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LEVERAGING ARTIFICIAL INTELLIGENCE POTENTIAL IN UZBEKISTAN'S ECONOMY

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Abstract: *This article explores the potential of artificial intelligence (AI) in transforming Uzbekistan's economy, emphasizing the country's ongoing reforms and strategies to integrate AI technologies. It examines the legislative framework, including the Presidential Decree No. PQ-4996 (2021) and the "Digital Uzbekistan – 2030" strategy, which aim to foster AI adoption in economic sectors, public administration, and social spheres. The theoretical aspects of AI's economic impact are analyzed, highlighting its dual role in automating traditional jobs and creating new opportunities in technological fields. Globally, AI enhances competitiveness, productivity, and innovation, as seen in leading nations like the United States, China, and the European Union. In Uzbekistan, AI applications in commerce, banking, agriculture, and industry are gaining traction, supported by educational initiatives and research institutions. The article provides recommendations for maximizing AI's economic benefits, including legal reforms, workforce training, and sector-specific applications like smart agriculture and transport systems. Uzbekistan's efforts position it to leverage AI for sustainable economic growth and global competitiveness by 2030.*

Keywords: *Artificial Intelligence (AI), Uzbekistan Economy, Digital Economy, AI Reforms, Economic Impact, Creative Destruction, Productivity, Innovation Ecosystem, Global Competitiveness, Smart Agriculture, Banking Sector, Workforce Training, Digital Uzbekistan 2030, Legal Framework, Technological Development*

Introduction

Reforms aimed at developing the field of artificial intelligence (AI) in Uzbekistan have been actively implemented in recent years within the framework of

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the country's transition to a digital economy and the introduction of innovative technologies. In this process, legal documents adopted by the state, support for educational and scientific research activities, as well as the role of the private sector and international cooperation, play a significant role. The reforms for AI development in Uzbekistan began with several key government documents.

The Presidential Decree No. PQ-4996, dated February 17, 2021, "On Measures to Create Conditions for the Rapid Implementation of Artificial Intelligence Technologies," approved an action plan for studying and implementing AI technologies in 2021-2022. This program outlined priority areas such as developing an AI strategy, creating a regulatory framework, and forming an educational and innovation ecosystem. The "Digital Uzbekistan – 2030" strategy, approved by Presidential Decree No. PF-6079 on October 5, 2020, laid the general foundation for integrating AI into the country's economy and public administration. Within the strategy, it was planned to use AI technologies to improve the quality of public services and data processing.

Theoretical Aspects of AI's

Economic Impact

According to the theory of automation and its impact on the labor market, AI and automation may eliminate many traditional jobs while creating new employment opportunities in emerging technological fields. This concept is based on the theory of "creative destruction" developed by Joseph Schumpeter. Researchers analyze how AI and robotics reshape the economy and alter labor demand, emphasizing the potential increase in income inequality despite economic growth[1].

The theory of improving production efficiency suggests that automation and optimization enhance productivity by reducing costs and contributing to economic growth. AI and digital technologies are reshaping the economy by introducing new production methods. For example, AI is bringing significant changes to logistics, supply chains, and service optimization. Another study models how AI contributes to

[1] "The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies" (Эрик Бринйолфссон ва Эндрю Макафи, 2014) (https://wwnorton.com/books/The-Second-Machine-Age/)

long-term economic growth by increasing production efficiency[2]. Researchers highlight that AI accelerates innovation and ensures efficient use of resources.

Although AI may eliminate traditional jobs, it creates new employment opportunities in technological fields such as data analysis and robotics, diversifying the economy. AI fosters new economic opportunities, particularly for startups and high-tech enterprises. AI-based services (such as personalized marketing) inject new energy into the economy. Studies indicate that AI can help create new professions (AI specialists, robotics engineers) and economic sectors (such as autonomous transportation), and adapting the education system accordingly is essential[3].

Discussions

Artificial intelligence (AI) has become one of the most significant technological discoveries of the 21st century, transforming various sectors worldwide, including governance, economy, industry, education, healthcare, and more. This technology plays a crucial role in modern societal development by mimicking human intelligence, solving complex problems, and enhancing efficiency. Across the globe, large-scale reforms are being implemented to develop AI and integrate it into the economy, fostering global competitiveness and economic growth. Uzbekistan is also taking important steps to develop AI technologies and integrate them into the national economy, aligning with this global trend.

Leading nations in AI development are formulating their strategies to integrate this technology into all sectors of the economy. For example, in the United States, the "National Artificial Intelligence Initiative Act" was passed in 2020 to support AI innovations, allocating over $6.5 billion for national research and development. This law aims to ensure the safety, transparency, and ethical aspects of AI while expanding its applications in industries such as manufacturing, transportation, and healthcare. The European Union prioritizes a human-centered approach to AI development and, in 2021, introduced the "Artificial Intelligence Act," which classifies AI systems

[2] "Artificial Intelligence and Economic Growth" (Филипп Агион, Бенжамин Ф. Жонс, Чарльз И. Жонс, 2017) (https://www.nber.org/papers/w23928).
[3] "The AI Economy: Work, Wealth and Welfare in the Robot Age" (Рожер Бутл, 2019) (https://www.palgrave.com/gp/book/9781137605955).

based on risk levels and imposes strict requirements on high-risk AI technologies. The EU's goal is to guarantee data security and protect citizens' rights while utilizing AI in the economy.

China also views AI as a fundamental pillar of its national development strategy. Under the "Next Generation Artificial Intelligence Development Plan" adopted in 2017, China aims to become a global leader in AI by 2030. To achieve this goal, the government collaborates with the private sector, investing billions of dollars in AI applications across consumer goods, logistics, and agriculture[4]. These reforms have not only increased economic efficiency but also strengthened China's position in the global technological competition. In Russia, the "National Strategy for the Development of Artificial Intelligence" was adopted in 2019, outlining plans to establish a legal framework for AI and implement it in public administration, energy, and transportation by 2030. The strategy places particular emphasis on ensuring public safety and maximizing AI's economic impact.

These global reforms highlight AI's growing role in the economy, improving efficiency while also raising concerns about data security, ethical norms, and societal impact. Consequently, global competition in AI development is intensifying[5]. Uzbekistan has also been actively implementing reforms to develop and apply AI in its economy. The country's efforts in this field have been accelerating since 2017. One of the key reforms was initiated by the Presidential Decree No. PQ-4996, issued on February 17, 2021, titled "Measures to Create Conditions for the Rapid Implementation of Artificial Intelligence Technologies." This decree defined the main directions and principles of AI implementation. It set tasks to develop AI technologies in economic sectors, social spheres, and public administration while ensuring unified standards, accountability, security, and transparency through a legal framework. The decree also aimed to improve public services, enhance data processing efficiency,

[4] "AI Superpowers: China, Silicon Valley, and the New World Order" (Кай-Фу Ли, 2018) (https://www.hmhbooks.com/shop/books/AI-Superpowers/9781328546395).
[5] "The Future of Work: Robots, AI, and Automation" (Даррел М. Уэст, 2018) (https://www.brookings.edu/book/the-future-of-work/).

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foster an innovation ecosystem in AI, and encourage the commercialization of research.

Additionally, Uzbekistan has introduced financial support programs to help businesses transition to AI-based operations, subsidizing retraining costs to preserve jobs and promoting research and development (R&D) in AI solutions. Within the "Digital Uzbekistan – 2030" strategy, the rapid implementation of AI technologies and the effective use of digital data have become long-term national priorities. By 2025, Uzbekistan aims to improve its position in the global AI readiness index and continues implementing reforms in this direction.

The global and national efforts in AI development and its economic applications highlight the significance of modern technologies in societal progress. While leading nations view AI as a tool for maintaining global competitiveness, Uzbekistan sees it as a crucial factor in its economic and social development. Strengthening the legal framework, applying AI in practice, and investing in human capital will help Uzbekistan achieve its goal of becoming an innovative nation by 2030. Through this book, we will examine these processes in detail and discuss the future prospects of AI.

AI's Role in Enhancing Global Competitiveness

AI enables nations and companies to enhance their global market competitiveness, accelerate innovation, and stimulate economic growth. Researcher Kai-Fu Lee demonstrates how AI positively influences the economies of countries like China and the United States. In China, AI has accelerated innovations in e-commerce and mobile payments. A special regulatory regime for AI implementation has been introduced in Uzbekistan. This regime aims to provide legal flexibility for testing and applying AI-based programs. For instance, IT Park residents were granted benefits, and a five-year special period was established for pilot projects. One of the crucial aspects of AI development is training highly qualified specialists. From the 2021-2022 academic year, AI-related education programs have been introduced at the Tashkent University of Information Technologies (TUIT) and other higher education

institutions. By 2023, AI-related education was reported to be offered at four universities.

The Ministry of Information Technologies and Communications has established the "Scientific Research Institute for Digital Technologies and Artificial Intelligence Development." This institute conducts fundamental and applied research in AI, trains specialists, and commercializes innovative projects. As a result of the reforms, in 2019, Uzbekistan ranked 158th among 190 countries in AI readiness for public administration, while by 2023, this ranking improved by 17 positions.

AI contributes to economic expansion by automating processes, enhancing productivity, and creating new business opportunities. According to a study by **PwC (2018)**, AI is expected to contribute **$15.7 trillion** to the global economy by 2030, with **$6.6 trillion** from increased productivity and **$9.1 trillion** from new market opportunities. AI-driven automation reduces human labor costs while increasing output quality and efficiency in industries such as manufacturing, logistics, and services. AI fosters the development of new products, services, and business models, enabling companies to enter new markets and disrupt traditional industries. AI-powered analytics allow businesses to identify emerging trends and consumer demands, improving decision-making and market positioning.

AI is revolutionizing multiple industries, enhancing their global competitiveness through innovation and efficiency gains. AI-powered robotics, predictive maintenance, and smart factories reduce operational costs and increase precision. AI-driven diagnostics, drug discovery, and robotic-assisted surgeries enhance medical efficiency and global access to quality healthcare. In addition, AI-based risk assessment, fraud detection, and algorithmic trading improve decision-making and financial stability. AI applications like precision farming and smart irrigation optimize resource use and increase agricultural yields. Also AI strengthens global security by identifying cyber threats and preventing attacks in real time.

Nations investing in AI research, development, and infrastructure improve their **economic resilience and technological leadership.** In the **United States** Through initiatives like the *National AI Initiative Act*, the U.S. aims to maintain AI

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dominance by funding research and private sector collaborations. The *Next Generation AI Development Plan* (2017) aims to make China a global AI leader by 2030, heavily investing in AI-driven innovation. In **European Union t**he *Artificial Intelligence Act* focuses on ethical AI deployment while ensuring Europe's competitiveness in AI technologies. Countries excelling in AI adoption experience **higher GDP growth rates,** stronger digital economies, and greater global influence.

Artificial intelligence (AI) significantly enhances workforce productivity by automating repetitive tasks, thereby allowing workers to concentrate on complex, creative, and high-value activities. In AI-augmented employment contexts, AI functions as a collaborator rather than a substitute for human labor, augmenting decision-making processes across diverse sectors such as law, education, and healthcare. This collaborative dynamic improves efficiency and outcomes by leveraging AI's analytical capabilities alongside human expertise.

To adapt to these technological advancements, governments and businesses are increasingly investing in reskilling and upskilling initiatives. These programs aim to equip workers with the necessary competencies to thrive in AI-integrated work environments, ensuring a smooth transition into evolving job landscapes. While AI automation may displace certain roles, it simultaneously fosters job creation in emerging fields. The World Economic Forum (2020) projects that by 2025, AI will generate approximately 97 million new jobs, particularly in areas such as AI development, maintenance, and application, while concurrently transforming existing roles across industries.

Beyond its impact on employment, AI serves as a catalyst for scientific discovery and technological innovation, conferring a competitive advantage to nations that harness its potential. In the realm of drug discovery and biotechnology, AI-driven simulations have notably reduced the time required to develop new medicines and vaccines. A prominent example is DeepMind's AlphaFold, which has revolutionized protein folding analysis, expediting advancements in medical research. Similarly, in addressing climate change, AI contributes to sustainability efforts by

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optimizing energy consumption, predicting climate patterns, and enhancing environmental management strategies.

The convergence of AI with quantum computing represents a frontier of unprecedented potential, promising to unlock advanced problem-solving capabilities in fields such as logistics, cryptography, and material sciences. This synergy is anticipated to drive transformative breakthroughs, further solidifying AI's role as a cornerstone of future technological progress. Collectively, these developments underscore AI's multifaceted contributions to workforce productivity, economic growth, and global innovation.

AI Applications in the Commercial and Banking Sectors

AI is being utilized in the commercial and banking sectors to assess clients' creditworthiness and detect fraud. At the "RETAIL CENTRAL ASIA" forum held in Tashkent in 2023, banking and fintech companies highlighted AI's importance in speech and video analysis. By 2023, more than 20 AI-based projects were launched, and another 70 projects were developed for various industries and large enterprises. The demand for specialists in big data processing and language models was estimated at 600 professionals, indicating a growing need for AI talent.

Global AI Market Growth Projections. The global AI market is expected to continue expanding. The AI market size reached $184 billion in 2024 and is projected to grow to nearly $827 billion by 2030, increasing 4.5 times over the next five years[6]. AI is having a positive economic impact in advanced countries. In the U.S., AI plays a crucial role in boosting corporate profits.

[6] https://www.statista.com/forecasts/1474143/global-ai-market-size

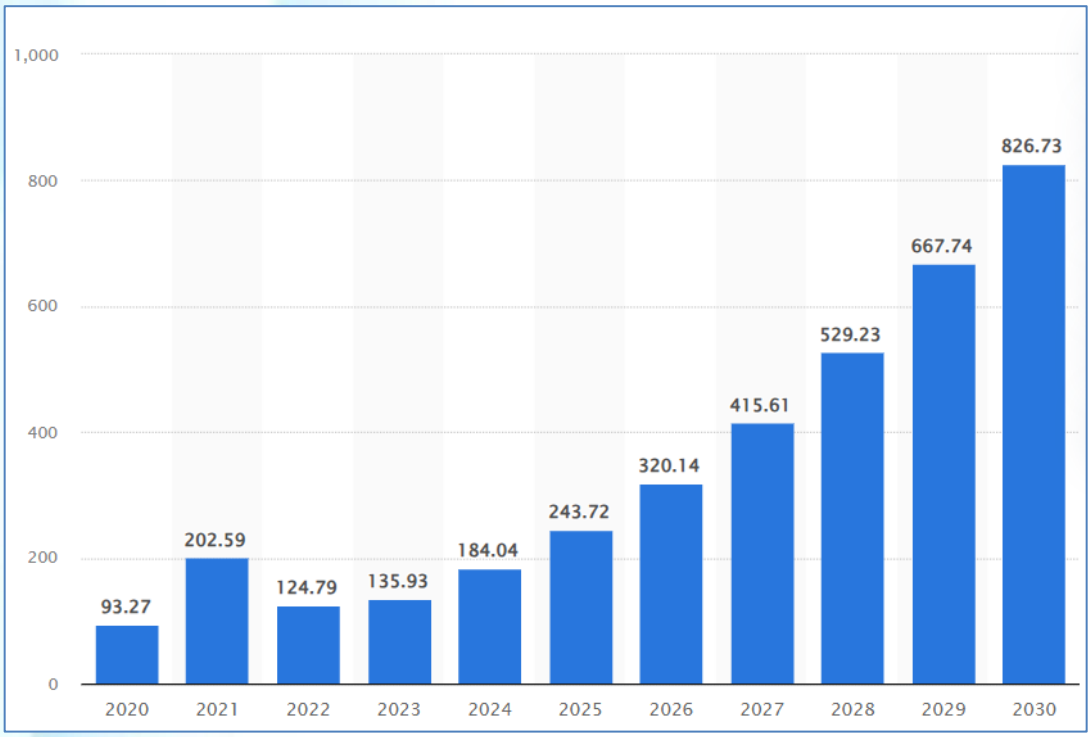

Figure 1. Global Artificial Intelligence Market Size and Forecast, (in billions of dollars, 2020-2030)

According to PwC's 2021 report, AI is expected to contribute $3.7 trillion to the U.S. economy by 2030, mainly through automation and data analysis. In China, AI has improved agricultural productivity by using drones and data analysis. Companies like XAG and DJI have developed AI-powered drones, helping farmers manage land efficiently and detect pests. In 2022, the use of drones in agriculture led to a 15-20% increase in productivity.

In Japan, AI has enabled the adoption of the "smart farming" concept. For example, Fujitsu utilized AI to optimize water and fertilizer usage in rice cultivation, reducing costs by 10-15% and improving crop quality. In Germany, AI is leading the development of autonomous transportation. Volkswagen and Bosch have employed AI to enhance logistics, increasing efficiency in freight transport and road safety by 20%.

Recommendations

To analyze the economic impact of AI in Uzbekistan, it is necessary to conduct both fundamental and applied research. It is advisable to establish research groups to assess AI’s potential benefits and risks across various sectors, including

agriculture, industry, transport, and finance. Developing simulation and predictive models using big data and machine learning to evaluate AI's economic efficiency would be beneficial. International experiences (China, the U.S., South Korea) should be studied and adapted to Uzbekistan's context.

A favorable legal environment is crucial for AI integration into the economy. This includes adopting a special law on AI, defining principles of AI usage, ethical standards, and data security guarantees. It is necessary to establish a certification and standardization system for AI-based products and services.

The preparation of highly skilled AI specialists is also essential. By 2025, AI-related bachelor's and master's programs should be introduced in more than ten universities. Short-term intensive courses involving foreign experts (e.g., from Google, IBM) should be organized, and AI training programs should be implemented in various economic sectors (such as RegTech courses for bank employees).

The implementation of "smart agriculture" systems (e.g., using drones and AI to analyze soil fertility) and testing "Smart Water Management" systems for water resource management should be prioritized. The introduction of AI-based automated production lines under the "Industry 4.0" concept (e.g., in the textile and automotive industries) is advisable. Predictive models can be used to optimize raw material prices and production volumes.

In the financial and banking sector, AI can be used for credit risk assessment and biometric user identification (Face-ID). SubTech and RegTech systems should be implemented in commercial banks. In the transport sector, "smart transport" systems should be introduced, including AI-powered logistics optimization and AI-based traffic management systems using cameras and sensors.

To ensure the successful implementation of AI projects, necessary resources such as high-speed internet and server infrastructure should be expanded (e.g., implementing 5G networks). Public-private partnerships (PPP) should be utilized to finance AI projects. Additionally, tax incentives and an investment fund for AI startups (e.g., the "Digital Uzbekistan" fund) should be established.

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