INTERNATIONAL PRACTICE OF USING ARTIFICIAL INTELLIGENCE IN CUSTOMS: PROSPECTS FOR IMPLEMENTATION IN THE REPUBLIC OF BELARUS

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The article is devoted to the application of artificial intelligence (hereinafter — AI) technologies in the activities of Belarusian customs authorities. It is emphasized that the use of AI is still limited, mainly to X-ray inspection systems at the border. The prospect of introducing automated kiosks for passenger control and the development of big data analytics is noted. The importance of international cooperation in the field of customs digitalization, especially with China and the EAEU countries, is emphasized. Problems of legal regulation of the digital transformation of customs authorities are noted: the lack of responsibility of AI systems and the need for human control. In conclusion, it is noted that successful digital transformation requires a comprehensive approach: infrastructure modernization, legislative development, staff training and integration with international standards. The potential of AI for improving the efficiency and transparency of customs procedures is noted.

Keywords: artificial intelligence; customs; implementation; Republic of Belarus; prospects.

МЕЖДУНАРОДНАЯ ПРАКТИКА ИСПОЛЬЗОВАНИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ТАМОЖЕННОМ ДЕЛЕ: ПЕРСПЕКТИВЫ ВНЕДРЕНИЯ В РЕСПУБЛИКЕ БЕЛАРУСЬ

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Статья посвящена применению технологий искусственного интеллекта (ИИ) в деятельности таможенных органов Беларуси. Подчеркивается, что использование ИИ пока ограничено — в основном в системах рентгеновского досмотра на границе. Отмечается перспектива внедрения автоматизированных киосков для пассажирского контроля и развитие аналитики на основе больших данных. Подчеркнуто значение международного сотрудничества в области цифровизации таможни, особенно с Китаем и странами ЕАЭС. Отмечаются проблемы правового регулирования цифровой трансформации таможенных органов: отсутствие ответственности у ИИ-систем и необходимость человеческого контроля. Обозначено, что успешная цифровая трансформация требует комплексного подхода — модернизации инфраструктуры, развития законодательства, обучения персонала и интеграции с международными стандартами. Отмечается потенциал ИИ для повышения эффективности и прозрачности таможенных процедур.

Ключевые слова: искусственный интеллект; таможенное дело; внедрение; Республика Беларусь; перспективы.

The development of national artificial intelligence solutions has been underway in Belarus since the latter half of the 20th century. Currently, the Republic of Belarus ranks 82nd out of 174 countries in the Global AI Readiness Index [1].

At present, the use of AI technologies by Belarusian customs authorities remains limited. While full integration into customs operations and control processes is not yet evident, partial

applications are observable, particularly through technical equipment deployed at border checkpoints. According to V. Orlovsky, Chairman of the State Customs Committee of Belarus, AI components are employed in the scanning of high-risk goods transiting from third countries through Russia into Belarus. X-ray inspection systems (hereinafter – XISs) do more than simply visualize cargo – they analyze the resulting images using specialized software. All border checkpoints operating along the western frontier are equipped with XISs [2].

Future integration strategies include the deployment of AI technologies for automated passenger processing in airports. Dedicated kiosks will be capable of scanning identity documents and utilizing embedded cameras to perform biometric verification.

Further developments in AI-enhanced X-ray analytics were discussed in October 2024 during a meeting between Vladimir Orlovsky and representatives of the Chinese Embassy. The parties emphasized the growing effectiveness of Belarus-China cooperation in customs modernization. The meeting's agenda covered bilateral engagement in technology deployment, specifically AI-assisted border infrastructure. Positive responses were expressed concerning the use of AI for interpretation of X-ray imaging in customs inspection systems. Enhancing the analytical capabilities of such systems was recognized as increasingly vital for improving border security and monitoring transboundary goods [3].

The processing of customs data generates large volumes of information, which may be assessed using algorithmic tools and machine learning methods. This analytical approach enables pattern recognition, identification of potential violations and risks, process optimization, and data-informed decision-making. Data analytics strengthens the operational responsiveness of customs services and contributes to improved risk mitigation.

Belarusian customs authorities are actively studying international best practices as a foundation for establishing an

environment conducive to AI integration. For example, in May 2024, Vladimir Orlovsky, visiting the Republic of Azerbaijan as part of the presidential delegation of Belarus, met with Shahin Baghirov, Chairman of the State Customs Committee of Azerbaijan. Discussions centered on bilateral cooperation, including AI deployment in customs modernization. At Baku's Main Customs Administration, Belarusian delegates observed electronic customs procedures and reviewed the Trans-Caspian Transit Customs Portal. They examined the implementation of an AI-driven risk assessment system and a range of digital services and projects [4].

Despite growing interest, legal constraints remain. AI lacks autonomous judgment and accountability, rendering it unsuitable for functions involving legal responsibility for customs violations. For instance, Article 14.4(2) of the Administrative Offenses Code of Belarus addresses non-payment of duties due to negligence – a determination AI systems cannot reliably perform [5]. Human oversight will remain essential, both for AI system maintenance and enforcement procedures.

As of now, Belarus lacks dedicated legal regulations governing AI use in customs. Relevant legislation is under development. Nevertheless, foundational provisions concerning digital regulation are articulated in the Law of the Republic of Belarus N 455-Z «On Information, Informatization, and Information Protection», dated 10 November 2008. Article 7 outlines government obligations to foster digital technology through standardization and compliance monitoring, while Article 8 defines the institutions responsible for governance in this domain. Article 25 affirms the right of public and private entities to develop IT systems and networks [6].

Thus, current applications of AI in Belarusian customs operations are minimal, with image analysis software representing the primary example. The Belarusian customs service continues to evaluate global practices and consolidate

theoretical frameworks for future implementation. Although legal infrastructure is still evolving, the potential for AI integration remains substantial.

During an address at the International Customs Forum held in Moscow in October 2021, the Head of the Main Information Technology Directorate of the Russian Federal Customs Service noted that automation in Russian customs began before the establishment of the State Customs Committee in 1990. He emphasized that customs are the only regulatory sector in the Russian Federation permitting legally binding decisions made by software agents – a legislative advancement unparalleled in other domains [7].

A key consideration for successful implementation is the professional training of customs personnel. Familiarity with AI principles, data processing, and information analysis is critical. Training programs and seminars are already being offered to support employee development. In parallel, several national projects aimed at process automation and risk analytics have already been introduced [8].

The assessment of advanced technological solutions has allowed for the identification of specific domains within customs control where automation may be effectively implemented – particularly in procedural inspections, documentation verification, and commodity classification.

The digital transformation of real-time physical border control systems is aimed at automating customs clearance procedures at border crossing points of the Eurasian Economic Union. This agenda contributes to the creation of smart border crossing points [9].

Sensor-based technologies integrated with intelligent data processing systems are envisioned as core components of these checkpoints. These devices will record the technical specifications of transported goods and vehicles, enabling the automated detection and interdiction of unauthorized shipments of radioactive materials, nuclear substances, and hazardous waste across national borders.

Documentary automation and risk management customs operations that rely solely on document verification-excluding product sampling – can be delegated to specialized departments within electronic declaration centers, enabling full automation of those procedures. Replacing conventional paper certificates with digital ones may resolve multiple operational inefficiencies. These electronic certificates must be structurally formalized to support automated processing without manual intervention. The information in the customs declaration is accompanied by a large number of documents (documents confirming the fact of the transaction, permits, transport documents, etc.), a list of which is contained in column 44. Document verification forms a key element of customs risk management systems [10].

Effective stewardship of digital technologies is a contemporary priority, requiring collaborative analysis based on global experiences and best practices.

The rapid evolution of robotics and algorithmic systems – driven by deep neural networks – has produced increasingly autonomous systems capable of independent decision-making. While neural architectures have long been understood, recent progress has enabled improved training and refinement of network-based algorithms. As robotic complexity increases – including in self-learning systems – so does the necessity for enhanced accountability in scenarios involving potential harm or liability.

In Belarusian legal scholarship, discourse on digital system responsibility remains limited, with existing literature primarily addressing isolated sectoral concerns. In contrast to jurisdictions with established legal research on autonomous technologies, Belarus faces nascent challenges in regulating public interactions with robotic systems. This calls for the assimilation of foreign legal doctrine and enforcement practices in shaping nationally coherent strategies for legal regulation.

Digital legislation resides at the intersection of several legal branches –particularly civil, administrative, and information

law. Harmonized legal regulation within the EAEU, alongside alignment with global standards and norms is essential.

Legal categorization approaches current international legal discourse offers three principal approaches to the legal status of autonomous systems:

— technology as legal object: only natural or legal persons can possess legal rights;

— system developers retain authorship of the underlying technology;

— electronic legal entity: the concept of an electronic person is introduced, with limited legal capacity. this raises questions of status, product legitimacy, and potential shared liability between the developer and the system;

— civil products extension: technologies producing new legal objects may fall under provisions such as article 136 of the Civil Code («fruits, products, and income»), though substantial adaptation of intellectual property law would be required [11].

Legal reform priorities enhancements to liability regulation should address: the origin of responsibility in automated system applications; definition of liable parties; technical and operational characteristics impacting risk attribution.

Integrated framework for digital customs transformation comprehensive regulatory and operational strategies must prioritize:

— data protection and legal compliance;

— long-term investment in human capital and technical infrastructure;

— the establishment of clear legal definitions and accountability frameworks for advanced technologies [11].

Advantages and implementation challenges key benefits of digital systems in customs operations include:

— rapid analysis of large datasets and data-driven decision-making;

— development of automated inspection tools for high-risk cargo monitoring;

— full automation of customs clearance procedures;

— intelligent checkpoint design for border processing;

— autonomous detection and prevention of unauthorized or restricted goods;

— automated document verification and code assignment based on semantic processing of unstructured information;

— barriers to adoption ethical, social, technical, and legal challenges continue to constrain broad implementation.

In conclusion, it is worth noting that in the context of rapid changes caused by the gradual digital transformation of the global market, the further success of the digital transformation of customs authorities depends on a comprehensive approach that includes not only technical upgrades to infrastructure, but also systemic changes in legal regulation and management, as well as staff training and the development of new competencies in the field of digital and information technologies. An important condition is synchronization with international standards and practices, which will allow successful models to be scaled up and integrated into regional and interregional digital platforms. Particular attention should be paid to the introduction of breakthrough technologies such as artificial intelligence, blockchain, big data and cloud solutions, which can significantly improve the efficiency of customs control, reduce bureaucratic barriers and increase the transparency of procedures.

It is also necessary to take into account the challenges associated with technical limitations, asymmetries in the development of digital infrastructure in EAEU partner countries, and the imperfection of the legal framework for regulating new technologies. Overcoming these challenges requires active interdepartmental and international cooperation, as well as investment in the development of digital literacy and telecommunications infrastructure.

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References

1. AI Preparedness Index (AIPI) // International Monetary Fund. – 2025. – URL: https://www.imf.org/external/datamapper/AI_PI@AIPI/ADVEC/EME/LIC/BLR (date of access: 23.05.2025).

2. Цифровизация и логистика. Глава ГТК о новшествах в таможенной сфере в год председательства Беларуси в ЕАЭС // Государственный таможенный комитет Республики Беларусь. – 17.03.2025. – URL: https://gtk.gov.by/news/tsifrovizatsiya-i-logistika-glava-gtk-o-novshestvakh-v-tamozhennoy-sfere-v-god-predsedatelstva-belar/ (дата обращения: 24.05.2025).

3. Бакеренко, Ю. Орловский отметил, что сотрудничество Беларуси и Китая в таможенной сфере заметно укрепляется / Ю. Бакеренко // СБ – Беларусь сегодня. – 11.10.2024. – URL: https://www.sb.by/articles/orlovskiy-otmetil-chto-sotrudnichestvo-belarusi-i-kitaya-v-tamozhennoy-sfere-zametno-ukreplyaetsya.html (дата обращения: 24.05.2025).

4. Руководитель белорусской таможни Владимир Орловский обсудил с председателем таможенного комитета Азербайджана Шахином Багировым вопросы двустороннего сотрудничества // Государственный таможенный комитет Республики Беларусь. –

17.05.2024. – URL: https://www.customs.gov.by/news/rukovoditel-belorusskoy-tamozhni-vladimir-orlovskiy-obsudil-s-predsedatelem-gosudarstvennogo-tamozhe/ (дата обращения: 24.05.2025).

5. Кодекс Республики Беларусь об административных правонарушениях от 6 янв. 2021 г. № 91-З : принят Палатой представителей 18 дек. 2020 г. : одобр. Советом Респ. 18 дек. 2020 г. // ЭТАЛОН : информ.-поисковая система (дата обращения: 23.04.2025).

6. Об информации, информатизации и защите информации: Закон Респ. Беларусь от 10 нояб. 2008 г. № 455-З // ЭТАЛОН : информ.-поисковая система (дата обращения: 23.04.2025).

7. От автоматизации таможенных операций к интеллектуальной таможне // Альта-Софт. – 24.12.2021. – URL: https://www.alta.ru/expert_opinion/85937 (дата обращения: 20.05.2025).

8. О рисках, угрозах и отсутствии системности в цифровизации // InfoWatch. – 12.08.2021. – URL: https://www.infowatch.ru/resources/blog/tochka-zreniya-kasperskoy/o-riskakh-ugrozakh-i-otsutstvii-sistemnosti-v-tsifrovizatsii/ (дата обращения: 02.05.2025).

9. Доклад о развитии цифровой (Интернет) торговли ЕАЭС // Евразийская экономическая комиссия URL: https://eec.eaeunion.org/upload/medialibrary/b29/tsifrovaya-torgovlya.pdf?ysclid=lw6iyfdck4877022888 (дата обращения: 11.05.2025).

10. Яковлев, В. С. Интеграция искусственного интеллекта в системы управления рисками для оптимизации таможенных процедур / В. С. Яковлев // Научные высказывания. – 2024. – №12 (59). – С. 91–93. – URL: https://nvjournal.ru/article/Integratsija_iskusstvennogo_intellekta_v_sistemy_upravlenija_riskami_dlja_optimizatsii_tamozhennyh_protsedur (дата обращения: 11.05.2025).

11. Дубовик, С. Цифровая экономика: успеть за будущим / С. Дубовик // Навуковая, вытворча-практычная газета Беларусі «Навука». – 2018 – 2 крас. – С. 1, 3. – URL: https://gazeta-navuka.by/images/electronic-catalog/02.04.18.pdf (дата обращения: 17.05.2025).