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AUTOMATION OF LAWMAKING: PROSPECTS FOR THE IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY

The foundation for this article is research and developments dedicated to the implementation of information and digital technologies in the legislative process to enhance its efficiency, transparency, and strengthen interactions between government authorities and citizens. The scientific novelty of the study lies in the application of advanced digital technologies to optimize legislative activities and expand civic participation in this process.

The article explores the prospects for integrating artificial intelligence (AI) technologies into the legislative process, analyzing contemporary approaches to the automation of drafting, analyzing, and adapting regulatory legal acts. The article focuses on the application of natural language processing (NLP), machine learning, and expert systems to enhance the efficiency and accuracy of law-making processes.

The authors conduct a comparative analysis of the experience of digitalization of lawmaking in different countries, focusing on the potential risks and legal challenges associated with the use of artificial intelligence technologies in this area. It is noted that AI is already being used in certain elements of legislative activity, but mainly as an auxiliary tool rather than an independent participant in the process. Based on the results of the study, it was concluded that the automation of lawmaking using AI is highly promising. Its use is particularly in demand at the stages of information analysis, preparation of draft laws and assessment of regulatory impact. At the same time, the need to develop regulatory, ethical, and procedural frameworks for the safe and effective integration of AI into lawmaking is emphasized.

The conclusion offers recommendations for integrating intelligent systems into Kazakhstan's legislative process and outlines possible directions for further research.

Keywords: lawmaking, artificial intelligence, research study, prospects, efficiency.

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Заң шығаруды автоматтандыру:
жасанды интеллект технологиясын енгізу перспективалары

Осы мақаланы жазу үшін оның тиімділігін, ашықтығын арттыру және мемлекеттік органдар мен азаматтар арасындағы өзара іс-қимылды күшейту мақсатында заң шығару процесіне ақпараттық және цифрлық технологияларды енгізуге арналған зерттеулер мен әзірлемелер негіз болып табылады. Жұмыстың ғылыми жаңалығызаңнамалық қызметті оңтайландыру және осы процеске азаматтық қатысуды кеңейту үшін озық цифрлық технологияларды қолдану. Мәселен, мақалада заң шығару процесіне жасанды интеллект (ЖИ) технологияларын енгізу перспективалары қарастырылады, нормативтік-құқықтық актілерді әзірлеуді, талдауды және бейімдеуді автоматтандырудың заманауи тәсілдері талданады. Заң шығармашылығының тиімділігі мен дәлдігін арттыру үшін табиғи тілді өңдеу әдістерін (NLP), машиналық оқытуды және сараптамалық жүйелерді қолдануға баса назар аударылады.

Авторлар осы салада жасанды интеллект технологияларын пайдаланумен байланысты ықтимал тәуекелдер мен құқықтық сын-қатерлерге назар аудара отырып, әртүрлі елдердегі заң шығарушылықты цифрландыру тәжірибесіне салыстырмалы талдау жүргізеді. ЖИ қазірдің өзінде заңнамалық қызметтің жекелеген элементтерінде қолданылады, бірақ көбінесе процестің тәуелсіз қатысушысы емес, көмекші құрал ретінде қолданылады. Зерттеу қорытындысы бойынша ЖИ қолдану арқылы заң шығаруды автоматтандырудың жоғары перспективасы туралы қорытынды жасалды. Оны ақпаратты талдау, заң жобаларын дайындау және реттеуші

дерінде қолдану ерекше сұранысқа ие болып көрінеді. Сонымен қатар ЖИ заң шығару қызметіне қауіпсіз және тиімді интеграциялау үшін нормативтік, этикалық және процедуралық негіздерді әзірлеу қажеттілігі атап өтіледі.

Қорытындыда зияткерлік жүйелерді Қазақстанның заңнамалық процесіне интеграциялау бойынша ұсынымдар ұсынылды, сондай-ақ одан әрі зерттеудің ықтимал бағыттары қаралды.

Түйін сөздер: заң шығару, жасанды интеллект, зерттеу жұмысы, перспективалар, тиімділік.

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**Автоматизация законотворчества:
перспективы внедрения технологии искусственного интеллекта**

Основой для написания данной статьи являются исследования и разработки, посвящённые внедрению информационных и цифровых технологий в законотворческий процесс с целью повышения его эффективности, прозрачности и усиления взаимодействия между государственными органами и гражданами. Научная новизна работы заключается в использовании передовых цифровых технологий для оптимизации законодательной деятельности и расширения гражданского участия в этом процессе. Так, в статье рассматриваются перспективы внедрения технологий искусственного интеллекта (ИИ) в законотворческий процесс, анализируются современные подходы к автоматизации разработки, анализа и адаптации нормативно-правовых актов.

Особое внимание уделяется использованию методов обработки естественного языка (NLP), машинного обучения и экспертных систем для повышения эффективности и точности правотворческой деятельности.

Авторы проводят сравнительный анализ опыта цифровизации законотворчества в различных странах, акцентируя внимание на потенциальных рисках и правовых вызовах, связанных с использованием технологий искусственного интеллекта в данной сфере. Отмечается, что ИИ уже применяется в отдельных элементах законодательной деятельности, однако преимущественно в качестве вспомогательного инструмента, а не самостоятельного участника процесса. По итогам исследования сделан вывод о высокой перспективности автоматизации законотворчества с применением ИИ. Особенно востребованным представляется его использование на этапах анализа информации, подготовки законопроектов и оценки регулятивного воздействия. Вместе с тем подчёркивается необходимость разработки нормативных, этических и процедурных основ для безопасной и эффективной интеграции ИИ в законотворческую деятельность.

В заключении предложены рекомендации по интеграции интеллектуальных систем в законодательный процесс Казахстана, а также рассмотрены возможные направления дальнейших исследований.

Ключевые слова: законотворчество, искусственный интеллект, исследовательская работа, перспективы, эффективность.

Introduction

The advancement of digital technologies in the sphere of lawmaking is becoming a distinct and forward-looking field of academic interest, encompassing the use of information security systems, artificial intelligence (AI), big data processing, and digital service platforms. Both on the global stage and within the Republic of Kazakhstan, systematic efforts are being undertaken to research and integrate such technologies into legislative practices. Although individual studies have addressed aspects of this evolution, the digital transformation of lawmaking institutions remains an actively developing domain, reinforcing its academic significance and novelty. Strategic directions in this regard have been articulated by the Head of State and are reflected in several foundational policy documents. These include the President's Address to the People of Kazakhstan "The Economic Course of a Fair Kazakhstan" dated September 1, 2023 (https://adilet.zan.kz/rus/docs/K23002023_1/links); the Concept of Legal Policy of the Republic of Kazakhstan until 2030 (https://adilet.zan.kz/rus/docs/U2100000674); the Concept for the Development of Artificial Intelligence for 2024–2029 (https://adilet.zan.kz/rus/docs/P2400000592); and the Concept of Digital Transformation, Development of the Information and Communication Technology Industry, and Cybersecurity for 2023–2029 (March 28, 2023, No. 269) (https://adilet.zan.kz/rus/docs/P2300000269). These state programs emphasize the integration of digital tools

into legislative mechanisms as part of a broader strategy for institutional modernization. The research focuses on three main areas which include the automation of document workflow and the development of e-government (eGov) and the establishment of platforms that enhance citizen-government interaction in the legislative sphere. The application of AI in legislative processes is currently being academically researched in Kazakhstan. Researchers investigate two applications of AI in legislation: using natural language processing to analyze bills and employing machine learning models to forecast legal outcomes from different decisions. The research community has identified data protection and cybersecurity as essential topics within the legislative domain. Research projects that protect legislative data and processes include investigations into maintaining confidential information safety during law discussions and adoption.

Materials and methods

When studying the issues raised, logical, formal – legal, analytical, as well as functional methods are used that determine the essence of the institution under study, the qualitative characteristics of the subject of the study, which make it possible to determine the possibility of regulating the impact of Constitutional and sectoral legislation on the state of law and order in the Republic of Kazakhstan.

The scientific analysis adopted by the authors consistently implements and effectively combines the principles of complexity and consistency, which made it possible to more fully and scientifically actualize the issues of lawmaking automation using AI.

The research study uses analysis and synthesis methods to examine existing scientific publications and international experiences with AI-based legislative automation and legislative acts. The study uses the comparative method to analyze different national approaches toward digitalizing the legislative process. The system analysis method evaluates lawmaking through legal technical and ethical perspectives. The research includes expert interviews with law and information technology specialists to assess the potential of legislative process automation.

Effective use of methods helps to achieve the objectivity and reliability of the results. Thus, the study shows that artificial intelligence technologies have significant potential for automating lawmaking, especially at the stages of analysis, forecasting and preparation of draft regulations. International experience shows the successful use of AI as an auxiliary tool, however, full implementation requires solving legal, ethical and technical issues.

Literature review

The government of Kazakhstan works with international organizations including the World Bank and United Nations (UN) to enhance digital public services and legislative processes. The partnership involves studies for improving digital platforms that enhance government-to-citizen engagement. The legal framework development for digital technologies including blockchain and artificial intelligence (AI) receives special focus because these tools help monitor law enforcement activities and provide transparency in legislative procedures. The European Union (EU) puts substantial effort into creating digital platforms which enable citizens to participate in legislative processes through the eParticipation platform (https://en-m-wikipedia-org.translate.goog/). The EU is also exploring the potential of AI for legislative analysis and law enforcement forecasting through projects related to eLegislation (https://www.gov.si/en/registries/projects/ezakonodaja/). These systems improve government-citizen interaction and make the legislative process more open and accessible. The United States is one of the leading countries in the development of automated legislative systems, including the use of AI for bill analysis and law enforcement monitoring. In particular, the AI Bill Drafting system provides legislators with tools for automatically drafting bills (https://www.softwareimprovementgroup.com). American researchers are also actively studying cybersecurity issues in legislative processes. In Canada, legislative digitalization is closely linked to the active use of platforms for public discussions of laws and citizen proposals. The Canadian government is conducting research on the use of Big Data to assess the consequences of legislative enactments (https://www.bigdatasummitcanada.com/). South Korea and Japan are actively implementing AI technologies in the legislative process. In South Korea, researchers are exploring the use of machine learning to predict the consequences of legal decisions, while Japan is experimenting with the automation of routine legal review processes (https://www.cambridge.org/).

Studies worldwide show that AI applications of natural language processing (NLP) in European Parliament legal text analysis speed up the evaluation of legislative proposals against current legal frameworks. Such projects highlight the effectiveness of

AI in reducing errors and expediting legal expertise (https://www.europarl.europa.eu/). The use of Big Data for analyzing law enforcement practices in countries such as Germany, the United Kingdom, and the Netherlands has become a crucial component of legislative process research (https://academic.oup.com/). This approach enables the modeling of potential legislative outcomes and enhances the legal framework based on real-world data.

For instance, Richard Susskind's work discusses the impact of information technology on lawmaking, the legal profession, and legal institutions. It examines issues related to automation and AI integration in the legal field. Susskind, R. E. The Future of Law: Facing the Challenges of Information Technology // Oxford University Press. – 2013. https://www-amazon-com.translate.goog/ One of the directions in which digital technologies are influencing legislative studies is the application of big data and machine learning. For example, I. Rubinstein, S. Lee, and P. M. Schwartz have examined how data mining techniques and internet profiling are becoming subject to new forms of regulation and technological control in the context of legal analysis (Rubinstein, I., Lee, S., & Schwartz, P. M. Data Mining and Internet Profiling: Emerging Regulatory and Technological Approaches // University of Chicago Law Review. – 2018. https://www.researchgate.net/publication/228189354_Data_Mining_and_Internet_Profiling_Emerging_Regulatory_and_Technological_Approaches). A different aspect of AI integration into legal processes is explored by M. Lippi and P. Torroni, who assess the potential of argumentation mining for automatically extracting legal reasoning from statutes and judicial decisions – a technique increasingly relevant in analyzing legislative drafts (Lippi, M., & Torroni, P. Argumentation Mining: State of the Art and Emerging Trends // ACM Transactions on Internet Technology. – 2016. https://dl.acm.org/doi/10.1145/2850417). Questions of fairness and algorithmic transparency, particularly in relation to AI applications in law enforcement and policy design, are addressed by R. Binns in his monograph Fairness in Machine Learning: Lessons from Political Philosophy, where he draws connections between philosophical principles and computational models (Binns, R. // Springer Briefs in Computer Science. – 2021. https://arxiv.org/abs/1712.03586). Comparative perspectives on AI use in legislative drafting are offered by A. Jungherr, who analyzes international case studies to identify both promising practices and the limitations of automating lawmaking procedures (https://journals.sagepub.com/doi/full/10.1177/20563051231186353).

Together, these sources contribute to a more profound academic understanding of how digital tools – including AI, big data, and computational linguistics – are reshaping the contours of legislative work. For instance, in the article by Bondarchuk I.V. and Rudenko A.V., the prospects of implementing digital technologies in legislative processes are analyzed, along with the potential risks and legal consequences of digitalization. They argue that a legal system overly reliant on big data risks deviating arbitrarily and undemocratically from the fundamental values of the legal framework (https://cyberleninka.ru/article/n/tsifrovizatsiya-normotvorcheskoy-deyatelnosti-v-usloviyah-informatsionnogo-obschestva# Vestnik of Moscow City Pedagogical University. Series: Legal Sciences, 2022). The monograph by E.V. Suslonova covers aspects of digitalization in public administration, including legislative processes. It explores approaches to creating a digital government and legislative infrastructure. Suslonova, E. V. Digital Government: Concept and Practice // Prospect Publishing. – 2020. – 144 p. https://elar.urfu.ru/bitstream/10995/106480/3/978-5-7996-3380-6_2021.pdf.pdf

Multiple monographs about e-government development exist for the Republic of Kazakhstan. One of them, Kazakhstan: Information and Communication Infrastructure, provides insights into the country's modern information infrastructure and its evolution in the context of digitalization (Barlybaeva S., 2014 // https://dokumen.pub/9786012473810.html). Furthermore, in 2023, the Kazakhstan Institute for Strategic Studies (KISI) presented the monograph Kazakhstan-2023: Current Trends and Future Outlook, which analyzes key transformations in the political system, society, economy, and foreign policy, including aspects of digitalization and e-government development (https://kisi.kz/ru/kisi-prezentoval-monografiju-kazahstan-2023-tendenchii-nastoyashhego-i-kontury-budushhego/). Additionally, the study E-Government: Marketing Strategy for Brand Promotion, prepared by the Sange Research Center in 2007, examines strategies for promoting and implementing e-government in Kazakhstan (https://sange.kz/wp-content/uploads/2018/02/Egov2007.pdf). A detailed analysis of Kazakhstan's progress in digital governance is provided in the study The Evolution of E-Government in Kazakhstan: From Formation to Digital Transformation (2004–2022), which outlines the

key phases of development – from the initial establishment of digital infrastructure to the implementation of comprehensive digital transformation initiatives in public administration. Special attention is given to analyzing government programs and initiatives aimed at improving service quality, increasing transparency, and enhancing the efficiency of state bodies (Sabdenov 2024). These monographs offer a thorough analysis and valuable recommendations for the development of e-government in Kazakhstan. A.K. Kuttybayeva presents The Use of Artificial Intelligence in Lawmaking: Organizational and Legal Aspects as a significant work which studies AI integration into lawmaking through legal and organizational analysis and international implementation and specific implementation challenges. (Kuttybayeva 2024). The conference proceedings Artificial Intelligence and Law: The Experience of the Republic of Kazakhstan present scientific articles and reports that discuss AI application challenges in legal work and AI integration prospects for legislative processes (https://www.zqai.kz/ru/). The academic studies deliver important knowledge about AI implementation in legislative activities.

Results and discussion

The research on digitalization of lawmaking in Kazakhstan has a certain scientific novelty because it is based on the application of the latest technologies, such as AI and Big Data, to improve the legislative process. The review of the previous studies has revealed that Kazakhstan has a good basis for the digitalization of lawmaking. However, the implementation of more complex and advanced solutions, such as predicting the consequences of laws and involving public opinion in the legislative process, is not well enough studied.

The research demonstrates clear alignment with a vital national objective while providing solutions to a vital governmental challenge and holding importance at both national and international levels and producing results that will advance science and technology development. The results will have a major impact on scientific and technological progress. The projected social and economic impact stands at a very high level.

Multiple elements support the scientific and technological requirements which establish the significance of this research. The Criminal Procedure Code of Kazakhstan contains exact duplicate articles in its provisions. We believe personal inviolability in criminal proceedings extends beyond Article 14 of the CPC of the Republic of Kazakhstan. The Criminal Procedure Code of the Republic of Kazakhstan (CPC RK) contains several provisions aimed at safeguarding personal inviolability, most notably in Article 15, which articulates the principle of protecting the rights and freedoms of individuals during criminal proceedings. This article is supported by a range of specific guarantees outlined in the Code, including:

- Article 17, which affirms the sanctity of one's dwelling;
- Article 18, which provides legal protection against unlawful interference with property;
- Article 16, which addresses the protection of personal and family privacy;
- Article 13, which upholds the right to personal honor and dignity.

While these norms reflect and align with constitutional principles – particularly those embedded in Articles 15 and 16 of the Constitution of the Republic of Kazakhstan – Article 15 of the CPC serves a more overarching function. It operates not only as a procedural right but also as a unifying provision, integrating and reinforcing the guarantees found in Article 14, which focuses on the protection of participants' legal interests in the criminal justice process. In this context, personal inviolability is not treated in isolation but as part of a broader commitment to upholding human rights throughout all stages of criminal proceedings. However, despite the fact that these articles reflect the principle of personal inviolability, Article 14 of the CPC RK does not reference Articles 16, 17, or 18 of the CPC. This reveals legislative drafting deficiencies: the legislator repeats the same issue verbatim in different articles concerning compensation for damages and the security of persons involved in criminal proceedings.

The CPC RK (Articles 39-42) and the Civil Code of the Republic of Kazakhstan (Articles 922, 923) provide provisions that state compensation is available only to those who may be acquitted. However, from the point of view of the principle of personal inviolability in criminal proceedings, it is also necessary to consider the issue of compensation for persons who are not subject to rehabilitation. The right to personal inviolability is not only applicable to suspects and persons unlawfully detained on criminal charges, but also to those lawfully imprisoned. What if they were subjected to violence during criminal proceedings, endangering their life and health, or suffered harm to their honor and reputation due to improper application of CPC provisions? At the same time, law enforcement officers authorized

to conduct criminal proceedings, in accordance with paragraph 5 of the above-mentioned Resolution of the Plenum of the Supreme Court of the Republic of Kazakhstan No. 7 and paragraphs 2 and 8 of Article 14 of the CPC RK, must ensure that "detainees, suspects, accused persons, defendants, and convicts also have the right to compensation for harm caused to them in cases where, during the judicial process, they were subjected to violence or cruel treatment; when decisions or actions of the authorities conducting criminal proceedings humiliated their honor and dignity; when unnecessary personal data was collected, disclosed, or disseminated; or when persons deprived of liberty were held in conditions dangerous to their life and health". In this regard, Article 42 of the CPC RK requires the necessary amendments and additions through a Resolution of the Plenum of the Supreme Court of the Republic of Kazakhstan.

There are long-standing legislative proposals whose necessity is undisputed, yet they remain unadopted. Although detective activities are not a new concept globally, private investigation remains unregulated in Kazakhstan. The first draft law on this matter was developed in 2012 but has yet to be passed. The Constitution of the Republic of Kazakhstan in Article 13 grants every person the right to defend their rights and freedoms through all means which are not prohibited by law. In this regard, the introduction of private detective activities in Kazakhstan has a constitutional basis. The primary objectives of this initiative should include expanding citizens' ability to protect their rights and legitimate interests. As we previously noted, granting individuals the ability to defend themselves, whether personally or with the assistance of a private investigator, would ensure better protection of their rights and interests in criminal proceedings.

The initial phase of the research project involves studying the potential use of big data for predicting the consequences of new legislation based on historical information and the analysis of contemporary trends. The analysis of extensive judicial decisions together with law enforcement practices through artificial intelligence (AI) helps identify patterns and challenges to enhance legislation. The research investigates methods to use natural language processing (NLP) technologies for automated legal document drafting and verification and editing and digital legislative initiative integration with international law to enable cross-country knowledge exchange. The study of automated legal technologies that enforce laws without human intervention needs to address ethical concerns about AI usage because legislative drafting receives valuable data insights from social media and digital sources to track public opinions and demands. The research must stress both the responsibility and fairness and transparency aspects of AI decision-making processes. The implementation of these changes will establish enhanced citizen involvement in legislative procedures while making the process more transparent.

The development of the project will reach an essential milestone through the establishment of an AI-based prediction system which enables risk reduction and forecasting of legal and social impacts that occur within the proposed program. The direction represents an innovative approach for Kazakhstan because current research in this field primarily simplifies document management instead of developing law enforcement models. The proposed development project targets the creation of a single integrated platform which will handle all legislative development stages from discussion through adoption and enforcement monitoring. The system provides automated draft storage functions for electronic legislation (e-legislation) and aims to improve the connection between lawmakers and citizens during the law creation process. Research indicates that digitalization within legislative activities leads to better efficiency and transparency while decreasing corruption levels. Kazakhstan will obtain a distinctive solution through this implementation which could function as a reference model for international nations. It is proposed to establish an ethical and legal framework for AI use in legislative processes, which represents a novel direction both for Kazakhstan and for global legal science. The Republic of Kazakhstan is actively discussing the draft law "On Artificial Intelligence". On March 3, 2025, Member of the Mazhilis E. Smyshlyaeva presented this draft, aiming to establish a transparent legal framework for integrating AI technologies into the country's economy. The proposed draft law on artificial intelligence in Kazakhstan is structured into seven chapters comprising 27 articles. One of its key features is the introduction of a tiered classification system for AI technologies, assigning them to minimal, medium, or high-risk categories depending on their potential societal impact. Importantly, the law prohibits the development and deployment of fully autonomous decision-making systems that function without any human oversight. Moreover, developers and system owners are obligated to disclose the use of AI in their products and provide clear explanations of how these technologies operate (https://online.zakon.kz/). In contrast, the European Union

has already implemented a comprehensive legal framework through the Artificial Intelligence Act (AI Act), which officially took effect on August 1, 2024. This legislation is designed to mitigate the risks posed by AI applications and includes provisions for the establishment of a regulatory authority responsible for enforcement. The EU model distinguishes between different levels of risk – including limited, high, and unacceptable – and introduces a separate category for generative AI systems, such as neural networks. Non-compliance may lead to substantial financial penalties, reflecting the seriousness of the regulatory approach. The use of AI systems to manipulate people's cognitive behavior or specific vulnerable groups including children and biometric identification systems like facial recognition is strictly prohibited (https://ru.euronews.com/). Thus, Kazakhstan is following global trends in AI regulation, developing its own legislation while considering international experience and the specifics of the national economy.

The ultimate outcome of digitalizing lawmaking is the integration of AI technologies into the legislative sphere. AI can analyze legal texts for contradictions, legal accuracy, and compliance with current legislation. The identification of potential gaps or inconsistencies enables AI to perform legal assessments of draft laws and process judicial decisions and analyze norm application in practice and draft amendments by correcting errors and simplifying wording and ensuring compliance with legislative standards and requirements.

The fast processing capabilities of AI enable it to analyze enormous data sets which leads to accelerated legislative procedures. The system allows politicians to retrieve precedents as well as comparable laws and project modification suggestions at a fast pace. AI systems predict legal applications of new laws through the evaluation of court decisions and past law enforcement tactics. The ability of legislators to foresee how new norms will be interpreted by judges and regulatory bodies exists because of this system. AI systems create models to predict how new laws will affect crime statistics as well as employment numbers and economic growth which helps prevent adverse or unexpected results. AI systems process public comments and proposals during legislative discussions which leads to faster evaluation and enhances government-to-citizen communication. AI systems generate customized recommendations about relevant laws to citizens through analysis of their activities and location and personal preferences. The application of legislation in tax collection and licensing and administrative decision-making can be automated through AI which leads to simplified law enforcement and decreased government agency workload.

AI may enable full or partial legal consulting automation in the future to provide exact advice about drafting and amending laws and their effect analysis. Augmented reality (AR) and virtual reality (VR) technologies could be utilized for visualizing and modeling the impact of legislation – for example, demonstrating potential changes to urban infrastructure following the adoption of a specific law. The integration of blockchain technologies into the legislative process holds significant potential for increasing both transparency and information integrity. By recording every change made to draft laws and maintaining immutable logs of parliamentary votes, blockchain ensures traceability and verifiability at each stage of decision-making. In parallel, the implementation of smart contracts could contribute to the automation of specific regulatory tasks – especially in fields such as commercial transactions or public procurement, where legal parameters can be formalized in programmable code. These tools allow for the automatic execution of legally significant actions without requiring direct human control, provided the pre-defined conditions are met. To assess how proposed legislation might affect different social groups or economic sectors, predictive AI models will be essential. These models, when supported by dedicated digital platforms, can also facilitate broader civic participation. Citizens would gain the ability to engage with draft laws via online consultations, submit feedback, and support initiatives through digital petition systems and voting mechanisms. Nevertheless, alongside these innovations, one must not overlook the growing importance of cybersecurity. As legislative procedures increasingly rely on digital infrastructure, protecting the integrity of data and the rights of users becomes a fundamental requirement. Ensuring a secure and trustworthy digital environment is not only a technical challenge but also a legal and ethical imperative in the evolution of lawmaking.The protection of citizens' rights to personal data and the requirements of confidentiality necessitate the creation of methods and algorithms for securing data used in law analysis and drafting as well as a regulatory framework for digital technologies in lawmaking. This framework should address data protection, electronic signatures, and liability for automated decision-making. In the future, AI may be able to autonomously generate legislative proposals based on data analysis

and predictive modeling of future scenarios. Such systems could offer optimal legal solutions tailored to specific social and economic conditions.

Conclusion

Thus, the competitive advantage of the expected project results is evident. There are no fundamental differences between this research concept and existing similar or competing ideas. The concept and outcomes of such research already exist globally, and in Kazakhstan, the digitalization of the legislative process is becoming a key component of public administration and judicial reforms. The government has in recent years introduced digital technologies to improve transparency, efficiency and accessibility in legislative activities. Among the key projects in this area is the e-Parliament system which has not been fully launched yet. The implementation of digital platforms aimed at automating legislative activities is intended to streamline communication among members of parliament, government agencies, and the public. These systems are expected to enhance transparency by allowing citizens to monitor the development of draft legislation, contribute to public consultations, and offer constructive feedback. In parallel, Kazakhstan is pursuing the development of an integrated digital environment connecting all branches of state power, which is anticipated to accelerate deliberative processes, improve institutional coordination, and support the coherent advancement of legislative proposals.

Although various research projects and pilot initiatives focused on digital governance – including its legislative dimension – are currently underway, many remain at the exploratory stage. Robust evaluations of their socio-economic impact, operational effectiveness, and long-term viability are still being formed through ongoing data collection and analytical efforts.

At the same time, the application of artificial intelligence in legislative processes, while offering considerable advantages in terms of automation, predictive analysis, and expanding public engagement, also encounters natural limitations. Certain legislative tasks inherently require human judgment, ethical reasoning, and sensitivity to legal context – aspects that current AI models cannot fully replicate.

Therefore, while AI and digital tools can significantly modernize and improve lawmaking practices, their use must be carefully balanced with legal integrity, public accountability, and ethical responsibility.

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References

AI Legislation in the US: A 2024 Overview // https://www.softwareimprovementgroup.com/us-ai-legislation-overview/#:~:text=The20National%20Artificial%20Intelligence%20Initiative,and%20secure%20development%20of%20AI

Barlybaeva, S. Kazahstan: informacionno-kommunikatsionnaja infrastruktura [Kazakhstan: Information and Communication Infrastructure]. – Almaty: Kazakh universiteti, 2014. – 92 p. // https://dokumen.pub/9786012473810.html

Big Data Summit Canada, 2024. Using AI and Big Data to Predict the Impact of Legislation // https://www.bigdatasummit-canada.com/ (date of reference: 19.10.2024).

Big data policing: The use of big data and algorithms by the Netherlands Police. A Journal of Policy and Practice, Volume 17, 2023 // https://academic.oup.com/policing/article/doi/10.1093/police/paad061/7281562

Binns, R. Fairness in Machine Learning: Lessons from Political Philosophy. – Springer Briefs in Computer Science, 2021 // https://arxiv.org/abs/1712.03586 (date of reference: 19.10.2024).

Bondarchuk, I. V., Rudenko, A. V. Tsifrovizatsija normotvorcheskoj dejatel'nosti v uslovijah informacionnogo obshhestva [Digitalization of Law-Making Activities in the Information Society] // Vestnik Moskovskogo gorodskogo pedagogicheskogo universiteta. Serija: Juridicheskie nauki (Bulletin of the Moscow City Pedagogical University. Series: Legal Sciences). 2022 // https://cyberleninka.ru/article/n/tsifrovizatsiya-normotvorcheskoy-deyatelnosti-v-usloviyah-informatsionnogo-obschestva (date of reference: 19.10.2024).

Concepts of artificial intelligence development for 2024-2029. Approved by Resolution of the Government of the Republic of Kazakhstan dated July 24, 2024 No. 592 // https://adilet.zan.kz/rus/docs/P2400000592

Concepts of legal policy of the Republic of Kazakhstan until 2030. Decree of the President of the Republic of Kazakhstan dated October 15, 2021 No. 674 // https://adilet.zan.kz/rus/docs/U2100000674

Concepts of digital transformation, development of the information and communication technology and cybersecurity industry for 2023-2029. Approved by Resolution of the Government of the Republic of Kazakhstan dated March 28, 2023 No. 269 // https://adilet.zan.kz/rus/docs/P2300000269

Conference Proceedings “Artificial Intelligence and Law: Experience of the Republic of Kazakhstan and Foreign Countries”. – Astana, 2024 // https://www.zqai.kz/ru/novoe-v-zakonodatelstve/sbornik-materialov-konferencii-iskusstvennyy-intellekt-i-pravo-opyt

Criminal Procedure Code of the Republic of Kazakhstan dated July 4, 2014 No. 231-V ZRK // https://adilet.zan.kz/rus/docs/K1400000231

Dossier on the draft Law of the Republic of Kazakhstan “On Artificial Intelligence” (January 2025) //https://online .zakon.kz/Document/?doc_id=34868071&pos=202;-51#pos=202;-51

European Parliament. The Role of AI in Law-Making and Legal Text Analysis // https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652713/IPOL_STU(2020)652713_EN.pdf (date of reference: 19.10.2024).

E-Government. Marketing Strategy for Brand Promotion. – Astana, 2007 // https://sange.kz/wp-content/uploads/2018/02/Egov2007.pdf

Jungherr, A. AI Applications in Law-Making: A Comparative Study // SAGE Journals, 2023 // https://journals.sagepub.com/doi/full/10.1177/20563051231186353 (date of reference: 19.10.2024).

Katsumi NITTA, Ken SATOH AI Applications to the Law Domain in Japan. Asian Journal of Law and Society, 7 (2020), pp. 471–494 // https://www.cambridge.org/core/services/aop-cambridge-core/content/view/B0E405E2EBC9BED36D9D38E-736B4A099/S2052901520000352a.pdf/ai_applications_to_the_law_domain_in_japan.pdf

Kazakhstan-2023: tendentsii nastojashhego i kontury budushhego. Kollektivnaja monografija [Kazakhstan-2023: Trends of the Present and Future Prospects. A Collective Monograph]. – Astana: Kazakhstan Institute for Strategic Studies under the President of the Republic of Kazakhstan, 2023. – 294 p. // https://kisi.kz/wp-content/uploads/2023/12/kniga-2023-finalnyj.pdf

Kuttybaeva, A.K. Ispol’zovanie iskusstvennogo intellekta v zakonotvorchestve: organizatsionnye i pravovye aspekty [The Use of Artificial Intelligence in Lawmaking: Organizational and Legal Aspects]. 2024 // file:///C:/Users/user/Downloads/6_60-69.pdf

Lippi, M., & Torroni, P. Argumentation Mining: State of the Art and Emerging Trends // ACM Transactions on Internet Technology. 2016 // https://dl.acm.org/doi/10.1145/2850417 (date of reference: 19.10.2024).

Opportunities of Artificial Intelligence Policy Department for Economic, Scientific and Quality of Life Policies, June 2020 // https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652713/IPOL_STU(2020)652713_EN.pdf

President Kassym-Jomart Tokayev`s State of the Nation Address “Economic course of a Just Kazakhstan” dated September 1, 2023] // https://www.akorda.kz/en/president-kassym-jomart-tokayevs-state-of-the-nation-address-economic-course-of-a-just-kazakhstan-283243

Rubinstein, I., Lee, S., & Schwartz, P. M. Data Mining and Internet Profiling: Emerging Regulatory and Technological Approaches // University of Chicago Law Review. 2018. //https://www.researchgate.net/publication/228189354_Data_Mining_and_Internet_Profiling_Emerging_Regulatory_and_Technological_Approaches (date of reference: 19.10.2024).

Suslonova, E. V. Tsifrovoe pravitel’stvo: kontseptsija i praktika [Digital Government: Concept and Practice]. – Moscow: Prospekt, 2020. – 144 p. // https://elar.urfu.ru/bitstream/10995/106480/3/978-5-7996-3380-6_2021.pdf.pdf (date of reference: 19.10.2024).

Sabdenov, R. i dr. Evoljutsija “elektronnogo pravitel’stva” v Kazahstane: ot formirovanija do tsifrovoj transformatsii (2004-2022) [Evolution of “E-Government” in Kazakhstan: From Formation to Digital Transformation (2004-2022)]. 2024 // https://journal-ks.kisi.kz/index.php/ks/article/view/318

Susskind, R. E. Budushchee prava: Vyzovy informacionnyh tekhnologij [The Future of Law: Challenges of Information Technology]. – Oxford: Oxford University Press, 2013 // https://www.amazon.com/Future-Law-Challenges-Information-Technology/dp/0198764960 (date of reference: 19.10.2024).

The EU Law on AI Regulation has entered into force. 01.08.2024 // https://ru.euronews.com/next/2024/08/01/the-eu-ai-act-enters-into-force

Vikipedija. Svobodnaja jenciklopedija [Wikipedia. The Free Encyclopedia] // https://en-m-wikipedia-org.translate.goog/wiki/E-participation?_x_tr_sl=en&_x_tr_tl=ru&_x_tr_hl=ru&_x_tr_pto=sc

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