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MODERN ECONOMY AND INTELLIGENT TECHNOLOGIES

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Annotation
This article provides a scientific and theoretical analysis of the development of intelligent technologies (artificial intelligence, big data — Big Data, machine learning, and digital platforms) in the context of the modern economy, as well as their impact on economic processes. The relevance of the study lies in the fact that, as a result of globalization and digital transformation processes, the demand for innovative technologies is rapidly increasing across all sectors of the economy [1]. In this regard, the implementation of intelligent technologies is considered an important factor in enhancing economic efficiency, ensuring the rational use of resources, and improving management systems [2].
The methodological framework of the study includes system analysis, a comparative approach, statistical data processing, and a review of scientific literature. Using these methods, the level of application of intelligent technologies and their effectiveness in the economies of developed and developing countries were examined [3].
The results of the study demonstrate that artificial intelligence and digital technologies contribute to increasing production efficiency, reducing costs, improving the accuracy of market forecasts, and facilitating the emergence of new business models [4]. In addition, the rapid development of e-commerce, fintech, and the digital services sector leads to structural changes in the economy.
The discussion section analyzes the existing challenges in the implementation of intelligent technologies, such as the shortage of qualified personnel, the insufficient development of digital infrastructure, and cybersecurity issues [5]. At the same time, it

is substantiated that these challenges can be addressed through the improvement of public policy and the enhancement of the investment climate.
In conclusion, it should be emphasized that in the modern economy, intelligent technologies are becoming a strategic resource and play a crucial role in ensuring sustainable economic growth. Their effective implementation is one of the key factors in increasing the competitiveness of the national economy [6].
Keywords
Modern economy, intelligent technologies, artificial intelligence, digital transformation, innovation, economic efficiency.

Introduction

Globalization and digital transformation have significantly reshaped the structure of the modern world economy, leading to increased interdependence among national markets and the rapid integration of advanced digital technologies into all sectors of economic activity [1]. These processes have accelerated innovation, improved access to information, and transformed traditional production and management systems into more flexible and technology-driven models [2]. The growing role of intelligent technologies in the modern economy is becoming increasingly evident as artificial intelligence, big data analytics, machine learning, and digital platforms are widely applied to enhance productivity, optimize decision-making processes, and improve overall economic efficiency [3]. These technologies are now considered key drivers of economic growth, competitiveness, and long-term sustainable development in both developed and developing countries [4]. Challenges in transitioning from traditional to digital economy are mainly associated with structural changes in economic systems, where traditional production and management models must be replaced or significantly transformed by digital and data-driven approaches [5]. This transition often faces difficulties such as institutional inertia, lack of digital skills among the workforce, and insufficient technological infrastructure, which slow down the overall process of digital transformation [6]. In addition, disparities between developed and developing economies further intensify these challenges, creating a digital divide that affects global economic equality [7]. Barriers to technology adoption include a wide range of economic, technical, and social factors that limit the effective implementation of intelligent technologies in business and public sectors [8]. Among the most significant barriers are high

implementation costs, limited access to advanced technologies, cybersecurity risks, and resistance to organizational change [9]. Furthermore, insufficient investment in research and development, as well as weak regulatory frameworks, can significantly reduce the speed of technology diffusion in emerging economies [10].

Problem Statement

Challenges in transitioning from traditional to digital economy are primarily related to the structural transformation of economic systems, where established industrial models must be replaced by digital, data-driven, and innovation-oriented frameworks [1]. This transition is often hindered by institutional resistance, insufficient digital literacy among the workforce, and inadequate technological infrastructure [2]. Moreover, the uneven level of digital development between countries creates a global digital divide, which further complicates the process of economic digitalization and limits inclusive growth [3]. Barriers to technology adoption represent a complex set of economic, organizational, and technological obstacles that slow down the implementation of intelligent technologies in various sectors [4]. Key barriers include high initial investment costs, lack of skilled human capital, concerns related to cybersecurity and data privacy, and resistance to organizational change within enterprises [5]. Additionally, weak regulatory frameworks and insufficient government support for innovation further reduce the speed and efficiency of technology diffusion, especially in developing economies [6].

Research Aim and Objectives

To analyze the role of intelligent technologies in the modern economy, focusing on how artificial intelligence, big data, machine learning, and digital platforms contribute to economic growth, productivity enhancement, decision-making efficiency, and the transformation of traditional economic systems into digitally driven and innovation-based structures [1].

To identify key types of intelligent technologies, including artificial intelligence, big data analytics, machine learning systems, blockchain-based solutions, and digital platforms that are widely used in modern economic systems for automation, data processing, and decision support [2]. To evaluate their economic impact, particularly their contribution to increasing productivity, reducing operational costs, improving efficiency

in production and service delivery, and supporting the development of new digital business models and markets [3].To examine existing challenges related to the adoption of intelligent technologies, such as high implementation costs, shortage of qualified specialists, cybersecurity risks, insufficient digital infrastructure, and regulatory limitations in both developed and developing economies [4]. The modern economic system, characterized by globalization, digital transformation, and the increasing integration of advanced technologies into production, management, and service sectors, which collectively shape contemporary economic development patterns [5]. Intelligent technologies and their economic impact, with a focus on how artificial intelligence, big data, machine learning, and digital platforms influence productivity, efficiency, innovation processes, and the structural transformation of modern economies [6].

Methods

System analysis is applied to examine the modern economic system as an integrated and interdependent structure, where intelligent technologies interact with production, management, and service processes, enabling a holistic understanding of their functional roles and systemic effects [1]. Comparative analysis is used to evaluate differences and similarities in the adoption and impact of intelligent technologies across developed and developing economies, allowing for the identification of best practices and structural disparities in digital transformation processes [2]. Statistical analysis is employed to process and interpret quantitative data related to economic performance indicators, technological adoption rates, productivity levels, and digital innovation metrics, ensuring objective and evidence-based conclusions [3]. Literature review involves the systematic examination of existing scientific publications, theoretical frameworks, and empirical studies to establish a solid conceptual foundation for understanding intelligent technologies and their role in modern economic development [4]. Scientific articles and journals are used as primary academic sources to provide peer-reviewed theoretical and empirical insights into intelligent technologies, digital transformation, and their economic implications, ensuring the scientific validity and reliability of the research [5]. International reports (IMF, World Bank, etc.) serve as authoritative sources of macroeconomic data, global development indicators, and policy analyses, offering

comprehensive information on digital economy trends, technological adoption, and economic performance across countries [6]. Statistical databases are utilized to obtain quantitative data from reliable platforms such as national statistical agencies and international databases, enabling accurate measurement and comparative assessment of economic indicators related to digital transformation and intelligent technologies [7]. Comparative study of developed and developing countries is conducted to analyze differences in the level of digital transformation, availability of intelligent technologies, infrastructure development, human capital quality, and innovation capacity, thereby identifying key factors that influence unequal technological progress across global economies [8]. Evaluation of technological efficiency focuses on assessing how effectively intelligent technologies are utilized in economic processes by measuring their impact on productivity growth, cost reduction, decision-making accuracy, and overall economic performance in both developed and developing countries [9].

Results

Artificial Intelligence (AI) refers to computational systems capable of performing tasks that typically require human intelligence, such as decision-making, pattern recognition, language processing, and predictive analysis, thereby significantly improving efficiency and automation in modern economic processes [1]. Big Data represents the large-scale collection, storage, and analysis of complex datasets that cannot be processed using traditional methods, enabling organizations to extract valuable insights, identify trends, and support data-driven decision-making in economic activities [2]. Machine Learning (ML) is a subset of artificial intelligence that involves the development of algorithms that allow systems to learn from data, improve performance over time, and make predictions or decisions without explicit programming, widely applied in forecasting and optimization tasks [3]. Digital Platforms are technology-based infrastructures that facilitate interaction, exchange, and transactions between users, businesses, and institutions, playing a crucial role in enabling digital ecosystems, e-commerce, and modern service delivery models [4].Increased productivity is one of the most significant economic impacts of intelligent technologies, as automation, artificial intelligence, and data-driven systems enable organizations to optimize production processes, reduce

manual labor, and enhance overall operational efficiency, leading to higher output levels with the same or fewer resources [5]. Cost reduction occurs through the optimization of resource allocation, automation of repetitive tasks, and minimization of operational inefficiencies, allowing businesses to lower production and administrative expenses while maintaining or improving the quality of goods and services [6]. Improved forecasting accuracy is achieved through the use of advanced analytics, machine learning algorithms, and big data processing, which enable more precise predictions of market trends, consumer behavior, and economic fluctuations, thereby supporting better strategic planning and decision-making processes [7]. E-commerce represents a rapidly growing sector of the digital economy, where goods and services are bought and sold through online platforms, driven by intelligent technologies that enhance customer experience, logistics optimization, personalized marketing, and real-time transaction processing [8]. Fintech refers to the integration of financial services with advanced digital technologies such as artificial intelligence, blockchain, and big data analytics, enabling more efficient payment systems, digital banking, risk assessment, and financial inclusion across different segments of society [9]. Digital services encompass a wide range of technology-based services including cloud computing, software-as-a-service (SaaS), online education, telemedicine, and digital communication platforms, which collectively contribute to the modernization and diversification of economic structures [10]. Empirical findings (if applicable) involve the presentation and analysis of quantitative data through tables, charts, and graphs to visually represent trends, relationships, and comparisons related to the adoption and impact of intelligent technologies, thereby supporting evidence-based conclusions and enhancing the clarity of research results [11].

Discussion

Interpretation of results involves providing a detailed explanation of the empirical findings, highlighting how intelligent technologies influence economic performance, productivity growth, and structural transformation within modern economic systems, while linking observed outcomes to the research objectives and theoretical framework [1]. Comparison with previous studies is conducted through a literature-based discussion that contrasts the current research findings with existing academic works, identifying

similarities, differences, and possible reasons for variations, thereby situating the study within the broader scientific discourse on digital economy and technological innovation [2]. Challenges in the adoption and implementation of intelligent technologies include a significant skills gap, where the workforce lacks adequate digital competencies required for advanced technologies [3]; underdeveloped digital infrastructure, which limits access to reliable and high-speed technological systems necessary for innovation [4]; and cybersecurity issues, which pose risks related to data protection, privacy, and system reliability in increasingly digitalized economic environments [5]. Policy improvement refers to the development and implementation of effective governmental strategies and regulatory frameworks that support digital transformation, encourage innovation, ensure fair competition, and create a favorable environment for the adoption of intelligent technologies in the modern economy [6]. Education system development focuses on modernizing curricula, enhancing digital literacy, and strengthening STEM (Science, Technology, Engineering, and Mathematics) education to prepare a highly skilled workforce capable of effectively using and developing intelligent technologies in various economic sectors [7]. Investment enhancement involves increasing both public and private investments in research and development (R&D), digital infrastructure, and innovative startups, which is essential for accelerating technological progress and ensuring sustainable economic growth in the context of the digital economy [8].

Conclusion

Summary of key findings highlights that intelligent technologies such as artificial intelligence, big data, machine learning, and digital platforms play a crucial role in enhancing productivity, reducing costs, improving decision-making processes, and accelerating the digital transformation of modern economic systems, thereby contributing significantly to economic growth and efficiency [1].

Theoretical and practical implications indicate that the study strengthens existing economic theories related to digital transformation and innovation while also providing practical insights for policymakers, business leaders, and researchers on how to effectively implement intelligent technologies to improve competitiveness and sustainable development [2].

Final conclusions emphasize that intelligent technologies have become a strategic driver of the modern economy, fundamentally transforming traditional economic structures into data-driven and innovation-oriented systems, and their effective adoption is essential for long-term economic stability, global competitiveness, and sustainable growth [3].

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