This is seen in the development and widespread dissemination of financial and communication platforms for investors and investment projects. Such development greatly facilitates the search for investors and, accordingly, to attract investments, since financial platforms are designed not only to provide communication between investors and entrepreneurs, but also to complete transactions in electronic form by conducting transactions in a network mode [6].

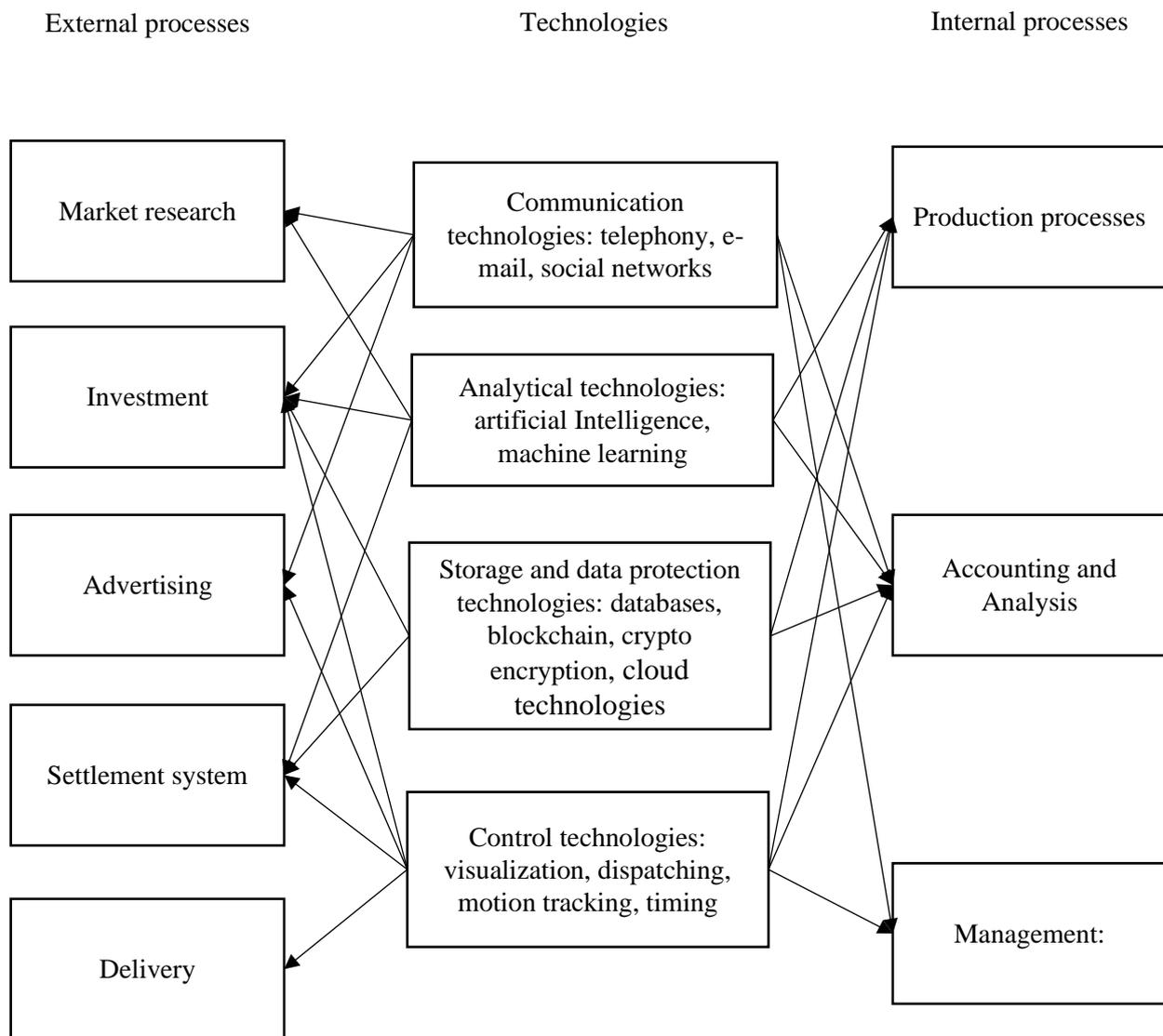


Fig 1. The system of economic processes in conjunction with digital technology

IV. CONCLUSIONS

Thus, after analyzing the publications listed, it is possible to form a certain system of indicators that reflects the main economic processes taking place at each commercial enterprise. The combination of these processes and their transformation to digital conversion allows us to determine the main elements and directions of technology development in their relationship with the elements of the functioning of the enterprise.

Economic processes should be divided into external and internal. The fundamental importance of this separation is that the internal environment of the enterprise contains processes that are significantly different in technological terms from the processes of the external environment.

The basis of the study of economic processes of the external environment is the use of the life cycle of an enterprise, namely such processes as market research, attracting investment, advertising, settlements with customers and delivery of goods, in view of the fact that entrepreneurship in the digital economy

has a bright focus on e-commerce. We assign the production processes to the internal environment of the enterprise, where it is necessary to add such as analysis and accounting, as well as management.

As a result of the study, the totality of economic processes in their relationship with digital technologies can be reduced to the following system (Figure 1).

Thus, a review and analysis of literary sources revealed the key economic processes taking place in the enterprise, as well as a number of digital technologies that have certain relationships with these processes.

Acknowledgment

This research was conducted within the scientific project (Project No. 0761-2019-0004).

References

- [1] Akimov, S.S. Business process modeling within the digital economy development framework [Electronic resource] / S.S. Akimov // Modern

- Management Trends and the Digital Economy: from Regional Development to Global Economic Growth (MTDE 2019) : Proceedings of the 1st International Scientific, 14-15 Apr. 2019, Yekaterinburg, Russia. - Electronic data. - Paris : Atlantis Press, 2019. - Vol. 81. - P. 262-267.
- [2] Anand M. Analytics: Fueling The Digital Economy. Digitalist magazine. Access mode: <https://www.digitalistmag.com/future-of-work/2017/02/06/analytics-fueling-digital-economy-04889429> (circulation date: 03/10/2019).
- [3] C. Fuchs The implications of new information and communication technologies for sustainability // *Environ Dev Sustain* (2008) 10:291–309 DOI 10.1007/s10668-006-9065-0.
- [4] [4] N. Lane Advancing the Digital Economy into the 21st Century // *Information Systems Frontiers* 1: 3, 317-320 (1999)
- [5] [5] N.M. Abdikeev Cognitive management technologies in the digital economy. The world of the new economy. 2017. No. 3. P. 24-28.
- [6] Akimov, S.S. The relationship of the development of the digital economy and investment activities / S.S. Akimov // *Management of economic systems*. - 2018. - No. 12. - p. 6.
- [7] S.S Akimov., V.A. Tripkosh Production processes in a value stream map. In the compilation: Actual problems of economic activity and education in modern conditions Collection of scientific papers of the Thirteenth International Scientific and Practical Conference. 2018. P. 235-239.
- [8] O.A. Afanasyev The use of digital communications technology in marketing in the transition to a digital economy. *Alley of science*. 2017. V. 2. No. 16. P. 62-66.
- [9] Yu.A. Kuznetsov, V.I. Perova, D.S. Semikov Information and communication technologies as a factor in the development of the digital economy in the Russian Federation. *Bulletin of the Nizhny Novgorod University named after N. Lobachevsky. Series: Social sciences*. 2017. No. 4 (48). P. 38-47.
- [10] T.A. Kuzovkova, T.Yu. Salyutina, O.I. Sharavova Transformation of tasks and indicators of the statistics of info-communications in the context of the digital development of the economy and society. *Methodological issues of teaching infocommunications in higher education*. 2018. V. 7. No. 4. P. 9-16.
- [11] V.P. Kupriyanovsky, S.A. Sinyagov, D.E. Namiot, A.P. Dobrynin, K.Yu. Chernykh Information technology in the system of universities, science and innovation in the digital economy as exemplified by the UK. *International Journal of Open Information Technologies*. 2016. V. 4. No. 4. P. 30-39.
- [12] L.I. Malyavkina Information systems and technologies of the digital economy: modern trends. Education and science without borders: fundamental and applied research. 2018. No. 8. P. 123-127.
- [13] R.V. Okorokov, A.V. Zadorozhny The effectiveness of the use of intelligent technologies in domestic energy. Saint-Petersburg: Publishing house Polytechnic. University, 2015. - 230 p.
- [14] R.V. Okorokov, A.A. Timofeeva Effective management of industrial enterprises based on digital economy technologies. *Modern trends in the development of science and technology*. 2017. No. 3-13 (24). P. 107-111.
- [15] Sozykina M.S. Information technology in the digital economy. *Academy*. 2019. No. 1 (40). P. 34-35.
- [16] N.Yu. Surova, S.A. Bezdelov New technologies for the economy of the future: rating of projects and regulatory mechanisms in the digital economy. *Academy Herald*. 2018. No. 1. P. 5-9.
- [17] Ya.V. Trofimova Modern technology to minimize losses in the digital economy. *Bulletin of USTU. Science, education, economics. Series: Economy*. 2018. No 2 (24). P. 40-45.
- [18] S.L. Shatrov Accounting technologies of the digital economy. *Transport services market (problems of increasing efficiency)*. 2018. No. 1 (11). P. 64-73.
- [19] T.V. Shorets Transformation of approaches to the organization of control of settlements with counterparties in the development of the digital economy. *Transport services market (problems of increasing efficiency)*. 2018. No. 1 (11). P. 74-79.