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## ARTIFICIAL INTELLIGENCE AS A TOOL FOR ENHANCING COMPANY COMPETITIVENESS

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**Abstract.** The article examines the role of artificial intelligence as one of the key tools for enhancing the competitiveness of companies in the context of the digital transformation of the economy. The place of artificial intelligence in the system of forming sustainable competitive advantages of an enterprise is substantiated. The main artificial intelligence technologies used in business are analyzed, including machine learning, big data analytics, natural language processing, computer vision, and robotic process automation, and the directions of their practical application in production, marketing, financial, logistics, and managerial activities of enterprises are identified. It is established that the use of artificial intelligence contributes to increasing operational efficiency, improving the quality of managerial decision-making, enhancing customer orientation, and strengthening companies' adaptability to changes in the external environment. It is substantiated that AI acts not only as a tool for automating individual processes, but

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also as a strategic resource that ensures the transition to data-driven management and the formation of long-term competitive advantages. The main risks and limitations of implementing artificial intelligence, including financial, human resource, technological, ethical, and legal ones, are analyzed, and directions for their mitigation are identified. Approaches to assessing the effectiveness of AI use are summarized, and the feasibility of applying a comprehensive approach that combines economic, technological, and organizational-managerial indicators is proven. An example of a KPI system for assessing the effectiveness of AI use is proposed, and practical recommendations for improving the efficiency of artificial intelligence implementation in enterprise activities are formulated. These recommendations include the phased implementation of AI solutions, the development of digital competencies of personnel, ensuring data quality and security, and the integration of intelligent systems into companies' strategic management.

**Keywords:** artificial intelligence, enterprise competitiveness, digital transformation, data-driven management, innovation, risks of AI implementation, effectiveness of AI use.

**Introduction.** The current stage of economic development is characterized by an acceleration of digital transformation processes, which necessitates a reconsideration of traditional approaches to enterprise management and the formation of their competitive advantages. In the context of intensified global competition, increasing uncertainty of the market environment, and growing consumer requirements, the use of innovative technologies capable of ensuring flexibility, adaptability, and sustainable business development becomes particularly important. One of such key technologies is artificial intelligence, which is increasingly being integrated into the activities of enterprises across various industries.

Artificial intelligence acts not only as a tool for automating individual operations but also as an important element of strategic management that influences production, managerial, financial, and marketing processes. Its application makes it possible to increase operational efficiency, improve the quality of managerial decision-making, accelerate innovation processes, and form a higher level of customer orientation. As a result, AI is increasingly viewed as a factor in the formation of long-term competitive advantages and the strengthening of enterprises' market positions in the digital economy.

At the same time, the implementation of artificial intelligence is accompanied by a number of challenges and limitations related to high financial costs, a shortage of qualified personnel, issues of data quality and security, as well as ethical and legal aspects of the use of intelligent systems. This necessitates not only a technological but also a comprehensive scientific understanding of the role of artificial intelligence in enhancing enterprise competitiveness, taking into account strategic, organizational, and managerial factors.

In this regard, conducting a comprehensive study of the role of artificial intelligence as a tool for enhancing enterprise competitiveness is particularly relevant, as it allows for the generalization of modern theoretical approaches, the identification of key areas of practical application of AI, and the outlining of the advantages and risks of its implementation in contemporary business conditions.

**Analysis of Publications on the Research Topic.** The issues related to the use of artificial intelligence in enterprise activities and its impact on competitiveness have been actively studied in the works of foreign and domestic scholars. In contemporary economic literature, artificial intelligence is regarded as one of the key drivers of business digital transformation and a factor in the formation of long-term competitive advantages.

In foreign studies, primary attention is paid to the strategic aspects of AI implementation and its impact on company productivity and innovativeness. In particular, authors in [1] emphasize that digital technologies, including artificial intelligence, are transforming the structure of industry competition by creating new barriers to market entry and increasing the importance of intangible assets. Other authors focus on examining the role of machine learning and big data analytics in managerial decision-making, demonstrating that companies actively

using AI exhibit higher levels of operational efficiency and adaptability to changes in the external environment [2; 3].

A significant share of publications is devoted to the practical aspects of artificial intelligence application in specific functional areas of enterprises, such as marketing, logistics, finance, and human resource management. Researchers note that the implementation of intelligent systems enables the personalization of customer interactions [4], optimization of supply chains [5; 6; 7], and reduction of operational costs [8]. At the same time, a number of studies emphasize the risks associated with AI use, including ethical, legal, and human resource issues [9; 10].

Domestic scientific research is mainly focused on analyzing the potential of digital technologies to enhance enterprise performance in the context of a transformational economy. Ukrainian scholars consider artificial intelligence as a component of the digital economy [11] and as a tool for modernizing managerial processes [12]. The works of domestic authors highlight the importance of adapting foreign experience in AI implementation to national economic conditions, taking into account the level of technological development, institutional constraints, and human capital potential [13; 14; 15].

At the same time, the analysis of literature sources indicates that most domestic studies are fragmented in nature and primarily concentrate on individual areas of artificial intelligence application, without forming a holistic view of its impact on enterprise competitiveness. Insufficient attention is paid to the development of universal approaches to assessing the effectiveness of AI implementation from the perspective of companies' strategic development.

Thus, the generalization of contemporary foreign and domestic studies allows for the conclusion that there is a substantial body of scientific research in the field of artificial intelligence application in business, while simultaneously confirming the need for further comprehensive studies aimed at a systematic substantiation of the role of AI as a tool for enhancing enterprise competitiveness.

**Purpose and Objectives of the Study.** The purpose of the study is to diagnose the role of artificial intelligence as a tool for enhancing enterprise competitiveness and to substantiate the main directions of its effective use in contemporary business conditions. To achieve this purpose, the study sets the following objectives: to analyze modern scientific approaches to defining enterprise competitiveness; to examine key artificial intelligence technologies used in business; to identify the main advantages and risks of AI implementation; and to assess its impact on key performance indicators of companies.

**Main Material.** In modern economic science, enterprise competitiveness is considered a multidimensional category that reflects the ability of a business entity to achieve and maintain stable market positions through efficient resource utilization, innovation implementation, and adaptation to changes in the external environment. In the digital economy, information technologies play a key role in shaping such advantages, among which artificial intelligence occupies a special place as a strategic management tool [16, p. 1433].

From the perspective of the resource-based approach, artificial intelligence can be defined as a specific intangible asset that provides enterprises with access to unique analytical capabilities. Machine learning algorithms, intelligent analytics systems, and automated decision-making mechanisms form a new quality of management based on the use of data as a strategic resource. When properly integrated, such technologies meet the main criteria for creating competitive advantages—value, rarity, and difficulty of imitation. Within the dynamic approach to competitiveness, artificial intelligence serves as a tool for enhancing enterprise adaptability. Due to its ability to analyze large volumes of data in real time, AI enables timely responses to changes in market conditions, consumer behavior, and competitors' actions. This is particularly important in conditions of high uncertainty, when traditional planning methods prove to be insufficiently effective [2].

The use of artificial intelligence in the competitiveness management system also transforms approaches to managerial decision-making. The transition from intuitive management to data-driven approaches increases the soundness of strategic and tactical decisions, reduces the risk of errors, and promotes more efficient resource utilization. As a result, artificial intelligence becomes not only a technological tool but also an element of the enterprise's strategic architecture that determines its long-term development and competitive position [17, p. 89].

Summarizing theoretical approaches, it is appropriate to consider artificial intelligence as an integrative factor that combines resource-based, innovation, and strategic approaches to competitiveness management (Table 1). This makes it possible to form a comprehensive view of the role of AI in modern business and to substantiate the need for its systematic implementation.

**Table 1 – The Role of Artificial Intelligence in the Main Theoretical Approaches to Competitiveness Management**

Theoretical approach	Role of artificial intelligence	Impact on competitiveness
Resource-based approach	Intangible strategic resource	Formation of sustainable competitive advantages
Innovation approach	Catalyst of technological and managerial innovations	Acceleration of new product and business model development
Dynamic approach	Tool for adaptation to environmental changes	Increased flexibility and resilience of the enterprise
Strategic approach	Basis of data-driven management	Improvement of the quality of strategic decisions

Source: systematized by the author

The effective use of artificial intelligence as a tool for enhancing enterprise competitiveness largely depends on the selection and integration of specific AI technologies into business processes. Current practice indicates that the most widely used technologies include machine learning, big data analytics, natural language processing, computer vision, and robotic process automation (Table 2).

**Table 2 – Key Artificial Intelligence Technologies and Their Impact on Enterprise Competitiveness**

AI technology	Main areas of application	Impact on competitiveness
Machine learning	Forecasting, pricing, inventory management	Risk reduction, increased decision accuracy
Big data analytics	Strategic analysis, data-driven management	Increased adaptability and innovativeness
Natural language processing	Customer service, marketing	Growth of customer loyalty
Computer vision	Quality control, logistics	Cost reduction, productivity improvement
RPA + AI	Administrative and managerial processes	Resource optimization and operational efficiency

Source: systematized by the author

Machine learning is a core technology that enables systems to self-learn based on accumulated data. In enterprise activities, it is used for demand forecasting, pricing optimization, inventory management, and the identification of hidden patterns in financial and operational indicators. The application of such algorithms contributes to improved forecasting accuracy and reduced managerial risks, which directly affects companies' competitive positions [18, p. 200].

Big data analytics in combination with artificial intelligence makes it possible to process large volumes of heterogeneous information, including structured and unstructured data. This

creates a foundation for the formation of data-driven management, in which strategic and tactical decisions are made based on a comprehensive analysis of internal and external data. Research confirms that companies actively using Big Data and AI demonstrate higher levels of innovativeness and adaptability to market changes [17, p. 90].

Natural language processing (NLP) technologies are widely applied in marketing, customer service, and knowledge management. Chatbots, virtual assistants, and text data analysis systems ensure the automation of customer interactions, reduce request processing time, and increase customer satisfaction levels. As a result, enterprises gain additional competitive advantages by improving service quality and customer loyalty [19, p. 71].

Computer vision is an important component of the digitalization of production and logistics processes. It is used for automated product quality control, monitoring of production lines, warehouse operation management, and security assurance. The application of this technology helps reduce errors, increase operational accuracy, and lower costs, which positively affects enterprise competitiveness [5; 6].

Robotic process automation (RPA) combined with AI facilitates the automation of administrative and managerial functions, such as document processing, financial reporting, and human resource management. This makes it possible to free up resources for strategically important tasks and increase the overall efficiency of enterprise operations [20, p. 83].

Artificial intelligence is increasingly being implemented in enterprise activities and is viewed not only as a tool for automating individual operations, but as a comprehensive factor in the formation of sustainable competitive advantages (Table 3). Its application covers virtually all functional areas of business and directly affects key indicators of competitiveness, including operational efficiency, innovative potential, financial stability, and the level of customer orientation.

**Table 3 – Summary of Areas of Artificial Intelligence Application and Their Impact on Enterprise Competitiveness**

Functional area	Areas of AI application	Key competitiveness indicators	Expected outcome
Production	Predictive maintenance, process control	Operational efficiency	Cost reduction, stable quality
Marketing	Consumer behavior analysis, personalization	Customer orientation	Growth of loyalty and market share
Finance	Forecasting, risk management	Financial stability	Sustainable development
Human resource management	Recruitment and evaluation	Human capital	Productivity improvement
Logistics	Route and inventory optimization	Operational efficiency	Supply reliability

*Source: systematized by the author*

One of the basic areas of artificial intelligence application is the optimization of production processes. AI solutions are used for predictive maintenance of equipment, quality control, and management of production cycles. Machine learning algorithms make it possible to detect potential failures at early stages, reduce downtime, and minimize resource losses. This ensures increased operational efficiency, lower production costs, and stability of production results, which are important factors of price competitiveness [2].

In the field of marketing, artificial intelligence provides in-depth analysis of consumer behavior, personalization of offerings, and optimization of communication strategies. The use of AI enables the segmentation of customers based on complex multidimensional attributes and the forecasting of demand and purchasing decisions. This increases the effectiveness of marketing

campaigns, contributes to higher customer loyalty, and positively affects the enterprise's market share [4, p. 128; 19, p. 73].

Artificial intelligence also plays an important role in financial management. Intelligent financial data analysis systems make it possible to forecast cash flows, assess financial risks, and improve the accuracy of managerial decisions. As a result, enterprises strengthen their financial stability, reduce the likelihood of financial losses, and ensure sustainable development even in an unstable market environment [21].

Human resource management is also undergoing significant changes under the influence of AI. Artificial intelligence algorithms are used for recruitment, employee performance evaluation, and forecasting workforce needs. This contributes to the formation of an optimal staff structure and the development of human capital, which in the modern economy is one of the key intangible sources of competitive advantage [9, p. 306].

In logistics and supply chain management, artificial intelligence is applied to route optimization, demand forecasting, and inventory management. Such solutions reduce transportation costs, decrease inventory levels, and increase supply reliability, which directly affect the overall operational efficiency of the enterprise [7, p. 50].

Overall, the implementation of artificial intelligence improves the quality of managerial decision-making through the transition to data-driven approaches, reduces subjectivity in strategic planning, and stimulates enterprises' innovative activity. This contributes to the formation of long-term competitive advantages and enhances business adaptability to changes in the external environment [22].

Despite the significant potential of artificial intelligence as a tool for enhancing enterprise competitiveness, its implementation in business activities is accompanied by a number of risks and limitations, ignoring which may lead to reduced effectiveness of AI use or even a negative impact on companies' performance (Table 4). Therefore, a comprehensive analysis of such risks is a necessary prerequisite for the development of a well-grounded digital transformation strategy.

**Table 4 – Main Risks of Artificial Intelligence Implementation and Directions for Their Mitigation**

<b>Risk group</b>	<b>Characteristics</b>	<b>Mitigation directions</b>
Financial	High implementation costs	Phased implementation, ROI analysis
Human resources	Shortage of digital competencies	Staff training, engagement of experts
Data and security	Poor data quality, cyber threats	Data governance, cybersecurity
Ethical and legal	Regulatory uncertainty	Compliance with standards and regulations
Organizational	Excessive automation	Combination of AI and human control

*Source: systematized by the author*

One of the key constraints is the high level of financial costs associated with the development, implementation, and maintenance of AI systems. Investments in software, hardware resources, cybersecurity, and staff training can be substantial, especially for small and medium-sized enterprises. In the absence of clearly defined goals and expected outcomes, such expenditures do not always translate into an adequate economic effect, thereby reducing the feasibility of using artificial intelligence.

A significant risk is also the shortage of qualified personnel capable of effectively working with AI technologies. The lack of specialists in data analytics, machine learning, and digital management limits enterprises' ability to fully integrate artificial intelligence into business processes. In addition, employee resistance to organizational change may reduce the effectiveness of innovative solutions and create additional managerial barriers.

An important aspect involves risks related to data quality and security. The effectiveness of AI systems directly depends on the completeness, reliability, and timeliness of the information

used to train algorithms. Poor data quality may lead to inaccurate forecasts and inadequate managerial decisions. Moreover, the growing threat of cyberattacks, data breaches, and violations of confidentiality can cause significant damage to an enterprise's reputation and financial condition.

A separate group of risks is associated with the ethical and legal aspects of artificial intelligence use. Issues of algorithm transparency, responsibility for decisions made by AI systems, and compliance with personal data protection requirements remain insufficiently regulated at the legislative level in many countries. This creates legal uncertainty and may limit the scale of artificial intelligence application in certain areas of enterprise activity [10].

In addition, there is a risk of excessive technological dependence of enterprises on AI solutions. Full automation of processes without adequate human oversight may lead to a loss of managerial flexibility and a reduced ability to respond to non-standard situations. In this regard, scholarly research emphasizes the need to maintain a balance between automation and the human factor in the competitiveness management system.

Evaluating the effectiveness of artificial intelligence use is an important stage in the formation and implementation of strategies to enhance enterprise competitiveness. Unlike traditional investment projects, AI implementation has a complex nature and affects not only financial results but also qualitative aspects of a company's activities, requiring the application of multidimensional methodological approaches.

The scientific literature identifies several approaches to evaluating the effectiveness of artificial intelligence use (Table 5). The most common is the economic approach, which is based on the analysis of financial indicators, including profitability growth, cost reduction, and increased labor productivity. Evaluating the economic effect allows determining the feasibility of investments in AI technologies and calculating their payback period. However, using only financial indicators does not provide a complete understanding of AI's impact on enterprise competitiveness [23].

**Table 5 – Main Approaches to Evaluating the Effectiveness of Artificial Intelligence Use**

<b>Approach</b>	<b>Key Indicators</b>	<b>Advantages</b>	<b>Limitations</b>
Economic	Profitability, costs, ROI	Quantitative assessment	Ignores qualitative aspects
Technological	Accuracy, speed, level of automation	Assessment of AI quality	Narrow specialization
Organizational	Digital maturity, staff readiness	Accounts for human factor	Difficult to measure
Comprehensive	Combination of quantitative and qualitative indicators	Systematic assessment	High complexity

*Source: systematized by the author based on [23]*

The technological approach focuses on assessing the performance of AI systems, including forecast accuracy, data processing speed, and the level of process automation. This approach allows evaluating the quality of technological solutions and their alignment with business needs. At the same time, it does not account for the strategic and organizational aspects of artificial intelligence use [23].

The organizational-managerial approach involves assessing changes in management structure, decision-making processes, and the enterprise's level of digital maturity. Important indicators in this context include the degree of AI integration into business processes, staff readiness to work with innovative technologies, and the effectiveness of human-AI interaction [23].

The most promising is the comprehensive approach to evaluating AI effectiveness, which combines economic, technological, and organizational indicators. This approach allows considering both quantitative and qualitative results of artificial intelligence implementation and provides a more objective assessment of its impact on enterprise competitiveness.

For practical implementation of a comprehensive approach, it is advisable to develop a system of key performance indicators (KPIs) that reflect the impact of artificial intelligence on various aspects of competitiveness. Such indicators may include labor productivity, decision-making time, share of innovative products, satisfaction index, and profitability (Table 6). The use of KPIs allows for monitoring the results of AI implementation over time and adjusting the development strategy based on the obtained outcomes.

**Table 6 – Example of a KPI System for Evaluating AI Effectiveness**

<b>Evaluation Area</b>	<b>Indicator</b>	<b>Expected Result</b>
Operations	Labor productivity	Increased efficiency
Management	Decision-making time	Enhanced flexibility
Innovation	Share of innovative products	Differentiation
Customers	Satisfaction index	Increased loyalty
Finance	Profitability	Sustainable development

*Source: developed by the author*

Thus, applying a comprehensive methodological approach to evaluating the effectiveness of artificial intelligence use provides a foundation for informed management of enterprise competitiveness and the formation of long-term competitive advantages in the digital economy.

**Conclusions and Prospects for Further Research.** The study substantiates the role of artificial intelligence as one of the key tools for enhancing enterprise competitiveness in the digital economy. It has been established that implementing AI technologies contributes to the transformation of traditional management models, improving operational efficiency, increasing innovation activity, and enhancing the quality of managerial decisions. Artificial intelligence is considered not only a technological tool for automation but also a strategic resource capable of creating sustainable competitive advantages.

The generalization of theoretical approaches indicates that the effectiveness of AI use depends on the level of digital maturity of the enterprise, the quality and security of data, the development of digital competencies of personnel, and the degree of AI integration into strategic management systems. It has been shown that AI has the most significant impact on competitiveness indicators such as labor productivity, financial stability, customer orientation, and the enterprise's ability to adapt under conditions of uncertainty.

At the same time, the study identified a number of risks and limitations associated with AI implementation, including financial, personnel, technological, and ethical aspects. This highlights the necessity of a comprehensive approach to AI use, combining technological innovations with organizational and managerial solutions.

Prospects for further research include the development of industry-oriented models for evaluating AI effectiveness, conducting empirical studies on the impact of AI on the competitiveness of enterprises of different sizes, and deepening the analysis of human capital interaction with intelligent systems. Another promising area for future research is the study of ethical and regulatory aspects of AI application in business in the context of ensuring sustainable enterprise development.

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## ШТУЧНИЙ ІНТЕЛЕКТ ЯК ІНСТРУМЕНТ ПІДВИЩЕННЯ КОНКУРЕНТОСПРОМОЖНОСТІ КОМПАНІЙ

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**Анотація.** У статті досліджено роль штучного інтелекту як одного з ключових інструментів підвищення конкурентоспроможності компаній в умовах цифрової трансформації економіки. Обґрунтовано місце штучного інтелекту в системі формування стійких конкурентних переваг підприємства. Проаналізовано основні технології штучного інтелекту, що застосовуються у бізнесі, зокрема машинне навчання, аналітику великих даних, обробку природної мови, комп'ютерний зір та роботизовану автоматизацію процесів, а також визначено напрями їх практичного використання у виробничій, маркетинговій, фінансовій, логістичній та управлінській діяльності підприємств. Встановлено, що використання штучного інтелекту сприяє підвищенню операційної ефективності, якості управлінських рішень, рівня клієнтоорієнтованості та адаптивності компаній до змін зовнішнього середовища. Обґрунтовано, що ШІ виступає не лише інструментом автоматизації окремих процесів, а стратегічним ресурсом, який забезпечує перехід до data-driven управління та формування довгострокових конкурентних переваг. Проаналізовано основні ризики та обмеження впровадження штучного інтелекту, зокрема фінансові, кадрові, технологічні, етичні та правові, і визначено напрями їх мінімізації. Узагальнено підходи до оцінювання ефективності використання ШІ, доведено доцільність застосування комплексного підходу, що поєднує економічні, технологічні та організаційно-управлінські показники. Запропоновано приклад системи КРІ для оцінювання ефективності використання ШІ та сформовано практичні рекомендації щодо підвищення ефективності використання штучного інтелекту в діяльності підприємств, які передбачають поетапне впровадження ШІ-рішень, розвиток цифрових компетенцій персоналу, забезпечення якості та безпеки даних, а також інтеграцію інтелектуальних систем у стратегічне управління компаніями.

**Ключові слова:** штучний інтелект, конкурентоспроможність підприємства, цифрова трансформація, data-driven управління, інновації, ризики впровадження ШІ, ефективність використання ШІ.