THE ROLE OF CRIMINAL ANALYSIS IN STATE BORDER PROTECTION: APPLICATIONS IN UKRAINE

O papel da análise criminal na proteção das fronteiras estatais: aplicações na Ucrânia

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ABSTRACT

Protecting state borders is critical for ensuring any country's territorial integrity and security. Given Ukraine's geopolitical location and current situation, border protection has gained particular significance. In this context, criminal analysis is a key tool for identifying and preventing crimes related to illegal border crossings. Examining the history and current application of criminal analysis for border protection reveals a continuous evolution of this practice in response to technological advancements. From the early stages of information systematization, criminal analysis has adapted to integrating advanced tools and software, significantly expanding its capabilities in ensuring border security. Today, criminal analysis is actively employed in investigating crimes associated with illegal border crossings and studying trends and patterns. It involves predicting potential threats and developing preventive measures to prevent and combat violations. The practical application of criminal analysis enhances the security of Ukraine's state borders and strengthens national stability.

Keywords: Ukraine; criminal analysis; state border protection; crimes; illegal border crossing.

RESUMO

A proteção das fronteiras estatais é uma tarefa criticamente importante para garantir a integridade territorial e a segurança de qualquer país. Na Ucrânia, considerando sua localização geopolítica e a situação atual, a proteção das fronteiras adquiriu uma importância particular. Nesse contexto, a análise criminal atua como uma ferramenta chave para identificar e prevenir crimes relacionados ao cruzamento ilegal de fronteiras. A análise da história e da aplicação atual da análise criminal para a proteção das fronteiras estatais revela uma evolução contínua dessa prática em resposta aos avanços tecnológicos. Desde os primeiros estágios de sistematização das informações, a análise criminal adaptou-se à integração de ferramentas e softwares avançados, expandindo significativamente suas capacidades para garantir a segurança das fronteiras. Atualmente, a análise criminal é empregada ativamente na investigação de crimes associados ao cruzamento ilegal de fronteiras e no estudo de tendências e padrões nessa área. Ela inclui a previsão de ameaças potenciais e o desenvolvimento de medidas preventivas voltadas para a prevenção e combate a violações. A aplicação eficaz da análise criminal contribui para o aumento da segurança das fronteiras da Ucrânia e para o fortalecimento da estabilidade nacional.

Palavras-chave: Ucrânia; análise criminal; proteção da fronteira estatal; crimes; passagem ilegal de fronteira.

1. INTRODUCTION

Border Protection (SB)[1] is one of the most critical aspects of national security, ensuring territorial integrity and safeguarding the country's sovereignty. In the context of the modern geopolitical situation, both Ukraine and most countries around the world face a range of complex challenges in law enforcement, including crimes related to illegal border crossings[2][3], which pose threats to state and national security. These challenges require developing systematic approaches and practical strategies to address them.

The research problem lies in the necessity of improving approaches to state border protection by integrating modern technologies and methods of criminal analysis. Illegal border crossings, organized crime, and global security challenges require the effective utilization of available data, retrospective studies, and innovative algorithms for threat prediction. The lack of a unified system for information integration between agencies, issues with data quality, and insufficient use of artificial intelligence and machine learning capabilities limit the potential of criminal analysis. This creates an urgent need to develop unified approaches for monitoring, analyzing, and preventing criminal activities, especially in modern geopolitical challenges (QUICKSET, 2024).

These issues have become particularly relevant with the onset of the aggressor's war against Ukraine when ensuring border security has become critically important for maintaining stability at international borders. In this context, informational and analytical activities, particularly criminal analysis, serve as crucial tools for monitoring the situation at the border and forecasting potential threats. The importance of criminal analysis lies in its ability to systematically study and predict crimes related to illegal border crossings, which allows for more effective detection and investigation of such crimes and facilitates the development of strategic measures for their prevention (KIREIEVA et al., 2022).

The historical development of criminal analysis, starting from the 19th century, is discussed in the first chapter of the study. During this period, key methods emerged, such as creating criminal

[1]According to Article 1 of the Law of Ukraine "On the State Border of Ukraine": The state border of Ukraine is the line and vertical plane passing through this line that defines the boundaries of Ukraine's territory, including land, water, subsoil, and airspace.
[2]According to Article 201 of the Criminal Code of Ukraine, smuggling involves the movement across the customs border of Ukraine of cultural values, toxic, potent, explosive, or radioactive substances, weapons or ammunition (excluding shotguns and their ammunition), parts of firearms, or special technical means for secretly obtaining information, either outside customs control or by concealing from customs control.
[3]According to Article 332 of the Criminal Code of Ukraine: Illegal movement of persons across the state border of Ukraine, organization of illegal transportation of persons across the state border of Ukraine, management of such actions or assistance in their commission by advice, instructions, provision of means or elimination of obstacles.

maps and classifying offenders. These innovations became the foundation for developing modern analytical approaches in law enforcement.

The second chapter is dedicated to the technological breakthroughs of the 20th century, which transformed criminal analysis. Attention is focused on the implementation of centralized criminal registries, the creation of analytical units, and the use of geo-analysis methods. These achievements significantly increased the accuracy of crime prediction and improved crime prevention strategies.

The third chapter analyzes the role of modern technologies in the development of criminal analysis in the 21st century. It discusses the implementation of artificial intelligence, big data, machine learning, and natural language processing. These tools enable more comprehensive data analysis and the development of effective strategies for protecting state borders.

Scientific research in criminal analysis demonstrates significant progress in developing data collection, processing, and analysis methods. One of the key topics is enhancing the effectiveness of utilizing various information sources, such as open government data and operational data obtained through technical means. Researchers are also exploring issues related to data quality assurance and its integration into a unified analytical system. An important direction is the development of algorithms for analyzing criminal activity, including clustering methods and neural networks, which contribute to uncovering hidden trends and methods of committing crimes (WALCZAK, 2021).

Retrospective data analysis is an essential source for studying the evolution of criminal analysis, aimed at identifying long-term trends in crime at the border. Examining historical documents, reports, and statistical data helps to form a historical perspective on the development of criminal analysis methods and refine contemporary approaches to its application (GOTTLIEB et al., 1992). A holistic approach was employed to achieve this objective, incorporating a thorough literature review, content analysis of selected sources, and retrospective and comparative methods. The study identifies significant trends and challenges in criminal analysis and offers recommendations for future scientific inquiry and practical actions to improve border security in Ukraine.

Moreover, this study employs a comprehensive approach to analyze the history and current state of criminal analysis in the context of state border protection. The foundation of the research was a systematic review of scientific publications, historical documents, and official reports (TELEP et al., 2023). This enabled the identification of key trends, achievements, and challenges related to the application of criminal analysis, integrating knowledge from disciplines such as criminology, law enforcement, and information technology. Content analysis of documents, including legislative acts, procedural guidelines, and case studies, evaluated the practical application of criminal analysis. This method allowed for identifying standard practices, determining weaknesses in using

analytical tools, and exploring opportunities to improve their integration at various levels (KHAN et al., 2023).

Thus, this study aims to systematize existing knowledge, identify interconnections between various aspects of criminal analysis application, and develop recommendations for further improvement. The synthesis of the obtained results has enabled a comprehensive understanding of the role of criminal analysis in ensuring state border security, creating the prerequisites for its effective utilization in the face of modern challenges.

2. EMERGENCE AND DEVELOPMENT OF CRIMINAL ANALYSIS: HISTORICAL PERIODS

Criminal analysis plays a pivotal role in border protection, serving as a tool for identifying, analyzing, and predicting crimes related to illegal border crossings. Its evolution has been intricately connected with legal, organizational, and technological changes that have influenced the methodologies and characteristics of this tool (RAMESH, 2021). This section delineates three fundamental periods and distinct stages in the development of criminal analysis: its inception, the emergence of contemporary criminal analysis, and the adoption of advanced approaches.

2.1. THE FIRST PERIOD – 19TH CENTURY: THE EMERGENCE OF CRIMINAL ANALYSIS

The origins of criminal analysis can be traced back to the 19th century when analytical methods began to be employed to study crime. This period was marked by significant social and economic changes, including industrialization and urbanization, which increased crime rates. In response to these changes, police and other law enforcement agencies sought new approaches to understanding and combating crime.

One of the early examples of using analytical methods in criminology was a study conducted in 1829 by Italian geographer Adriano Balbi and French sociologist André Michel Guerry. They created the first criminological maps illustrating the correlation between education levels and crime rates in France. Their research laid the foundation for future geographic profiling, which would later become an essential tool in criminal analysis (HUNT, 2019). Balbi and Guerry's maps depicted the distribution of crime and helped identify social and economic factors contributing to its occurrence. This approach marked a significant step in understanding the relationship between social conditions and crime.

During the same period, the police in the United Kingdom of Great Britain and Northern Ireland (UK) also began implementing new analytical methods. London detectives initiated the classification of criminals and crimes, which became a critical stage in developing the criminal justice system. The UK police developed a classification system based on the types of crimes committed and the offenders' criminal histories. This enabled the police to organize investigations better and utilize accumulated information for crime prevention.

In addition to classification, statistical crime analysis methods were developed in the UK during this time. These methods allowed for identifying trends and patterns in criminal activity, which, in turn, helped allocate police resources more effectively and develop preventive measures. This period also introduced the first formalized approaches to collecting data on criminals, such as creating registries and records of criminal cases (KEAY & KIRBY, 2018).

A significant influence on the development of criminal analysis in the 19th century came from the growing interest in social sciences. Criminology began to take shape during this period, notably through the work of thinkers such as Cesare Lombroso, who developed theories about the relationship between physiological features and criminal behavior (FERRACUTI, 1996). Although these theories were later debunked, they highlighted the need for a scientific approach to studying crime.

Thus, the period of the emergence of criminal analysis in the 19th century laid the groundwork for the further development of the discipline. Analytical methods, such as crime mapping, offender classification, and statistical analysis, marked an essential step in the formation of modern criminology and policing practices. These early developments prepared the foundation for more comprehensive and systematic approaches to criminal analysis that emerged in the 20th century.

2.2. THE SECOND PERIOD – 20TH CENTURY: THE EMERGENCE OF MODERN CRIMINAL ANALYSIS

The development of criminal analysis in the 20th century is marked by significant innovations and structural changes that have profoundly impacted the effectiveness of law enforcement agencies. This period can be divided into several key stages, each contributing to the formation of modern criminal analysis methods.

2.2.1. THE CONTRIBUTION OF A. VOLLMER TO THE DEVELOPMENT OF CRIMINAL ANALYSIS

August Vollmer is regarded as the founder of the modern system of police organization and criminal analysis (WILSON, 1953). As the Chief of Police in Berkeley, United States of America (US), Vollmer introduced a series of innovations that became foundational for developing criminal analysis as a scientific discipline. Notably, he established centralized criminal registries that allowed for the storage and analysis of crime and offender data at a national level. Another significant innovation was the implementation of cartographic methods, which were used to identify areas of criminal group concentrations, greatly facilitating police operations (CARTE, 1972).

Building on the development of criminal analysis, Vollmer contributed to the creation of academic programs in criminology and police sciences, laying the groundwork for the professional training of individuals in the field. One of his significant achievements was establishing a police training school, where criminal law, sociology, and psychology courses were first introduced. This curriculum enabled law enforcement officers to understand criminals' motivations and behaviors better. Vollmer was also a strong advocate for using polygraphs and other scientific methods in criminal investigations, a pioneering approach at the time. His emphasis on the necessity of studying forensic medicine and other scientific disciplines contributed to the professionalization of law enforcement, transforming it into a proper scientific discipline. Thanks to his efforts, police forces began to collaborate with universities and research institutions actively, allowing for the implementation of cutting-edge crime-fighting methods based on scientific research (OLIVER, 2017).

August Vollmer laid the foundation for modern criminal analysis by introducing centralized criminal registries, cartographic methods, and academic programs for law enforcement training. His innovations and scientific approach contributed to the professionalization of policing and the implementation of advanced crime-fighting methods.

2.2.2. THE DEVELOPMENT OF ANALYTICAL UNITS IN THE 1960S-1970S

A key stage in the development of criminal analysis occurred during the 1960s and 1970s when intelligence units with analytical teams were established in central police departments in the US (STEVENSON, 2013). This development was in response to the rapid rise in crime rates and the enactment of crime control laws, which required a more systematic and scientific investigation approach.

These units specialized in collecting and analyzing information on crimes and their participants, enabling a better understanding of criminal patterns and more informed decision-making during

investigations. This approach significantly enhanced police effectiveness and laid the foundation for the further development of criminal analysis.

At the same time, criminal analysis became an indispensable tool in the arsenal of special services, allowing them to counter complex national security threats effectively (TYSHCHUK, 2024). Through detailed analysis of operational data on criminal activities, special services began to identify patterns, trends, and networks of criminal groups involved in espionage or terrorist activities. For instance, in the United States, agencies such as the Bureau of Intelligence and the Internal Security Section were among the first to adapt criminal analysis to their tasks. Over time, one of these agencies, the Bureau of Intelligence, even adopted a name reflecting its focus: the Crime Analysis Service.

2.2.3. PROFESSIONALIZATION OF CRIMINAL ANALYSIS

At the end of the 1970s, the Comprehensive Criminal Prevention Program of the International Association of Criminal Analysts (IACA, 2024) was established. This program became the foundation for the professionalization of criminal analysis, allowing for the standardization of working methods and the enhancement of analyst training. Additionally, it facilitated the development of international cooperation in this field, marking a significant step in the globalization of efforts to combat crime (IACA, 2024)[4].

In the mid-1990s, advancements were made in cartographic methods for crime representation, enabling analysts to obtain three-dimensional depictions of events. This led to revolutionary changes in police operations, including creating comprehensive analytical systems for addressing various types of crime.

The development of IACA allowed for the determination of strategies and key areas of focus for criminal analysts worldwide. As a result, criminal analysis emerged as a distinct professional field, becoming an integral part of police work in most developed countries. For instance, the

[4]The Law Enforcement Analyst – Foundational certification program is based on a collection of core competencies that analysts are expected to possess. The study guide describes each one in detail.
A certification program provides the foundation on which a profession demarcates the knowledge, skills and abilities necessary for successfully meeting the job duties and responsibilities within its given field. Crime analysis, intelligence analysis, investigative analysis, geographic profiling, police research and planning units and personnel all share a common skill set.

General Secretariat of INTERPOL established a criminal analysis unit (INTERPOL, 2024)[5], and Europol bases its operations on the Integrated Data Management Concept (EUROPOL, 2024)[6].

2.3. THE THIRD PERIOD – 21ST CENTURY: IMPLEMENTATION OF ADVANCED APPROACHES IN CRIMINAL ANALYSIS

At the beginning of the 21st century, criminal analysis underwent significant changes due to the adoption of cutting-edge technologies and approaches, marking a new era in law enforcement. One of the most important innovations of this period was implementing an intelligence-led approach known as Intelligence-Led Policing (ILP). This concept, which first emerged in the UK in the 1990s, became a key tool in the fight against organized crime (OSCE, 2017, p. 6):

> Intelligence-led policing (ILP) is a modern approach to law enforcement. First introduced in the United Kingdom in the 1990s, ILP has primarily been used to counter serious and organized crime. Promising results in recent years have prompted law enforcement authorities to expand the intelligence-led proactive methodology to all areas of police management as a comprehensive business model. ILP focuses on systematically gathering and evaluating data and information through a defined analysis process, turning it into strategic and operational analysis products, which serve as the basis for improved, informed, and evidence-based decision-making.

Intelligence-Led Policing (ILP) is based on systematically collecting, analyzing, and utilizing intelligence information to make strategic and operational decisions. The primary advantage of this approach lies in its ability to respond to crimes after they occur and anticipate and prevent them through in-depth data analysis. While "intelligence" is traditionally associated with exceptional services, in the context of ILP, it encompasses a much broader spectrum—from acquiring initial operational data in law enforcement to its analytical processing and formulation of conclusions.

For instance, ILP has been successfully implemented in various countries, including the United States, where the National Criminal Intelligence Sharing Plan was developed (UNITED STATES DEPARTMENT OF JUSTICE, 2003), and the Federative Republic of Brazil (FRB), where the "Sistema Nacional de Informações de Segurança Pública" operates (GOV.BR, 2012). The National Intelligence Model was developed in the UK, which became the foundation for building an intelligence system within the police (HMICFRS, 2023)[7].

[5]Timely and accurate intelligence analysis is key to understanding the inner-workings and driving factors of crime phenomena and criminal enterprises.
[6]To improve Europol's effectiveness in providing accurate crime analysis to the competent authorities of the Member States, the legislator determined that the organization should use new technologies to process data.
[7]An intelligence-led business model used by UK police forces to gather, evaluate and manage information. It helps forces to make the most effective decisions and was devised by the National Criminal Intelligence Service.

Research by leading scholars, criminal intelligence officers, and analysts has led to the development of new methods in criminal analysis. Notable works include “Basic Elements of Intelligence” by GODFREY and HARRIS (1971), “Intelligence 2000: Revisiting the Basic Elements” by ATKIN (2009), and “Criminal Intelligence for the 21st Century: A Guide for Intelligence Professionals” by LEIU & IALEIA (2011). Significant contributions have also come from international organizations such as the International Association of Law Enforcement Intelligence Analysts (IALEIA, 2024)[8] and the Association of Law Enforcement Intelligence Units (LEIU, 1956).

These approaches have helped law enforcement agencies adapt to new conditions, expand their capabilities for crime prevention and investigation, and significantly enhance the effectiveness of criminal analysis. They have also contributed to a new understanding of criminal analysis methods, altering how law enforcement agencies approach this activity.

Another significant development in the 21st century has been the adoption of unique service methods, such as using “OSINT” (Open Source Intelligence) tools, which allow for collecting and analyzing data from open sources. These tools greatly expand the capabilities of law enforcement agencies, providing access to a vast array of information previously unavailable for criminal analysis. Such tools support various European Union and Ukraine law enforcement programs, such as EUAM Ukraine (EUROPEAN UNION EUAM UKRAINE, 2023).

In the 2000s, Ukrainian law enforcement agencies began recognizing the importance of information and analytical activities in combating crime. Thanks to initiatives by the State Border Guard Service of Ukraine, criminal analysis gained official status as a distinct activity area in 2008, when instructions for organizing and conducting criminal analysis were introduced. This marked a significant step in professionalizing this field, significantly contributing to more effective combat against organized crime at the SB.

At the same time, the FRB also made significant strides in developing criminal analysis. For example, improvements were made to databases, including the aforementioned “Sistema Nacional de Informações de Segurança Pública” (GOV.BR, 2012), indicating positive progress in this area. Moreover, efforts continue to systematize knowledge and implement new methodologies of criminal analysis within police organizations. Integrating data and new technologies across various states in the federation demonstrates that criminal analysis plays an increasingly important role in enhancing public safety management in FRB (SOUZA, 2024).

[8]IALEIA is the largest professional organization in the world representing law enforcement analysts, a nonprofit 501(c) 3 corporation based in the US.

Today, criminal analysis is characterized by the active use of new technologies and interdisciplinary approaches. Scholars and practitioners are increasingly focused on developing integrated systems that combine big data analysis, machine learning, artificial intelligence, and geographic information systems to enhance the effectiveness of criminal analysis. These innovations contribute to developing criminal analysis as a distinct professional field crucial for contemporary law enforcement activities.

JACOBSON (2022) noted that technological advancements encompass the law enforcement field, providing police with the tools and resources necessary to protect citizens and solve crimes. Computer and network technologies support covert investigations, provide easy access to global networks and databases, and offer a wealth of evidence to secure legal convictions (STEINMETZ et al., 2023). An essential aspect of these changes is software for processing large volumes of data for crime forecasting and identifying organized criminal groups. KUMAR, CHITUMADUGULA, and RAYALACHERUVU (2022, p. 627) emphasize the dual nature of big data:

> Big Data presents a problem for criminal investigators, but it can also aid in their ability to identify patterns and source information to avert and solve crimes. Because data mining is the best field for applying massive volume crime datasets, knowledge discovered through data mining techniques will be helpful and support police forces.

The 21st century marked a turning point for criminal analysis with the adoption of advanced technologies such as OSINT, big data, artificial intelligence, and machine learning. These tools have significantly enhanced law enforcement capabilities in crime forecasting and prevention. The professionalization of criminal analysis in Ukraine and Brazil underscores its critical role in ensuring security and combating organized crime.

3. APPLICATION OF CRIMINAL ANALYSIS

The third chapter explores the practical application of criminal analysis, emphasizing its pivotal role in addressing modern challenges to state border security. It examines how geopolitical shifts, technological advancements, and socio-economic dynamics influence crime trends and law enforcement strategies. The chapter highlights the integration of cutting-edge tools like big data, artificial intelligence, and machine learning into criminal analysis processes, alongside the development of collaborative international practices. These advancements have transformed criminal analysis into a vital component of proactive crime prevention, ensuring more effective responses to cross-border crime and enhancing overall border security.

3.1. GEOPOLITICAL CONTEXT OF BORDER SECURITY AND THE ROLE OF CRIMINAL ANALYSIS

The aggressor's war against Ukraine has become a defining geopolitical conflict of the 21st century, illustrating a return to realpolitik in global governance and affecting relations between world leaders, including the US, China, and the European Union (EU). The US's retreat from its international role, marked by its exit from Afghanistan, created conditions for aggressive intrusion into Ukraine, highlighting the weakening of the American position and the rise of a multipolar world order. China, in turn, has exploited the situation to intensify geopolitical rivalries and support the aggressor, disregarding the possibility of a peaceful resolution. Although facing significant economic and strategic challenges, the EU strives to bolster its defense capabilities and autonomy, but it also encounters issues related to internal efficiency and external relations. Overall, the current global order requires restructuring, as major players like the US and China are failing to address key geopolitical issues, leaving Ukraine at a crossroads between survival and the prospect of long-term development (TRILLO-FIGUEROA, 2024).

Furthermore, in this global context, where territorial disputes are used as a strategic tool, violations of territorial integrity serve as a prominent example of hybrid confrontation, where external actors exploit regional conflicts to achieve their objectives. This underscores the critical importance of safeguarding SB for national security and the need for an adequate response to external manipulations (ISKANDAROV et al., 2024).

The technological revolution further complicates the situation. From microchips to artificial intelligence and quantum computing, new technologies are transforming the world, including the profession of criminal analysis. These advancements often challenge law enforcement agencies, providing criminals with new, powerful tools to evade detection.

As a result, monitoring and risk analysis become critically important for managing border security and migration. For instance, FRONTEX, through its comprehensive monitoring and analysis systems like EUROSUR, provides strategic analysis of the overall European border situation and assists member states in effectively responding to various threats. The EUROSUR system integrates data from national coordination centers, creating a comprehensive situational picture and coordinating responses to threats, including illegal migration and cross-border crime. This underscores the importance of criminal analysis to ensure border security amid global challenges and regional conflicts (FRONTEX, 2024).

In light of the above, the practical application of criminal analysis is critically essential for border authorities and units, as it contributes to a deeper understanding of the criminal environment

and the development of methods to counter organized criminal groups. The analytical process, which includes planning, data collection, evaluation, analysis, and dissemination of information about suspects and criminals, generates insights that enable border authorities and units to adopt a proactive approach to responding to offenders.

Once organized criminal groups are identified and their tactics studied, border authorities and units can assess current trends in the criminal environment, forecast developments, and, if necessary, prevent future crimes. The results of this analysis form the basis for decision-making and the formulation of criminal investigation strategies, support the rational allocation of resources and enhance the operational effectiveness of border security agencies.

3.2. THE ESSENCE, TECHNOLOGIES, AND TOOLS OF CRIMINAL ANALYSIS

Criminal analysis and analytical technologies are continuously improving, with new methods and areas of application emerging, significantly enhancing the effectiveness of law enforcement agencies. In the context of the rapid evolution of information technologies and the increasing complexity of tasks faced by law enforcement agencies, leading countries worldwide are actively implementing advanced methods for analyzing information sources, which helps improve the accuracy and timeliness of decision-making in the fight against crime (SHKOLNIKOV, 2023).

3.2.1. THE ESSENCE OF CRIMINAL ANALYSIS AND ITS APPLICATION IN UKRAINE

When addressing the concept of the term “criminal analysis,” it is essential to note that in Ukraine, it lacks a legislative definition, which leads to a variable description within scientific circles. The international scientific community also does not have a unified perspective on this concept. For example, FENNELLY (2012, p. 169) argues that:

> Crime analysis can be defined as the study of daily reports and crime to determine the location, time of day, unique characteristics, similarities to other crimes, and any significant data that will or may identify patterns of criminal behavior. This is done through collecting, collating, analyzing reports, and evaluating crime data.

For example, SILVA (2015), referring to BRUCE (2012), indicates that criminal analysis is a systematic set of analytical processes. These processes provide timely and relevant information regarding crime patterns, offender profiles, correlations, and trends (POLOVNIKOV et al., 2020). This analysis aims to assist individuals in operational and administrative roles in planning and deploying optimal resources for crime prevention and response and to support case investigation,

arrest, and resolution. In this context, criminal analysts support a range of functions within departments, including organizing patrols, special operations, tactical units, investigations, planning and research, crime prevention, and administrative services.

According to the IACA, crime analysis is defined as the follows (BJA.OJP.GOV, 2024, p. 1; SAGE PUBLICATIONS INC, 2024, p. 3-4):

> A profession and process in which quantitative and qualitative techniques are used to analyze data valuable to police agencies and their communities. It includes the analysis of crime and criminals, crime victims, disorder, quality of life issues, traffic issues, and internal police operations, and its results support criminal investigation and prosecution, patrol activities, crime prevention and reduction strategies, problem-solving, and the evaluation of police efforts.

The concepts outlined clarify the essence of criminal analysis as a specific type of information-analytical activity, which involves processing large volumes of information accumulated in databases to derive new insights into crimes and criminality. While criminal analysis is often equated with, compared to, or attempted to be integrated with criminal intelligence, these two processes have significant differences. Criminal intelligence focuses on the collection and accumulation of information, as well as its evaluation. However, when criminal intelligence personnel analyze and synthesize the information gathered to produce actionable data, this is an aspect of the information-analytical activity or criminal analysis.

Doctrinal misunderstandings may arise due to autonomous and isolated operations without adequate interaction or coordination between law enforcement (police) and unique (intelligence and counterintelligence) agencies. Misunderstandings are further compounded by the names and powers of specific law enforcement units, which can be broadly referred to as “criminal intelligence units of the police.” These units do not engage in classical intelligence activities outside the country's context of national security but use similar methods and forms of work within the country to combat crime. They may consider part of their efforts related to data collection and initial processing to be criminal analysis (MOTSA, 2022).

The intelligence tool “OSINT” also requires clear differentiation from criminal analysis and should remain a tool. Although “OSINT” originated within intelligence agencies, it is now widely used by law enforcement agencies for gathering necessary information (BONVICINO, 2024).

A professional approach is critical for practical criminal analysis. Personnel engaged in information-analytical activities must be specially trained to work with software for processing, analyzing, comparing, and synthesizing large volumes of data. Conducting criminal analysis should be at least a primary or even the sole activity of the respective positions, and prior practical experience in operational information collection is also essential.

Thus, the main differences between criminal analysis and criminal intelligence lie in their core functions. Criminal analysis is focused on processing and analyzing existing information, while criminal intelligence focuses on collecting new data. Databases are the primary resource for criminal analysis, providing information for further processing, whereas criminal intelligence supplies these databases with new knowledge. Criminal analysis utilizes various software tools for data processing, while criminal intelligence relies on specific information collection methods. It is important to note that in practice, there may sometimes be an improper use of resources, where units perform functions not aligned with their specialization. This can lead to reduced effectiveness in task execution and violation of the specialization principle (KIREIEVA et al., 2022).

The essence of criminal analysis becomes more apparent when compared to criminal intelligence, as shown in the following table:

Parameter	Criminal Analysis	Criminal Intelligence
Process	Information processing	Information gathering
Role of Databases	Utilizing databases for analysis	Filling databases with new information
Main Tools	Software tools	Collection methods and techniques
Practical Issues	Performing tasks not related to information collection	Performing tasks not related to information analysis

Table. 1: Comparison of Criminal Analysis and Criminal Intelligence

The primary areas of using information resources in criminal analysis units of Ukraine's State Border Guard Service encompass several key aspects. Firstly, their databases, integrated into information and telecommunication systems, ensure practical criminal analysis for detecting and preventing offenses at the SB. Information resources from other law enforcement agencies and departments in Ukraine play a crucial role, facilitating inter-agency cooperation and enhancing analytical capabilities (Table 2). Additionally, criminal analysts actively utilize open sources of information, such as the Internet and social media, to complement and expand existing databases. A significant component of the analysis involves collecting and processing data on crossing the SB by individuals and cargo, which enables more accurate forecasting and prevention of potential threats – identifying the owners of electronic devices aids in establishing their connection to specific offenses or suspects, which is a critical element in the investigative process.

Law Enforcement Agency	Databases Integrated into Information and Telecommunications Systems	Description

State Border Guard Service of Ukraine	Arkan	A set of organizational and administrative measures, program and technical means, and telecommunication tools that ensure the processing of information (input, reception, obtaining, transmission, registration, storage) regarding the control of persons, vehicles, and cargo crossing the state border of Ukraine, and automated access to information resources (databases) of the "Arkan" system entities (VERKHOVNA RADA OF UKRAINE, 2008)
National Police of Ukraine	National Police Information Portal	A set of technical and software tools designed for processing information generated in the course of the National Police of Ukraine's activities and its informational and analytical support (VERKHOVNA RADA OF UKRAINE, 2017, No. 676)
	Automated Operational Information System	A set of programs and technical tools for electronic communications designed for accumulating and processing information generated during operational search activities and criminal analysis within the National Police of Ukraine (VERKHOVNA RADA OF UKRAINE, 2017, No. 870)
State Migration Service of Ukraine	Unified Information and Analytical System for Migration Process Management	An information and communication system created using registry tools that automate activity processes and ensures electronic information interaction to implement state migration policy, including combating illegal migration (VERKHOVNA RADA OF UKRAINE, 2023)
State Customs Service of Ukraine	Unified Automated Information System of the State Customs Service of Ukraine	A multifunctional integrated automated system that provides informational support and management of customs affairs and consists of several interconnected information systems (VERKHOVNA RADA OF UKRAINE, 2010)

Table. 2: Main Databases Used by the Criminal Analysis Units of the State Border Guard Service of Ukraine

In the context of utilizing databases integrated into specified information and telecommunications systems, the application of modern software, such as I2 Analyst's Notebook and Microsoft Excel, becomes essential, significantly enhancing the capabilities of criminal analysis. These tools enable the analysis of large data sets, which is critical for achieving high accuracy in threat forecasting and effective crime prevention. Algorithms developed for Microsoft Excel aid in processing informational arrays, while the capabilities of I2 Analyst's Notebook facilitate the analysis of phone connections and the establishment of relationships between individuals. The interaction of these analytical methods and software supports the creation of visual relationship diagrams using Google Earth, fostering a deeper understanding of complex analytical data and improving the effectiveness of national security measures (Table. 3).

Software Tools	Usage
i2 Analyst's Notebook	Data Collection and Processing (I2, 2024)
Microsoft Excel (Analyze Data)	Analysis of Large Data Sets (MICROSOFT, 2024)
Google Earth	Creation and Visualization of Relationship Diagrams (GOOGLE EARTH, 2024)

Table. 3: Main Software Tools Used by the Criminal Analysis Units of the State Border Guard Service of Ukraine

3.2.2. TECHNOLOGIES AND TOOLS OF CRIMINAL ANALYSIS (TABLE. 4)

In today's environment, where a vast amount of information flows to the police, criminal analysis becomes crucial for effective crime investigation. It facilitates the use of modern methods for detecting and predicting criminal trends. Big data technologies, machine learning, artificial intelligence, and natural language processing play a central role in this process, enabling the rapid and accurate analysis of large volumes of information, uncovering hidden patterns and trends, and forecasting potential crimes. This significantly enhances the efficiency of criminal investigations and contributes to reducing crime rates through improved suspect identification and the prediction of criminal threats (TYAGI & SHARMA, 2020).

Machine learning, particularly neural networks (NNs), plays a crucial role in criminal analysis due to its ability to automatically detect complex and often non-linear relationships between crimes and their geospatial and temporal factors. Unlike traditional parametric statistical methods, which linear models and simple associations may limit, NNs enable the development of systems capable of classifying crime types and categories and predicting the likely locations of their occurrence. This allows law enforcement agencies to obtain more accurate predictions and enhance crime prevention strategies by using powerful analytical tools to identify and forecast trends that are not feasible with traditional analytical methods (WALCZAK, 2021).

Existing data analysis tools in criminal justice, such as LEARCAT, FCCPS, and JEET, significantly facilitate access to information and crime analysis at various levels. These tools provide capabilities for detailed examination of crime data, justice expenditures, and correctional facility statistics, contributing to comprehensive analysis and valuable insights. They enhance transparency and access to information, supporting informed decision-making. However, the evident need for further improvement and expansion of these tools is crucial. New data and technologies can offer opportunities for more accurate and effective resource management and criminal situation analysis within the justice system (BJS, 2024, All Data Analysis Tools).

Cluster analysis, a statistical grouping method, also deserves attention as it aids in criminal analysis by identifying patterns and trends within crime data, grouping them based on similar characteristics. This approach enhances the understanding of the distribution of criminal activities, identifies potential gang hotspots, and aids in developing effective crime prevention strategies. Criminal analysis integrates cluster analysis results with other methods to provide a comprehensive assessment and develop recommendations for law enforcement agencies. PORĘBSKI (2021, pp. 99, 118) examines cluster analysis as follows:

> Cluster analysis (or clustering – these two terms will be used interchangeably) is one of the statistical methods that makes it possible to divide a dataset into a particular number of subsets, grouping similar objects (observations) based on a defined similarity measure. The cluster analysis method seems extremely useful in criminological and sociological research concerning the relationship between crime and space. Not only does it ensure an objective criterion for division, it also allows for adjusting the number of areas and considers the spatial distribution of crime. Broader use of clustering in the research concerning the spatial dimension of law, including breaking it, is recommended.

Additionally, one of the main focuses of contemporary research is the improvement of crime prediction algorithms, including those related to SB. This involves analyzing retrospective data and identifying tactics, patterns, and trends, which enables the prediction of potential locations and times of illegal SB crossings. Such approaches allow for more effective resource allocation and preventive measures.

Technology/Tool	Description	Key Capabilities	Role in Criminal Analysis
Big Data	Technologies for collecting, storing, processing, and analyzing large volumes of information from various sources	Identification of patterns and correlations, processing of unstructured data, tools for large-scale analysis	Provides a foundation for crime analysis and forecasting, optimizes resource utilization for investigations
Machine Learning (ML)	Algorithms that learn from data, detecting complex relationships and making predictions	Outcome prediction, data classification, automatic anomaly detection	Enhances the accuracy of crime location and timing forecasts, automates investigation processes
Artificial Intelligence (AI)	Technologies that mimic human cognitive functions to perform complex tasks	Data analysis automation, pattern recognition, decision-making based on calculations	Application for automated crime data analysis, recognition, and prediction of criminal trends
Natural Language Processing (NLP)	Algorithms that enable computers to analyze	Text analysis, keyword and topic	Used for automated analysis of textual

	and understand textual data	detection, automation of text source processing	evidence, social media, and other text-based sources in investigations
Neural Networks (NNs)	Machine learning models that recognize complex patterns in data through multi-layered information processing	Non-linear modeling, learning from large data volumes, analysis of complex relationships	Classification and prediction of crime types, automation of decision-making in criminal investigations
Data Analysis Tools	Software that provides access to data and enables in-depth analysis, such as LEARCAT (BJS, 2024, LEARCAT), FCCPS (BJS, 2024, FCCPS), JEET (BJS, 2024, JEET)	Data collection and visualization, statistical analysis, reporting, informed decision-making	Provides analytical data for informed decision-making and optimizes resource management and crime situation analysis.
Cluster Analysis	A method for grouping data that divides objects into subsets based on similar characteristics	Detection of patterns within data groups, identification of similar crime cases, recognition of group characteristics	Identifies and groups crimes for developing specific strategies to combat criminal activity

Table. 4: The Role of Technologies and Tools in Criminal Analysis

3.3. THE SIGNIFICANCE OF SOCIO-ECONOMIC FACTORS AND INTERNATIONAL COOPERATION

Analyzing socio-economic factors is a crucial aspect of ensuring the adequate protection of SB. Examining changes in political situations, economic crises, migration flows, and other social phenomena helps to understand the impact of these factors on crime rates. Understanding these processes allows for developing adaptive models to prevent crime and enhance security at SB (PEW RESEARCH CENTER, 2024).

Criminal analysis aids in identifying trends related to socio-economic changes that may influence criminal activity at SB. Political instability, economic downturns, social inequality, and migration flows can create conditions conducive to increased criminal activity. For instance, financial crises can exacerbate social tensions, raising the crime risk. Migration flows can also pose new challenges for border control and the fight against illegal immigration and smuggling.

To effectively protect SB, it is essential to utilize socio-economic analysis data in developing comprehensive crime prevention models. This includes forecasting potential risk areas and implementing preventive measures to mitigate threats.

International cooperation and information exchange are critical to combating organized crime at SB. Crime often has a transnational character today, necessitating coordinated efforts among countries and international organizations. Joint scientific initiatives, sharing of experiences, and best practices contribute to refining security methodologies and strategies (BORGES & CORREA, 2024).

Research in this field emphasizes the importance of innovative and interdisciplinary approaches to ensuring security at SB. Integrating knowledge from criminology, sociology, economics, information technology, and other disciplines allows for developing more effective strategies to address global security challenges. Global interaction between states and international organizations fosters stability and security, essential for protecting national interests and maintaining law and order.

4. CONCLUSIONS

The development of criminal analysis has undergone three key stages. The first stage, beginning in the 19th century, was marked by the emergence of analytical methods in combating crime. Early crime mapping and offender classification laid the groundwork for further scientific research.

The second stage, occurring in the 20th century, saw significant advancements in criminal analysis due to the introduction of new technologies such as computer systems, forensic methods, and geo-analysis. These innovations enhanced the accuracy of investigations and the effectiveness of crime forecasting.

In the 21st century, the third stage is characterized by using big data, artificial intelligence, and machine learning. These cutting-edge technologies allow for more effective data processing and analysis, integrating various sources of information to improve crime forecasting and prevention.

Technological advancements in information technology and forensics have significantly impacted criminal analysis methods. From computer systems to machine learning algorithms, new tools have expanded data processing capabilities, leading to more effective crime response.

Integrating diverse information sources has become a key aspect of modern criminal analysis. Data from social networks, financial institutions, and other sources enable the creation of comprehensive offender profiles and the detection of connections between different types of crimes.

The future of criminal analysis is expected to involve further development in data visualization technologies and new forecasting methods. Key areas will remain to refine existing analytical methods and integrate new technologies to enhance national security.

Criminal analysis is a vital tool for identifying and predicting criminal trends through the processing and analyzing of crime data. It encompasses studying and integrating existing data with new technologies to improve law enforcement effectiveness.

At both the international and national levels, there is variability in definitions of criminal analysis. However, the general understanding of its essence as a process of data processing and analysis to enhance law enforcement is consistent.

Modern technologies, such as big data, machine learning, artificial intelligence, and natural language processing, are crucial in advancing criminal analysis. They enable more effective detection of criminal trends and forecasting of potential crimes.

Practical criminal analysis requires highly skilled analysts who must be specially trained and possess practical experience in data collection and processing.

REFERENCES

ATKIN, H. **Intelligence 2000: revisando los elementos básicos. In C. Reppalli (Ed.)**, *Inteligencia Criminal en el Siglo XXI*. Grafica Sur Editora SRL, Buenos Aires, 2009. p. 119-126.

BJA.OJP.GOV. **Overview of Crime Analysis**. 2024, p. 1-2. Available at: https://cmn-cdn-001.sagepub.com/books/titles/270193/att_sb1_121516.pdf. Access date: 1 Aug 2024.

BJS. **All Data Analysis Tools**. 2024. Available at: https://bjs.ojp.gov/data/data-analysis-tools. Access date: 1 Aug 2024.

BJS. JEET. 2024. Available at: https://bjs.ojp.gov/jeet. Access date: 1 Aug 2024.

BJS. FCCPS. 2024. Available at: https://fccps.bjs.ojp.gov/. Access date: 1 Aug 2024.

BJS. LEARCAT. 2024. Available at: https://learcat.bjs.ojp.gov/IncidentsCrime?Data+Year=2022&Unit+of+Analysis=Count. Access date: 1 Aug 2024.

BONVICINO, J. OSINT – Inteligência em Fontes Abertas e sua aplicação jurídica. **Direito e Tecnologia**. 2024. Available at: https://www.jusbrasil.com.br/artigos/osint-inteligencia-em-fontes-abertas-e-sua-aplicacao-juridica/2474867924. 11 Jun 2025.

BORGES, C. A. F., & CORREA, P. G. P. Cooperação policial internacional transfronteiriça: o caso do Amapá e da Guiana Francesa. **Revista Brasileira de Estudos de Defesa**, v. 10, n. 2, Jul 2023, p. 63-101. Available at: https://doi.org/10.26792/RBED.v10n2.2023.75332. Access date: 11 Jun 2025.

BRUCE, C. **Exploring crime analysis: readings on essential skills**. Overland Park, KS, USA: International Association of Crime Analysts – IACA, 2012.

CARTE, G. E. **AUGUST VOLLMER AND THE ORIGINS OF POLICE PROFESSIONALISM**. U.S. DEPARTMENT OF JUSTICE. OFFICE OF JUSTICE PROGRAMS: NCJRS Virtual Library, Oct 1972, p. 1-311. Available at: https://www.ojp.gov/ncjrs/virtual-library/abstracts/august-vollmer-and-origins-police-professionalism. Access date: 1 Aug 2024.

EUROPEAN UNION EUAM UKRAINE. **Sharing EU best practices on Open Source Intelligence and Criminal Analysis to investigate International Crimes**. 4 Apr 2023. Available at: https://www.euam-ukraine.eu/news/sharing-eu-best-practices-on-open-source-intelligence-and-criminal-analysis-to-investigate-international-crimes/. Access date: 1 Aug 2024.

EUROPOL. **Integrated data management concept**. 28 Jun 2024. Available at: https://www.europol.europa.eu/about-europol/data-protection-transparency/idmc. Access date: 1 Aug 2024.

FENNELLY, L. J. **Handbook of Loss Prevention and Crime Prevention (Fifth Edition): Chapter 14 – Crime Analysis**. Butterworth-Heinemann, 27 Jan 2012, p. 169-172. Available at: https://doi.org/10.1016/B978-0-12-385246-5.00014-6. Access date: 1 Aug 2024.

FERRACUTI, S. "Cesare Lombroso (1835-1907)." **The Journal of Forensic Psychiatry**, v. 7, n. 1, p. 130-149, 1996. Available at: https://doi.org/10.1080/09585189608409921. Access date: 11 Jan 2025.

FRONTEX. **Monitoring and risk analysis**. Available at: https://www.frontex.europa.eu/what-we-do/monitoring-and-risk-analysis/monitoring-and-risk-analysis/. Access date: 1 Aug 2024.

GODFREY, E. D., & HARRIS, D. R. **BASIC ELEMENTS OF INTELLIGENCE – A MANUAL OF THEORY, STRUCTURE AND PROCEDURES FOR USE BY LAW ENFORCEMENT AGENCIES AGAINST ORGANIZED CRIME**. OFFICE OF JUSTICE PROGRAMS: NCJRS Virtual Library, Nov 1971, p. 1-150. Available at: https://www.ojp.gov/ncjrs/virtual-

library/abstracts/basic-elements-intelligence-manual-theory-structure-and-procedures. Access date: 1 Aug 2024.

GOOGLE EARTH. 2024. Available at: https://earth.google.com/web/@-12.5810684,-42.24788214,460.49839595a,6050057.54038061d,35y,0.01575871h,0t,0r/data=OgMKATA. Access date: 1 Aug 2024.

GOTTLIEB, S., ARENBERG, S., BUSACK, S. D. (Ed.). **Crime Analysis: From Concept to Reality**. California Office of Criminal Justice Planning, National Institute of Justice, National Criminal Justice Reference Service, U.S. Department of Justice. 1992. Available at: https://www.ncjrs.gov/pdffiles1/Digitization/137374NCJRS.pdf. Access date: 11 Jan 2025.

GOV.BR. **SINESP**. Ministério da Justiça e Segurança Pública. 2012. Available at: https://www.gov.br/mj/pt-br/assuntos/sua-seguranca/seguranca-publica/sinesp-1/. Access date: 1 Aug 2024.

I2. I2 Analyst's Notebook. 2024. Available at: https://i2group.com/i2-analysts-notebook. Access date: 1 Aug 2024.

HMICFRS. **National intelligence model (NIM)**. 24 Mar 2023. Available at: https://hmicfrs.justiceinspectorates.gov.uk/glossary/national-intelligence-model/. Access date: 1 Aug 2024.

HUNT, J. From Crime Mapping to Crime Forecasting: The Evolution of Place-Based Policing. **OFFICE OF JUSTICE PROGRAMS: NCJRS Virtual Library**, Nov 2019, p. 1-6. Available at: https://www.ojp.gov/ncjrs/virtual-library/abstracts/crime-mapping-crime-forecasting-evolution-place-based-policing. Access date: 1 Aug 2024.

IACA. **About the IACA**. 2024. Available at: https://www.iaca.net. Access date: 1 Aug 2024.

IACA. **Certified Law Enforcement Analyst (CLEA)**. 2024. Available at: https://www.iaca.net/clea-certification. Access date: 1 Aug 2024.

IACA. **Law Enforcement Analyst – Foundational (LEAF)**. 2024. Available at: https://www.iaca.net/leaf-certification. Access date: 1 Aug 2024.

IALEIA. **Mission**. 2024. Available at: https://www.ialeia.org/mission.php. Access date: 1 Aug 2024.

INTERPOL. **Criminal intelligence analysis**. 2024. Available at: https://www.interpol.int/How-we-work/Criminal-intelligence-analysis. Access date: 1 Aug 2024.

ISKANDAROV, K. I., GAWLICZEK, P., & SOBOŃ, A. Violation of territorial integrity as a tool for waging long-term hybrid warfare (against the backdrop of power games in the South Caucasus region). **Security and Defence Quarterly**, v. 45, n. 1, 2024, p. 1-17. Available at: https://doi.org/10.35467/sdq/174507. Access date: 1 Aug 2024.

JACOBSON, N. **How Technology Is Changing Law Enforcement**. CPI OPENFOX, 14 Nov 2022. Available at: https://www.openfox.com/how-technology-is-changing-law-enforcement/. Access date: 1 Aug 2024.

KEAY, S., & KIRBY, K. The Evolution of the Police Analyst and the Influence of Evidence-Based Policing. Policing: **A Journal of Policy and Practice**, v. 12, n. 3, Sep 2018, p. 265-276. Available at: https://doi.org/10.1093/police/pax065. Access date: 11 Jan 2025.

KHAN, J., RAMAN, A., SAMBAMOORTHY, N., PRASHANTH, K. **Research Methodology (Methods, Approaches, and Techniques)**. 9 Sep 2023. Available at: https://doi.org/10.59646/rmmethods/040.Access date: 11 Jan 2025.

KIREIEVA, O. S., KRUTIK, Y. V., MAKHLAI, O. M., TREUS, A. S. **Foundations of Criminal Analysis: Theory and Practice of Application in the Operational Units of the State Border Guard Service of Ukraine**. 2022. NASBGSU Publishing. Available at: https://dspace.nadpsu.edu.ua/handle/123456789/3241. Access date: 11 Jan 2025.

KUMAR, A. V., CHITUMADUGULA, S., & RAYALACHERUVU, V. T. **Crime Data Analysis using Big Data Analytics and Visualization using Tableau**. IEEE Xplore: 2022 6th International Conference on Electronics, Communication and Aerospace Technology, Coimbatore, India, 2022, p. 627-632. https://doi.org/10.1109/ICECA55336.2022.10009119.

LEIU. **Association of Law Enforcement Intelligence Units Founded**. 1956. Available at: https://leiu.org/. Access date: 1 Aug 2024.

LEIU & IALEIA**. Criminal Intelligence for the 21st Century: A Guide for Intelligence Professionals**. IALEIA, 2011. Available at: https://www.ialeia.org/study_materials.php. Access date: 1 Aug 2024.

MICROSOFT. **Analyze Data in Excel**. 2024. Available at: https://support.microsoft.com/en-us/office/analyze-data-in-excel-3223aab8-f543-4fda-85ed-76bb0295ffc4. Access date: 1 Aug 2024.

MOTSA, V. Theoretical and methodological bases for the use of criminal analysis by operative units of law enforcement agencies in Ukraine. **Uzhhorod National University Herald. Series: Law**, v. 2, n. 73, 2022. Available at: https://doi.org/10.24144/2307-3322.2022.73.53. Access date: 11 Jan 2025.

OLIVER, W.M. **AUGUST VOLLMER: THE FATHER OF AMERICAN POLICING**. Rutgers: Durham. 2017. Available at: https://clcjbooks.rutgers.edu/books/august-vollmer-the-father-of-american-policing/. Access date: 1 Aug 2024.

OSCE. OSCE Guidebook Intelligence-Led Policing. **TNTD/SPMU Publication Series**, v. 13, Jun 2017, p. 1-104. Available at: https://www.osce.org/files/f/documents/d/3/327476.pdf. Access date: 1 Aug 2024.

PEW RESEARCH CENTER. **How Americans view the situation at the U.S.-Mexico border, its causes and consequences**. 15 Feb 2024. Available at: https://www.pewresearch.org/politics/2024/02/15/how-americans-view-the-situation-at-the-u-s-mexico-border-its-causes-and-consequences/?utm_source=chatgpt.com. Access date: 11 Jun 2025.

POLOVNIKOV, V., BILETSKYI, V., TYSHCHUK, V., OVERCHENKO, Y. Criminological profile of a perpetrator of a high treason. **Amazonia Investiga**, v. 9, n. 28, p. 176-189, 2020. Available at: 10.34069/AI/2020.28.04.21. Access date: 11 Jun 2025.

PORĘBSKI, A. Application of Cluster Analysis in Research on the Spatial Dimension of Penalised Behaviour. **Acta Universitatis Lodziensis. Folia Iuridica**, v. 94, 30 Mar 2021, p. 97-120. Available at: https://doi.org/10.18778/0208-6069.94.06. Access date: 1 Aug 2024.

QUICKSET. **Future Border Security Challenges**. 2024. Available at: https://www.quickset.com/future-border-security-challenges. Access date: 11 Jan 2025.

RAMESH, G. M. **History, Ideology, and Evolution of Criminal Profiling**. Honors Undergraduate Theses, University of Central Florida. 2021. Available at: https://stars.library.ucf.edu/honorstheses/1072. Access date: 11 Jan 2025.

SAGE PUBLICATIONS INC. **CHAPTER 1 Crime Analysis and the Profession**. 2024, p. 3-39. Available at: https://cmn-cdn-001.sagepub.com/books/titles/270193/att_sb1_121516.pdf. Access date: 1 Aug 2024.

SHKOLNIKOV, V. Types of Analytical Technologies and Their Classification (The Experience of the National Police of Ukraine). **National Technical University of Ukraine Journal. Political Science. Sociology. Law**, n 3(59), 2023. Available at: https://doi.org/10.20535/2308-5053.2023.3(59).295011. Access date: 11 Jan 2025.

SILVA, J.A. **Análise CriminAl: teoria e prática**. Salvador: Artpoesia, 2015, p. 1-288. Available at: https://ibsp.org.br/wp-content/uploads/2020/07/An%C3%A1lise-criminal-teoria-e-pr%C3%A1tica_Jo%C3%A3o-Apolin%C3%A1rio-da-Silva_ISBN-978-85-66783-14-8.pdf. Access date: 1 Aug 2024.

SOUZA, N. G. **Análise Criminal: uma história em constante evolução**. LinkedIn. 7 Jan 2024. Available at: https://pt.linkedin.com/pulse/an%C3%A1lise-criminal-uma-hist%C3%B3ria-em-constante-evolu%C3%A7%C3%A3o-g-souza-ph-d-xmk2f. Access date: 1 Aug 2024.

STEINMETZ, K. F., SCHAEFER, B. P., BREWER, C. G., & KURTZ, D. L. The Role of Computer Technologies in Structuring Evidence Gathering in Cybercrime Investigations: A Qualitative Analysis. **Criminal Justice Review**, 12 Mar 2023. Available at: https://doi.org/10.1177/07340168231161091. Access date: 1 Aug 2024.

STEVENSON, M. **Crime Analysis: The History and Development of a Discipline**. Honors Senior Theses/Projects, 5 Jun 2013, p. 1-77. Available at: https://typeset.io/pdf/crime-analysis-the-history-and-development-of-a-discipline-34eghzx97g.pdf. Access date: 1 Aug 2024.

TELEP, C. W., WEISBURD, David. A review of systematic reviews in policing. In: WEISBURD, David; JONATHAN-ZAMIR, Tali; PERRY, Gina; HASISI, Badi. (Ed.). **The Future of Evidence-Based Policing. Cambridge: Cambridge University Press**, 1 Jun 2023, p. 85-106.

TRILLO-FIGUEROA, S. C. **War in Ukraine, Year III: Geopolitical Equations Resolved**. CHINA-US Focus, 21 Feb 2024. Available at: https://www.chinausfocus.com/peace-security/war-in-ukraine-year-iii-geopolitical-equations-resolved. Access date: 11 Jan 2025.

TYAGI, D., & SHARMA, S. AN APPROACH TO CRIME DATA ANALYSIS: A SYSTEMATIC REVIEW. **International Journal of Engineering Technologies and Management Research**, v. 5, n. 2, 28 Feb 2018, p. 67-74. Available at: https://doi.org/10.29121/ijetmr.v5.i2.2018.615. Access date: 11 Jan 2025.

TYSHCHUK, V. Main Criteria for the Classification of Disinformation and Attempts to Criminalisation of Its Spread in Ukraine. **Bratislava Law Review**, v. 8, n. 1, p. 203-224, 2024. Available at: 10.46282/blr.2024.8.1.372. https://blr.flaw.uniba.sk/index.php/BLR/article/view/372. Access date: 11 Jan 2025.

UNITED STATES DEPARTMENT OF JUSTICE. **The National Criminal Intelligence Sharing Plan**. Global Justice Information Sharing Initiative, Oct 2003, p. 1-40. Available at: https://bja.ojp.gov/sites/g/files/xyckuh186/files/media/document/national_criminal_intelligence_sharing_plan.pdf. Access date: 1 Aug 2024.

VERKHOVNA RADA OF UKRAINE. **On Approval of the Regulation on the Automated Information System for Operational Purposes of the Unified Information System of the Ministry of Internal Affairs**. Legislation of Ukraine, 20 Oct 2017 № 870. Available at: https://zakon.rada.gov.ua/laws/show/z1433-17?lang=en#Text. Access date: 1 Aug 2024.

VERKHOVNA RADA OF UKRAINE. **On Approval of the Regulation on the Information and Communication System "Information Portal of the National Police of Ukraine."** Legislation of Ukraine, 3 Aug 2017 № 676. Available at: https://zakon.rada.gov.ua/laws/show/z1059-17?lang=en#Text. Access date: 1 Aug 2024.

VERKHOVNA RADA OF UKRAINE. **On Approval of the Integrated Interagency Information and Telecommunication System Regulation for Monitoring Persons, Vehicles, and Cargo Crossing the State Border**. Legislation of Ukraine, 3 Apr 2008 № 284/287/214/150/64/175/266/75. Available at: https://zakon.rada.gov.ua/laws/show/z0396-08?lang=en#Text. Access date: 1 Aug 2024.

VERKHOVNA RADA OF UKRAINE. **On Approval of the Regulation on the Unified Automated Information System of the State Customs Service of Ukraine**. Legislation of Ukraine, 4 Nov 2010 № 1341. Available at: https://zakon.rada.gov.ua/rada/show/va341342-10?lang=en#Text. Access date: 1 Aug 2024.

VERKHOVNA RADA OF UKRAINE. **On Approval of the Regulation on the Unified Information and Analytical System for Migration Management**. Legislation of Ukraine, 4 Oct 2023 № 811. Available at: https://zakon.rada.gov.ua/laws/show/z1814-23?lang=en#Text. Access date: 1 Aug 2024.

WALCZAK, S. Predicting Crime and Other Uses of Neural Networks in Police Decision Making. **Frontiers in Psychology**, v. 12, 07 Oct 2021, p. 1-11. Available at: https://doi.org/10.3389/fpsyg.2021.587943. Access date: 1 Aug 2024.

WILSON, O. W. August Vollmer. **The Journal of Criminal Law, Criminology, and Police Science**, v. 44, n. 1, May – Jun 1953, p. 91-103. Available at: https://doi.org/10.2307/1139476. Access date: 1 Aug 2024.

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