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THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE: GLOBAL CHANGES AND THE APPROACH OF THE INTERNATIONAL COMMUNITY

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ANNOTATION

This article explores the transformative potential of artificial intelligence (AI) and the emerging challenges it brings to the modern world. AI today is reshaping important sectors such as healthcare, education, industry, and governance. In healthcare, it enables early diagnosis and personalized treatment; in education, it supports adaptive learning and digital innovation; in industry, it increases efficiency through automation; and in governance, it improves decision-making and public services. At the same time, AI raises serious ethical, legal, and social concerns. Issues such as privacy protection, algorithmic bias, responsibility for AI-driven decisions, and the risk of deepening social inequality require careful attention. Therefore, the development of AI must be guided by principles of responsibility, transparency, and human-centered values.

This article employs descriptive-analytical and comparative-legal methods, drawing upon interdisciplinary sources in law, economics, and ethics. The article also emphasizes the global response to these challenges. International organizations, including the United Nations, the European Union, and UNESCO, are developing regulatory and ethical frameworks to ensure that AI contributes to sustainable and inclusive growth. Particular attention is given to Uzbekistan's national strategies in this area. The country is actively investing in digital transformation, scientific research, and the training of specialists in AI technologies. The main goal of this article is to provide a balanced understanding of how AI progress can be guided through international cooperation and national initiatives, ensuring that artificial intelligence serves the interests of humanity and supports sustainable development.

Keywords: Artificial Intelligence (AI), digital transformation, global governance, ethical challenges, international regulation, emerging technologies, AI policy, data privacy, automation, human rights, AI in Uzbekistan, global security, AI legislation, technological ethics, international cooperation.

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SUN'IY INTELEKTNING RIVOJLANISHI: GLOBAL O'ZGARISHLAR VA XALQARO HAMJAMIYATNING YONDASHUVI

ANNOTATSIYA

Ushbu maqolada sun'iy intellektning (SI) o'zgarishlarga olib keluvchi salohiyati va zamonaviy dunyoda yuzaga keltirayotgan muammolari ko'rib chiqiladi. Bugungi kunda SI sog'liqni saqlash, ta'lim, sanoat va boshqaruv kabi muhim sohalarni tubdan o'zgartirmoqda. Sog'liqni saqlashda u erta tashxis qo'yish va shaxsga mos davolash imkonini beradi; ta'limda adaptiv o'qitish va raqamli innovatsiyalarni qo'llab-quvvatlaydi; sanoatda avtomatlashtirish orqali samaradorlikni oshiradi; boshqaruvda esa qaror qabul qilish va davlat xizmatlarini ko'rsatishni yaxshilaydi. Ushbu maqolada tavsifiy-tahliliy va qiyosiy-huquqiy usullar qo'llanilib, huquq, iqtisodiyot va axloq sohasidagi fanlararo manbalarga ham tayanilgan.

Biroq SI bir qator jiddiy axloqiy, huquqiy va ijtimoiy muammolarni ham yuzaga chiqaradi. Ular qatoriga shaxsiy hayotni himoya qilish, algoritmik xolislik, SI tomonidan qabul qilingan qarorlar uchun javobgarlik va ijtimoiy tengsizlikning chuqurlashuvi xavfi kiradi. Shuning uchun SI rivoji mas'uliyat, shaffoflik va inson manfaatlariga yo'naltirilgan tamoyillarga asoslanishi lozim.

Maqolada, shuningdek, ushbu muammolarga global yondashuv ham ta'kidlab o'tiladi. Birlashgan Millatlar Tashkiloti, Yevropa Ittifoqi va YUNESKO kabi xalqaro tashkilotlar SI'ning barqaror va inklyuziv o'sishga hissa qo'shishini ta'minlash uchun huquqiy va axloqiy me'yorlarni ishlab chiqmoqda. Ayniqsa, O'zbekistonning bu sohadagi milliy strategiyalariga alohida e'tibor qaratiladi. Mamlakat raqamli transformatsiya, ilmiy tadqiqotlar va SI texnologiyalari bo'yicha mutaxassislarini tayyorlashga faol sarmoya kiritmoqda. Ushbu maqolaning asosiy maqsadi – sun'iy intellekt taraqqiyoti xalqaro hamkorlik va milliy tashabbuslar orqali boshqarilishi, natijada SI insoniyat manfaatlariga xizmat qilishi va barqaror rivojlanishni qo'llab-quvvatlashini tushuntirishdir.

Kalit so'zlar: sun'iy intellekt (SI), raqamli transformatsiya, global boshqaruv, axloqiy muammolar, xalqaro tartibga solish, yangi texnologiyalar, SI siyosati, ma'lumotlar maxfiyligi, avtomatlashtirish, inson huquqlari, O'zbekistonda SI, global xavfsizlik, SI qonunchiligi, texnologik etika, xalqaro hamkorlik.

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РАЗВИТИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА: ГЛОБАЛЬНЫЕ ИЗМЕНЕНИЯ И ПОДХОД МЕЖДУНАРОДНОГО СООБЩЕСТВА

АННОТАЦИЯ

В данной статье рассматривается трансформационный потенциал искусственного интеллекта (ИИ) и возникающие вызовы, которые он приносит в современный мир. Сегодня ИИ меняет

важные сферы, такие как здравоохранение, образование, промышленность и управление. В здравоохранении он обеспечивает раннюю диагностику и персонализированное лечение; в образовании поддерживает адаптивное обучение и цифровые инновации; в промышленности повышает эффективность за счёт автоматизации; а в сфере управления улучшает процесс принятия решений и предоставление государственных услуг. В данной статье используются описательно-аналитические и сравнительно-правовые методы, основанные на междисциплинарных источниках в области права, экономики и этики.

В то же время ИИ поднимает серьёзные этические, правовые и социальные вопросы. К ним относятся защита конфиденциальности, алгоритмическая предвзятость, ответственность за решения, принимаемые ИИ, а также риск углубления социального неравенства. Поэтому развитие ИИ должно быть основано на принципах ответственности, прозрачности и ориентации на человека. В статье также подчёркивается глобальная реакция на эти вызовы. Международные организации, включая Организацию Объединённых Наций, Европейский Союз и ЮНЕСКО, разрабатывают нормативные и этические рамки, чтобы гарантировать вклад ИИ в устойчивый и инклюзивный рост. Особое внимание уделяется национальным стратегиям Узбекистана в этой сфере. Страна активно инвестирует в цифровую трансформацию, научные исследования и подготовку специалистов по технологиям ИИ.

Основная цель данной статьи заключается в том, чтобы дать сбалансированное понимание того, как прогресс в области ИИ может быть направлен через международное сотрудничество и национальные инициативы, обеспечивая служение искусственного интеллекта интересам человечества и поддержку устойчивого развития.

Ключевые слова: Искусственный интеллект (ИИ), цифровая трансформация, глобальное управление, этические проблемы, международное регулирование, новые технологии, политика в области ИИ, конфиденциальность данных, автоматизация, права человека, ИИ в Узбекистане, глобальная безопасность, законодательство в области ИИ, технологическая этика, международное сотрудничество.

Artificial Intelligence (AI) refers to a branch of computer science focused on developing systems capable of performing tasks that typically require human intelligence. These tasks include natural language processing, pattern recognition, learning, decision-making, and predictive analytics. Today, AI is no longer confined to research laboratories — it is increasingly present in everyday life, from voice assistants on smartphones to smart systems in healthcare and transportation.

One of AI's greatest strengths lies in its ability to analyze and process vast amounts of data in a short time. This capability opens up new possibilities in diagnosing diseases, managing cities, combating crime, enabling personalized education, and boosting labor productivity. When implemented effectively, AI technologies can significantly improve quality of life and accelerate economic development.

Also, James Barrat said that:

“A powerful AI system tasked with ensuring your safety might imprison you at home. If you asked for happiness, it might hook you up to a life support ... And since it's a highly complex system, you may never understand it well enough to make sure you've got it right” [1].

AI systems come in various forms. Narrow AI, or weak AI, is designed to perform specific tasks — such as recommendation algorithms in online shopping. A more advanced concept is General AI, which theoretically could perform any intellectual task that a human can do. Another important category is Explainable AI, which is crucial in sensitive fields like law and medicine, as it ensures transparency and justifiability in decision-making processes.

Many developed nations are actively working to create balanced regulatory frameworks for AI. For example, the European Union has adopted the AI Act, the world's first comprehensive legal

framework for AI, which regulates AI applications based on their level of risk. Meanwhile, the United States emphasizes self-regulation by promoting ethical principles developed in collaboration with the business and academic communities.

AI development, beyond technology – a legal, ethical, and economic imperative

The advancement of artificial intelligence (AI) is not merely a technological evolution—it is increasingly recognized as a multidimensional process involving **social, legal, and ethical dimensions**. As AI becomes further integrated into the fabric of modern life, its development must be accompanied by robust regulatory mechanisms to ensure **safe, fair, and sustainable** deployment across sectors. Regulation must not be an afterthought; rather, it should accompany every phase of AI implementation, guiding its use while safeguarding human rights and societal interests.

Therefore, Ray Kurzweil's book **"The Singularity is near: When Humans transcend biology"** argues that, *"By the time of the Singularity, there won't be a distinction between humans and technology. ... Technology will be the metaphorical opposable thumb that enables our next step in evolution."* [2]

The Strategy for the Development of Artificial Intelligence Technologies until 2030 (hereinafter - the Strategy) was developed in accordance with the Decree of the President of the Republic of Uzbekistan dated August 30, 2024 No. UP-132 **"On Measures to Implement the Tasks Defined in the Fourth Open Dialogue of the President of the Republic of Uzbekistan with Entrepreneurs"** in order to create the necessary conditions for the introduction of artificial intelligence technologies in the social sphere and sectors of the economy, including the definition of legal, technological, and economic foundations[3].

The experience of technologically advanced countries in establishing such frameworks can serve as a model for nations that are in the early stages of shaping their AI policies. These established models offer practical pathways for addressing challenges such as algorithmic bias, data privacy, and the accountability of autonomous systems.

Legislation on informatization consists of this Law and other legislative acts. If an international treaty of the Republic of Uzbekistan establishes rules other than those provided for by the legislation of the Republic of Uzbekistan on informatization, then the rules of the international treaty shall apply[4].

Similarly, Bostrom warns that, **"Superintelligence: Paths, Dangers, Strategies"** *"Let an ultra-intelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. ... there would then unquestionably be an 'intelligence explosion' ... man would be left far behind"* [5].

Furthermore, AI is no longer just transforming individual industries—it is becoming a critical driver of global economic growth. Recent studies underline its potential to contribute significantly to global GDP and reshape the competitive landscape in both developed and emerging markets.

Global AI economic outlook

According to Next Move Strategy Consulting, the global AI market is projected to grow from hundreds of billions today to over **\$1.8 trillion** by 2030, underscoring its role as one of the most powerful technological and economic forces of the 21st century.

For example, examines challenges and possibilities of generative AI (especially large-language models) on scientific authorship; critiques binary views (tech vs. humans), explores how AI changes meaning and practices in scholarship [6].

This exponential growth is attributed to AI's ability to optimize operational efficiency, enable hyper-personalized services, and foster innovative ecosystems across sectors. Looks at whether AI (ChatGPT-4) can write scientific discussion sections good enough for high impact journals; reviewer-blinded evaluation [7].

As a result, AI is becoming not only a technological asset but a strategic pillar of national economic policy and international competitiveness. As AI continues to evolve, it is imperative that global and national strategies remain dynamic, inclusive, and ethically grounded—ensuring that the technology serves humanity, rather than challenges it [8].

Indicator	Value / Forecast	Source
Projected Global AI Market Size (by 2030)	\$1.8 trillion	Next Move Strategy Consulting (2023)
Expected Contribution to Global GDP (by 2030)	Up to \$12 trillion	PwC, McKinsey Global Institute
Key Sectors Benefiting from AI	Healthcare, Finance, Education, Transport	OECD, World Economic Forum
Primary Drivers of AI Economic Value	Automation, Innovation, Productivity Gains	Stanford AI Index, 2024 Report

Artificial Intelligence: benefits vs risks and global responses

Aspect	Details
Main Concern	Spread of synthetic content (deepfakes) and misinformation through AI-generated media
Technology Involved	Deepfakes, GPT models, neural networks
Use Cases	Entertainment Social media Political propaganda Fake news
Documented Risk	72% of participants in a study believed AI-generated news was real (GPT model experiment)
Ethical Issues	Truth manipulation Loss of trust in media Electoral interference
Expert Warnings	Elon Musk and Steve Wozniak call for a temporary halt on powerful AI models until safety protocols are in place
International Actions	UN, EU, OECD discussions Regulatory proposals Global AI safety initiatives
Regulatory Focus	Content transparency Data accountability International cooperation
Proposed Solutions	Global governance Ethical guidelines Risk-based AI classification e.g., EU AI Act [4].

Uzbekistan's strategy for the development and regulation of Artificial Intelligence

On October 14, 2024, the President of the Republic of Uzbekistan signed Decree No. PD-358, approving the National Strategy for the Development of Artificial Intelligence Technologies through 2030. The decree outlines a roadmap for implementation between 2024 and 2026, and establishes clear targets for 2030, including:

- Increasing the total value of AI-based software products and services to \$1.5 billion;
- Ensuring that 10% of services on the Unified Government Services Portal are powered by AI;
- Expanding the number of AI-focused resident companies in the IT Park to 50;

- Training 1,000 highly qualified specialists in the field of artificial intelligence;
- Establishing 10 AI research laboratories and increasing the number of university faculty with scientific degrees (PhD, DSc) in AI to 40;
- Raising Uzbekistan’s position to among the top 50 countries in the Government AI Readiness Index.

To support these objectives, the Fund for Reconstruction and Development has committed to providing an interest-free loan of \$50 million to the Ministry of Digital Technologies, starting from January 1, 2025, for a term of five years. In addition, a list of around 100 pilot projects is being developed to integrate AI across various sectors of the economy.

A new state institution — the Center for the Development of Artificial Intelligence and the Digital Economy — is planned to be established under the Ministry of Digital Technologies, based on the existing Center for Digital Economy Research.

Priority areas for AI integration

The strategy identifies several key sectors where artificial intelligence will be actively applied:

- Banking and Finance: fraud detection, credit risk evaluation, and market trend forecasting;
- Taxation and Customs: reducing the shadow economy, detecting suspicious customs activities, and managing risks;
- Healthcare: disease diagnosis, treatment planning, analysis of medical images, and patient data management;
- Agriculture: yield forecasting, resource optimization, and monitoring crops, poultry, fish, and livestock;
- Energy: energy resource management, optimizing production and distribution, expanding renewable energy usage, and forecasting demand.

Recent advances in artificial intelligence and digital technologies in Uzbekistan

Uzbekistan has made significant strides in adopting artificial intelligence (AI) and digital identification technologies across both public and private sectors. To date, biometric identification systems have been deployed in over **70 organizations**, including **29 commercial banks** (representing **82% of all banks**), **5 state institutions**, **13 payment systems**, **9 online marketplaces**, and **2 mobile network operators**. As a result, more than **6.4 million users** have registered, and the total number of biometric identification events has exceeded **14 million**.

Since the launch of biometric solutions, the time required for identity verification in enterprises has been reduced to just one second, and the process of document authentication has been fully automated, significantly enhancing operational efficiency and security.

Innovations in natural language processing and contactless payments

A notable development is the creation of “**Muxlisa**”, Uzbekistan’s first AI-powered voice assistant tailored to the Uzbek language. The system includes modules for speech-to-text and text-to-speech conversion, supported by a robust linguistic model grounded in Uzbek linguistics.[5]. The project has amassed a dataset of 4.7 million text entries and 350 hours of voice recordings, serving as a foundation for language training and AI refinement.

In the field of contactless payment technologies, the introduction of “**MyID Palm**”, a palm recognition-based identification system, marks a significant innovation. After successful pilot testing, the technology has already been implemented at 45 metro stations, offering a seamless biometric payment experience [6].

AI in education and capacity building

For the 2024/2025 academic year, Uzbekistan has introduced a dedicated AI education track, allocating **1,050 university** admission slots (including 1,018 for bachelor’s degrees and 32 for master’s programs) across **13 higher education** institutions. This move reflects a strategic commitment to building a future-ready workforce equipped with AI expertise.

To raise awareness and promote the adoption of AI technologies, the Ministry of Digital Technologies conducted over 400 presentations in nearly **60 institutions** during 2024. These sessions were aimed at deputy heads responsible for digitalization, heads of IT divisions, and technical experts from various government and economic management bodies.

Uzbekistan has also prioritized international collaboration to bolster its AI capabilities. In partnership with **NVIDIA**, more than 20 technical sessions have been held, and in cooperation with Run: ai, an additional 15 sessions were organized [7]. On February 20, 2024, Anton Zhuraev, the CIS Regional Director for Business Development at NVIDIA, visited **Inha University** in Tashkent, where he led a seminar-training for faculty and students. Concurrently, specialized training sessions were conducted at the Ministry of Digital Technologies for representatives of public administration and economic entities.

Moreover, ongoing joint efforts with NVIDIA aim to establish a high-performance computing (HPC) cluster in Uzbekistan. This will support the deployment of AI technologies, enable parallel computing, and facilitate machine learning projects. As part of this initiative, Uzbekistan plans to procure GPU-based infrastructure (graphics processing units) essential for AI modeling, data processing, and advanced simulation.

Forthcoming legislative developments in the regulation of Artificial Intelligence in Uzbekistan

In a significant legislative advancement, the Legislative Chamber of the **Oliy Majlis** of the Republic of Uzbekistan adopted, in its first reading on April 15, 2025, a draft law aimed at regulating relations arising from the use of artificial intelligence (AI).

Rather than creating a standalone, sector-specific statute, the current legislative approach seeks to incorporate amendments and additions into existing legal instruments, most notably the Law “**On Informatization**” and the Code of Administrative Responsibility. This method ensures continuity and coherence within the national legal framework and facilitates the harmonization of emerging norms with pre-established legal standards.

Such a gradual and cautious legislative strategy may be regarded as a pragmatic response to the challenges of regulating a rapidly evolving technological domain during a transitional phase. Rather than rushing to enact a comprehensive, possibly rigid, AI law, Uzbekistan is opting to embed foundational principles of AI governance into the familiar legal architecture.

This pathway offers multiple advantages. It provides greater legal predictability and stability for developers, companies, and other market participants, who can adapt to new requirements that are firmly rooted in the country’s existing normative base. By integrating AI regulation through already recognized legal structures, the government reduces legal uncertainty while simultaneously laying the groundwork for future regulatory sophistication.

In essence, Uzbekistan is constructing a flexible, adaptive legal environment one that balances innovation with responsibility and prepares the national legal system for the broader integration of AI across sectors.

International experience has demonstrated that effective regulation of artificial intelligence (AI) is unattainable without a careful balance between supporting innovation and safeguarding citizens’ rights. Countries around the world have adopted diverse regulatory approaches—ranging from stringent legal controls to more flexible, ethics-based frameworks. Despite these differences, a unifying objective remains: to ensure that technological advancement ultimately serves human welfare rather than undermines it.

This principle is becoming increasingly critical amid the rapid proliferation and deployment of AI-driven solutions, which are transforming nearly every sector of modern life. The pace and

scale of this transformation demand regulatory models that are not only adaptive but also ethically grounded and socially responsive.

As a member of the global technological ecosystem, Uzbekistan recognizes the strategic importance of these developments and has already taken decisive steps toward formulating its own national AI strategy. By aligning with global best practices—through legal reform, institutional capacity building, investment in education and research, and the development of regulatory frameworks

Uzbekistan positions itself not merely as a user of AI technologies, but as a responsible and proactive participant in shaping their ethical and effective application.

Going forward, it is vital that the country's efforts are rooted in inclusive dialogue, transparency, and a long-term vision focused on sustainable development for the benefit of society as a whole. This means not only adopting AI but ensuring it is implemented safely, equitably, and in accordance with universally shared values.

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