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O USO DE INTELIGÊNCIA ARTIFICIAL E OUTRAS TECNOLOGIAS NOS PROCESSOS CRIMINAIS: PROBLEMAS, SOLUÇÕES E PERSPECTIVAS

THE USE OF ARTIFICIAL INTELLIGENCE AND OTHER TECHNOLOGIES IN CRIMINAL PROCEEDINGS: PROBLEMS, SOLUTIONS AND PROSPECTS

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ABSTRACT

Purpose: This article aims to form an idea of the developed new technologies and, based on the analysis of their practical potential, to determine the possibility of using them in the investigation of crimes, especially those committed in the field of information and telecommunication technologies.

Methodology: The article was written using the dialectical method of scientific cognition, along with general scientific and specialized methods, including comparative legal, logical-analytical, formal-logical, systemic-structural, and statistical approaches.

Results: based on the analysis of successfully applied technologies in various spheres of life of Russian society and abroad, including in the industrial, military, economic fields, in

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the field of social engineering, the issue of using the latest technologies in criminal proceedings, including in the production of investigative and other procedural actions, collection, verification and evaluation is investigated evidence, the formation of an evidence base. The norms of the Code of Criminal Procedure of the Russian Federation regulating the process of proving the admissibility of the use of the latest technologies are analyzed.

Conclusions: in criminal proceedings on cross-border crimes committed using the latest technologies, employees of the preliminary investigation bodies need to improve their competence in applying the latest technologies in the field of use to state bodies conducting criminal proceedings, it is necessary to introduce scientific and technological progress in order to identify and investigate crimes.
It is necessary to improve the legal regulation in this area in criminal proceedings.

Keywords: Justice; Evidence; Proof process; Information and telecommunication technologies; Neural networks; Nanotechnology.

RESUMO

Objetivo: Este artigo tem como objetivo formar uma ideia das novas tecnologias desenvolvidas e, com base na análise de seu potencial prático, determinar a possibilidade de usá-las na investigação de crimes, especialmente aqueles cometidos no campo das tecnologias de informação e telecomunicação.

Metodologia: O artigo foi escrito utilizando o método dialético de cognição científica, juntamente com métodos científicos gerais e especializados, incluindo abordagens comparativo-jurídicas, lógico-analíticas, formal-lógicas, sistêmico-estruturais e estatísticas.

Resultados: Com base na análise de tecnologias aplicadas com sucesso em várias esferas da vida da sociedade russa e no exterior, incluindo os campos industrial, militar, econômico e de engenharia social, é investigada a questão do uso das tecnologias mais recentes em processos criminais, incluindo na produção de ações investigativas e outras ações processuais, na coleta, verificação e avaliação de provas e na formação de uma base probatória. São analisadas as normas do Código de Processo Penal da Federação Russa que regulam o processo de comprovação da admissibilidade do uso das tecnologias mais recentes.

Conclusões: Em processos criminais sobre crimes transfronteiriços cometidos com o uso das tecnologias mais recentes, os funcionários dos órgãos de investigação preliminar precisam aprimorar sua competência na aplicação das tecnologias mais recentes. Para os órgãos estatais que conduzem processos criminais, é necessário introduzir o progresso científico e tecnológico para identificar e investigar crimes. É necessário aprimorar a regulamentação legal nessa área em processos criminais.

Palavras-chave: Justiça; Evidência; Processo de prova; Tecnologias de informação e telecomunicação; Redes neurais; Nanotecnologia.

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1 INTRODUCTION

The scale of illegal activity in Russia poses a serious threat to the rule of law, ensuring the rights and interests of the individual, the economic and social development of society, and the security of the state (Polovchenko, 2021). Crime, following synchronously with the progressive and economic development of society, is becoming more organized and sophisticated, putting into circulation the achievements of scientific knowledge and the latest technologies (Chirkov et al., 2022; Bagratuni et al., 2023).

According to statistical data provided by the Prosecutor General's Office of the Russian Federation, every fourth registered crime is related to the use of information and telecommunication technologies or computer information (Akhmetshin et al, 2024). This amounts to 363 thousand crimes. The growth of such crimes, which was previously observed almost twice as fast, has slowed down to 77%. More than half of all cybercrimes (209.7 thousand) are committed via the Internet, and over 42% (155.2 thousand) are committed using mobile communications (Official website of the Prosecutor General's Office of the Russian Federation, n.d.).

To successfully confront modern crime, a set of the best achievements of science, technology and innovation is needed, aimed at identifying, uncovering and investigating crimes, which should exceed the technical equipment of the criminal world.

Currently, humanity is on the verge of a great scientific revolution, comparable perhaps to the discoveries of Copernicus, Galileo or Newton. Copernicus offered a new perspective on the nature of the solar system. Galileo Galilei invented the telescope and made a number of astronomical discoveries, upending the world of perception of everyday things and laying the foundation for classical mechanics. Sir Isaac Newton created a general theory of mechanics, explaining celestial and terrestrial phenomena, creating the basis for science for the next 200 years.

Humanity around the world has witnessed the explosive development of new fields of science and technology (Malika et al., 2022; Borodkin, 2023). In recent years, Russia has taken drastic actions aimed at modernizing science and improving technological progress (Akhmetshin et al., 2021).

This reality has set a trend for finding new ways and mechanisms for collecting, verifying and evaluating information not previously known to the practice of investigating crimes. But along with the positive features of innovations introduced into criminal procedural activities, new problems have arisen, for example, concerning the safety of evidence obtained with the

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help of information technology, protecting them from falsification and use for compromising purposes, the safety of personal data when working with digital content and conducting digital investigations. The issue of new practice-oriented competencies of employees of the preliminary investigation bodies has also become relevant – today it is obvious that an investigator must possess not only knowledge in the field of law, but also be competent in existing scientific and technological developments, the use of which is advisable to solve the tasks of the criminal process and optimize its work.

This article seeks to conceptualize the newly developed technologies and assess their practical potential to determine how they can be applied in criminal investigations, particularly in cases involving information and telecommunication technologies.

2 MATERIALS AND METHODS

When writing the article, the dialectical method of scientific cognition was used, as well as a set of general scientific and special methods for studying legal phenomena and processes in the field of preliminary investigation: comparative legal, logical-analytical, formal-logical, systemic-structural, statistical and some others.

To write the article, the materials were selected according to the areas of application of the latest technologies and the positive experience of their use. The research and conclusions of the authors were analyzed, which give grounds to assume the admissibility and possibilities of using artificial intelligence in criminal proceedings. The sources describing the use of the latest technologies in law enforcement in other states were studied.

3 RESULTS ANALYSIS

There is no common understanding of the term "new technologies". This is an extensive and progressive concept that includes many techniques and tools. If we turn to the English language, the word "innovation" is interpreted as the use of innovations in the form of new technologies, types of products and services, new forms of service organization and management. The American scientist Carl Wake at the end of the 20th century called the signs of the concept "new technologies": stochasticity (unpredictability), continuity, independence, abstraction (Weick, 1990).

At the beginning of this century, scientists from various scientific fields in Russia and abroad, without detracting from the importance of special industry research, began to talk

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about the necessary integration of various fields of knowledge together in order to create a holistic picture of the world around them and develop on this basis a unified interdisciplinary knowledge, the creation of new breakthrough technologies.

Thanks to American scientists W.S. Bainbridge and M.C. Roco (2006), this innovation materialized and was called convergent or NBIC – technological knowledge or NBIC – convergence, combining the initial letters of four fundamental branches of knowledge: Nano – nano; Bio – bio; Info – info; Cogno – cogno – technologies.

The essence of the idea was the mutual integration of various scientific and technological fields, which allows, through a single set of tools, to increase human productivity, transform society, science and human evolution as a whole in order to achieve previously impossible tasks.

However, as time passed, it became obvious that it was illogical to develop a unity of understanding of the material world without the branch of social and humanitarian knowledge, and Russian scientists at the Kurchatov Institute Research Center proposed the concept of NBICS convergence, which made it possible to introduce the field of humanitarian knowledge to mutual research (Dubrovsky, 2013).

Knowledge about nanotechnology has the potential for revolutionary advances in information technology, artificial intelligence, cybersecurity, robotics, medicine, biochemistry, quantum physics, etc. Knowledge about biotechnology reveals the possibilities of studying human matter. Knowledge in the field of information technology allows you to automate numerous processes, optimizing the work with information. Cognitive knowledge provides an opportunity to delegate tasks traditionally performed by humans to a robotic process and intelligent machines.

It was the convergence of scientific knowledge that formed a synergy in the approach to cognition, erasing the boundaries of narrow disciplines, which made it possible to successfully develop modern technologies.

The convergence of knowledge about nano- and biotechnologies allows, for example, magnetic nanoparticles to extract DNA from various biomaterials such as skin, saliva, blood, hair for subsequent identification of biological traces in order to prove the involvement of the suspect and the accused in the commission of a crime, which is indispensable in the investigation of crimes that infringe on life and health, sexual integrity and sexual personal freedom.

The use of special knowledge in the field of nanotechnology in the investigation of crimes presents great prospects, especially in the activities of a specialist and forensic activities, as

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they allow you to work with objects at the nanometer level, ensuring high accuracy and speed of research.

The convergence of nano- and cognitive knowledge makes it possible to use nanoengineers to study the brain, its computer modeling and the creation of a "strong" artificial intelligence.

The development of information and communication technologies has already been realized - the federal videoconferencing system is successfully used in the production of investigative and judicial actions.

In modern reality, in various spheres – from statements at the scientific and state levels to everyday conversations, the possibilities of artificial intelligence and the expediency of its use for the benefit of man, society and the state are actively discussed.

Artificial intelligence is one of the components of cognitive technologies that spreads around the globe like an octopus, penetrating with tentacles into all spheres of human activity. The very process of cognition acquires new colors. Some previously unique human cognitive abilities of perception and information processing are transferred to artificial intelligence.

Scientists who have brought cognitive knowledge to life have tried not only to understand, but also to create objects with artificial intelligence – there are already thousands of programs that have penetrated deeply into the infrastructure of every branch of life – not magic or science fiction, but exact science, technology and mathematics.

But scientific and technological progress is constantly being improved, replacing new technologies with the latest and innovative ones, thereby creating an understanding that the development and use of convergent knowledge and technologies has no boundaries, and in the near future they will be widely and effectively used in criminal proceedings.

Russia and many other countries have accumulated a wealth of experience in using information technology in the investigation of crimes, which allows not only to receive information efficiently and promptly, but also to store it in databases for later use. The ability to extract evidence from the information space over time is a revolutionary breakthrough in the field of crime investigation, and such experience is already being used by Rosfinmonitoring in its financial intelligence and information storage (Thyssen & Grinenko, 2022).

Thanks to the latest achievements, it has become possible to record ordinary speech, convert it into text, recognize, distort and even commit crimes using imitation of someone else's voice. Moreover, evidence of a person's presence in a certain place can be detected

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by his photo, biometric data, left without observing cyber hygiene, digital footprint in the Internet space.

Modern computers, smartphones, digital watches, gaming and smart consoles, thanks to the latest technologies and programs of artificial neural networks programmed into them, record and analyze location, voice and speech identification signs, health anomalies, active actions even if the device is not in use.

The progressive development of technology is impossible, firstly, to stop, and, secondly, to predict. It is necessary to constantly monitor the potential of new scientific and technological achievements, taking into account, among other things, the positive experience of foreign countries in order to assess the possibility of their application for the needs of criminal proceedings and operational investigative activities.

For example, the following approaches can be used: machine learning algorithms and neural networks, programs for recognizing non-verbal signals, network analysis, virtual reality and interactive platforms for recreating criminal acts, high-volume digital archiving and other technologies.

Some already widely used digital technologies are able to significantly expand the possibilities of criminal procedural activities.

One of the modern directions is the use of a geographic information system (GIS). GIS is a set of programs that allow you to collect, process and analyze images, as well as use geographical coordinates, including data from the global positioning system (GPS) and satellite images in real and past time.

When investigating crimes, these technologies can be used to track the movement of people and their large concentrations, the movement of vehicles, to monitor buildings, structures and adjacent territories in real and past time. The special value of such developments lies in the fact that with their help it is possible to collect information in any, even inaccessible point of the earth.

Not so long ago, the Ministry of Internal Affairs of the Russian Federation introduced the federal neural network for security and control of vehicles "Web" into its law enforcement activities (Vasin, 2022).

Remote sensing monitoring technologies are widely used to explore our Earth from space (Lupyan et al., 2012). Geospatial Artificial Intelligence (Gepai) can recognize and explore the available data (Fateev & Nosov, 2020). The use of geospatial technologies such as LiDAR, satellite imagery, drone mapping and ground-based camera imagery allows you to obtain accurate data in 3D format. In Russia, 2GIS and Yandex Maps service solutions have

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such technological capabilities.

Modern information technologies also facilitate online investigations of crimes based on open sources (OSINT). This is a completely new approach to finding and analyzing information from open databases such as Internet search engines, social networks, forums and blogs. The availability of such sources allows every Internet user to search, collect and verify information necessary for criminal procedural proof.

Employees of the preliminary investigation bodies, who are competent in working with social engineering and profiling services, are able to collect information about the accused (suspect), make up his psychological portrait, carry out the investigation more efficiently and effectively.

An innovative approach is to apply financial intelligence. This is the process of collecting information about the financial transactions of suspects and accused in order to identify their criminal activities, concealment of income, money laundering and other financial frauds. Data mining algorithms are used to verify and analyze data in order to identify persons involved in financial transactions and compare the information obtained with other evidence available in a criminal case.

Currently, Rosfinmonitoring carries out financial intelligence on countering the legalization (laundering) of proceeds from crime, the financing of terrorism and the financing of the proliferation of weapons of mass destruction (Official website of the Federal Financial Monitoring Service, n.d.).

Of interest for the investigation of crimes is the technology of documenting information "EyeWitness to Atrocities", which allows any user to send author's video or audio content to the program's database, which is subsequently available to law enforcement and judicial authorities in order to facilitate criminal justice (Andreev, 2018).

The search and detention of suspects and accused of committing a crime, as well as the prevention of possible illegal actions, is carried out on the basis of created system solutions for facial recognition and gestures based on biometric data.

Face and gesture recognition is another popular application of artificial neural networks to identify people. It is no coincidence that the project in Russia includes the creation of a Coordinating Council for the development of digital identification and authentication technologies based on biometric personal data (Government of the Russian Federation, 2022).

The NtechLab facial recognition program developed in Russia identifies up to 50 people in a frame at a moment, identifies faces in the video within three seconds, compares the

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results with requests for wanted persons from information systems, and in case of a match sends information to law enforcement agencies (NtechLab, n.d.).

Other countries, such as India, offer system solutions for identifying gestures and behavioral actions of individuals. Artificial intelligence technologies are trained to classify hand gestures and identify violators of the law with an accuracy level of 98.96%. Scientists from the state of Bangladesh have created an algorithm for tracking people's behavior, comparing it with the typical habits and condition of criminals. The program identifies potential criminals based on signs that they are angry, how exactly they gesture, look around, smoke, run, jump, bump, walk, what poses they take, etc.

The digital information received by participants in criminal proceedings should be attributed to other documents as a source of evidence, which does not contradict Article 86 of the Code of Criminal Procedure of the Russian Federation.

Undoubtedly, information obtained through information technology can be distorted through deepfakes - technologies that allow you to create and replace elements in existing photographs and videos using artificial intelligence and neural networks, which, in principle, does not distinguish it from evidence obtained in the off-line mode and the rules for evaluating evidence provided for by the norms of art. 17 of the Code of Criminal Procedure of the Russian Federation, so in accordance with them - jurors, the prosecutor, the investigator, the inquirer evaluate according to their inner conviction, based on the totality of evidence available in the criminal case, guided by the law and conscience.

4 CONCLUSIONS

In conclusion, it can be noted that the use of digital documentary evidence has a number of advantages over traditional methods of proof in criminal proceedings. They have greater accuracy, can be used anywhere and allow monitoring, documentation and investigation in remote operation conditions. In addition, they democratize the process of establishing the facts of a crime and mitigate the subjectivity inherent in traditional methods of proof. These are just some of the opportunities that new technologies provide for more effective and successful crime investigation. In order to more quickly and efficiently investigate crimes and administer justice, the criminal process must go hand in hand with the progressive development of new technologies.

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