

**INFORMATION AND ANALYTICAL TECHNOLOGIES  
IN CRIMINALISTICS AND FORENSIC EXPERTISE:  
DEVELOPMENT TRENDS IN THE WAR IN UKRAINE**

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**INTRODUCTION**

The current level of ensuring the safety of the population of Ukraine from threats to life, health and property does not fully meet the safety standards inherent in the leading countries of the world.

Taking into account the complexity and variety of factors affecting the level of national security, the state and dynamics of crime, the degree of protection of the population from emergencies, a radical improvement in the security situation in the country can be achieved only through the joint efforts and joint coordinated work of the security forces, other state bodies and local self-government bodies<sup>1</sup>.

At the same time, the experience of foreign countries is useful and can be implemented in Ukraine, in particular, in terms of large-scale use of technical means, devices and devices, including photo, audio, video recording functions, which provide the possibility of recording and early detection of offenses, recognition (identification) of various objects (persons, vehicles, etc.).

The measures taken in this area at the level of the state and local self-government bodies are currently fragmented and unsystematic. Under these conditions, one of the priorities is to address the issue of creating integrated security monitoring systems as a means that can significantly contribute to improving the effectiveness of measures for the Prevention of criminal and other offenses, comprehensive security of the population, territory and objects, including those related to critical infrastructure of the state.

The EU's Eastern Partnership policy until 2025 sets new long-term goals aimed at responding to new priorities, strengthening resilience to solving common problems, promoting sustainable development and continuing to deliver concrete results for citizens, one of which is to ensure sustainable digital transformation. Supporting sustainable digital transformation is one of the policy priorities identified by the European Commission in the proposal for long-term policy objectives of the Eastern Partnership for the period beyond 2020 (published 18 March 2020)<sup>2</sup>.

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<sup>1</sup> On the unified system of video monitoring of the state of Public Security: Draft Law No. 11031 (2024, February 20). URL: <https://itd.rada.gov.ua/billInfo/Bills/Card/43733>.

<sup>2</sup> An official website of the European Union. Joint Communication: Eastern Partnership policy beyond 2020: Reinforcing Resilience – an Eastern Partnership that delivers for all. URL : [https://www.eeas.europa.eu/eeas/joint-communication-eastern-partnership-policy-beyond-2020-reinforcing-resilience-%E2%80%93-eastern\\_en](https://www.eeas.europa.eu/eeas/joint-communication-eastern-partnership-policy-beyond-2020-reinforcing-resilience-%E2%80%93-eastern_en).

In line with the European Commission's proposals for new EU Eastern Partnership Policy Priorities, a strong digital presence in the EU's neighboring countries will contribute to growth and promote sustainable development<sup>3</sup>. In this regard, E will continue to invest in the digital transformation of partner countries in accordance with EU legislation and best practices and will support the expansion of highly innovative digital technologies in the region. The EU will continue to support partner countries and promote their cyber resilience.

Theoretical and practical problems of legal regulation of social transformation due to the use of digital technologies, issues of legal support in the field of Social Communications in the context of digital transformation have recently been the subject of scientific discussions. In particular, on November 23, 2023, the III All-Ukrainian scientific and Practical Conference "social and digital transformation: theoretical and practical problems of legal regulation" was held (organized by DNU "Institute of information, security and law of the National Academy of Sciences of Ukraine", Research Institute of intellectual property of the National Academy of Sciences of Ukraine). At the conference, in particular, the peculiarities of legal support for the development of modern information infrastructure of society and problems of legal regulation of public relations in the field of application of Internet of Things technologies were considered. Directions for improving legislation on the protection of human rights in the context of the use of digital technologies are proposed. During the active expert discussion of these issues, the participants of the All-Ukrainian scientific and practical conference noted the following:

the international community associates the success of any social transformation with the implementation of large-scale digital transformations based on the active implementation and use of the achievements of the Fourth Industrial Revolution: Internet of Things technologies; Industry 4.0; artificial intelligence; robotics; Blockchain; Big data; Smart Contracts; social networks and Electronic Communications; Cloud and nano -, Biotechnologies, etc;

most countries of the world have adopted or are considering the possibility of adopting national strategies for the introduction of IoT technologies; at the same time, about 70 States – national strategies for the development of artificial intelligence and robotics, considering this a basic condition for development;

the issue of organizing proper legal support for the social and digital transformation of society, as well as assigning the task of developing conceptual foundations for the development of legislation to specialized scientific institutions of the National Academy of Sciences of Ukraine and the

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<sup>3</sup> An official website of the European Union. Joint Communication: Eastern Partnership: Commission proposes new policy objectives for beyond 2020. URL: [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_20\\_452](https://ec.europa.eu/commission/presscorner/detail/en/IP_20_452).

National Academy of Sciences of Ukraine and the research service of the Verkhovna Rada of Ukraine, is relevant<sup>4</sup>.

The works of such legal scholars as G. K. Avdeeva, V. S. Batyrgareeva, V. I. Borisov, T. Ya. Gnidets, Yu. I. Dmitrik, K. V. Dubonos, N. M. Dyachenko, V. A. Zhuravel, V. P. Zakharov, A. A. Ignatovich, R. S. Kozyakov, V. O. Konovalova, T. M. Lemekha A. M. Lysenko, O. S. Melnik, A. O. Moroz, I. V. Oleshko, Yu. V. Osadchaya, O. V. Rybalsky, V. I. Rudeshko, V. I. Solovyov, L. I. Sopilnik, I. O. Suprun, V. V. Topchy, A. O. Fesenko, V. G. Khakhanovsky, L. M. Khmelnychy, R. Yu. Tsarev, V. A. Shvets, V. M. Shevchuk, V. Yu. Shepitko, and others were devoted to the use of information technologies and innovations in the investigation of criminal offenses<sup>5</sup>.

It should be noted that the literature sources mainly considered certain aspects of the use of information and analytical systems and video monitoring technologies in the activities of law enforcement agencies. At the same time, not all existing technologies have been the subject of research and coverage in the context of ensuring the safety of the population of Ukraine from threats to life, health and property, so the question of studying the possibility of introducing such technologies in activities related to the investigation and Prevention of criminal offenses needs further consideration. Also, in connection with the war in Ukraine, the issue of using the capabilities of information analytics technologies in improving the effectiveness of investigating war crimes and crimes of aggression in Ukraine is becoming extremely relevant. So, the task of studying global trends in the use of information and analytical systems and video monitoring technologies is relevant, and taking into account the need to improve regulatory regulation in this area in Ukraine, it is quite justified<sup>6</sup>.

### **1. Prerequisites and legal grounds for the introduction of information and analytical systems and video monitoring technologies in the activities of law enforcement agencies of Ukraine**

On 2024, February 20 the Verkhovna Rada of Ukraine registered the draft law "on the unified system of video monitoring of the state of Public Security",

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<sup>4</sup> Соціальна і цифрова трансформація: теоретичні та практичні проблеми правового регулювання : матеріали III Всеукр. наук.-практ. конф. (Київ, 23 листоп. 2023 р.). Київ, ДНУ «Інститут інформації, безпеки і права НАПрН України», 2023. С.5.

<sup>5</sup> Проблеми використання систем штучного інтелекту в роботі органів кримінальної юстиції // Використання технологій штучного інтелекту у протидії злочинності : матеріали наук.-практ. онлайн-семінару (м. Харків, 5 листоп. 2020 р.). Харків : Право, 2020. С. 6-10. URL: <https://dspace.nlu.edu.ua/bits.../123456789/18957/1/6-10.pdf>

<sup>6</sup> Примітка. Стаття написана у межах розробки фундаментальної теми «Інноваційні методи та цифрові технології в криміналістиці та судовій експертизі», яка досліджується фахівцями НДІ вивчення проблем злочинності імені академіка В. В. Сташиса НАПрН України.

which proposes to introduce a single All-Ukrainian system of video monitoring using personal data of citizens<sup>7</sup>.

The presented project was developed in order to ensure national and state security, increase the overall level of Public Security and order, ensure the safety of places of residence and stay of citizens by introducing a unified system of video monitoring of the state of Public Security on the basis of state authorities and local self-government bodies in accordance with the unified functional and technological standards, which will ensure monitoring and contribute to the prevention and elimination of possible threats, as well as control over the elimination of the consequences of emergencies and offenses.

The draft law stipulates that state regulation of public relations in the field of creating and implementing a unified video monitoring system for the state of Public Security will be based on the following principles:

- rule of law;
- legality;
- respect and respect for human and civil rights and freedoms;
- openness and transparency;
- continuity;
- ensuring the security of a person, society and the state in the use of information and communication technologies;
- respect for human dignity;
- openness to democratic civilian control.

In order for the future video monitoring system of Ukraine to work, the draft law provides for regulatory regulation in the following important areas:

uniform functional and technical requirements for the construction and functioning of video monitoring systems for the state of Public Security at the central, regional and local levels, departmental video monitoring systems for enterprises, institutions of organizations (regardless of ownership forms) and individuals installed in public places, the procedure for access to information, as well as the composition of video data, metadata, analytical data, video archives, alarms created by them;

ensuring uniform rules for information exchange at the state, regional and local levels between subjects of the unified video monitoring system for the state of Public Security through a single information space, taking into account the differentiation of access rights to information;

ensuring the protection of information, including personal data in video monitoring systems of the state of Public Security at the central, regional and local levels and departmental video monitoring systems of enterprises, institutions of organizations (regardless of ownership forms) and individuals established in public places.

According to the authors of the draft law, the introduction of a unified system of video monitoring of the state of Public Security corresponds to and is based on such important regulatory legal acts as the Constitution of Ukraine,

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<sup>7</sup> On the unified system of video monitoring of the state of Public Security: Draft Law No. 11031 (2024, February 20). URL: <https://itd.rada.gov.ua/billInfo/Bills/Card/43733>.

the Code of civil protection of Ukraine, the laws of Ukraine "on national security of Ukraine", "on information protection in information and communication systems", "on electronic communications", "on critical infrastructure", "on high-risk objects", "on the National Police". Indeed, Presidential Decree No. 273/2023 of May 11, 2023 approved a comprehensive strategic plan for reforming law enforcement agencies as part of the security and defense sector of Ukraine for 2023–2027<sup>8</sup>. "Every element of the state system – law enforcement agencies, first of all – should work in such a way that people really feel safe and secure, so that people really feel justice, so that it is guaranteed at the level of institutions, at the level of the daily work of those by whom people judge the state. Trust in the state, trust in the state is formed from trust in those who act on behalf of the state. Law enforcement officers and the prosecutor's office system are key in this. Of course, together with all others who work in the state apparatus," the president of Ukraine stressed<sup>9</sup>.

The document was jointly developed by an interdepartmental group, which included the heads of the Office of the prosecutor general, the Ministry of internal affairs, the Ministry of justice, the SBU, the state Bureau of Investigation, the National Police, the state border service, BEB, the state customs service, as well as representatives of the Office of the president of Ukraine, the Cabinet of Ministers of Ukraine, international experts from the Office of the Council of Europe in Ukraine, the EU EU project "PRAVO-JUSTICE", the law enforcement department of the US Embassy in Ukraine, the International Organization for development law (IDLO). The main goal of the plan developers was to put a person, his life, health, honor and dignity, rights and legally protected interests in the center of attention of the law enforcement sector, the security and defense sector. Every Ukrainian should be sure that he lives in security, has freedom and can count on the mechanisms of Justice.

The plan defines six strategic priorities that will allow modernizing the security sector and bringing it in line with the standards that Ukraine must achieve on the way to EU membership, which include::

1. efficiency and effectiveness of law enforcement agencies and the prosecutor's office as an integral component of the security and defense sector, within which they ensure the national security of Ukraine, including public security and order, counteract crime, taking into account strategic goals and in accordance with human rights and fundamental freedoms standards, including gender equality.

2. consistent criminal policy, the priority of which is the Prevention of crime, the inevitability of responsibility, the protection of the individual,

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<sup>8</sup> On the Comprehensive Strategic Plan for reforming law enforcement agencies as part of the security and defense sector of Ukraine for 2023-2027: decree of the president of Ukraine No. 273/2023 (2023, May 11). URL: <https://www.president.gov.ua/documents/2732023-46733>.

<sup>9</sup> Президент України схвалив Комплексний стратегічний план реформування органів правопорядку (12.05.2023). URL: <https://www.gp.gov.ua/ua/posts/prezident-ukrayini-sxvaliv-kompleksnii-strategichniy-plan-reformuvannya-organiv-pravoporyadku>.

society and the state from criminal offenses, ensuring the interests of the victim.

3. efficiency of criminal proceedings in compliance with international standards and the rule of law.

4. a result-oriented management system in accordance with established priorities.

5. comprehensive digital transformation.

6. openness, transparency, accountability and independence.

The plan provides for a comprehensive digital transformation, in particular:

1. implementation of a consolidated step-by-step digital transformation of law enforcement agencies and prosecutor's offices based on strategic management tools that comply with EU Best Practices.

2. further implementation of innovative technological achievements in the activities of law enforcement agencies and the prosecutor's office, providing flexibility of operational processes, IT solutions, digital ability to quickly respond to events and changes and achieve results focused on the interests of society.

3. Step-by-step implementation of an electronic criminal management system through comprehensive replacement and modernization of equipment, ensuring compatibility of IT systems, uninterrupted operation, access of all participants in criminal proceedings and interoperability.

4. improving the efficiency of law enforcement agencies and the prosecutor's office by ensuring greater availability and completeness of Information, developing and implementing services on the unified state web portal of electronic services.

5. implementation of security and protection measures for personal data in accordance with EU standards.

6. improve and implement more secure, flexible, capable and affordable communication systems between all law enforcement agencies and other emergency services (including digital radio: voice communication and broadband data transmission).

7. introduction of a unified personal authentication system and a biometric comparison system in all law enforcement agencies and prosecutor's offices, while gradually ensuring its compatibility with European systems. It is widely used in the implementation of pre-trial investigations, as well as for data processing and analytical activities of law enforcement agencies and the prosecutor's office of artificial intelligence, blockchain, cloud computing and other innovative solutions.

8. updating operational processes using IT systems suitable for data exchange with EU institutions in accordance with EU standards.

9. granting law enforcement agencies and prosecutor's offices, in order to ensure the performance of their functions, the right to direct joint access to

automated information and Reference Systems, registers and databases, the holder (administrator) of which is other state bodies<sup>10</sup>.

## **2. The role of information and analytical systems and video monitoring technologies in the investigation and counteraction to criminal offenses**

Video surveillance is a surveillance process implemented using optoelectronic devices designed for visual monitoring and automatic analysis<sup>11</sup>. Video surveillance systems are widespread and widely used in various spheres of human life. To control the environment for the purpose of life safety, video surveillance systems are now widely used – a set of equipment and software designed to monitor behavior, actions or information in order to collect information, influence, manage and coordinate. Thanks to automation and speed of work, the use of biometrics for face recognition, such technologies are very useful in any field of human activity where it is necessary to check and confirm a person by its biometric characteristics. This can be security, defense, migration processes, banking and monitoring, etc. moreover, it is no longer possible to give an exhaustive list of areas of application of biometric technologies today, since the very idea of verifying and confirming a person's identity is already becoming more and more attractive and associated with security.

Within the framework of the Project "Safe City" Municipal enterprise "Informatika" introduced a new analytical module for video surveillance (Kyiv Smart Safe City)<sup>12</sup>. The unique module allows you to search for criminals not only thanks to specialized face recognition cameras. It captures images from any camera installed within the network and compares them with the existing database of offenders. If the system detects similarities, the operator immediately receives an alarm signal. Therefore, law enforcement officers will be able to track down dangerous criminals faster. The new analytical facial recognition module includes an analytical system and a database consisting of a list of wanted people.

To some extent, conclusions can be drawn about the effectiveness of implementing the Smart Safe City system by analyzing the indicators of street crime in Ukraine. So, in recent years, during the gradual implementation of the project (during 2017-2019), the level of crimes committed on the streets has sharply decreased. For comparison, if in 2013 66,971 criminal offenses

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<sup>10</sup> On the Comprehensive Strategic Plan for reforming law enforcement agencies as part of the security and defense sector of Ukraine for 2023-2027: decree of the president of Ukraine No. 273/2023 (2023, May 11). URL: <https://www.president.gov.ua/documents/2732023-46733>.

<sup>11</sup> Рувінська В.М., Девятков В.В. Відеоспостереження для систем безпеки: моделі, методи та запропоновані рішення. Інформатика та математичні методи в моделюванні. 2021. Том 11, № 4. С. 331-342. URL: [http://immm.op.edu.ua/files/archive/n4\\_v11\\_2021/2021\\_4\(9\).pdf](http://immm.op.edu.ua/files/archive/n4_v11_2021/2021_4(9).pdf)

<sup>12</sup> У рамках проекту «Безпечне місто» запущено новий аналітичний модуль відеоспостереження, що прискорить пошук правопорушників. URL: [https://kyivcity.gov.ua/news/u\\_ramkakh\\_proektu\\_bezpechne\\_misto\\_zapuscheno\\_noviy\\_analitic\\_hnii\\_modul\\_videosposterezheniya\\_scho\\_priskorit\\_poshuk\\_prapovorushnikov/](https://kyivcity.gov.ua/news/u_ramkakh_proektu_bezpechne_misto_zapuscheno_noviy_analitic_hnii_modul_videosposterezheniya_scho_priskorit_poshuk_prapovorushnikov/).

committed on the streets were taken into account, in 2014 – 66,255, in 2015 – 61,718, in 2016 – 62,064, in 2017 the number of such offenses was 45,707 – in 2018-42,465, and in 2019-38,139 criminal offenses<sup>13</sup>.

In Ukraine, the Smart City project is actively used in the following cities: Kyiv, Kharkiv, Lviv, Dnipro, Vinnytsia, Mariupol, Chernihiv, etc. a special type of such project is "Smart Safe City" – a new generation information and analytical program that recognizes potential hazards, analyzes the situation in real time and transmits already processed data on detected threats of a terrorist, criminal, man-made nature in places of mass stay of citizens, at critical infrastructure facilities, transport interchanges, emergency service operators for rapid response to emergencies. Digital technologies using biometric characteristics of a person are successfully used in the activities of migration services in almost all countries of the world. The idea of checking and confirming a person's identity when crossing the state border is already becoming more and more attractive and associated with security.

Biometric passports are becoming increasingly common in the world<sup>14</sup>. According to the world Civil Aviation Organization (ICAO), more than 90 countries out of 193 UN member states are currently issuing such documents, and more than twenty states are ready to implement such documents in the coming years.

About 45 countries that issue biometric documents store both fingerprints and face images on documents at the same time, while more than 30 countries use only a digitized photo of the document owner. Other countries currently use only face images, but they plan to use fingerprinting data in the near future. According to the ICAO, more than 15 countries currently use automated checkpoint systems for electronic passport holders. In order to pass the passport control procedure, the traveler can use the "electronic gate", which automatically checks their biometric data with the information stored on the document chip. Among the countries that read (scan) e-passports at airports and borders are the United States, Great Britain, Singapore, Portugal, New Zealand, Japan, Indonesia and Germany.

The initiator of the introduction of biometric passports at the state level was the United States: in 2002, the US Congress passed the law on the security of state borders, according to which citizens of countries that had agreements with the United States on visa-free travel could freely enter the United States for up to 90 days only if they had biometric documents<sup>15</sup>.

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<sup>13</sup> Зменшення можливостей вчинення злочинів: стратегічний підхід: монографія / за заг. ред. В. В. Голіни. – Харків: Право, 2020. – С.191. URL: [https://ivpz.kh.ua/wp-content/uploads/2021/09//моно\\_Стратегія-зменшення-можливостей.pdf](https://ivpz.kh.ua/wp-content/uploads/2021/09//моно_Стратегія-зменшення-можливостей.pdf).

<sup>14</sup> Держприкордонслужба презентувала систему фіксації біометричних даних іноземців та осіб без громадянства. URL: <https://dpsu.gov.ua/ua/news/Derzhprikordonsluzhba-prezentovala-sistemu-fiksacii-biometrichnih-danih-inozemciv-ta-osib-bez-gromadyanstva/>.

<sup>15</sup> Homeland Security Act of 2002. URL: <https://www.govinfo.gov/link/plaw/107/public/296?link-type=html>



Since 2004, the US-Visit program has been launched in the United States, which provided for the introduction of a fingerprint system and photographing all foreigners arriving in America (115 airports, 14 seaports, 104 checkpoints, a biometric database for more than 5 million people). More than 80 countries around the world (including Afghanistan, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) use electronic ID-card programs that contain biometric data<sup>16</sup>.

Currently, the world's largest biometric identification system is Aadhaar (India). Aadhaar is an Indian online identification service provided by the UIDAI state agency. As of the end of early 2024, more than 1.3 billion people were registered in the system, which is more than 94% of Indian citizens<sup>17</sup>.

In connection with the war in Ukraine, a number of European countries, including the United Kingdom, have introduced a simplified visa regime for Ukrainians who have a biometric passport<sup>18</sup>.

On 20.11.2012, Ukraine adopted the law "on the Unified State Demographic Register and documents confirming Ukrainian citizenship, identity or its special status" No. 5492-VI, which provides for the introduction of documents with an electronic carrier that provides for the placement of biometric data about a person<sup>19</sup>. In 2017, the Government of Ukraine approved the regulation on the national system of biometric verification and identification of Ukrainian citizens, foreigners and stateless persons<sup>20</sup>. The document defines that this is an automated system created in the interests of national security, economic well-being and Human Rights, which ensures the identification of a foreigner and a stateless person entering and leaving Ukraine, monitoring their compliance with the rules of stay on the territory of our state.

In December 2017, the state border service presented a system for recording biometric data of foreigners and stateless persons<sup>21</sup>. This system of recording biometric data of foreigners and stateless persons is deployed by the border agency in compliance with the decree of the president of Ukraine of

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<sup>16</sup> United States Visitor and Immigrant Status Indicator Technology (US-VISIT). URL: <https://www.epic.org/privacy/us-visit/>

<sup>17</sup> Unique Identification Authority Of India. URL: <https://uidai.gov.in> (дата доступу 30.11.23).

<sup>18</sup> Biometric Residence Permit – Ukrainian Refugee Help. URL: <https://ukrainianrefugeehelp.co.uk/biometric-residence-permit/>

<sup>19</sup> Law of Ukraine No. 5492-VI "About a single state demographic register and documents certifying a person or his special status". (2012, November 20) / Verkhovna Rada of Ukraine. URL: <https://zakon.rada.gov.ua/go/5492-17>. Retrieved from: <https://zakon.rada.gov.ua/go/5492-17>.

<sup>20</sup> Resolution of the Cabinet of Ministers of Ukraine No. 1073 "Regulations on the national system of biometric verification and identification of citizens of Ukraine, foreigners and stateless persons". (2017, December 27). Retrieved from: <https://zakon.rada.gov.ua/laws/show/1073-2017-п#Text>.

<sup>21</sup> Держприкордонслужба презентувала систему фіксації біометричних даних іноземців та осіб без громадянства. URL: <https://dpsu.gov.ua/ua/news/Derzhprikordonsluzhba-prezentuvala-sistemu-fiksacii-biometrichnih-danih-inozemciv-ta-osib-bez-gromadyanstva/>.

August 30, 2017 No. 256 "on the decision of the National Security and Defense Council of Ukraine of July 10, 2017 "on strengthening control over the entry into Ukraine, departure from Ukraine of foreigners and stateless persons, their compliance with the rules of stay on the territory of Ukraine". It is one of the subsystems of the departmental automated border control system. The state border service is actively working to improve the security component on the borders of Ukraine. Today, the technical means of the State Border Service allow reading foreign passports manufactured according to ICAO International standards, including those with a built-in chip, ID cards and driver's licenses. At the same time, the experience of advanced countries of the world, European and American partners in building Passport Control Automation Systems is constantly being studied. The best samples of equipment are implemented in the departmental information and telecommunications system. 157 existing checkpoints are equipped with means for reading information from biometric documents, and 126 checkpoints are connected to Interpol databases. Since August 2017, the information system of the border agency automatically calculates the number of allowed days of stay of foreigners in Ukraine.

The launch of the biometric data recording system of the State Border Service is another step towards improving the security component when crossing the border and improving the border control system. During passport control, state Border Service inspectors will check the passport documents of foreigners, including through Interpol databases. Information (fingerprints) will also be read using readers, which will be sent to the Department's biometric data processing subsystem. In addition, through the interdepartmental information and telecommunications system "Arkan", it will be sent to the National system of biometric verification and identification of Ukrainian citizens, foreigners and stateless persons of the State Migration Service. When a person crosses the border again, the identity identification process will be carried out. At the same time, the inspector will see whether the person has submitted their biometric data and will check them. If the data does not match, the person will be sent for additional monitoring to clarify the circumstances.

The issue of illegal migration for any country in the world is a state-level problem. So, from November 18, 2023, the Finnish government decided to close part of the eastern border of the country – the border checkpoints Waalimaa, Nuyamaa, Imatra and Niirala. The Finnish Border Guard Service reported a steady increase in the number of asylum seekers arriving at border crossing points in the south-east of the country in recent days<sup>22</sup>.

Therefore, the use of biometric technologies is effective, in particular for monitoring the movement of persons across the state border. In leading European countries, video surveillance systems using biometric

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<sup>22</sup> Фінляндія закриває частину пунктів пропуску на кордоні з РФ через вплив біженців (16.11.2023). URL: [https://lb.ua/society/2023/11/16/584592\\_finlyandiya\\_zakriie\\_chastinu\\_punktiv.html](https://lb.ua/society/2023/11/16/584592_finlyandiya_zakriie_chastinu_punktiv.html)

characteristics of a person are also used. There is a tendency to integrate stationary video surveillance systems with portable ones. In particular, in the UK, British Police Minister Chris Philp proposed in 2023 that police forces across England and Wales implement facial recognition technology, and this is likely to push for the integration of this technology with portable police video cameras worn on the body<sup>23</sup>.

### **3. International information cooperation in the field of Criminalistics and forensic expertise in the field of Investigation and counteraction to war crimes**

Thanks to joint efforts, the president, the Cabinet of Ministers and the Verkhovna Rada of Ukraine managed to use legitimate international legal mechanisms, primarily the International Criminal Court and the UN Security Council, to bring those responsible to justice for violating international humanitarian law and committing war crimes in Ukraine. At the same time, in the territories of Ukraine liberated from occupation (Bucha, Gostomel, Irpen, etc.), it is already possible to implement a special mechanism of Justice, which consists in the joint work of national and international specialists: experts, investigators, prosecutors and judges to collect objective and impartial evidence of gross violation of international laws and customs of warfare in Ukraine.

There are various forms of international cooperation in the field of Forensic Science. In particular, the main ones include: 1) information exchange (scientific and information exchange); 2) joint scientific and practical events (conferences, symposia, congresses, etc.); 3) training of expert personnel and professional development abroad; 4) interaction within the framework of improving the quality of forensic examinations in different countries; 5) international standardization of forensic medical activities; 6) interaction within the framework of international expert associations (organizations); 7) involvement of forensic experts from different countries in the investigation and trial of international crimes<sup>24</sup>.

A form of international cooperation in the field of forensic expertise is the participation of forensic experts from different states in the investigation and judicial review of crimes in the field of humanitarian law and other crimes of an international nature<sup>25</sup>. Thus, the Netherlands Institute of Forensic Science (NFI) is one of the world's leading forensic laboratories<sup>26</sup>. This is the National

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<sup>23</sup> Home Office pushes for more police facial-recognition deployments. (17 May 2023). URL: <https://www.computerweekly.com/news/366537695/Home-Office-pushes-for-more-police-facial-recognition-deployments>

<sup>24</sup> Shepitko, V.Y., Shepitko, M.V. (2021) The role of forensic science and forensic examination in international cooperation in the investigation of crimes. *Journal of the National Academy of Legal Sciences of Ukraine*, no. 28(1), pp. 179–186 (in English).

<sup>25</sup> Shepitko, V.Y., Shepitko, M.V. (2021) The role of forensic science and forensic examination in international cooperation in the investigation of crimes. *Journal of the National Academy of Legal Sciences of Ukraine*, no. 28(1), pp. 179–186 (in English).

<sup>26</sup> Netherlands Forensic Institute (NFI). URL: <https://www.forensicinstitute.nl/>

Institute of forensic expertise of the Netherlands, located in the Hague. It is an autonomous division of the Ministry of security and Justice of the Netherlands, which reports to the Directorate-General for the administration of justice and law and order. The range of expert activities includes more than 30 forensic expert areas, including forensic medical research (including DNA examinations). The Dutch DNA database is maintained. NFI has three main areas of activity: conducting forensic examinations in criminal proceedings; developing new methods of forensic examination; training of experts and their professional development. NFI experts participated in the work of the Joint Investigation Team (JIT) consisting of representatives of Ukraine, the Netherlands, Malaysia, Australia and Belgium during the investigation of the circumstances of the crash of the Malaysian Airlines Boeing-777 flight MH17 on July 17, 2014<sup>27</sup>.

A form of international cooperation in the field of forensic expertise is the participation of forensic experts from different states in the investigation and judicial review of crimes in the field of humanitarian law and other crimes of an international nature<sup>28</sup>. The Verkhovna Rada of Ukraine and the European Parliament ratified the association agreement between Ukraine and the EU on September 16, 2014.

The rules of Procedure and Evidence of the International Criminal Court contain rules, in particular articles 42, 43, 56, 93, which provide for the possibility of involving experts in the activities of the International Criminal Court<sup>29</sup>. 38 countries of the world have already applied to the International Court of Justice in The Hague because of Russia's crimes against Ukraine<sup>30</sup>. The International Criminal Court will conduct an independent investigation of war crimes in Ukraine, seeking to establish the truth. The rules of Procedure and Evidence of the International Criminal Court also provide for the use of specialized knowledge. Thus, Rule 19 "Expertise in the unit" regulates the possibility of applying for an expert examination in various cases<sup>31</sup>.

The European network of forensic institutes (ENFSI) was founded in 1995 to improve the mutual exchange of information in the field of Forensic Science. This, as well as improving the quality of Forensic Services in Europe, have become the main problems of the network. In addition to general work

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<sup>27</sup> Останні дані кримінального розслідування катастрофи авіалайнера Boeing-777 рейса MH17 (24.05.2018) <https://www.prosecutionservice.nl/latest/news/2018/05/24/последние-данные-уголовного-расследования-катастрофы-авиалайнера-boeing-777-рейса-mh17>

<sup>28</sup> Shepitko Valery Yu., Shepitko Mykhaylo V. (2021) The role of forensic science and forensic examination in international cooperation in the investigation of crimes

// Journal of the National Academy of Legal Sciences of Ukraine, Vol. 28, No. 1, 2021. p. 179-186. (in English).

<sup>29</sup> Rome Statute of the International Criminal Court. URL: <https://www.icc-cpi.int/sites/default/files/RS-Eng.pdf>

<sup>30</sup> United Kingdom government official. (2022) URL: <https://twitter.com/BorisJohnson/status/1499123882296582149>

<sup>31</sup> The Rules of Procedure and Evidence of the International Criminal Court. URL: [https://www.icc-cpi.int/sites/default/files/NR/rdonlyres/F1E0AC1C-A3F3-4A3C-B9A7-B3E8B115E886/140164/Rules\\_of\\_procedure\\_and\\_Evidence\\_English.pdf](https://www.icc-cpi.int/sites/default/files/NR/rdonlyres/F1E0AC1C-A3F3-4A3C-B9A7-B3E8B115E886/140164/Rules_of_procedure_and_Evidence_English.pdf)

in the field of quality management and competencies, research and development, education and training, 17 different expert working groups are engaged in various forensic examinations<sup>32</sup>. ENFSI is the world's largest United Organization of forensic institutions, which has received international recognition. Among the countries whose institutions are part of the European network: Armenia, Austria, Azerbaijan, Belgium, Bulgaria, Great Britain, Hungary, Greece, Georgia, Denmark, Spain, Ireland, Italy, Lithuania, Latvia, Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Turkey, Sweden, Switzerland. The most well-known ENFSI institutions that conduct expert research are the Dutch, Polish, Prague and Hungarian forensic institutes.

There are also specialized international forensic expert organizations. Thus, in relation to the Forensic Research of firearms, two major international organizations can be distinguished, the Association of ballist experts is the Association of experts in the field of Forensic Research of firearms and tool traces (AFTE – Association of experts on firearms and tools) and the working group devoted to the research of firearms and shot products in the European network of forensic institutes the European network of forensic institutes (ENFSI Firearm/GSR working group)<sup>33</sup>.

AFTER is the largest international professional organization of United ballist experts. It has almost 1,300 members from 40 countries around the world. The association holds an annual six-day training seminar, one of which, held in August 2021, had more than 450 participants. The association publishes a specialized scientific and practical Journal (indexed by the SCOPUS system).

The working group of experts in the field of research on firearms and firing products at ENFSI brings together specialists from Europe and is open to specialists from other regions of the world. As part of the work of the Working Group, research projects are carried out and an annual conference is held. The conference, which was held in a virtual format in October 2021, was attended by more than 180 specialists.

The Kyiv Scientific Research Institute of forensic examinations of the Ministry of Justice of Ukraine (hereinafter KNIISE) is in international relations with scientific institutions, educational institutions of foreign countries, international and non-governmental organizations in accordance with Article 24 of the law of Ukraine "on forensic expertise", holding joint conferences, symposia, seminars and exchanging specialists within the framework of international projects and programs and outside the relevant programs. In 2017, KNIISE became a member of the European Network of Forensic Science Institutes (ENFSI). It should be noted that the National Research Center "Institute of forensic examinations named after Professor M.

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<sup>32</sup> European Network of Forensic Science Institutes. URL: <https://enfsi.eu/>.

<sup>33</sup> Pavel Giverts Обзор тем обсуждаемых международной ассоциацией экспертов баллистов (AFTE) (2021).

S. Bokarius "(Kharkiv) became a member of the European network of forensic expert institutions in 2018<sup>34</sup>.

In 2019, KNIISE became the first institution among the expert research institutions of forensic examinations of the Ministry of Justice of Ukraine, which accepts a part in the exchange program CEPOL-the European Union Agency for law Enforcement training (Cepol – European Union Agency for law Enforcement Training)<sup>35</sup>. CEPOL provides an opportunity to become participants in the exchange program for forensic experts and specialists of KNIISE who have become active participants in the exchange and training program on the Leed CEPOL educational platform. CEPOL promotes cooperation and knowledge sharing among EU law enforcement officials (including third countries), and now forensic institutions, on issues arising from EU security priorities, in particular in terms of EU policy on Combating Organized Crime. In countries that cooperate with CEPOL, there are National CEPOL divisions (National contact points). The involvement of the TAIEX (Technical Assistance Information Exchange) tool is also a priority in KNIISE's international activities. This is a type of external assistance provided by the European Commission to exchange information in order to build the institutional capacity necessary to adapt national legislation to the *acquis communautaire*. Within the framework of the TAIEX tool, KNIISE experts conduct study visits that provide an opportunity to study the experience of an EU member state, organize and conduct seminars and working meetings with relevant partners of EU member states in the field of forensic expertise.

The expert service of the Ministry of internal affairs of Ukraine is a system of State specialized institutions of forensic expertise. The expert service of the Ministry of internal affairs is the largest network of forensic institutions in Ukraine and has 24 administrative and laboratory complexes. In nine regional centers, full-profile administrative laboratory complexes of forensic expertise were created and provided with modern equipment (state research and development center of the Ministry of internal affairs, Kiev, Kharkiv, Vinnytsia, Volyn, Zaporizhia, Ivano-Frankivsk, Lviv, and Mykolaiv). "The expert service of the Ministry of internal affairs of Ukraine performs 79 types of expert research and has a significant number of trained specialists in 79 expert specialties<sup>36</sup>.

When conducting forensic examinations, digital biometric identification technologies are used to identify the persons involved. A striking example of the use of biometric technology in the activity of a forensic expert is genotyposcopic examination (DNA analysis), which covers the study of micro traces at the cellular level. This method is used for conducting forensic examinations, for example, to identify the dead. In particular, in Kharkiv, DNA studies have been conducted since 2014 in the laboratory of forensic

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<sup>34</sup> Делегация ХНДІСЕ на щорічній зустрічі ENFSI у місті Будапешт (2018). URL: <https://www.hniise.gov.ua/14143-delegatsya-xndse-na-shchorochni-zustrch-enfsi-u-mst-budapesht.html>

<sup>35</sup> КНДІСЕ: Міжнародна діяльність. URL: <https://kndise.gov.ua/mizhnarodna-diyalnist/>

<sup>36</sup> Про Експертну службу МВС. URL: <https://dndekc.mvs.gov.ua/про-експертну-службу-мвс/>.

biological research of the Kharkiv research and development center of the Ministry of internal affairs of Ukraine. The National Research Center "Institute of forensic examinations named after Professor M. S. Bokarius" (Kharkiv) received a mobile DNA laboratory for rapid DNA analysis. The samples were examined in September 2023, after receiving a mobile laboratory from the French government. Forensic molecular genetic expertise solves the problem of identifying a person by DNA analysis, including identifying victims of disasters, military operations, when close relatives are alive<sup>37</sup>.

An essential feature is the close integration of forensic records and biometric information systems. Thus, the creation and expansion of centralized national databases is an important aspect of the use of Forensic Genetics in the criminal justice system. Such databases contain genetic profiles that are established and stored in accordance with the criteria defined in the legislation of each country using forensic records of human genetic traits with automated information and search systems<sup>38</sup>. Automated forensic records are designed to accumulate and store data obtained in the course of research, for the purpose of further verification by comparing them with those data that are already stored in the database. Automated accounting of human genetic traits operates at the central and regional levels. The creation of forensic records of human genetic characteristics contributed to the genetic analysis of biological samples obtained at the crime scene, which greatly simplified the work of investigators. They received tools that allow them to identify the criminal or his victim, extract irrefutable evidence and solve crimes.

## CONCLUSIONS

The use of information and analytical systems and video monitoring technologies by law enforcement agencies of Ukraine is a necessary condition for ensuring the effectiveness of Investigation and Prevention of criminal offenses, ensuring national security, overcoming the consequences of war and post-war reconstruction of the country.

The conducted research allows us to determine the main directions of using information and analytical systems and video monitoring technologies:

- ensuring national and state security;
- ensuring an appropriate state of Public Safety and order;
- elimination of threats to the life and health of individuals in public places; prevention of accidents, road accidents, catastrophes, fires, emergencies, dangerous events, natural disasters;

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<sup>37</sup> Види судових експертиз, які проводяться у лабораторії біологічних досліджень та питання які вони вирішують: Інформаційний лист. ДНДЕКЦ МВС України, Київський НДЕКЦ МВС України, 2017. URL: [https://ndekc.kiev.ua/wp-content/uploads/2017/02/Инф.лист\\_ДНК-2017.pdf](https://ndekc.kiev.ua/wp-content/uploads/2017/02/Инф.лист_ДНК-2017.pdf)

<sup>38</sup> Ірина Спринцева Актуальні питання криміналістичних обліків генетичних ознак людини. *Молодий вчений*. № 9 (85) (2020). URL: <https://molodyvchenyi.ua/index.php/journal/article/view/703/679>.

- detection of criminal and other offenses and their termination;
- implementation of preventive and preventive activities aimed at preventing the commission of offenses;
- identification and search of persons who are hiding from the bodies of pre-trial investigation, investigating judge, court, evade serving a sentence in the form of restriction of freedom and in the form of imprisonment, missing persons, missing persons under special circumstances, and other persons in cases defined by law;
- implementation of situational analysis systems to ensure the safety of the state's population or certain administrative divisions;
- ensuring transport safety, including traffic regulation and monitoring compliance with traffic rules by its participants and the legality of operating vehicles on the road network;
- protection of high-risk objects, critical infrastructure objects; implementation of border control and passage of persons, vehicles, cargo across the state border of Ukraine and to and from the temporarily occupied territory in accordance with the established procedure, as well as detection and suppression of cases of illegal movement of them;
- Environmental Protection;
- ensuring the safety of children, students, and students in preschool, general education, extracurricular, and vocational educational institutions;
- taking measures to provide emergency care to people who find themselves in a situation that is dangerous to their life or health;
- ensuring the safety of property and other objects regardless of the form of ownership;
- in automated forensic records of the expert service of the Ministry of internal affairs;
- in forensic expertise, in particular during international information interaction in the field of expert information, databases, forensic evidence, when conducting certain types of high-tech expert research.

The use of digital technologies and systems will expand the possibilities of timely notification of law enforcement officers about offenses, search and identification of criminals, and optimize the process of investigating criminal offenses.

## **ABSTRACT**

The article is devoted to the study of the possibilities of using information and analytical systems and video monitoring technologies in the activities of law enforcement agencies of Ukraine. The article considers the experience of leading European countries regarding the use of such technologies in activities both in the course of prevention activities and during pre-trial investigation of criminal offenses. First of all, thanks to these technologies, the possibilities of timely notification of law enforcement officers about offenses, search and identification of criminals, performing important tasks of ensuring national and state security, ensuring the proper state of Public Security and order are expanded. Based on the analysis of axiological aspects of the introduction of



information technologies and security systems in law enforcement activities in the leading countries of the world, examples of implementation, results of specialized scientific research in this area, it is concluded that the use of digital technologies and video monitoring systems will expand the possibilities of timely notification of law enforcement officers about offenses, search and identification of criminals, optimize the process of investigating criminal offenses. The introduction of video monitoring systems and technologies is an important step towards our country's integration into the European Space.

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