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ARTIFICIAL INTELLIGENCE IN CRIME PREVENTION AND INVESTIGATION

The article is devoted to artificial intelligence's role and capabilities in law enforcement. The author analyzes how artificial intelligence can improve the effectiveness of crime investigation and prevention and also considers the regulatory and legal aspects of its use in this field.

The article reveals the key aspects of information provision in law enforcement activities, particularly the use of artificial intelligence to analyze large volumes of data, automate routine processes, and predict potential crimes. The author also considers challenges and issues related to the use of artificial intelligence, including privacy issues, data analysis accuracy, and ethical aspects.

The article pays special attention to the regulatory and legal support for the use of artificial intelligence in law enforcement activities. The author analyzes the Concept of artificial intelligence development in Ukraine and considers foreign experience using elements of artificial intelligence in law enforcement activities.

The article focuses on the features of the "Cassandra" system in the penitentiary system. The article also examines the role and functionality of this system aimed at assessing the risk of reoffending among prisoners. It was studied the methods of data analysis used to predict relapses and determine the risk level. The author analyzes the effectiveness, possible advantages, and limitations of using the "Cassandra" system in the penitentiary system.

The article also outlines the possibilities of using artificial intelligence to investigate war crimes using the Clearview AI program as an example. The author analyzes the functionality and capabilities of this program in detecting and identifying persons involved in war crimes by analyzing faces from an extensive database.

The article is an essential addition to the scientific discourse on the role of artificial intelligence in modern society and its potential in the field of law enforcement.

Key words: information provision for law enforcement activities, artificial intelligence in crime investigation, artificial intelligence in crime prevention, regulatory and legal support for the use of artificial intelligence in law enforcement activities, the Concept of the artificial intelligence development in Ukraine, foreign experience in the use of artificial intelligence in law enforcement activities.

Колесніков А.П. ШТУЧНИЙ ІНТЕЛЕКТ В ЗАПОБІГАННІ ТА РОЗСЛІДУВАНІ ЗЛОЧИНІВ

Стаття присвячена дослідженню ролі та можливостей штучного інтелекту в контексті правоохоронної діяльності. Автор аналізує, як штучний інтелект може використовуватися для підвищення ефективності розслідування злочинів та їхнього запобігання, а також розглядають нормативно-правові аспекти використання штучного інтелекту в цій сфері.

Стаття розкриває ключові аспекти інформаційного забезпечення правоохоронної діяльності, зокрема використання штучного інтелекту для аналізу великих обсягів даних, автоматизації рутинних процесів та прогнозування потенційних злочинів. Автори також розглядають виклики та проблеми, пов'язані з використанням штучного інтелекту, включаючи питання приватності, точності аналізу даних та етичні аспекти.

Особливу увагу в статті приділено нормативно-правовому забезпеченню використання штучного інтелекту в правоохоронній діяльності. Автор аналізує Концепцію розвитку штучного інтелекту в Україні та розглядає закордонний досвід використання елементів штучного інтелекту в правоохоронній діяльності.

У статті приділено увагу особливостям модулю "Касандра" у пенітенціарній системі. Вона розглядає роль і функціонал цієї системи, що спрямовані на оцінку ризику повторного вчинення кримінального правопорушення серед ув'язнених. Досліджуються методи аналізу даних, що використовуються для прогнозування рецидивів та визначення рівня ризику. Автор аналізує ефективність та можливі переваги і обмеження використання модуля "Касандра" у пенітенціарній системі.

У статті також окреслені можливості використання штучного інтелекту при розслідуванні військових злочинів на прикладі програми Clearview AI. Автор аналізує функціонал та можливості цієї програми у виявленні та ідентифікації осіб, залучених до військових злочинів, шляхом аналізу обличчя з великої бази даних.

Стаття є важливим доповненням до наукового дискурсу про роль штучного інтелекту в сучасному суспільстві та його потенціал у сфері правоохоронної діяльності.

Ключові слова: інформаційне забезпечення правоохоронної діяльності, штучний інтелект в розслідуванні злочинів, штучний інтелект в запобіганні злочинів, нормативно-правове забезпечення використання штучного інтелекту в правоохоронній діяльності, Концепція розвитку штучного інтелекту в Україні, закордонний досвід використання штучного інтелекту в правоохоронній діяльності.

Problem Statement. Global digitization determines the newest opportunities in all spheres of social development. Therefore, the prospects for its application and challenges regarding the development of legal instruments of regulation are relevant. This issue has become especially pressing during the systemic globalization of

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the artificial intelligence use. The advantages of AI have been proven not only in the business environment but also during activity of state structures, particularly law enforcement agencies. Artificial intelligence can bring essential results for investigating crimes, as it can process large amounts of data, analyze the information, and highlight critical relationships and patterns that help law enforcement agencies detect and investigate crimes. At the same time, creating a legal field that would allow it to be used as a procedural investigation tool does not exist in Ukraine today. This issue actualizes the need for further scientific investigations in this direction.

Analysis of recent research and publications. Taking into account the relative novelty of using artificial intelligence in law enforcement, over the last period scientists have noted its future prospects. Thus, Professor V. Teremetskyi notes that the value of law and order enforcement is pointed in its systemic properties, in particular, emergence, stability, integrability, structure, purposefulness, etc. [1, p. 52], namely the integration of artificial intelligence tools into the law enforcement system and is a vivid example of emergent qualities that will allow optimizing the crime investigation system.

The use of artificial intelligence in law enforcement has become more widespread abroad. In this context, it is worth paying attention to the worki of M. Belova and D. Belov [5], who investigate the peculiarities of international experience in this field, in particular, conduct a review of implemented projects and programs that introduce artificial intelligence into pre-trial investigations of criminal cases in various countries of the world through the lens of legal regulation, as well as thorough research by S. Matulene, V. Shevchuk, and Y. Baltruniene [10].

Generally the use of artificial intelligence, particularly in the field of law enforcement, were investigated by O. Zachek, Yu. Dmyryk, and V. Senyk [11].

A number of other publications dealing with certain aspects of digitalisation in the field of law enforcement are worthy of note [13; 14; 15; 16].

Along with taking into account the impact of scientific achievements, the approaches regarding the systematic use of the latest information technologies in law enforcement activities require further formation.

The purpose of the article is to investigate the organizational and legal aspects of artificial intelligence usage regulation in Ukraine and outline individual vectors of its improvement in the context of law enforcement activities.

Presentation of the main research material. The research starts with a general analysis of the legal framework for the artificial intelligence use. The basic document in this direction is the "Concept of Artificial Intelligence Development in Ukraine " [2] (hereinafter - the Concept), where among the basic principles it is stated "increasing the level of public safety through the use of artificial intelligence technologies during the development of measures for the resocialization of convicted persons and the risk of reoffending" [2]. In this case, its use is aimed at preventive effect. One of the attempts to implement this principle was the launch in mid-2021 of the "Unified Register of Convicted Persons and Persons Taken Into Custody" [3], with the support of the EU projects "Pravo-Justice" and EDGE. The main purpose of this register is to create a single database of convicts and prisoners, to keep records of recidivism, to summarize statistical data on the number of people who re-enter the system of punishment, and to ensure communication between bodies and institutions of the penitentiary system and probation, as well as facilitating interaction with other state structures. At the same time, one of the important modules is the "Cassandra" subsystem, designed to assess information about the risk of committing a new criminal offense by a person in prison.

The Cassandra system automatically creates a recidivism risk assessment using automated inference algorithms that draw on processed data from large, structured sets of information about an individual's criminal history, housing, education and employment, financial status, behavioral control, and thinking, alcohol and drug use, social connections and other aspects. These data are used to determine the level of risk of reoffending. The assessment is based on the calculation of points and their correlation with the established levels of risk (low, medium, high, very high). Cassandra also provides predictions about an individual's likelihood of reoffending using machine learning and automated inference algorithms based on the processing of large structured data sets. Although the decision on the early release of a convicted person is made by a judge in any case, using artificial intelligence tools will make the decision-making procedure much more transparent and reduce the probability of materializing corruption risks. In the future, developers envision additional tools for machine learning of the system based on artificial intelligence tools. However, the "European Ethical Charter on the use of artificial intelligence (AI) in judicial systems " [4] recommends conducting a significant amount of scientific research when using programs of this type. Considering the lack of publications on the theme in public access, this may be one of the reasons for the next postponement of the official presentation of the program.

At the same time, it is worth paying attention to some short-sightedness of the developers of the system when formulating the naming. It is a well-known myth that no one believed the predictions of the legendary prophetess of ancient Greek mythology, Cassandra, and her fate ended tragically.

In the Concept it was allocated the "Justice" module, which determined the intriguing potential of using artificial intelligence to "prevent socially dangerous phenomena by analyzing available data". While we view this norm as progressive, it also carries substantial risks of infringing on citizens' rights and freedoms.

In the context of ensuring the implementation of the Concept, the Resolution of the Cabinet of Ministers of Ukraine dated May 12, 2021, N. 438-r approved the "Action plan for the implementation of the Concept of Artificial Intelligence Development in Ukraine for 2021-202424" [9]. The subsection 6 of the Plan refers to the "implementation of artificial intelligence technologies into the national cyber security system to analyze and classify threats and choose

a strategy to contain them and prevent their occurrence" [9]. The first among responsible authorities for this area is the National Police. The indicator of the task performance is the approval of countermeasures against cyber threats using artificial intelligence technologies. There was not found a document on the content of these measures on official resources.

Artificial intelligence can help police and law enforcement agencies identify patterns, find connections, and analyze large volumes of data to aid in crime investigations. It can also be used for automatic processing of text documents, face recognition and crime prediction; helps detect fraud and fraudulent schemes, which contributes to the fight against financial crime and corruption. Artificial intelligence can also be used to identify suspects and potential witnesses.

This approach in law enforcement activities is quite progressive and versatile.

The use of artificial intelligence technologies in the implementation of "predictive policing" strategies is one of the areas of modern law enforcement activity. "Predictive policing" is an approach based on the use of data analysis and artificial intelligence algorithms to predict the places, times, and types of possible crimes.

The basic idea of "predictive policing" is to use statistical data about past crimes, as well as other relevant data, such as socioeconomic indicators, population information, climatic conditions, and more, to create models for predicting crime in certain areas. These models can help law enforcement agencies make decisions about resource allocation, patrol routing, and preventive measures to prevent crime.

In general, the directions of using artificial intelligence in the "Predictive policing" system can be defined as follows:

1. Data analysis. AI can process large amounts of data, including past crime reports, patrol patterns, social and economic data, weather information, and other factors that may influence crime.

2. Identification regularities. Using statistical analysis and machine learning, AI identifies patterns and trends that are not always obvious to a human analyst.

3. Spatial analysis. Spatial analytical tools make it possible to identify "hot spots" of crime where high crime activity is concentrated.AI crime prediction is already being used in some US cities, such as Chicago and New York, where systems analyze data and help police determine where and when to increase police presence.

Let’s describe several examples of the successful use of similar technologies abroad.

The PredPol system is software that uses data analysis algorithms to predict places and times where crimes are likely to occur. It is based on the statement that crimes are not evenly distributed over the territory but often tend to cluster in certain areas and at certain times. The system analyzes historical crime data, such as assaults, thefts, robberies, and others, and uses various mathematical models and statistical methods to determine the probability of future crimes in certain areas and at certain times. Police can use these predictions to assign patrol cars or officers to certain areas in the city where crime is most likely. This makes it possible to optimize the use of police resources and concentrate them where are most needed [6]. HunchLab is another example of predictive analytics in the police, similar to PredPol, but with a specific approach and functionality. This system uses data analysis to identify and predict potential crime locations and times. However, HunchLab takes into account more factors, such as geographic features, socioeconomic conditions, and other contextual variables that may influence crime in a given neighborhood.

The main idea behind HunchLab is to give police officers a tool to help them more accurately analyze and predict crime at the local level. The system generates "suspects" or "summaries" that show how likely crimes are to occur in certain areas and periods and also provide recommendations on the optimal deployment of police resources to prevent crimes.

HunchLab can also consider the dynamics of changes in society, such as changes in the economy, demographic trends, and socio-political factors, which allows for more accurate predictions of crime. This helps the police to make better decisions about the allocation of resources and the development of crime prevention strategies [7].

There are also promising applications for the use of artificial intelligence in law enforcement agencies investigating economic crimes in Ukraine. Thus, in an interview with Ukrinform (which belongs to the "white" list of Ukrainian media, so author considers it possible to use its materials in this scientific study), the director of the National Anti-Corruption Bureau Semen Kryvonos noted that negotiations are underway with a company that owns an analytical product, which will potentially be able to investigate in "Prozoro tenders, when company X during a specific period of time took part in 50 procurements where there are signs of abnormally inflated prices for a certain category of goods" [5]. At the same time, he noted that the program will not replace the work of a NABU detective.

It is also worth noting the prospects of using artificial intelligence technologies in the investigation of war crimes during the period of military aggression of the Russian Federation in Ukraine. Clearview AI technology, provided to the Ukrainian government to identify both the living and the dead, highlights the importance of artificial intelligence in today's conflicts. As of July 2022, 4 months after its transfer, "7 agencies and more than 600 military personnel were actively using the Clearview AI platform, performing more than 60,000 searches. Each search could save a life at a roadblock, help identify a missing person, etc." [8].

Conclusions. Artificial intelligence can significantly improve the ability of law enforcement agencies to combat crime by enabling faster detection and investigation of crimes, reducing the risk of criminal activity, and improving overall public safety. However, although artificial intelligence can be a powerful tool in the investigation of crimes, it cannot completely replace human expertise and interpersonal communication. Simplified access to large

amounts of personal data also requires high privacy protection and ethical considerations to avoid abuses and violations of citizens' rights.

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