

REGULATORY POLICY OF THE USE OF ARTIFICIAL INTELLIGENCE IN THE CONTEXT OF STATE SOCIO-ECONOMIC DEVELOPMENT

Volodymyr Filippov¹, Sergey Neykov², Dmytro Horban³, Kostiantyn Shaposhnykov⁴, Petro Zhuravel⁵, Mariia Matskovych⁶

¹ Dr. Prof., Odesa Polytechnic National University, Odesa, Ukraine, E-mail address: v.filippov@op.edu.ua

² PhD. Odesa Institute of Entrepreneurship and Law, Odesa, Ukraine, E-mail address: n.serg.a@ukr.net

³ PhD. Academy of Labour, Social Relations and Tourism, Kyiv, Ukraine, E-mail address: gorban.d.a@gmail.com

⁴ Dr. Prof., State Scientific Institution "Institute of Education Content Modernization", Kyiv, Ukraine, E-mail address: k.s.shaposhnykov@gmail.com

⁵ PhD. Classic Private University, Zaporizhzhia, Ukraine, E-mail address: pedro.crane3001@gmail.com

⁶ Drohobych Branch of the State Scientific Institution "Institute of Education Content Modernization", Drohobych, Ukraine, E-mail address: maria.dydynska@gmail.com

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Abstract

The purpose of the article is to develop and substantiate the theoretical foundations of the formation of a regulatory policy for the use of artificial intelligence in the context of the socio-economic development of the state. The theoretical foundations of the development of a regulatory policy for the use of artificial intelligence are considered. To substantiate the conceptual provisions of determining the prerequisites of the regulatory policy of the use of artificial intelligence, it is advisable to use a modified methodical approach of SWOT analysis. The world experience of the development of the institutional foundations of the use of artificial intelligence in the leading spheres of the national economy has been studied. The need for the formation of an appropriate organizational mechanism of regulatory policy as a set of tools, methods, approaches of the state's economic policy. The specifics of the implementation of the regulatory policy mechanism for the use of artificial intelligence in the context of a systemic approach are considered. The potential possibilities of applying regulatory policy in the context of identifying production, social, and institutional potentials are substantiated. It is proposed to use the SWOT analysis method to assess the prerequisites and justify the strategic directions of the regulatory policy in the field of artificial intelligence.

Keywords: state regulation, regulatory policy, artificial intelligence, institutions, potential, socio-economic development.

JEL Codes: L83.

Introduction

The development of artificial intelligence, digitalization, and the introduction of generative language models in all spheres of the national economy actualizes discussions about the need to regulate the spread of artificial intelligence and develop an adaptive regulatory policy. The current situation in the state of the institutional environment for the regulation of artificial intelligence projects is characterized by the presence of a sufficient number of norms of a recommendatory nature, and the

existing regulatory frameworks that determine the basis of regulation in the field of application of artificial intelligence technologies are at the stage of formation and belong to the norms of "soft law". Decision-making of a regulatory nature takes place in the context of the complex application of regulatory, technical, ethical regulators and existing self-regulation mechanisms. The main goal of the regulatory policy in the field of artificial intelligence is to minimize risks and increase security in the process of using these technologies. The purpose of the article is to develop and substantiate the theoretical foundations of the formation of a

regulatory policy for the use of artificial intelligence in the context of the socio-economic development of the state.

Literature review

For some time, artificial intelligence developed without wide application in various spheres of life. However, in November 2022, the release of ChatGPT-3 brought AI out of the shadows, repositioning it from a tool for software developers to a consumer-oriented tool that ordinary people can use on their own without the need for technical knowledge. Therefore, it became necessary to develop the main principles and principles of regulatory policy in order to protect public interests.

One of the key issues facing any potential regulatory framework is definition (ie, how exactly to define AI). Various researchers have proposed definitions (Chhillar D., 2022; El Qadi A. et al., 2023; Lăzăroiu G. et al., 2023), and while some common elements exist, differences raise questions about the capacity of public regulators, who develop regulations, find a definition that works best within the regulatory framework.

The issue of forming the foundations of regulatory policy is in the focus of attention of many researchers. On the one hand, scientists investigate the mechanism of regulatory policy construction: a universal approach or differentiation of methods depending on the field of application of AI (Darwiesh A. et al., 2023; Sharbek N., 2022; Yonghu Yang et al., 2023; Marhasova V. et al., 2024); regulation of artificial intelligence should be risk-based and targeted (Feras Mi Alnaser et al., 2023).

Scientific publications Nikiforov P. et al. (2022), Shaposhnykov K. et al. (2023), Zhavoronok A. et al. (2022) are devoted to regulatory police and various aspects of innovative development of enterprises in the context of digital transformations.

An important question is whether all areas of use of artificial intelligence will be subject to regulation, especially in health care, financial services, housing, labor and child safety (Mhlanga D., 2021; Uzun M., 2020).

Despite the fact that artificial intelligence continues to develop rapidly, the formation of principles of regulation of the fields of application

of artificial intelligence are developing more slowly.

A significant part of the research is devoted to the consideration of the conceptual foundations of the formation of regulatory policy in the field of economic activity, the conditions for the application of foreign experience, and the development of the institutional environment. However, the digitalization of the economy, the transformation of socio-economic life, and globalization processes require the improvement of regulatory influence on the part of the state and the introduction of modern tools of state regulation in the direction of the development of information technologies and, in particular, artificial intelligence technologies. This once again proves the relevance of the chosen direction of research and proves the need for further research.

Methodical approach

In order to substantiate the conceptual provisions of determining the prerequisites of the regulatory policy of the use of artificial intelligence, it is advisable to use a modified methodical approach of SWOT analysis, which is based on the identification of threats, opportunities, strengths and weaknesses of the regulatory policy according to the level of influence on the implementation of artificial intelligence systems in the leading spheres of economic activity. Criterion definition strong and weak parties, opportunities and threats used industrial, institutional and social potential regulatory politicians by applying the expert method evaluations an assessment was made opportunities, threats, strong and weak parties on a scale in the range of 0–1 according to the criteria – “degree impact” and “probability onset”. Rating probability the onset was carried out in intervals: 0–0.3 – “low”; 0.31–0.6 “average”; 0.61–1.0 – “high”. Degree impact tools regulatory policies for implementation artificial intelligence projects was determined in the intervals of 0.67–1.0 – “strong”, 0.34–0.66 – “moderate”, 0–0.33 – “small”.

Results

Considering that it is expedient to adhere to the definition of regulatory policy, it is expedient to start research from the Law of

Ukraine “On the Basics of State Regulatory Policy in the Field of Economic Activity” dated September 11, 2003. According to this document, state regulatory policy is a direction of state economic policy aimed at improving the legal regulation of economic relations, as well as administrative relations between regulatory bodies or other state authorities and economic entities, preventing the adoption of economically impractical and ineffective regulatory acts, reducing state interference in the activities of economic entities and eliminating obstacles to the development of economic activity (The Verkhovna Rada of Ukraine, 2023). According to the selected research topic, the main subjects of regulatory policy in the field of artificial intelligence in Ukraine, according to the above-mentioned Law, are the Verkhovna Rada of Ukraine, the President of Ukraine, the Cabinet of Ministers of Ukraine, the National Bank of Ukraine, local bodies of executive power and local self-government, and authorized persons who have the right to individually adopt regulatory acts. According to the Law, territorial and central bodies are classified as regulatory bodies of executive power, state and specialized institutions and organizations, non-commercial self-governing organizations, as well as carrying out leadership and management of certain types mandatory state social insurance, if these are bodies, institutions and organizations adopt regulatory acts in accordance with their powers.

The development of institutional foundations of regulatory policy in the field of artificial intelligence has been taking place over the last decade. The first institutional initiatives in this area were launched in the countries of the European Union, the USA and China. As noted by experts in the Stanford University AI Index report Report 2022, from 2016 to 2022, the number of adopted laws increased from 1 in 2016 to 18 in 2022. The leaders in terms of the number of adopted normative legal documents are the USA, Spain, Great Britain, and Belgium. Also, since 2014, the number of scientific publications devoted to the use of artificial intelligence technologies and their adaptation has increased by more than 5 times (Institute for

Human-Centered AI, 2023).

A significant stage was the agreement by the European Parliament and the European Council of the provisions of the Artificial Intelligence Act (AI Act) (europarl, 2023), the main purpose of which is to protect civil rights and democracy from high-risk artificial intelligence, ensure the rule of law, achieve environmental sustainability, and stimulate the introduction of innovative technologies. In the basis of the draft law, artificial intelligence systems are classified as prohibited harmful AI practices, high-risk AI practices, which are the main object of influence of the specified law, limited risk systems, the developers of which must comply with the requirements of process transparency, and systems with a low degree of risk, which regulatory restrictions do not apply. To ensure transparency, development companies, as well as state institutions using artificial intelligence technologies, must be registered in the EU database of high-risk systems. As for developers of AI systems themselves, they must register their products before they appear on the market or put into operation. High-risk systems must meet requirements for risk management, testing, technical reliability, training and data management, transparency, cybersecurity and human control. The bill also provides for the application of special rules regarding the use of fundamental models - AI systems capable of competently performing such a range of tasks as creating video, text, images, and software code. Restrictions also apply to generative AI systems (ChatGPT): developers must report copyrighted objects used to train the model (OECD, 2019).

In the USA, since October 2023, the Decree on Safe, Reliable and Decent Trust in Artificial Intelligence has been in effect, which is also based on the transparency of the processes of developing artificial intelligence systems. Development companies must provide the government with information about the results of security testing and the possibility of introducing the development into the market. Special attention in the regulatory act is given to ensuring the security of personal data. For the implementation of regulatory implementation,

the creation of a Research Coordination Network is expected, and projects aimed at ensuring a high level of confidentiality of data of US federal agencies will be supported by the National Science Foundation. Another direction of state regulation of the use of artificial intelligence systems is the expansion of research based on the implementation of the National Research Resource in the Field of Artificial Intelligence (National AI Research Resource) is a pilot project that provides access to data in the field of AI to scientists and students. Health care and climate change are recognized as priority areas for AI projects.

One of the leaders in the use of artificial intelligence systems is China, in which the regulatory policy of the government aimed at support cooperation between companies, research structures, universities, state bodies authorities, as well as activation participation representatives of the People's Republic of China in development international rules and standards.

According to studies conducted by analysts of the American company Gartner, most companies in the world are currently at the level of awareness of the features and benefits of artificial intelligence technologies, and

according to forecasts, the stable implementation of AI technologies can be extended to most companies only by the beginning of 2025. According to Gartner, the S-shaped curve of the life cycle of AI technologies passes through five maturity phases, and most technological innovations in the field of AI (general AI, small and big data, responsible AI, generative AI, synthetic data, intelligent decision support, digital ethics, etc.) are at the stage of developing and launching technologies. According to analysts, this indicates the need of end users to use artificial intelligence technologies to solve specific tasks (Institute for Human-Centered AI, 2023).

According to the results of the survey (Erasmus+Programme of the European Union), 28% of respondents believe that their company's strategy almost does not include elements of digital transformation, 28% believe that digital transformation is taken into account and partially provided for in the company's strategic development, 40% state that digital technologies and modern technologies of artificial intelligence are at the basis of the development strategy of their organization and will be actively implemented (Fig. 1).

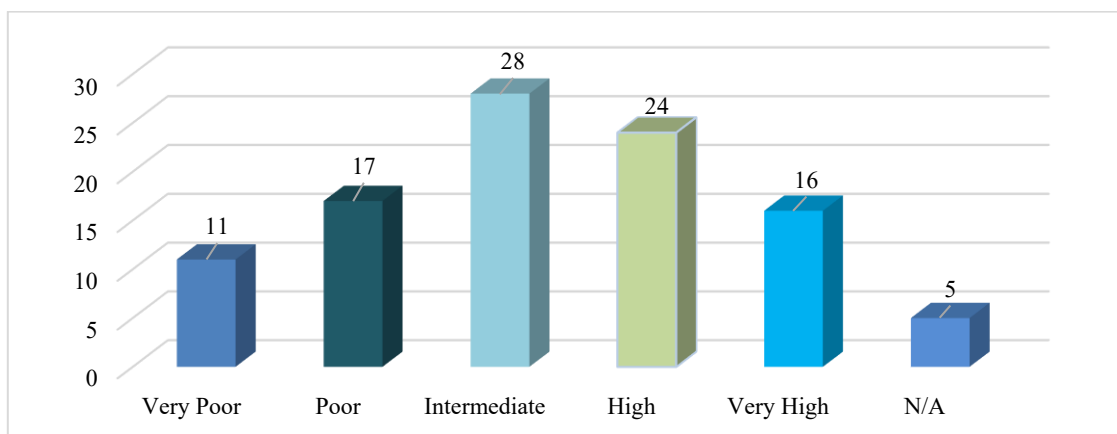


Figure 1. Organizations whose strategic development includes digital transformation and implementation of artificial intelligence technology

**Source: Erasmus+Programme of the European Union.*

Considering the factors restraining digital transformation and the use of artificial intelligence technologies (Fig. 2), it is appropriate

to single out lack of time (55%), lack of IT skills among employees (45%) and lack of financial resources (45%).

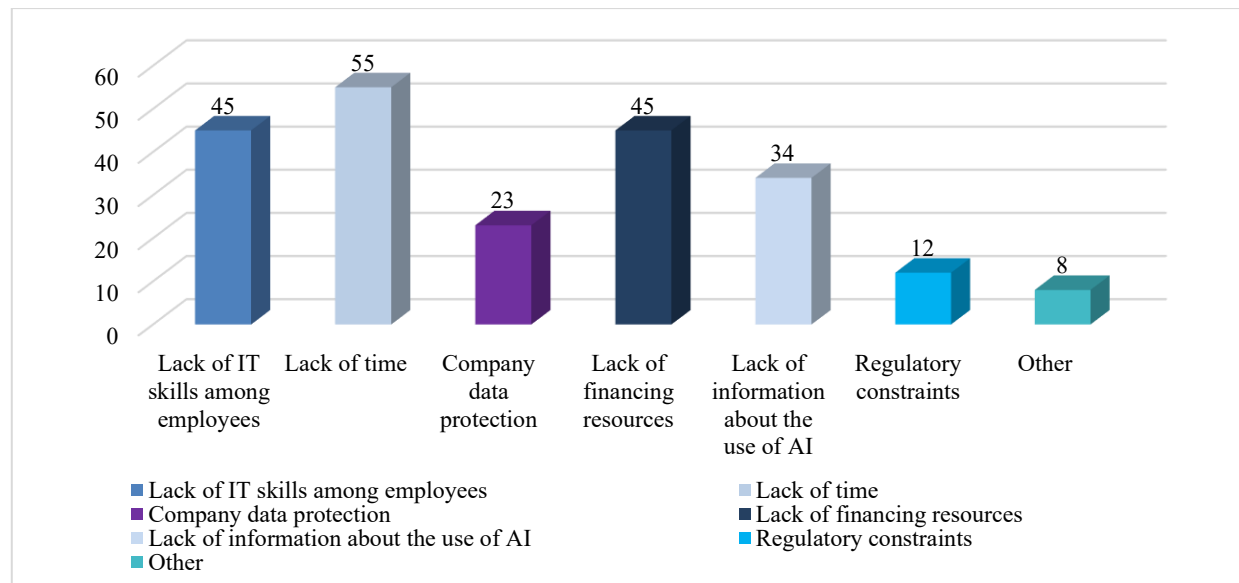


Figure 2. Factors restraining digital transformation and introduction of artificial intelligence technology

**Source: Erasmus+Programme of the European Union.*

Improving the institutional foundations of the regulatory policy in the field of artificial intelligence involves defining the goal and prospects for its development, namely the implementation of innovative measures and modern information technologies to minimize threats, the activation of investment activities, including on the basis of the implementation of public-private partnership projects, the maintenance of an appropriate level of information potential. The specified measures require the formation of an appropriate organizational mechanism of regulatory policy as a set of tools, methods, approaches of the state's economic policy aimed at supporting the use of artificial intelligence in the spheres of socio-economic activity with the provision of appropriate measures to minimize risks and threats. The implementation of the specified mechanism takes place on the basis of strategic and program management with the identification of the necessary tools and directions (Fig. 3).

The implementation of the organizational mechanism of the regulatory policy of the use of artificial intelligence as a system begins with the coordination of its elements, the definition of target orientations, the subject and the object of the mechanism. The next step is the creation of a

subsystem of management factors with the determination of the forecast for the development of artificial intelligence projects. If there are problems with determining the required number of management factors, the goal of the mechanism is adjusted, specific tasks for its achievement may be specified. The choice of methods of implementation of the mechanism, the justification of the necessary resources takes place in accordance with the formed set of management factors. On the basis of the selected strategic directions, the goal of the regulatory policy is coordinated with the object of management and the period of the mechanism.

An important element of the process of forming the organizational mechanism of the regulatory policy of the use of artificial intelligence is the analysis of official statistical indicators of the socio-economic development of the country, which takes into account the state of digitization and challenges in the scientific, technological, economic and environmental spheres.

The obtained results make it possible to determine the priorities of the use of artificial intelligence depending on the level of development and requests of the relevant branches of the economy and spheres of life of

society in order to solve specific tasks of structural and technological renewal and obtain competitive advantages. A strategic approach to the formation and implementation of the regulatory policy for the use of artificial intelligence allows to adjust the developed

program documents focused on the development and implementation of key technologies of artificial intelligence and to improve institutional support, mechanisms of organizational and financial support, etc.

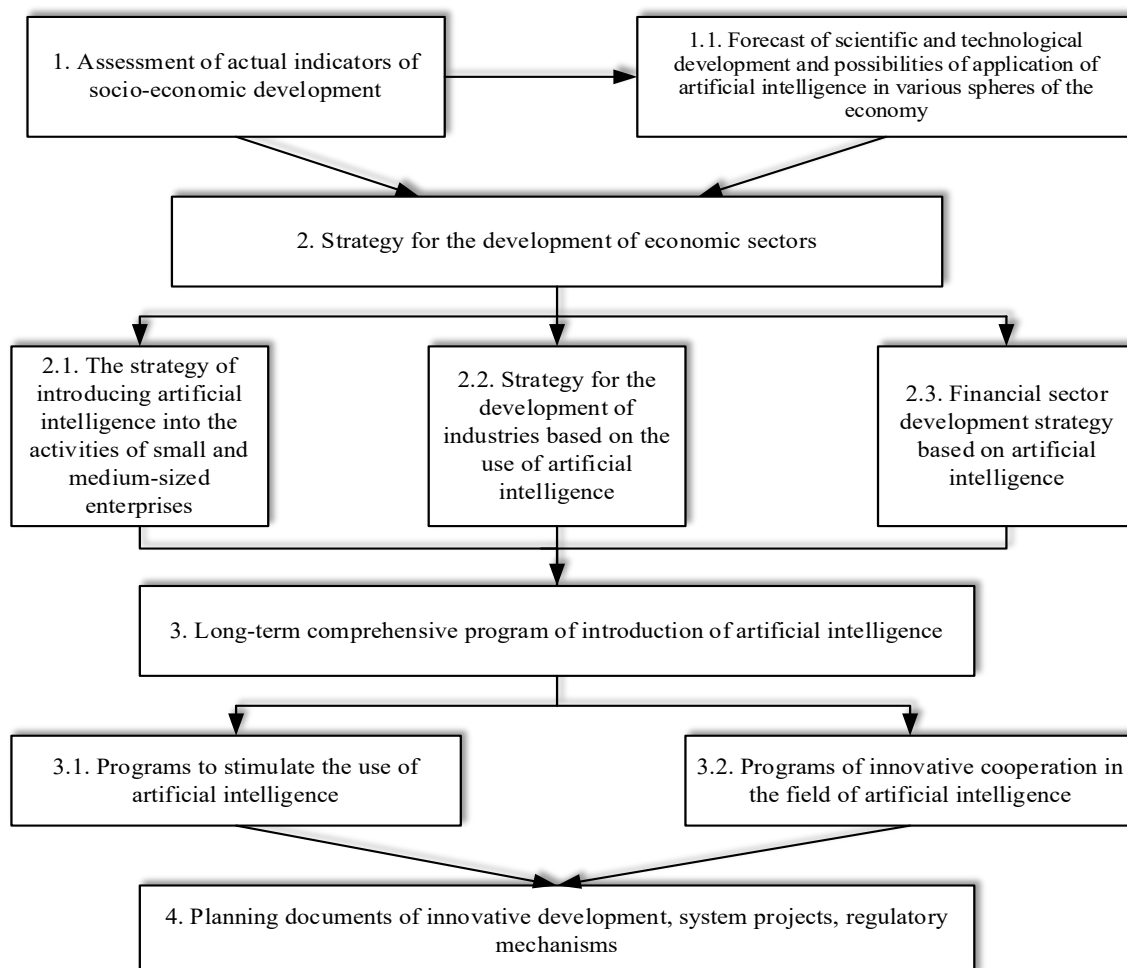


Figure 3. Factors restraining digital transformation and introduction of artificial intelligence technology

**Source: developed by the authors.*

The appropriate division of the specified groups of problems into macroeconomic and mesoeconomic allows taking into account the level of implementation of artificial intelligence projects in various industries, with the corresponding formation of an adequate set of means and tools of influence. Identified groups of problems with which state authorities and business representatives are dealing with provide an opportunity to form a system of potential opportunities for the regulatory policy of the state in the future. Therefore, taking into account

the above, it is advisable to single out the institutional, industrial, and social potential of the regulatory policy of the use of artificial intelligence. The study of the potential opportunities of regulatory policy in Ukraine, taking into account the current realities of the military aggression of the Russian Federation and the economic crisis, with the subsequent determination of strategic priorities, should be carried out on the basis of the use of SWOT analysis, the advantage of which is the systematization and further representation of the

strengths and weaknesses, threats and opportunities of regulatory policy. Structuring the results allows you to get answers to the following questions:

- what are the strengths and weaknesses of the regulatory policy of the state in the field of

using artificial intelligence?

- what are the possibilities of using benefits?

- what are the potential threats and risks of state regulation of the implementation of artificial intelligence projects? (Table 1).

Table 1. SWOT-analysis of the prerequisites for the formation of a regulatory policy for the use of artificial intelligence in the context of the development of the national economy

Production potential					
Strengths	Mark	VK	Weak sides	Mark	VK
1. Experience in the use of artificial intelligence technologies in certain sectors of the economy	9	0.37	1. Fall in the volume of industrial production	7	0.4
2. Availability of a production base for the use of artificial intelligence	8	0.23	2. Unprofitability of small business, priority in state support of large companies	8	0.24
3. Provision of qualified personnel in the field of IT technologies	8	0.24	3. Insufficient level of information infrastructure	9	0.28
4. Tendency to innovation of business processes (in conditions of post-war recovery)	8	0.16	4. Obsolescence of fixed assets and information support	7	0.08
$\sum = 0.37*9+0.23*8+0.24*8+0.16*8 = 8.37$			$\sum = 0.4*7+0.24*8+0.28*9+0.08*7=5.84$		
Opportunities	Mark	VK	Threats	Mark	VK
1. Expanding the scope of artificial intelligence.	7	0.13	1. The re-equipment of the main production assets requires significant investments, which is difficult under the conditions of martial law	7	0.25
2. Reducing the negative impact on business development.	7	0.28	2. The presence of entrepreneurial risks and the inability to manage them.	7	0.31
3. Cost reduction.	8	0.45	3. Bankruptcy and liquidation of enterprises.	7	0.33
4. Implementation of information security measures	9	0.14	4. Lowering the level of state support	9	0.11
$\sum =0.13*7+0.28*7+0.45*8+0.14*9 = 7.73$			$\sum = 0.25*7+0.31*7+0.33*7+0.11*9 = 7.22$		
Social potential					
Strengths	Mark	VK	Weak sides	Mark	VK
1. The population's need for the spread of artificial intelligence technologies	7	0.31	1. Demographic crisis, characterized by a rapid reduction of the population.	9	0.24
2. Top management's interest in using artificial intelligence	8	0.4	2. High level of external and internal population migration.	8	0.21
3. Cooperation of state authorities, local self-government and business representatives	7	0.19	3. Labor market imbalance.	7	0.33
4. Availability of labor market infrastructure, which creates opportunities for personnel training.	7	0.1	4. Low level of work motivation.	8	0.22
$\sum = 0.31*7+0.4*8+0.19*7+0.1*7 = 7.4$			$\sum =0.24*9+0.21*8+0.33*7+0.22*8=7.91$		
Opportunities			Threats		
1. Formation of population culture in the field of artificial intelligence	8	0.28	1. The risk of increasing the level of unemployment due to the spread of artificial intelligence in the spheres of economic activity of society.	7	0.2
2. Adaptation of artificial intelligence technologies to meet the needs of the population	9	0.31	2. Insufficient funding for the development of information infrastructure, especially in rural areas	8	0.37
3. The spread of artificial intelligence technologies in everyday activities	9	0.14	3. Activation of migration processes.	9	0.33
4. Motivation of the population in the use of artificial intelligence	8	0.27	4. Further reduction of the population.	8	0.1
$\sum = 0.28*8+0.31*9+0.14*9+0.27*8=8.45$			$\sum = 0.2*7+0.37*8+0.33*9+0.1*8=8.13$		
Institutional potential					
Strengths	Mark	VK	Weak sides	Mark	VK

1. Availability of organizations and institutions that can be involved in scientific research and development in the field of artificial intelligence	7	0.23	1. Low level of cooperation in the world market of scientific developments in the field of artificial intelligence,	9	0.38
2. Qualified scientific personnel for development.	7	0.34	2. Lack of regulatory tools for minimizing ethical risks in the field of artificial intelligence.	8	0.21
3. Development of a network of educational institutions for training specialists and conducting research	8	0.24	3. Lack of an effective system of strategic management of the development of artificial intelligence technologies	9	0.32
4 Availability of a set of economic and administrative tools for regulating the development of artificial intelligence	8	0.19	4. Inaccessibility of high technologies for small enterprises.	8	0.09
$\Sigma = 0.23*7 + 0.34*7 + 0.24*8 + 0.19*8 = 7.43$			$\Sigma = 0.38*9 + 0.21*8 + 0.32*9 + 0.09*8 = 8.7$		
Opportunities	Mark	VK	Threats	Mark	VK
1. Cost reduction due to the introduction of innovative technologies.	8	0.19	1. Low level of investment attractiveness of developments in the field of artificial intelligence under modern realities.	6	0.29
2. Expanding the use of information technologies.	7	0.27	2. The difficulty of achieving a balance between the positive and negative realities of using artificial intelligence in the process of developing regulatory tools.	7	0.41
3. Application of world experience in the use of regulatory control tools when using artificial intelligence	7	0.35	3. Technological backwardness of small business enterprises for the development of innovative technologies of artificial intelligence.	7	0.14
4. Implementation of world standards	7	0.19	4. Increasing the influence of risk factors and uncertainty	8	0.16
$\Sigma = 0.19*8 + 0.27*7 + 0.35*7 + 0.19*7 = 7.19$			$\Sigma = 0.29*6 + 0.41*7 + 0.14*7 + 0.16*8 = 6.87$		

**Source: systematized and calculated by the authors.*

Thus, the production potential of regulatory policy has a significant positive impact, which in the future involves the activation of measures to expand the scope of artificial intelligence in the economy and social life, reduce the costs of implementing artificial intelligence projects, and strengthen cybersecurity measures. Social and institutional potential should form the basis for overcoming problems in the field of social development, migration policy, finding a balance between the positive characteristics of artificial intelligence and risks that are a threat to market behavior, competitive relations, and the consumer value system of the results of using artificial intelligence. Therefore, specifying the results of the SWOT analysis, taking into account the possibilities of institutional development, will allow to form a system of strategic directions.

Conclusions

The development of artificial intelligence and its spread in the economy opens up huge opportunities in various areas of human life, but the task of the state is to support competition in the development of artificial intelligence projects in the conditions of free development of the economy, which carries social and economic risks. In Ukraine, based on world experience, special attention should be paid to strategic aspects, namely the national strategy for the development of artificial intelligence and institutional aspects of relations both within the framework of existing information legislation and the creation of new institutions to determine the legal status of artificial intelligence systems. The difficulty lies in ensuring a balance between the legal protection of national interests and the technological development of the leading spheres of the economy, which requires a systemic policy with the positioning of artificial intelligence as an important component of the growth of economic competitiveness. Further research will be based on the analysis of the impact of artificial intelligence on the efficiency of enterprises.

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