



FOREIGN EXPERIENCE OF DIGITALIZATION AT AGRO-INDUSTRIAL COMPLEX ENTERPRISES

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ABSTRACT

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Article data studied are the organizational and economic relations that arise in the process of evaluating the effectiveness of digitalization of enterprises in the agro-industrial complex. Research methods: content analysis of scientific literature on the research topic; comparative analysis; methods of financial and economic analysis; expert survey; statistical methods for analyzing the relationship and series of dynamics. The novelty of the study lies in the development of a methodology for assessing the effectiveness of digitalization of agro-industrial enterprises, based on an integrated approach, including the use of statistical and expert assessments, and involving the calculation of the index of the level of digitalization and the integral effect of the introduction of digital technologies, taking into account the industry characteristics of companies, which allows us to assess the rationality of the use of resources in the process of digital transformation of business processes of organizations. The practical significance of the study lies in the use of the developed methodology for assessing the development of a company, tracking the dynamics of its digitalization and conducting a comparative analysis with other enterprises in the industry.

KEYWORDS: *agro-industrial complex, digitalization, foreign experience*

1. INTRODUCTION

The high rates of scientific and technological progress and the development of productive forces have formed the objective conditions for a large-scale transition to the neo-industrial stage of development of the social production system, which, along with traditional technologies, will be based on composite technologies that open up new opportunities for generating economic benefits (nanotechnologies, biotechnologies, digital technologies, etc.).

With the transition of major world economies to the fifth technological order and the beginning of the formation of the components of the sixth, the role of information as a factor of production is critically increasing. [one]. In this regard, the competitiveness of the regional economy today is largely determined by the level of its informatization [2; 25]. The growth drivers of the economy of Uzbekistan, which

determine its sectoral structure, are high-tech industries, such as software development, research activities, as well as, in general, all high-tech industries that form the basis of a new technological order of the regional economy [3; 26]. In turn, we emphasize that the technologies of the digital economy will rapidly and inevitably penetrate into all spheres and areas of traditional management. The result of such a capture will be an increase in labor productivity; this will help to reduce costs, which will eventually affect the changes on the lower floors of the building. Experts confirm that the digital economy will put an end to the dominance of office clerks and other non-material workers and mark the emergence of a new social stratum. The key factor in digital transformation in the activities of market entities is the development of digital culture [4; 27]. With the development of information technology in

the world, the term digitalization has appeared. This term was first used by Canadian scientist Don Tapscott in the book "Electronic-Digital Society: Pros and Cons of the Age of Network Intelligence" in 1995 [5; 28]. In our times, digitalization has embraced almost all spheres of humanity. It gradually covers the economy. Many developed countries today have a great influence on the development of the digital economy, thereby adopting new legislative acts and government programs, gradually introducing digitalization into all areas of the economy and creating infrastructure for the development of the digital economy. According to the World Bank definition, in the most general sense, the digital economy is a system of economic, social and cultural relations based on the use of digital information and communication technologies. Considering all these factors, the Republic of Uzbekistan is also actively introducing elements of the digital economy into the national economy. This is confirmed by the words of the President of the Republic of Uzbekistan given in his Address to the Oliy Majlis: "... we should develop the National Concept of the Digital Economy, which provides for the renewal of all spheres of the economy based on digital technologies, and on this basis, implement the Digital Uzbekistan-2030 program" [6; 29]. In our opinion, the digital economy will ensure the growth of the gross domestic product by at least 30 percent and drastically reduce corruption. This is confirmed by analytical studies of authoritative international organizations. The starting step towards the formation, implementation and development of digitalization as a new innovative component of the economy was the adoption of the Decree of the President of the Republic of Uzbekistan "On the State Program for the Implementation of the Action Strategy in five priority areas of development of the Republic of Uzbekistan in 2017-2021", the main focus of which is the formation of an innovative model development of the economy of Uzbekistan [7; 30]. Further, a resolution was adopted by the President of the Republic of Uzbekistan Sh.M. Mirziyoyev dated July 3, 2018 No. PP-3832 "On measures to develop the digital economy in the Republic of Uzbekistan". In fact, this document is a comprehensive strategy for the development of information technologies in the country for the next decade.

2. MATERIALS AND METHODS

The purpose of the study is to study approaches to assessing the effectiveness of digitalization and develop a methodology for assessing the effectiveness of digitalization at enterprises of the agro-industrial complex.

Achievement of the set goal is determined by the solution of the following tasks: to explore the theoretical foundations of the digitalization of enterprises in the agro-industrial complex as an

element of innovative activity; explore national and foreign approaches to assessing the effectiveness of digitalization of organizations; analyze the organizational and economic conditions and prerequisites for the transition of agro-industrial enterprises to the digital economy; develop a methodology for evaluating the effectiveness of digitalization of enterprises in the agro-industrial complex.

3. RESULTS AND DISCUSSION

To study the practice of implementing innovative activities of domestic and foreign agro-industrial enterprises, it is necessary to disclose the content of the concept of the digital economy and determine the legislative framework of various countries.

In the scientific community, it is believed that for the first time the concept of the digital economy was introduced into wide circulation in 1995 by N. Negroponte, an American computer scientist, who meant by this large-scale processes of translating information into a binary code [8; 31]. Since then, the definition of this concept has evolved. Currently, in European countries, the digital economy is understood as a multi-level economic structure due to the development of digital technologies for the continuous development of innovation, investment, and competition, which stimulates an improvement in the quality of services provided [9; 32].

UK economic publications [10; 33] define the digital economy as business processes based on high-quality digital technologies that allow operations to be carried out on the Internet and meet the needs of entrepreneurs, consumers and the state.

International economic organizations [11; 34] characterize the digital economy as "a new way of the economy based on knowledge and digital technologies", which is based on the use of intangible assets, information and data.

Global consulting companies [12; 35] believe that the digital economy is a form of economic activity arising from the interaction of organizations, consumers and technical devices via the Internet.

At the same time, there is no single standardized approach to formulating the concept of digital economy in the Uzbek literature. In the Strategy for the Development of the Information Society in the Republic of Uzbekistan, the digital economy is understood as "economic activity in which digital data are the key production factor, the use of the analysis results of which can significantly increase the efficiency of various types of production."

The term "digitalization" is closely related to the digital economy, which researchers consider from various points of view (table 1): as the next stage in the development of an innovative economy, as a concept of the modern technological revolution, as processes for applying digital technologies, etc.

Table 1 - Approaches to the definition of the concept of digitalization

N. Negroponte, University of Massachusetts, 1995	Digitization of the economy - processes associated with the mass transfer of information into a binary code
A. Engovatova, Moscow State University. M. Lomonosov, 2016	The digital economy is an economy built on the use of digital technologies in the broadest sense.
V. Ivanov, RAS, 2015	Digital economy - reformatting the production sector based on computer technology
Strategy "Digital Uzbekistan-2030" and measures for its effective implementation	The digital economy is such an economic activity in which the key factors are digital data, the processing of large amounts of information and the use of the results of their analysis.
Alexandrov A. Yu. (2019)	Digitalization is a process that uses a set of means and methods for collecting, processing and transmitting data to obtain information of a new quality about the state of an object, process or phenomenon.
Alekseev A. N. (2019)	Digitalization is a way of life, a new basis for the development of the public administration system, economy, business, social sphere, and the whole society
Ananin V. I. (2019)	Digitalization is a system of interrelated methods and ways of collecting, storing, accumulating, searching, processing information based on the use of computer technology
J.S. Brennen, D. Kreiss	restructuring aspects of society around digital communication
M. M. Gobble	application of digital technologies and information to transform business processes

Thus, after analyzing modern approaches to the interpretation of the term in question, in this study, under digitalization

We will understand the process of introducing digital technologies into the business model of the organization.

Most of the developed countries of the world have adopted digital development programs focused on the digital transformation of the economy, in particular [13; 36]:

- Great Britain - "Digital Strategy";
- Germany - "Industrie 4.0" and "Smart Networking Strategy";
- European Union - "Europe 2020";
- China - "Internet Plus";
- Japan - "Smart Japan ICT Strategy";
- USA - "Advanced Manufacturing Partnership" and "Industrial Internet Consortium".

In Uzbekistan, the digitalization of the economy is one of the strategic directions for the implementation of breakthrough scientific, technological and socio-economic development of the country. The national project "Digital Uzbekistan - 2030 " has been implemented since 2019 and includes the following federal projects:

- Regulatory regulation of the digital environment;
- Information Security;
- Digital technologies;
- Information infrastructure;
- Digital public administration;
- Personnel for the digital economy.

The concept of Industry 4.0 was formed in 2011 in Germany with the aim of increasing the

competitiveness of German industry. To achieve the goal, the efforts of the scientific community, private business and the state were combined. The prerequisites for the development of the digital transformation process in Germany were the leading position of the country's manufacturing industry in the world market, as well as the development of innovative activities in the field of production and industrial technologies.

Currently, digital technologies play a key role in German agricultural production and ensure the vital activity of the crop and livestock industries. Not only most of the production processes of agricultural producers are automated, but also interaction with suppliers, consumers, the state and consulting centers.

For the first time, the use of GPS data to support production processes was carried out in the agricultural sector, which made it possible to rationalize the routes of agricultural machinery and reduce energy costs. The use of big data (Big Data) in combination with artificial intelligence provides effective management in the crop industry: soil cultivation and harvesting methods are optimized, processes are controlled in real time [14; 37].

In animal husbandry, the main production processes are carried out by robotic equipment; motion sensors and chips make it possible to timely monitor the animal's health and adjust the feeding system to increase productivity [15; 38].

Studies conducted in 2020 [16; 39] showed that about 80% of German farmers use digital technologies in their activities. The most used digital technologies are GPS-guided agricultural machinery

(45% of respondents), online monitoring tools (40%), artificial intelligence (32%), sensors (28%), robotic equipment and unmanned aerial vehicles (12%). In addition, about half of the surveyed agricultural producers use ready-made digital solutions "Smart Farm".

In turn, the UK is the European leader in the introduction of artificial intelligence in the agro-industrial sector. The strategy for digitalization of the economies of countries includes directions for development infrastructure, digital competencies, cyberspace, economic growth, digital sector, digital government, data economy [17; 40].

In order to introduce digital technologies and information systems into agricultural production in the UK, the Agrimetrics Innovation Center was created, which supports the development of business projects aimed at developing agricultural technological innovations.

An interactive digital map of agricultural land was also created based on GPS data. This and other specialized agricultural big data is stored on the platform and processed by artificial intelligence, which allows British farmers to solve problems and make decisions online. The information platform is also used by processing and trading organizations as an electronic trading platform [18; 41].

In 2013, the People's Republic of China began to introduce innovative technologies in the agro-industrial complex. As part of the Digital Silk Road project [19; 42], Chinese investors finance the introduction of digital technologies in agriculture not only in China, but also in other countries.

The introduction of new digital technologies in the production processes of the agricultural industry is carried out using the systematic approach "Industry 4.0". Farmers successfully use modern electronic technologies based on the use of big data and artificial intelligence: production monitoring and control systems, smart machinery and equipment (UAVs, sensors, automatic navigation, Internet of things), digital management platforms (forecasting the state of the economic market, electronic markets, export organization, ready-made digital solutions based on "smart" management) [20].

In addition, innovative technologies contribute to the fight against poverty in China. The "Running Chicken" project [20] involves the provision of chickens for poor families to grow and sell them after four months. The project is implemented using an intelligent monitoring system, mass slaughter, processing, transportation and other links in the production chain. Consumers receive an organic and high-quality product, the price of which is higher than the average market value, which helps to increase the income of low-income families.

The further development of the Chinese agro-industrial complex is accompanied by the development of the following digital transformation trends:

- combining individual technologies into a single digital circuit, general automation and digitalization of the industry;

- creation of a public information database of agricultural data for the purpose of standardization and forecasting of production processes;

- creation of a model for servicing rural areas with agricultural products to order.

Exploring the experience of introducing digital technologies in the agricultural sector, the United States should be singled out with a high level of implementation of digital technologies - about half of the country's agricultural producers. The US agricultural industry produces more than 40% of the world's agro-industrial products [21]. A more active use of modern innovative technologies is hindered by the low provision of the territory with stable cellular networks and the lack of equipment connected to the Internet. Thus, the main tasks facing the industry are the development of IT infrastructure and the introduction of digital transformation tools.

Nevertheless, the most promising technologies that are already in the early stages of use and will further increase the value added of the country's agriculture by \$500 billion and labor productivity by 7–9% [22] are:

- using the Internet of things and 5G to monitor the condition of land and crops. Integration of GPS data, irrigation, nutrient and other systems can improve resource use and increase crop yields by better identifying and predicting adverse impacts;

- Livestock monitoring using chips and sensors to monitor the health status of farm animals, identify stress factors, and prevent disease outbreaks;

- Management of buildings, structures and equipment to establish business processes, reduce energy consumption, control the technical condition;

- The use of UAVs and computer vision (inspection of crops and herds, analysis of field conditions, spraying of crops, planting crops in remote areas of land);

- Autonomous agricultural machinery is more efficient and accurate when working in the field, which can provide fuel savings and higher productivity.

The agro-industrial enterprises of Uzbekistan are somewhat behind the world's developed countries in terms of the level of implementation of digital technologies. The reasons for this are the shortage of qualified personnel in rural areas, the high physical and moral deterioration of the technical and technological base of most agricultural enterprises, and the insufficient development of information and communication infrastructure.

As part of the implementation of the Digital Agriculture project, experimental digital farms have now been created in order to prove the effectiveness of digital technologies to agricultural producers [23]. Existing pilot farms will solve the following problematic issues related to the spread of

digitalization and the introduction of innovative technologies:

- increasing public loyalty to digital transformation;
- The correctness and efficiency of choosing a package of digital technologies, depending on the current needs of farms;
- Formation of effective measures of state support for agro-industrial enterprises;
- Development of domestic industry, information technology, import substitution;
- Training of qualified specialists.

Actual tools for digitalization of the agro-industrial complex in Uzbekistan are electronic sensors, robotics, UAVs, ERP systems, big data analysis and artificial intelligence systems, IoT technologies (Internet of things), cloud services.

These tools are used in the implementation of complex digital solutions, such as Smart Farm, Smart Field, Smart Greenhouse, Digital Enterprise, Transport Management and others.

In addition, the Ministry of Agriculture of Uzbekistan is developing a catalog of technological solutions for the agro-industrial complex, which includes “applicable and promising developments made in Uzbekistan and abroad in the field of digitalization, automation, robotization, mechanization, electrification of agriculture, renewable energy, information and nanotechnologies, food processing” [24].

Based on a study of the practice of introducing digitalization at enterprises of the agro-industrial complex, Table 2 shows the level of use of digital technologies in various countries of the world.

Table 2 - World practice of using digital technologies at agribusiness enterprises

Digital technologies used in the agro-industrial complex	Uzbekistan	European countries (on the example of Germany)	Asian countries (on the example of China)	Countries of North America (on the example of the USA)
Sensors and sensors, wireless communication technologies	Average	Tall	Tall	Tall
Unmanned vehicles	Average	Short	Tall	Average
Robotic equipment	Tall	Short	Tall	Average
Precision farming systems	Average	Average	Tall	Average
Agribusiness Management (ERP)	Average	Short	Average	Average
IoT platforms (Internet of Things)	Short	Average	Tall	Tall
Analysis systems big data (Big Data)	Short	Short	Average	Short
Neurotechnologies and artificial intelligence	Short	Average	Average	Short
quantum technology	Short	Short	Short	Short

Note: the level of use of digital technologies is high (more than 40% of farms), medium (25-40% of farms), low (less than 25% of farms).

4. CONCLUSION

Thus, in different countries of the world, approaches to digital transformation and the level of their application differ, including depending on economic development, as well as technological trends in a particular country. Digitalization tools are interconnected, the level of their application is determined by the quantity and quality of relationships with other tools and mechanisms for digital transformation of the agro-industrial complex. At the same time, the transition to a digital economy as a strategic goal is present in most developed countries, which is due to modern global social, economic, technological and other trends.

REFERENCES

1. Savina T.N. *Digital Economy as a New Development Paradigm: Challenges, Opportunities and Prospects // Finance and Credit*. 2018. No. 3 (771).
2. Panshin B. *Digital economy: features and development trends // Science and innovations*. - 2016. - T. 3. - No. 157.
3. Kurpayanidi K.I., Ashurov M.S. *Uzbekistonda tadbirkorlik muhitining zamonaviy holati va uni samarali rivozhlantirish muammolarini baholash/GlobeEdit Academic Publishing, European Union, 2019.*
4. Khodiyev B. Yu. *Uzbekistan: building a "digital economy" // Russian Foreign Economic Bulletin*. - 2017. - No. 12. - S. 5-12.
5. Tapscott Don. *Electronic-digital society: Pros and cons of the era of network intelligence - Kyiv: ITN Press; 1999.*

6. Mirziyoev Sh.M. Message of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis / People's Word, December 28, 2019
7. On the state program for the implementation of the action strategy in five priority areas of development of the Republic of Uzbekistan in 2017 - 2021 in the "year of active investment and social development". Decree of the President of the Republic of Uzbekistan No. UP-5635 dated January 17, 2019//National Legislation Database, January 18, 2019, No. 06/19/5635/2502
8. Negroponte N. Being Digital. - New York: Knopf, 1995. - 243 p.
9. Expert Group on Taxation of the Digital Economy / European Commission. // The European Union: [website]. - 2014. - URL: <https://ec.europa.eu/> (date circulation: 10.09.2021).
10. The Digital Economy // British Computer Society: [website]. - 2013. - URL: https://policy.bcs.org/position_statements/digital-economy (date circulation: 10.09.2021).
11. Addressing the Tax Challenges of the Digital Economy, Action 1 - 2015 Final Report / OECD/G20 Base Erosion and Profit Shifting Project. - Paris: OECD Publishing. - 2015. - 290 p.
12. What is Digital Economy? // Deloitte: [site]. - 2019. - URL: <https://www.deloitte.com> (date circulation: 10.09.2021).
13. Skvortsov D. A. Analysis of methods for assessing the level of digitalization of the economy / D. A. Skvortsov // Theory and practice of modern economics: coll. articles of the International scientific-practical. Conf., May 15, 2020 - Penza, 2020. - P. 164-170.
14. Digitalization in agriculture // Federal Ministry of Food and Agriculture (Germany): [website]. - URL: https://www.bmel.de/EN/Home/home_node.html (date circulation: 10.09.2021).
15. Frohn, C. (2018). Germany's Smart Farm: Digital Technology in Agriculture. Liberal Institute. <http://4liberty.eu/germanys-smart-farm-digital-technology-in-agriculture>.
16. Prause, L. (2021). DigitalAgriculture and Labor: A FewChallenges for Social Sustainability. Sustainability. <https://www.researchgate.net>.
17. UK Digital Strategy // GOV.UK: [website]. - URL: <https://www.gov.uk/government/publications/uk-digital-strategy> (accessed 10.09.2021).
18. Medennikov V. I. Complementary dependencies of science and business are a necessary condition for the success of the digitalization of the agrarian economy / V. I. Medennikov // Digital Economy. - 2020. - No. 3. - P. 41-54.
19. One Belt, One Road: The full text of Xi Jinping's speech // INOSMI: [website]. - URL: <https://inosmi.ru/20170519/239391693.html>
20. Huateng M. China's Digital Transformation. Experience in transforming the infrastructure of the national economy / M. Huateng, M. Zhaoli, Ya. Deli, V. Hualei. - Moscow: Intellectual Literature, 2019. - 250 p.
21. Godin V. V. Agriculture in the digital age: challenges and solutions / V. V. Godin, M. N. Belousova, V. A. Belousov, A. E. Terekhova // E-Management. - 2020. - No. 3. - P. 4-15. - URL: <https://doi.org/10.26425/2658-3445-2020-1-4-15>
22. Goedde, L., Katz, J., Menard, A., Revellat, J. (2020). Agriculture's connected future: How technology can yield new growth. McKinsey and company. <https://www.mckinsey.com>.
23. Departmental project "Digital agriculture ": official. ed. / A. V. Gordeev, D. N. Patrushev, I. V. Lebedev [and others]; ed. S. N. Kosogor. - Moscow: FGBNU "Rosinformagrotech", 2019. - 48 p.
24. Digital transformation of Russian agriculture: official. ed. / A. V. Gordeev, S. N. Kosogor, O. A. Motorin [and others]; ed. O. A. Motorina. - Moscow: FGBNU "Rosinformagrotech", 2019. - 80 p.
25. Durmanov, A., Kalinin, N., Stoyka, A., Yanishevskaya, K., & Shapovalova, I. (2020). Features of application of innovative development strategies in international enterprise. *International Journal of Entrepreneurship*, 24(1 Special Issue), 1-9.
26. Tkachenko, S., Berezovska, L., Protas, O., Parashchenko, L., & Durmanov, A. (2019). Social partnership of services sector professionals in the entrepreneurship education. *Journal of Entrepreneurship Education*, 22(4).
27. Durmanov, A. S., Tillaev, A. X., Ismayilova, S. S., Djamalova, X. S., & Murodov, S. M. oqli. (2019). Economic-mathematical modeling of optimal level costs in the greenhouse vegetables in Uzbekistan. *Espacios*, 40(10).
28. Shulga, O., Nechyporuk, L., Slatvitskaya, I., Khasanov, B., & Bakhova, A. (2021). Methodological aspects of crisis management in entrepreneurial activities. *Academy of Entrepreneurship Journal*, 27(SpecialIssue 4), 1-7.
29. Durmanov, A., Bartosova, V., Drobyazko, S., Melnyk, O., & Fillipov, V. (2019). Mechanism to ensure sustainable development of enterprises in the information space. *Entrepreneurship and Sustainability Issues*, 7(2), 1377-1386. [https://doi.org/10.9770/jesi.2019.7.2\(40\)](https://doi.org/10.9770/jesi.2019.7.2(40))
30. Omelyanenko, V., Khasanov, B., Kolomiyets, G., Melentsova, O., & Pominova, I. (2020). Strategic decisions in the system of management of innovation activity of enterprises. *Academy of Strategic Management Journal*, 19(6), 1-7.
31. Borysenko, O., Pavlova, H., Chayka, Y., Nechyporuk, N., & Stoian, O. (2021). Increasing efficiency of entrepreneurial potential in service sector. *International Journal of Entrepreneurship*, 25(6).
32. Hilorme, T., Tkach, K., Dorenskyi, O., Katerna, O., & Durmanov, A. (2019). Decision making model of introducing energy-saving technologies based on the analytic hierarchy process. *Journal of Management Information and Decision Sciences*, (4), 489-494.
33. Khaustova, Y., Durmanov, A., Dubinina, M., Yurchenko, O., & Cherkesova, E. (2020). Quality of strategic business management in the aspect of growing the role of intellectual capital. *Academy of Strategic Management Journal*, 19(5), 1-7.
34. Durmanov, A., Umarov, S., Rakhimova, K., Khodjimukhamedova, S., Akhmedov, A., & Mirzayev, S. (2021). Development of the organizational and economic mechanisms of greenhouse industry in the Republic of Uzbekistan. *Journal of Environmental Management and Tourism*, 12(2), 331-340.

- [https://doi.org/10.14505/jemt.v12.2\(50\).03](https://doi.org/10.14505/jemt.v12.2(50).03)
35. Umarov, S. R., Durmanov, A. S., Kilicheva, F. B., Murodov, S. M. O., & Sattorov, O. B. (2019). Greenhouse vegetable market development based on the supply chain strategy in the Republic of Uzbekistan. *International Journal of Supply Chain Management*, 8(5), 864–874.
 36. Nurimbetov, T., Umarov, S., Khafizova, Z., Bayjanov, S., Nazarbaev, O., Mirkurbanova, R., & Durmanov, A. (2021). Optimization of the main arameters of the support-lump-breaking coil. *Eastern-European Journal of Enterprise Technologies*, 2(1–110), 27–36.
<https://doi.org/10.15587/1729-4061.2021.229184>
 37. Durmanov, A., Bayjanov, S., Khodjimukhamedova, S., Nurimbetov, T., Eshev, A., & Shanasirova, N. (2020). Issues of accounting for organizational and economic mechanisms in greenhouse activities. *Journal of Advanced Research in Dynamical and Control Systems*, 12(7 Special Issue), 114–126.
<https://doi.org/10.5373/JARDCS/V12SP7/20202089>
 38. Durmanov, A., Li, M., Khafizov, O., Maksumkhanova, A., Kilicheva, F., & Jahongir, R. (2019). Simulation modeling, analysis and performance assessment. In *International Conference on Information Science and Communications Technologies: Applications, Trends and Opportunities, ICISCT 2019*. Institute of Electrical and Electronics Engineers Inc.
<https://doi.org/10.1109/ICISCT47635.2019.9011977>
 39. Durmanov, A., Tulaboev, A., Li, M., Maksumkhanova, A., Saidmurodzoda, M., & Khafizov, O. (2019). Game theory and its application in agriculture (greenhouse complexes). In *International Conference on Information Science and Communications Technologies: Applications, Trends and Opportunities, ICISCT 2019*. Institute of Electrical and Electronics Engineers Inc.
<https://doi.org/10.1109/ICISCT47635.2019.9011995>
 40. Atakhanova, N. E., Almuradova, D. M., Khakimov, G. A., Usmonova, S. T., & Durmanov, A. S. (2020). Values of a mathematical model for predicting the survival of patients with triple negative breast cancer depending on androgen receptors. *International Journal of Pharmaceutical Research*, 12(3), 695–704.
<https://doi.org/10.31838/ijpr/2020.12.03.104>
 41. Shaulska, L., Kovalenko, S., Allayarov, S., Sydorenko, O., & Sukhanova, A. (2021). Strategic enterprise competitiveness management under global challenges. *Academy of Strategic Management Journal*, 20(4), 1–7.
 42. Shamborovskiy, G., Shelukhin, M., Allayarov, S., Khaustova, Y., & Breus, S. (2020). Efficiency of functioning and development of exhibition activity in international entrepreneurship. *Academy of Entrepreneurship Journal*, 26(Special Issue 4), 1–7.