

Brief information about the project

Name of the project	IPH AP26199757 Legal challenges of Kazakhstan's transformation in the context of the integration of artificial intelligence and blockchain technologies
Relevance	In the context of global digitalization, artificial intelligence and blockchain play a key role in the modernization of the economy and governance processes. These technologies have the potential to enhance transparency, efficiency, and automation across a wide range of processes. In Kazakhstan, as in other countries, there is an increasing level of activity aimed at their implementation in the financial sector, education system, healthcare, and public services. However, the legal regulation of these innovations is still at a formative stage, which gives rise to numerous issues requiring immediate resolution. The complexity of legal regulation lies in the need to create a balanced system that ensures the protection of the interests of the state, business, and citizens, while not hindering innovation. It is important to take into account risks associated with insufficient control over automation processes, issues of data protection, and legal liability for decisions made by artificial intelligence. It is also necessary to consider the specific features of blockchain technologies, such as decentralization and immutability of records, which require adaptation of existing legal mechanisms.
Purpose	The objective of the project is to study the legal aspects of the integration of artificial intelligence and blockchain technologies in Kazakhstan, with the development of recommendations for improving the legislative framework to ensure their safe, efficient, and innovation-driven application across various sectors of the economy and governance.
Objectives	The main objectives of the project include: 1. Study of the legal aspects of the use of artificial intelligence in various fields, including blockchain technologies. This includes the analysis of existing norms and legislation, as well as proposals for their improvement to address the unique challenges and issues associated with these technologies and their integration. 2. Examination of the practical application of artificial intelligence and blockchain technologies, as well as their potential interaction. This includes studying models of application in areas such as smart contracts, automated dispute resolution, and compliance verification. In addition, an important component is the analysis of ethical and moral issues arising from the use of these technologies, particularly blockchain. 3. Development of recommendations and regulatory policies for the use of artificial intelligence and blockchain technologies, as well as their integration. This includes defining standards for security, privacy, and

	transparency for AI systems and blockchain technologies, as well as creating publicly accessible documentation and usage guidelines. 4. Analysis of legal issues and limitations associated with the use of artificial intelligence and blockchain technologies, as well as their integration. This includes the assessment of intellectual property rights, issues of liability and security, including the regulation and classification of digital assets, as well as data protection and personal data legislation. 5. Conducting research on the impact of artificial intelligence and blockchain technologies on various areas of law. This may include studies on their influence on law enforcement, regulatory frameworks, contractual relations, and more. 6. Evaluation of the effectiveness of artificial intelligence within blockchain technologies from a legal perspective. This includes analyzing the advantages and disadvantages of such systems, their applicability in different legal contexts, and assessing potential risks and challenges. 7. Organization of training sessions and seminars for lawyers and other legal professionals to familiarize them with the issues related to the integration of artificial intelligence and blockchain technologies. This will help increase awareness and professional competence in this field. 8. Development of proposals and recommendations to improve preventive measures in the field of intellectual property and blockchain technologies in the Republic of Kazakhstan. In summary, the primary objective of the project is to study the issues associated with the integration of AI and blockchain in the legal sphere and to develop solutions to address these challenges. The project is aimed at creating reliable and efficient systems capable of improving legal processes while ensuring data protection and the accuracy of decisions.
Expected and achieved results	1. The research team plans to publish at least two (2) articles or review papers in peer-reviewed scientific journals indexed in the Social Sciences Citation Index and ranked in the first (Q1) or second (Q2) quartile by impact factor in the Web of Science database and/or having a CiteScore percentile of at least 50 in the Scopus database (one of which will fall under the category of multidisciplinary practical application). At least four (4) articles will also be prepared and published in domestic and international journals recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan. As a result of the project implementation, one Doctor of Philosophy (PhD) will be trained: Abdykadyr Ulan. The

topic of the doctoral dissertation is: “Legal Aspects of Cybercrime in the Context of the Development of Blockchain and Artificial Intelligence: The Kazakhstan Context.”

2. Publications and editions:

- Preparation and publication of a monograph and a textbook dedicated to the legal aspects of integrating AI and blockchain technologies in Kazakhstan.
- Publication of materials in leading international publishing houses as well as in national scientific journals to form a comprehensive scientific knowledge base.

3. Intellectual property:

- The registration of patents, author’s certificates, or other forms of intellectual property protection for unique legal developments related to the regulation of AI and blockchain technologies is not planned.

4. The development of scientific, technical, or engineering documentation is not предусмотрена within the research project.

5. Dissemination and implementation of results:

- Organization of and participation in national and international conferences, forums, and seminars dedicated to the legal aspects of digital transformation.
- Publication of research results in high-impact scientific journals as well as in popular publications aimed at the general public.

6. Target groups and practical application:

- The research results will be provided to relevant government bodies, including the Ministry of Digital Development, Innovations and Aerospace Industry, the Ministry of Justice, the Ministry of Information and Social Development, as well as their respective committees.
- The scientific outcomes will also be useful for commercial organizations engaged in the development and implementation of AI and blockchain technologies, law firms, and international organizations working in the field of digital technologies.
- Expanding access to knowledge through round tables, open lectures, and publications for a wide audience, contributing to the development of legal culture in the context of digitalization.

7. From a scientific and organizational perspective, the research is expected to yield the following results:

A comprehensive analysis of existing laws and regulations will be conducted, along with recommendations for their amendment and modernization in light of the specific challenges arising from the

	integration of these technologies. The study will examine practical applications, including smart contracts, automated dispute resolution systems, and automated compliance mechanisms. In addition, ethical and moral implications of the use of artificial intelligence in blockchain technologies will be considered as a key component of the research. The study will also include: • assessment of intellectual property rights, issues of liability and security, as well as legislation on data protection and personal information; • analysis of the impact on law enforcement, regulatory frameworks, contractual relations, and related areas; • evaluation of the advantages and disadvantages of such systems, their applicability in various legal contexts, and assessment of potential risks and challenges; • raising awareness of issues related to the integration of artificial intelligence and blockchain technologies. Within this objective, the research team intends to develop recommendations for improving legal education and enhancing legislation in the field of artificial intelligence and blockchain technologies. 8. Commercialization of research results: The commercialization of research outcomes, including intellectual activity results, will contribute to improving the quality of the implementation process of artificial intelligence and blockchain technologies in legislation, as well as facilitate the introduction of innovative solutions aimed at combating unfair practices. These measures will, in turn, help reduce unnecessary budget expenditures associated with excessive bureaucracy and inefficient use of financial resources.
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles	1. Spatay Altynbekovich Sartayev – Candidate of Legal Sciences. Principal Investigator, Chief Researcher. Scopus ID: 57200080901 H-index: 1 ORCID: 0000-0002-9865-7363 Web of Science ResearcherID: FZA-3700-2022 2. Karlygash Rakhimzhanovna Useinova – Candidate of Legal Sciences. Chief Researcher. Scopus ID: 57215492296 H-index: 1 ORCID: 0000-0002-4093-5658 Web of Science ResearcherID: GOJ-7128-2022 3. Aset Abirbekovich Toktybayev – Candidate of Legal Sciences. Leading Researcher. Scopus ID: 57216619680 ORCID: 0000-0002-2090-6825 4. Askar Talgatovich Berekenov – Master of Legal Sciences. Leading Researcher.

	5. Arailym Makulbekovna Zhaparbek – Master of Legal Sciences. Researcher. ORCID: 0000-0003-2312-8085 6. Arailym Kurmetovna Mereke – Master of Legal Sciences. Researcher.
Usage	In financial institutions, IT platforms, government agencies
Priority compared to real-world alternatives	The advantage of the project lies in the fact that it clearly explains the specific legal issues that arise during the implementation of artificial intelligence and blockchain in Kazakhstan and offers simple, practical solutions for their regulation. In other words, it is not just a theoretical study of technologies, but a practical approach to their safe and proper implementation in the country.
List of publications with links to them	1. Sartayev S.A., Useinova K.R., Zhaparbek A.M. Legal Issues of Kazakhstan's Transformation in the Context of AI and Blockchain Integration: Analysis of Legislation and Proposals for Its Improvement // Proceedings of the International Scientific and Practical Conference on "Legal Regulation of Municipal Solid Waste Management in the Context of Sustainable Development Goals: Challenges and Prospects." – Karaganda, 2025. – pp. 343–348. 2. Toktybayev A.A., Berekenov A.T., Zhaparbek A.M. Artificial Intelligence in Combating Internet Fraud: Opportunities and Challenges // Proceedings of the International Conference "The Collapse of the Russian Empire and the Revival of Kazakh Statehood." – Almaty, 2025. – pp. 96–101. ISBN 978-601-04-7321-8. 3. Sartayev S.A., Berekenov A.T., Mereke A.K., Kalshabayeva M.Zh. Artificial Intelligence and Blockchain in the Legal System: On the Issue of Improving Legal Norms // <i>Bulletin of Al-Farabi Kazakh National University. Law Series.</i> – Almaty, 2025. Issue No. 3 (in press). 4. Berekenov A.T., Toktybayev A.A., Useinova K.R. Integration of Blockchain Technologies and Artificial Intelligence: Concepts, Classification, and Areas of Application // <i>Scientific Works of the Almaty Academy of the Ministry of Internal Affairs of the Republic of Kazakhstan named after Maken Yesbulatov.</i> – No. 3(84). – 2025. – pp. 260–266. ISSN 2218-2098. https://alpolac.edu.kz/wp-content/uploads/2025/10/zhurnal-№384.pdf 5. Useinova K.R., Sartayev S.A., Toktybayev A.A., Zhaparbek A.M. <i>Law and Digital Technologies: Features of Legal Regulation of Artificial Intelligence in the Republic of Kazakhstan</i> // Textbook. – Almaty, 2025. – 107 p. ISBN 978-601-311-420-0. 6. Berekenov A.T., Toktybayev A.A., Useinova K.R. Integration of Blockchain Technologies and Artificial Intelligence: Concepts, Classification, and Areas of Application // <i>Scientific Works of the Almaty Academy of</i>

	<i>the Ministry of Internal Affairs of the Republic of Kazakhstan named after Makan Yesbulatov. – No. 3(84). – 2025. – pp. 260–266. ISSN 2218-2098.</i> https://alpolac.edu.kz/wp-content/uploads/2025/10/zhurnal-№384.pdf 7. Useinova K.R., Sartayev S.A., Toktybayev A.A., Zhaparbek A.M. <i>Law and Digital Technologies: Features of Legal Regulation of Artificial Intelligence in the Republic of Kazakhstan</i> // учебное пособие (Textbook). – Almaty, 2025. – 107 p. ISBN 978-601-311-420-0.
Patents	-