

Brief Information About the Project

Title	IRN AR25793719 “Development of a system for analyzing illegal cryptocurrency Transactions”
Relevance	Cryptocurrencies are becoming increasingly popular, and many users actively use them for various financial operations. However, as their popularity grows, the number of illicit transactions is also increasing. Existing security methods are not always effective, which creates a need for innovative approaches to identifying and preventing various types of fraud. In the context of growing interest in cryptocurrencies and their economic significance, the need for modern security methods specifically focused on detecting and preventing illicit operations is becoming especially urgent. In Kazakhstan, there is a significant shortage of scientific research and technologies for the effective monitoring and analysis of cryptocurrency transactions. The proposed system will provide effective tools for countering cyber threats, contributing to the creation of a secure cryptocurrency environment. Given the rapid growth of cryptocurrency use in the global economy, the development of a system for analyzing illicit cryptocurrency transactions is becoming a crucial element of financial security. The project will help create a national cyberspace monitoring system, which is particularly relevant amid the rise in cyberattacks and threats. Strengthening cyber defense is a national security priority. The implementation of the project will also contribute to the development of Kazakhstan’s technology sector by stimulating the growth of competencies in the development and deployment of innovative technologies. The project will enable Kazakhstan to take an active role in the global cryptocurrency ecosystem and participate in international research initiatives, thereby accelerating the country’s integration into the global community of cryptocurrency technologies. An important social component of the project is supplying the domestic market with locally developed software. The project is a unique study in the fields of cybersecurity, machine learning, forensics, financial technologies, and data analysis. It aligns with priority areas and is expected to generate a significant economic impact. The results are expected to be commercialized in the form of tools and software products suitable for use not only in Kazakhstan, but also abroad.

Goal	The goal of the project is to conduct comprehensive research and develop a system for analyzing illicit cryptocurrency transactions that is capable of effectively detecting and predicting security threats. The system will be aimed at identifying suspicious and unlawful operations, including the financing of extremism and money laundering.
Objectives	To achieve the project goal, the following objectives will be addressed: • Research and identification of information sources on cryptocurrency transactions. • Development of algorithms for data collection and preprocessing. • Development of criteria for classifying illicit transactions. • Creation of a dataset of illicit transactions and feature engineering for model training. • Development of machine learning and deep learning models for classifying illicit transactions. • Development and implementation of a cryptocurrency transaction analysis and monitoring system (software).
Expected and Achieved Results	Final result: For 2025: a list of data sources with their full characteristics will be compiled. A data collection module will be developed to provide access to complete and up-to-date data for further analysis. Criteria for transaction classification will be established, which will serve as the basis for the development of analysis and machine learning models. One article will be published in a journal recommended by KOKNVO and/or in other domestic peer-reviewed scientific publications. For 2026: a dataset of illicit transactions will be created for further training of a machine learning model. Models demonstrating high accuracy in classifying illicit transactions will be developed. One article will be published in a journal recommended by KOKNVO and/or in other domestic peer-reviewed scientific publications. For 2027: software using machine learning for the automatic detection and classification of illicit cryptocurrency transactions will be developed. One article will be published in a journal recommended by KOKNVO and/or in other domestic peer-reviewed scientific publications.
Names and surnames of the	Shaizat Medet Zhanbolatuly — Scopus h-index: 2 Scopus Author ID: 57216968174

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Priority compared to real-world alternatives	The project offers advantages over existing analogues through the development of a national solution tailored to Kazakhstan, the creation of an in-house dataset of illicit cryptocurrency transactions, the application of machine learning and deep learning methods, and the deployment of software for monitoring and analyzing suspicious activity. Unlike foreign commercial systems focused mainly on global compliance and investigation tasks, the project is aimed at building a localized scientific and technological foundation for the national financial security and cybersecurity system.
List of publications with links (by research area)	<u>Shaizat, M., Mussiraliyeva, S. (2025). Enhanced identification of illicit bitcoin transactions through genetic algorithm-based feature selection. Eastern-European Journal of Enterprise Technologies, 4 (9 (136)), 34–42.</u> <u>https://doi.org/10.15587/1729-4061.2025.335630</u>
Patent Information	-