

CRIMINALISTICS AND FORENSIC SCIENCES IN UKRAINE: HISTORY AND CURRENT TRENDS

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Annotation

The article is dedicated to the problems of formation and the present state of criminalistics, forensics and forensic sciences in Ukraine. The historical antecedents and peculiarities of scientific (special) knowledge application in crime prevention, formation of different forensic sciences (forensic medicine, forensic psychiatry, forensic psychology, forensic toxicology, forensic chemistry, forensic accounting and others) are addressed. The relationship of criminalistics, forensics and forensic sciences is analyzed, and their role in the current context is defined.

The functional purpose of criminalistics, forensics and forensic sciences makes it possible to determine the directions and trends of their development. Currently, criminalistics, forensics and forensic sciences are designed to provide the legal practice with the latest tools, techniques and technologies in various jurisdictional processes, contribute to the optimization of pre-trial, trial and extrajudicial proceedings, to improve the performance of employees of law enforcement and expert services.

Formation and development of criminalistics and other forensic sciences in Ukraine reflects their integrative function. The development of criminalistics, its trends are due to the influence of information flows, technological progress of society. Digital criminalistics, the use of digital evidence, protection of information sources and the problem of information security should become an important direction.

The article considers the role of national and European non-governmental organizations in the development of criminalistics, forensics and forensic

sciences in approximation to the common European space.

Keywords: criminalistics, forensics, forensic history, forensic knowledge, trends in forensic science, types of forensic science.

Science as a reflection of the activities of prominent figures

The development of criminalistics, forensics and certain forensic sciences depends on the contribution of individuals who carry out scientific or practical activities. The role of individuals in the history of the formation and development of criminalistics knowledge is significant. The decisive contribution to the development of criminalistics and forensics is made by a distinguished scientist-criminalist, a renowned research organizer, a forensic expert, a member of the Lithuanian Association of Criminalists and a member of the International Criminalists Congress, Doctor of Law, Professor Vidmantas Egidijus Kurapka, who is widely known not only in Lithuania but also outside the Republic of Lithuania. V. E. Kurapka conducts active work on popularization of criminalistics knowledge, establishment of contacts with criminalists of different countries of the world, interaction through national and international non-governmental societies of criminalists. A significant role belongs to V. E. Kurapka on the establishment and functioning of the Lithuanian Association of Criminalists and the International Criminalists Congress, in holding annual conferences (congresses): Criminalistics and Forensic Sciences: Science, Studies, Practice. The universities of Ukraine study the scientific works of Professor V. E. Kurapka, which reflect promising views and express progressive ideas on the doctrinal problems of European criminalistics, forensic science and criminalistics didactics. The scientific works of Professor V. E. Kurapka are useful not only for teachers, scientists, practitioners of law enforcement agencies and forensic experts, but likewise for students.

Introduction

Scientific basis of the research. The doctrinal problems of criminalistics and forensic science were addressed by criminalists from around the world: R. Belkin, A. Vinberg, M. Goc, V. Zhuravel, V. Konovalova, V. E. Kurapka, E. Locard, H. Malewski, S. Matuliene, H. Matusovskyi, J. Metenko, M. Saltevsykyi, M. Segai, E. Simakova-Yefremian, V. Tischenko, T. Tomashevski, B. Holyst, P. Saukko, Yu. Chornous, B. Shchur *et al.* An important basis for the formation of the doctrine of criminalistics and forensics is the development of separate criminalistics theories (doctrines) by certain scientists: identification theory, theory of criminalistics diagnostics, theory of forensic forecasting, theory of

criminalistics leads, theory of tactical operations, theories of tactical techniques systematization, theories of criminalistics didactics, etc. A certain synthesis of the study of the doctrine of criminalistics and forensics is the consideration of general theoretical, methodological and most relevant issues of development of this scientific knowledge in a comprehensive interdisciplinary study in the structure of the legal doctrine of Ukraine¹.

Statement of the scientific problem. Criminalistics, forensic sciences and forensics can be considered in terms of doctrinal approaches, the formation of their methodological principles, theories and concepts. Recourse to the doctrine of criminalistics and forensics requires establishing a relationship with the State's criminal policy and criminalistics strategy. Criminalistics, unlike other sciences of the criminal law cycle, traditionally and historically uses the term "criminalistics strategy" instead of policy. The criminalistics strategy has already been formed as a category and a separate direction.

The development of criminalistics strategy as a separate category in criminalistics has not reached the level of a separate section of science².

The history of criminalistics and forensic science is intrinsically linked to the establishment and development of the institution of involving informed individuals in criminal (or other) proceedings. Forensics is the examination, which is based on the use of specialized knowledge; it is carried out in accordance with the procedural and / or other law individual who possesses specialized knowledge³.

There is a need to establish the relationship between criminalistics and forensic sciences, criminalistics and forensics⁴. At the same time, traditionally, criminalistics and forensic sciences are considered to be controversial sciences, which are intended to contribute to achieving the truth in legal proceedings

¹ Tatsiy, V. Ya., Borisov, V. I., Batyrgareieva, V. S. *et al.* (2013). Criminal law sciences in Ukraine: state, problems and ways of development. Editors-in-chief Tatsiy, V. Ya., Borisov, V. I. *Legal Doctrine of Ukraine*: in 5 volumes. Edited by Tatsiy, V. Ya. T. 5, 1240; Judicial Law, and Forensic Legal Sciences. (2013). Edited by Tatsiy, V. Ya., Borysov, V. *Legal Doctrine of Ukraine*: in 5 volumes. Edited by Tatsiy, V. Ya. T. 5 (2), 472.

² Shepitko, M. V. (2021). *Criminal policy in the field of ensuring the activity of law enforcement bodies*. Monography. 23–25.

³ Shepitko, V. Yu. (2021). Legal regulation of expert activity and trends in the formation of a single European space in the field of forensics. *Topical Issues of Forensics and Criminalistics*. Collection of Writings of the International Scientific and Practical Conference-Polylogy (Kharkiv, April, 15–16, 2021). 93.

⁴ For more details see: Shepitko, M. V. (2020). Conceptual bases of the development of criminalistics and forensic sciences. *Archives of criminology and forensic sciences*. Academic journal. 1, 89–97.

through the development of investigation methods and evidentiary information evaluation. Criminalistics and forensic sciences is a reflection of the different development of science, which develops in different schools and accordingly – scientific fields with the use of those legal, technical, tactical and methodological possibilities, which were in the arsenal of its leading representatives⁵.

The role of national and European non-criminal organizations in the development of criminalistics and forensics

The history of criminalistics knows the times when there was a real push to create certain associations of criminalists for solving certain tasks. In this regard, the history of the emergence and functioning of the International Criminalistic Union (hereinafter referred to as ICU) is interesting.

The creation of the ICS is related not only to the emergence of the scientific idea and the historical circle of its supporters, but also to the active participation of famous personalities – Franz von Liszt, Gerardus Antonis van Hamel and Benoit Adolphe Georges Prince⁶.

It is also important that since 1897 the ICS has had representatives of Ukrainians (belonging to the Russian Empire at the time) (Professor V. P. Danevsky of the Imperial Kharkiv University). Later, (June 12, 1900) the International Criminalistics Union was joined by a renowned criminalist, the leader of the psychological aspect of criminal law, professor of criminal law at the Imperial Kharkiv University L. Ye. Vladimirov, and later on (from September 1, 1901) it was joined by A. A. Löwenstimm and M. J. Kuplevaskyi⁷.

The history of criminalistics knows other examples of the establishment of international criminalistics organizations. For example, in 1929, the International Academy of Criminalistics was founded and based in Vienna, Austria. Its founders were M. Bischoff, E. Locard, C. J. van LeddenHulsebosch, G. Popp, S. Türkel⁸.

Recent publications by renowned criminalists (von R. Ackermann, V. E. Kurapka, H. Malewski, V. Yu. Shepitko) show trends in the development

⁵ Shepitko, M. V. (2020). Conceptual bases of the development of criminalistics and forensic sciences. *Archives of criminology and forensic sciences*. Academic journal. 1, 89.

⁶ For more details see: Shepitko, M. (2019). Ukrainian Group of International Union of Penal Law: Way from Vienna to Paris. *A First Printed Criminalist*. 18, 43–61.

⁷ Shepitko, M. V. (2019). Ukrainian Group of International Union of Penal Law: Way from Vienna to Paris. *A First Printed Criminalist*. 18, 43–61.

⁸ For more details see: *Encyclopedia of Criminalistics in persons*. (2014). Edited by Shepitko, V. Yu.

of criminalistics and criminalistics didactics in various European countries (Germany, Lithuania, Ukraine)⁹.

In the current context in the European space, national associations of criminalists have been created and are successfully functioning, which perform an important role in the development of criminalistics and forensics, promote the best achievements in criminalistics (Lithuanian Association of Criminalists, Polish Association of Criminalists, Slovak Association of Criminalists, German Association of Criminalists, and others).

In particular, H. Malewski rightly says that a certain place in the development of criminalistics, especially at the present juncture, can be taken by the Lithuanian Association of Criminalists (which has been functioning since 2001). Among the initiators of founding the Association were representatives of academic criminalistics, collaborators of expert and criminalistics divisions, police and prosecutor's office. The main goal of the Association is to promote active criminalistics activities, advocate for the achievements of criminalistics and forensics, and involve its members in active scientific and methodological activities. Members of the Association organize and hold seminars, lectures, and competitions. The Association actively participates in conferences "Criminalistics and Forensic Science: Science, Studies, Practice"¹⁰.

Today in Ukraine, the International Criminalists Congress is an international non-profit organization that brings together scientists-criminalists, academics, and specialists of joint fields of scientific knowledge, judicial experts, collaborators of law enforcement bodies, public actors for the protection and defense of their legitimate interests. The existence of a single informational space requires further integration of criminalists, scientists and practitioners of other states and scientific schools, development of modern tools and methods of criminalistics, as well as the popularization of criminalistics knowledge.

An important event in international cooperation among criminalists is the signing by representatives of the Lithuanian Association of Criminalists, the Polish Association of Criminalists and the Criminalists Congress (Ukraine) of Palanga Memorandum on intention to establish the European Federation of

⁹ Ackermann, R., Kurapkai, V. E., Malewski, H., Shepitko, V. Yu. (2020). Schaffung eines einheitlichen europäischen kriminalistischen Raumes. Die Tätigkeit öffentlicher Organisationen zur Stärkung der internationalen Beziehungen. *Kriminalistik*. 6, 355–363.

¹⁰ Malewski, H. (2014). In Search of One's Own Teaching Model – Metamorphosis of Criminalistics Didactics in Lithuania. *Models of Criminalistics Teaching: History and Modernity*. A joint international project: collection of scientific papers. Edited by Yablokov, N. P., Shepitko, V. Yu. 60.

National Associations of Criminalists (16 November, 2017, Palanga, Lithuania). During the XV International Congress “Criminalistics and Forensic Science: Science, Studies, Practice”, which took place on 19–21 November 2019 in Kaunas, Lithuania, where the establishment of the European Federation of Criminal Justice Partnerships (Headquartered in Vilnius, Lithuania) was discussed. As of today, all the organizational measures for the establishment and start of real functioning of the European Federation of National Criminalists’ Associations, in which the association of Ukrainian criminalists has a worthy place, have been completed.

State of Criminalistics and Forensic Science in Ukraine

In Ukraine, the development of criminalistics is carried out in three main directions: 1) development of university science (science at educational institutions); 2) development of academic science (within the scope of activity of scientific-research institutes); 3) development within the limits of departmental subordination (within the scientific and research divisions of the Ministry of Internal Affairs of Ukraine, court and expert institutions of the Ministry of Justice of Ukraine, the Ministry of Health Care of Ukraine and others)¹¹.

The development of university science is carried out, as a rule, through scientific research specialized departments of law faculties, institutes or universities (departments of criminalistics¹², criminalistics and forensic medicine, criminalistics and forensic science, etc.) and the development of scientific topics of criminalistics direction in scientific and research sectors of higher legal education institutions.

Within the framework of academic science, research in criminalistics is carried out by structural divisions of the National Academy of Legal Sciences of Ukraine (NALSU), within the framework of its research institutes (i.e., Laboratory “Application of Modern Achievements of Science and Technology in Combating Criminality” of the Academician Stashis Scientific Research Institute for the Study Crime Problems National Academy of Legal Sciences of Ukraine).

¹¹ See: Shepitko, V. Yu. (2020). Modern State of Criminalistics in Ukraine and Problems of Criminalistic Didactics. *Criminalistic and Forensic Expertology: Science, Studies, Practice*. 50; Zhuravel, V. A., Shepitko, V. Yu. (2021). Development of Criminalistics and Forensics in Ukraine: Approaching a Single European Space. *Legal Science of Ukraine: the Current State, Challenges and Prospects of Development*. Monography. Edited by: Petryshyn, O. V., Zhuravel, V. A., Kuznetsova, N. S. et al. 3, 652, 653.

¹² See: Department of Criminalistics: History of Formation and Development. (2020). *To the 80th anniversary of the foundation*. Monography. Edited by Shepitko, V. Yu. 10.

Coordination of scientific research in this field is carried out by the division of criminal and legal sciences of NALSU. The structure of this department includes a bureau for problems of criminalistics, forensics, operative and investigative activities and legal psychology. In particular, the result of scientific research of the academic science is the preparation of fundamental works and encyclopedic editions¹³.

The development of criminalistics and forensics in Ukraine is related to the development of general and specific criminalistic theories, investigation of problems of criminalistic techniques, tactics and methods of investigation of certain types of crimes, formation of the general theory of forensic examinations (forensic experts). At the present stage, individual scientists and scientific teams are engaged in the development and implementation of scientific and technological means, methods and technologies in the practice of combating criminality. Confirmation of this fact is the presentation of a significant number of dissertations on various problems of criminalistics and forensics, preparation of monographs and scientific articles for publication, participation in international congresses, symposiums and conferences.

Trends in Criminalistics

Criminalistics belongs to the sciences of the criminal law cycle, which is dynamically evolving. Formation of scientific knowledge, which contributes to counteracting crime, is related to different processes: internal integration of criminalistics and integration of separate areas (scientific disciplines), namely forensic toxicology, forensic pharmacology, forensic psychology, forensic psychiatry, forensic medicine, forensic archeology, forensic accounting, forensic expertise, and others.

The formation and development of criminalistics in different countries of the world is a reflection of its integrative nature. The process of development of criminalistics is reflected in the names of scientific disciplines: “Forensic Sciences” in the United States, Great Britain, Canada, Australia; “Kriminalistik” in Germany, Austria; “Police Scientifique” in France, Switzerland. In

¹³ Criminal law sciences. Actual problems of combating criminality in Ukraine. (2008). Edited by Stashis, V. V. *The Legal System of Ukraine: History, State and Prospects*: in 5 volumes. Vol. 5; Tatsiy, V. Ya., Borisov, V. I., Batyrgareieva, V. S. et al. (2013). Criminal law sciences in Ukraine: state, problems and ways of development. Editors-in-chief Tatsiy, V. Ya., Borisov, V. I. *Legal Doctrine of Ukraine*: in 5 volumes. Edited by Tatsiy, V. Ya. T. 5; Criminalistics, forensics, legal psychology. (2018). Edited by: Shepitko, V. Yu. et al. *Large Ukrainian Legal Encyclopedia in 20 vol.* Vol. 20.

English-speaking countries, the term “Forensic Science” is likewise used to define other terms: “Criminalistics” (as part of the forensic sciences), “Criminal Investigation”, “Criminology”¹⁴.

The trend of criminalistics is the transformation and expansion of its subject matter, which is caused by the tendency of science to change the objects that are studied by it. Changes in the paradigm of criminalistics affect the system of knowledge, which is considered to be criminalistics. Globalization of criminalistics implies the following general principles: 1) widening the range of influence of criminalistics; 2) technologization and informatization of criminalistics postulates; 3) unification of criminalistics knowledge¹⁵.

The development of criminalistics and forensics is related to the formation of the terminological apparatus, the language of science. This is confirmed by the preparation and publication of dictionaries and encyclopedias in the field of science¹⁶. Ukraine’s integration into the international and European community necessitates the unification of terminology in the field of science¹⁷.

In the current context, in Ukraine the processes of reforming law enforcement bodies and courts are taking place, the legislation is changing dramatically, and electronic resources are being introduced. Criminalistics is influenced by the changes in the legal framework, the “revision” of traditional institutions of criminal law and procedure.

Actual in the Eastern European countries is the problem of using unified methods, technologies and tools for conducting forensic examinations, implementation and validation of judicial and expert methods, implementation of international standards, certification of scientific and methodological support, definition of a unified system of expert staff training in the framework of

¹⁴ Shepitko, V. Yu. (2020). Nature, subject and tendencies of criminalistics in the context of globalization of the modern world. *Criminal Process and Criminalistics: Critical Issues of the Times*: Collection of Articles. All-Ukrainian Scientific and Practical Conference on the occasion of the 20th Anniversary of the Department of Criminal Procedure and Criminalistics of Ivan Franko National University (June 24, 2020, Lviv). 225, 226.

¹⁵ Shepitko, V. Yu. (2020). Nature, subject and tendencies of criminalistics in the context of globalization of the modern world. *Criminal Process and Criminalistics: Critical Issues of the Times*: Collection of Articles. All-Ukrainian Scientific and Practical Conference on the occasion of the 20th Anniversary of the Department of Criminal Procedure and Criminalistics of Ivan Franko National University (June 24, 2020, Lviv). 225, 226.

¹⁶ *Glossary of Special Terms of Forensics*. (2007). Authors-compilers Mikhailenko, G. V. et al, under general edition by Rubis, A. S.; Shepitko, V. Yu. (2004). *Criminalistics: Dictionary of Terms*; Shepitko, V. Yu. (2001). *Criminalistics: Encyclopedic Dictionary (Ukrainian-Russian and Russian-Ukrainian)*. Edited by Tatsii, V. Ya.

¹⁷ See: *Criminal Law, Criminalistics and Forensic Sciences: Encyclopedia*. (2021). Authors-compilers Shepitko, V. Yu., Shepitko, M.

international cooperation¹⁸.

Currently, Ukraine is experiencing significant changes in the criminal legislation. In particular, in 2020 there is a division of criminal offenses into crimes and criminal misdemeanors. As for criminal offenses, simplified pre-trial investigation is concerned. In this sense, criminalistics must provide an algorithm of actions to law enforcement officers, and offer criminalistics methods of investigating criminal offenses.

The problem becomes particularly relevant due to the need for harmonization of the criminal procedural mechanism in accordance with the European standards, ensuring an appropriate balance of public and private interests¹⁹. During this period, suggestions were made about the necessity of ensuring the prosecutor's, court and lawyer's activities in a criminally safe manner.

In the current context, the formation of criminalistics knowledge is dependent on the scientific and technological progress of human cooperation. The development of criminalistics and forensics, their trends are caused by the influence of world information flows, the integration of knowledge about the possibilities of combating criminality with the aid of scientific and technological achievements of modern society.

An important trend of criminalistics is the integration of knowledge, proposing new, innovative scientific developments, aimed at solving problems of combating criminality²⁰. Digitalization of the social environment has led to the "technologization" of criminalistics, development and implementation of information, digital, telecommunication and other technologies. Today, the state has set the task of digitalization of the most important spheres of public life.

A significant milestone in the implementation of modern information technologies can be attributed to the latest development of the Electronic Court System (the Single Court Information and Telecommunication System), which provides for the exchange of procedural documents in electronic form²¹; use of

¹⁸ Shepitko, V. Yu. (2021). Legal regulation of expert activity and trends in the formation of a common European space in the field of forensics. *Topical Issues of Forensics and Criminalistics*. Collection of Materials of the International Scientific-Practical Conference-Polilog (Kharkiv, April, 15–16, 2021). 93.

¹⁹ Shepitko, V. Yu. (2014). Criminalistics in the system of legal sciences and its role in the global world. *Criminalistics and Forensic examination: Science, Studies, Practice*. Vol. I, 149.

²⁰ Shepitko, V. Yu. (2019). Innovations in criminalistics as a reflection of the development of science. *Innovations and digital technologies in criminalistics, forensics and legal practice*. Materials of the international "Round table" (Kharkiv, December 12, 2019). 147.

²¹ See: Unified judicial information and telecommunications system (UJITS) – "Electronic Court": <https://wiki.legalaid.gov.ua/index.php/>

the Unified Register of Court Proceedings, which is created through an automated electronic database system for collecting, storing, protecting, monitoring, searching for, and consolidating data on criminal offenses²². In addition, the information and telecommunication system of pre-trial investigations is being introduced in Ukraine²³.

It is significant that there are now registries of pre-trial investigations, judicial decisions and forensic techniques that record the status of judicial proceedings (trials). There is an automated document circulation system in the court²⁴.

Information technologies that play the most important role in ensuring the investigation of criminal offenses and court proceedings, include: automated data banks; automated information and process systems; automated workstations; software and hardware systems; software and hardware packages; automated decision making systems; decision making support systems or forensic examination support systems, etc²⁵. At the present stage of development of criminalistics, new scientific and technological devices and technologies are offered for use: audio- and video-control devices, monitoring and registration systems, digital photo and video recording equipment, electronic controllers, unmanned aerial vehicles, etc.

There are additional changes and innovative approaches in the criminal security of law enforcement bodies. In fact, we can state the emergence of a separate criminalistic trend – “*digital criminalistics*”²⁶ (Digital Forensic, Digital Forensic Science or Digital Criminalistics). Special journals use other terms to describe this area – “computer criminalistics” or “criminalistics in computer systems”. At the same time, some scientists even consider computer criminalistics as “the applied science of investigating crimes (incidents), related to computer information, in the investigation of digital evidence, methods of

²² See: Regulation on the Unified Register of pre-trial investigations, the order of its formation and maintenance: approved by Order of the Prosecutor General 30.06.2020 № 289 : <https://zakon.rada.gov.ua/laws/show/v0298905-20#Text>.

²³ See: Law of Ukraine of June 1, 2021 № 1498-IX “On Amendments to the Criminal Procedure Code of Ukraine regarding the introduction of information and telecommunication system of pre-trial investigation”: <https://zakon.rada.gov.ua/laws/show/1498-20#Text>

²⁴ Shepitko, M. V. (2021). *Criminal policy in the sphere of ensuring the activity of justice*. Monography. 132.

²⁵ Shepitko, V. Yu., Zhuravel, V. A., Konovalova, V. A. et al. (2019). *Criminalistics: textbook: in 2 volumes, Vol. 1*. Edited by Shepitko, V. Yu. 47.

²⁶ Shepitko, V. Yu. (2019). Innovations in criminalistics as a reflection of the development of science. *Innovative methods and digital technologies in criminalistics, forensics and legal practice*. Material of the international “Round Table” (Kharkiv, December 12, 2019). 148.

searching, obtaining and fixation of such evidence²⁷.

Digital Evidence and its Role in the Modern Doctrine of Criminalistics and Forensics

The institute of evidence and proof is essential for criminalistics – a self-contained branch of scientific knowledge. In the late 19th century, H. Gross, the founder of criminalistics, viewed it as complementary to criminal law and defined it as a study of the realities of criminal law. In the 1940s, Professor S. Potapov stated that criminalistics is a science of judicial evidence – a science of evidence law. Not coincidentally, in the 60s of the XX century there were already seen monographic works of renowned criminalists such as Professor R. Belkin “Collection, Examination and Evaluation of Evidence. Essence and Methods” (1966) and Professors R. Belkin and A. Vinberg, “Criminalistics and evidence” (1969).

In criminalistics, digital evidence should be considered in the mechanism of their marking formation. There is an axiom, which of its time was suggested by Dr. E. Locard, that “every contact – leaves a trace”²⁸. It can be stated that any criminal offence always leaves traces (materially-fixed, ideal, virtual or electronic). In the context of digital criminalistics people, after using information and communication technologies, leave digital footprints²⁹. In the criminalistics literature, attention was paid to digitalization of evidence³⁰.

In legal doctrine there are different approaches to the understanding of evidence. Evidence is regarded as “facts of reality”, “any factual data that are relevant for criminal proceedings”, “the appropriate medium (source) of information related to them”, “the penal procedures and the form (method) of its consolidation in the materials of criminal proceedings”.

Approaches to the possibilities of working with the so-called digital evidence (digital information or electronic traces) – information created through the use of high information technology deserves special attention. In scientific journals of foreign countries, the term “digital evidences” is widely used, which means any stored data or data transmitted using computer or other

²⁷ See: Hrytsiv. (2013). Criminalistics in computer systems: processes, ready solutions. *Bulletin of the National University “Lviv Polytechnic”. Automation, measurement and control.* 774, 120–126.

²⁸ *Encyclopedia of Criminalistics in Persons.* (2014). Edited by Shepitko, V. Yu. 212–214.

²⁹ See: *Cybercrime. Introduction to digital criminalistics.* Module 4. (2019). 4.

³⁰ Metenko, J., Samek, M., Metenkova, M. (2019). New view of the criminalistic documentation and its use. *Criminalistics and forensic expertology: science, studies, practice.* Book II, 151–152.

technology³¹. Digital evidence is actual data that is filed digitally and recorded on any type of storage medium³².

Along with the term “digital evidence,” other terms are used, such as “electronic evidence,” “electronic traces,” “digital information sources,” “electronic documents,” etc.

Digital evidence requires new approaches to their collection, preservation, use and examination during the proof in criminal proceedings. In working with digital evidence, it is necessary to follow such principles as: availability of training, expert support and prudent caution.

Digital evidence requires verification and authentication (validity verification procedures). In particular, compared to traditional evidence, digital evidence creates unique difficulties during authentication through the amount of available data, its speed, instability and fragmentation³³.

Development of Digital Criminalistics and Criminalistic Strategy, Digital Evidence and Evidence Standards

Digital criminalistics is “a branch of criminalistics centered on criminal procedural law and evidence regarding computers and related devices” (Maras, 2014, p. 29)³⁴, such as mobile devices (e.g., phones and smart phones), game consoles and other devices that function via the Internet (i.e., health and fitness devices and medical devices)³⁵. In addition, digital criminalistics is related to the process of collecting, receiving, storing, analyzing and submitting electronic (digital) evidence in court proceedings³⁶.

Digital criminalistics is a promising trend in the development of criminalistics knowledge and forensics. Therefore, digital criminalistics can be considered as a strategic direction in the development of criminalistics science. At the same time, the criminalistics strategy is defined as a sphere of knowledge with respect to combating criminality by means of criminalistics means for the long term. This means the necessity of development and use of new technologies, the possibility of data fixation in electronic systems, the great distances and extremes, the investigation of electronic and idealized traces, automation of

³¹ Tsekhan, D. M. (2013). Digital evidence concept, features and place in the system of evidence. *Scientific bulletin of the International humanitarian university*. Ser.: Jurisprudence. 5, 257.

³² Tsekhan, D. M. (2013). Digital evidence concept, features and place in the system of evidence. *Scientific bulletin of the International humanitarian university*. Ser.: Jurisprudence. 5, 256–260.

³³ *Cybercrime. Introduction to digital criminalistics*. Module 4. (2019). 6.

³⁴ Maras, M. H. (2014). *Computer Forensic: Cybercriminals, Laws, and Evidence*. Second Edition.

³⁵ *Cybercrime. Introduction to digital criminalistics*. Module 4. (2019). 2.

³⁶ *Cybercrime. Introduction to digital criminalistics*. Module 4. (2019). 2.

investigations and court proceedings by national authorities, work in international groups and institutions for investigations and court procedures³⁷.

It is necessary to state a high interest of scientists and practitioners to the strategy in criminalistics in the XXI century... The survey of 82 judges, 86 prosecutors, and 102 lawyers conducted in connection with the research of the criminalistics strategy in the structure of the criminalistics policy is very interesting. Judges expressed their desire for high-quality changes in the scientific and technological support of court proceedings through the automation of the court proceedings – the development and use of special computer programs, algorithms of court proceedings (91% of respondents). Prosecutors also mentioned the necessity of using modern technical equipment for work at the scene of crime (86%) and the use of photo, video, audio recording equipment, drones and other special equipment when conducting investigative (search and seizure) activities (52%). Lawyers took a similar (intermediate) position to judges and prosecutors and expressed their desire to automate the process of lawyer's activity (54%) and to use photo, video, audio recording and other special technology during pre-trial investigations (58%)³⁸.

One of the main directions of optimization of investigative, judicial and expert activity is its computerization and the possibilities of implementation of information technology – the crushing force of globalization of the modern world and a new category of criminalistics. This new category of criminalistics pretends to occupy a prominent place in its structure³⁹. Moreover, successful investigation of cybercrimes is not possible without obtaining (collecting) electronic (digital) evidence which the evidence base for making motivated and fair decisions is based on⁴⁰.

The development of digital criminalistics takes place in three main directions: 1) formation of a separate scientific field in criminalistics; 2) application of specialized knowledge while working with digital evidence; 3) conducting forensic examinations (computer forensics, in particular).

Special literature rightly points out that the main focus of computer (digital) criminalistics is the study of computer media in order to form evidence

³⁷ Shepitko, V. Yu., Zhuravel, V. A., Konovalova, V. A. *et al.* (2019). Criminalistics: textbook: in 2 volumes, Vol. 1. Edited by Shepitko, V. Yu. 253–254.

³⁸ Shepitko, M. V. (2021). *Criminal policy in the domain of ensuring the activities of justice*. Monography. 25.

³⁹ Shepitko, V. Yu., Zhuravel, V. A., Konovalova, V. A. *et al.* (2019). Criminalistics: textbook: in 2 volumes, Vol. 1. Edited by Shepitko, V. Yu. 41.

⁴⁰ Khakhanovsky, V. G., Hutsalyuk, M. V. (2019). Features of using electronic (digital) evidence in criminal proceedings. *Criminalistics bulletin*. 1 (31), 14.

for the court (conducting computer forensics, copyright objects), as well as the collection of operational information, which will not be used as evidence in court⁴¹. Moreover, computer criminalistics likewise includes other sectors in which the investigation of computer information plays an important role: investigation of incidents of information security in organizations, companies, and banking institutions⁴².

In criminal proceedings, collecting evidence in electronic form is quite a arduous process, due to the complexity of objects... Due to this fact, the assistance of an appropriate specialist (practitioner), which is sufficiently trained in this area is required, because even a small unqualified action on the evidence in electronic form can cause an unintentional loss of valuable information⁴³.

Examination of digital information is carried out during forensic examinations. This type of examinations includes computer forensics as a very new and promising type of forensic examinations⁴⁴, as well as the examination of telecommunication systems and devices (examination of digital and analog devices).

The pursuit of truth in criminal proceedings is a very complex process, the basis of which is evidence. There arises a question about the value of digital evidence, its sufficiency and role in the application of evidentiary standards. It is also important to establish the level of probability of the results of research and the problem of errors committed in the conclusions of forensic analysis during the examination of digital information.

Currently, a list (system) of evidentiary standards to be applied during criminal proceedings (“balance of probabilities”, “preponderance of evidence”, “availability of clear and verified evidence”, “beyond reasonable doubt”) is proposed⁴⁵. The question arises about the relationship between the attainment of truth in criminal proceedings and application of the standards of proof.

⁴¹ Hartsev, A. I. (2013). Criminalistics in computer systems: processes, ready solutions. *Bulletin of the National University “Lviv Polytechnic”. Automation, measurement and control.* 774, 120–121.

⁴² Hartsev, A. I. (2013). Criminalistics in computer systems: processes, ready solutions. *Bulletin of the National University “Lviv Polytechnic”. Automation, measurement and control.* 774, 121.

⁴³ Hutsaliuk, M. V., Havlovskiy, V. D., Khakhanovskiy, V. H. (2020). *The use of electronic (digital) evidence in criminal proceedings.* Method. recom. 2-nd ed., suppl. Edited by Korneika, O. V. 12.

⁴⁴ Rossinskaia, Ye. R. (2001). *Forensic computer-technical expertise.* 119.

⁴⁵ Kret, G. R. (2019). The system of standards of proof in the criminal proceedings of Ukraine. *Bulletin of the Southern Regional Center of the National Academy of Legal Sciences of Ukraine.* 19, 132–139.

Conclusions

An important function in the development of criminalistics, forensic sciences, and forensics is performed by criminalists, as well as by national and international non-profit organizations, which promote the best achievements of criminalistics science, popularize criminalistics knowledge, and advocate the necessity of using the best achievements of science and technology in combating criminality.

Criminalistics and forensics have a sufficiently high level of scientific research; the system of scientific knowledge has been formed. In the structure of criminalistics and forensic examinations, their general theory is actually formed and a whole range of specific scientific theories and teachings is proposed. In Ukraine, the development of criminalistics and forensics requires the existence of university and academic science, as well as its initiation within the limits of the departmental subordination.

The current state of development of criminalistics is characterized by the emergence of a new and promising trend – digital criminalistics (Digital Forensic, Digital Forensic Science or Digital Criminalistics). This is due to the digitalization of daily life, implementation of electronic systems and resources in the activities of law enforcement bodies and courts (electronic registries, electronic court, automated workstations, etc.), as well as the training of law enforcement officers and judges), as well as the commission of crimes in the cyber space.

Digital criminalistics is attributed to the strategic directions of science development (criminalistics strategy) and practical activities of law enforcement officials. Investigated is the use of modern information technology in the activities of judges, prosecutors and lawyers.

The role of digital evidence (digital information or electronic traces) in the modern doctrine of criminalistics is specified. Digital evidence requires new approaches to their collection, storage, use and examination during the proof in the criminal proceedings.

KRIMINALISTIKA IR TEISMO EKSPERTIZĖ UKRAINOJE: ISTORIJA IR ŠIUOLAIKINĖS TENDENCIJOS

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Santrauka

Straipsnis skirtas kriminalistikos, teismo ekspertizės ir teismo ekspertologijos formavimosi problemoms ir dabartinei būklei Ukrainoje pristatyti. Nagrinėjami istoriniai mokslo (specialiųjų žinių) taikymo nusikaltimų prevencijoje ir tyrime aspektai, pristatomi atkirų ekspertizės rūšių (teismo medicina, teismo psichiatrija, teismo psichologija, teismo toksikologija, teismo ekonominė ekspertizė ir kt.) formavimosi ypatumai. Analizuojamas kriminalistikos, teismo ekspertizės ir ekspertologijos santykis, apibrėžiamas jų vaidmuo dabartiniame kontekste.

Kriminalistikos, teismo ekspertizės ir ekspertologijos funkcinė paskirtis leidžia nustatyti jų raidos kryptis ir tendencijas. Šiuo metu aktualiausia kriminalistikos, teismo ekspertizės ir ekspertologijos paskirtis yra implementuoti naujausias priemones, technikas ir technologijas į baudžiamojo persekiojimo sistemą, prisidėti prie ikiteisminių, teisminių ir neteisminių procesų optimizavimo, gerinti teisės saugos pareigūnų ir ekspertų veiklą.

Kriminalistikos ir kitų kriminalistinių mokslų formavimasis ir raida Ukrainoje atspindi jų integracinę funkciją. Kriminalistikos raidą, jos tendencijas lemia informacijos srautų įtaka, visuomenės technologinė pažanga. Skaitmeninė kriminalistika, skaitmeninių įrodymų naudojimas, informacijos šaltinių apsauga ir informacijos saugumo problema turėtų tapti svarbia vystymosi kryptimi.

Straipsnyje nagrinėjamas nacionalinių ir Europos nevyriausybinų organizacijų vaidmuo plėtojant kriminalistiką, teismo ekspertizę ir ekspertologiją artėjant prie bendros Europos erdvės.

Raktiniai žodžiai: kriminalistika, teismo ekspertizė, ekspertologija, istorija, specialiosios žinios, teismo ekspertizės rūšys.