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Regulatory and Legal Regulation and Organization of Forensic Examination of Documents

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Abstract

The relevance of the research topic is determined by globalization factors and the development of a number of ways that can be used to manipulate documents as a source of evidence within the scope of investigative actions. The following methods were used in the work: historical, systematic, comparative, analysis method, legal hermeneutics method and others. The main results of the conducted research were the following: clarification of the chronology of the development and birth of the forensic institute regarding the investigation of documents, a detailed identification of the peculiarities of the regulation of this area within the limits of Ukrainian legislation with a study of the main normative legal acts. Specific features regarding the organizational aspects of the forensic investigation of documents, the types of such investigation and the methodology of its conduct are highlighted.

Keywords: Technical Research; Handwriting; Globalization; Criminal Process; Forgery.

Introduction

Forensic investigation of documents is a branch of forensic science and legal technique, where the origin of a particular document is found out, its analysis is carried out and some properties are identified for forgery. The relevance of its study and research in the modern world plays an important role, in particular, due to the need to ensure the "authenticity" and integrity of documents, the prevention of theft of intellectual property and fraud. In view of this, the purpose and main tasks of this work are to clarify the specifics of this institute, its historical origin and development, as well as legal regulation within Ukraine and the border.

For a broader analysis of the relevant topic, it is worth considering the works of other scientists. For example, Ukrainian authors O.L. Kobylyanskyi and A.V. Korneeva (2022) studied the concept of technical forensic examination of

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documents, its objects, methods, and prospects for development. Historical examples of the falsification of documents and their evolution related to the development of writing were also analysed. The authors also paid attention to the problematic aspects of the appointment and conduct of technical forensic studies of documents, including their importance in criminal proceedings on economic crimes (Chornous & Leliuk, 2023; Panov, 2023). The researchers also noted the need to introduce innovative technologies in the field of forensic document investigation. Another Ukrainian author V.S. Sezonov (2020) investigated the origin of forensic document studies, the development of knowledge in this field, and also proposed ways of detailing and expanding the basis of the classification of documents and their specific signs. The author singled out different types of documents and peculiarities of their research through handwriting, seals, stamps, signatures.

O.M. Sezonova and V.S. Sezonov (2022) investigated the possibilities of modern computer technologies for creating special documents and the prospects of using advanced forensic methods for researching such documents. In the work, the authors found out the main types of documents, the danger of using information technologies for the production of criminal data carriers, and also identified possible ways to develop the methodology of forensic investigation of documents, in order to prevent those types of crimes that have been developing recently due to the development of technologies and related with cybersecurity.

Ukrainian authors O. Samoilova and I. Pecherska (2022) analysed problematic issues regarding documents with altered content in the field of forensics. Researchers note that documents are a frequent object of examination due to their wide use in criminal activities, as well as physical evidence, documents are carriers of valuable information for investigating and solving crimes, punishing offenders. However, document analysis can be a complex task that requires specialized knowledge, especially when dealing with securities, currency, and other types of documents (Karnaukh, 2021; Antipova, 2023). That is why, the authors point out, forensic experts must have a deep understanding of various spheres of social life in order to identify and evaluate the properties that characterize this or that document, in order to avoid forgeries or early detection of signs of falsification.

T.F. Bezsonna and L.S. Zubtsova (2021) analysed the issues that arise during the technical examination of documents, and also emphasized the importance of experience and knowledge in criminal proceedings. The article also discussed the importance of proper organization and communication between the initiator of the examination and the expert institution that conducts the examination. In order to solve these issues, the authors propose to improve the methodological materials for ordering and conducting the technical examination of documents in accordance with

modern scientific and technical capabilities, as well as to provide expert institutions with modern technical equipment for high-quality and comprehensive examination.

The analysis of scientific works makes it possible to indicate that the majority of attention is paid to the problems of technical and forensic investigation of documents, as well as to the correlation between the development of information and communication technologies and the increase in forged documents. In turn, less attention has been paid to the regulatory regulation of this institute, as well as to the study of foreign experience regarding the legal regulation of the forensic examination of documents.

Materials and methods

The research was carried out using a number of methods of scientific knowledge, in particular, the main one was the historical method, with the help of which the genesis of the Institute of Forensic Research of Documents and its development both within the Ukrainian state and beyond the border Also, using the historical method, the step-by-step development of this field was singled out, taking into account those transformations that affected the current state of the field of forensic technology.

The scientific research also used the method of legal hermeneutics, with the help of which the issue of the concept of documents, normative and legal regulation of the forensic examination of documents and the analysis of the main legislative acts and norms (codes and separate special laws, instructions of central executive bodies and recommendations) were clarified. The systematic approach, in turn, was used in order to form a holistic understanding of the concept of forensic investigation of documents, taking into account such specific features as: features of the institute, its subject and object, main varieties and classification grounds. The study also clarified a number of methodological approaches to the study of documents in the field of forensics belonging to the institute as an evidentiary basis during the investigation of offences, investigation. In addition, the peculiarities of the preparation and organization of forensic examination of documents are revealed.

Using the comparative method, the question of the foreign experience of legal regulation of the Institute of Forensic Research of Documents was investigated, in particular, the experience of France, Germany, the Republic of Poland, and the United States of America was taken into account. Thus, the coverage of this experience became the main basis for proposals for improving the Ukrainian approach to the study of documents. With the help of the analysis method, questions related to the problems of modern technical and forensic research of information carriers were investigated, and on the basis of their isolation, possibilities for their solution are proposed. Also, the synthesis method made it possible to combine and,

in its integrity, to examine all the important characteristics and elements of the above-mentioned institute in order to single out the prospects for the development and improvement of this field, taking into account technical achievements and globalizing world processes and computer technologies. Using the method of analogy, the similar and different properties and features between foreign methods of document research in the field of forensics and Ukrainian ones were investigated, respectively.

The use of the statistical method came in handy when clarifying the value of the relevant institute based on statistical indicators regarding the conduct of the investigation, investigative (search) actions, other procedural measures, disclosure of criminal offences using documents as evidence. Data on the number of crimes related to the forgery of documents for illegal purposes is also provided. The source of statistical information in this work is the Office of the General Prosecutor of Ukraine (About registered criminal offenses and the results of their pre-trial investigation, 2023).

Also, the scientific method of modelling made it possible to form the future vision and form of regulation of the Institute of Forensic Research of Information Carriers, based on of the world achievements. Also, with the help of such a method of scientific knowledge as induction, a general conclusion related to the subject of the study was formed on the basis of certain clarified and analysed elements of the above-mentioned institute.

Results

Since ancient times, people have tried to forge or change the content of documents, guided by various goals: selfish, personal. History shows that in Ancient Rome, forged wills and loan documents were widely used as a means of enrichment. Since documents often define the rights and obligations of people, and also have a connection with legal actions, events or other facts, they are the object of encroachment by violators.

The first editions devoted to the problem of identifying and recognizing forged documents appeared in the 17th century, among them the book by F. Demel "Advice on the recognition of forged manuscripts" and J. Raveno's "Treatise on forgeries" (Kapoor et al., 2021). Revealing the genesis of the study of documents on the territory of Ukraine, it is worth relying on the state of forensic science in the Russian Empire at that time, which was partly a part of the state. Thus, at the end of the 19th century, there were generally no forensic institutions in the empire that would have the authority to examine documents for forgery, this function was performed by persons with special knowledge. A decisive role in the further development of this institute was played by the judicial reform of 1864, when the

circle of subjects authorized to conduct relevant examinations expanded. There was also an institution that checked suspicious documents for forgery, if this fact was confirmed, the document was sent for a number of additional examinations to restore the original content (Tomar et al., 2021).

The further development of Ukrainian criminology and forensic expertise was attributed to the establishment of the Kyiv Cabinet of Scientific and Forensic Expertise, headed by S. Potapov; later, a similar office was opened in the city of Odessa. It is also worth noting the important role of the Kyiv Institute of Forensic Science, which developed not only practical skills in the researched field, but also formed Ukrainian scientific doctrine (Sezonov, 2020). The modern development of the forensic examination of documents is connected with the activities of the Ministry of Justice of Ukraine and a number of research institutes, divisions of the Ministry of Internal Affairs in particular.

Regarding the foreign experience of the development of this institute, it is appropriate to note that in Germany, forensic examination of documents dates back to the beginning of the 20th century, when the first scientific laboratory of forensic documents was founded in 1901 (Sharma et al., 2021; Cherniavskyi et al., 2022; Curanovic, 2022; Boyd-Barrett, 2023). He primarily focused on the investigation of documents related to financial fraud and forgery cases. In France, forensic examination of documents began in 1910 with the creation of a similar bureau, which also dealt with handwriting analysis and forgery of documents. Document forensics in the United States began in the early 1930s, with an emphasis on handwriting and fingerprint analysis. In 1932, Albert S. Osborne published the book Doubtful Documents, which became the main reference in this field. The Federal Bureau of Investigation (FBI) Forensic Records Laboratory was founded in 1932 and is currently the primary resource for document forensics in the United States.

Returning to the understanding of the forensic investigation of documents, it is worth noting that this concept embodies the development of techniques, methods of review, analysis, and research of documents. This study has a clearly defined goal: collection of the evidence base, prerequisites for committing an offence, development of further strategies for combating manipulation of documents (Vapniarchuk et al., 2021). Considering this definition, the object of this institute is precisely the documents. The subject of the forensic examination of documents as direct evidence is the content of the techniques used to analyse the documents, the provisions on the possibilities of using technical means, as well as the data obtained during the investigation itself.

The term "document" is used with different meanings. Its normative interpretation is presented in the Law of Ukraine "On Information" (1992), where it is indicated that a document is a material carrier of information, which also

performs several basic functions in terms of preservation, transmission of relevant information in space and time. The doctrine regarding the role of the document in forensics indicates that the following types of documents should be included: written, graphic, photo, film, phonographic documents; all of them can act as physical evidence. It is also possible to classify documents in forensics according to their legal essence: genuine and forged documents; in particular, in real documents the content and their mandatory details correspond to reality, in fake ones — not. In particular, a forged document can also be classified based on the method of committing the forgery: intellectual or material forgery (Sezonov & Sezonova, 2022). The first is the introduction of knowingly false information into the content of the document, while maintaining its correct issue and form, and the second involves both changing the content of the document and its form.

Given the different classification grounds for dividing documents, their forensic investigation is also divided into several main sections: forensic investigation of writing and technical forensic investigation of documents. Forensic writing is the process of examining documents to establish the authenticity of documents, detect forgeries, establish authorship, and identify the person who wrote the document. Writing examination is an important component of forensics, used in cases of fraud, forgery, crimes against personal integrity, crimes against property and many others. Handwriting forensics usually involves analysing the handwriting, as well as the way the letters are written, the size and shape of the letters, word combinations, and placement on the page. The main principles of handwriting research are the establishment of specific signs of writing that are unique to each person.

When examining documents with this content, in addition to handwriting analysis, the expert pays attention to details that may indicate the forgery of the document, such as paper, seals, stamps, and other design elements. Peculiarities of forensic writing research are that they require a high level of professional competence and experience of an expert, since the results of the research can be important for the court and the final decision in criminal cases. It is also worth noting that the forensic investigation of writing can be performed using modern innovative achievements as well as traditional research methods. For example, with the help of computer programs that allow performing an automated comparison of handwriting and determining its characteristics using data analysis. Such programs can help forensic experts increase the accuracy and efficiency of their investigations. The main specific features of the technical forensic examination of documents are the use of special equipment and software that allows for the detection of forgeries, the examination of residual traces left on documents and the use of digital data processing technologies.

Among the stages of this research, it is possible to single out several: visual inspection of documents in order to detect signs of forgery or interference; use of special tools, such as microscopes, to study the features of documents and collect material samples; using technical means, such as a light scanner or a camera, to obtain high-quality images of documents; research of authenticity, authorship. It should also be noted that, depending on the nature of the examination, there is a division into the examination of requisites (detailed analysis of all elements of the document, including its format, font, size, style, and arrangement of text, security marks, seals, signatures, stamps and other markings) and examination of materials (detection and analysis of the various materials that can make up documents, such as paper, ink, paints, adhesives and other materials). With regard to the methodology of technical and forensic examination of documents, the main one is diagnostic, which consists in establishing methods of changes to the document, its type, content, taking into account invisible, etched, cleaned records.

In Ukrainian legislation, there is a certain system of normative legal acts that regulate the conduct of forensic examination of documents, as well as establish certain requirements for the organization of such an examination and for the expert who is authorized to conduct the relevant examination. Besides it, it is worth paying attention to the provisions of the Criminal Procedure Code of Ukraine No. 4651-VI, Article 358 "Research of documents" which indicates that if the protocols of investigative (search) actions and other documents attached to the materials of criminal proceedings contain information that is important for establishing the circumstances of the criminal proceedings, then the court at the initiative of the court or at the request of the participants in the court proceedings, must announce them at the court session and present them for familiarization (Criminal Procedure Code of Ukraine, 2012). In addition, participants in court proceedings can ask questions about documents to witnesses, experts, and specialists. If any document raises doubt about its authenticity, the participants in the court proceedings can ask the court to exclude it from the evidence and decide the case on the basis of other evidence or to order an appropriate examination of this document.

It is also worth highlighting the regulatory act No. z0705-98 (Instruction, Recommendation) (Instructions on the appointment and conduct…, 2023). In particular, it recognizes the main types of examination, including handwriting and technical examination of documents. As a basis for carrying out one or another examination, the Instruction determines the presence of a procedural document on the appointment of the corresponding examination, which is drawn up by a person with sufficient authority with mandatory details, questions and defined objects of research. Section 2 of the researched act also contains provisions on the rights, duties, and responsibilities of the expert, in particular, he has the right to familiarize

himself with the case materials that are directly related to the examination, to submit a request for the provision of additional samples and items related to the examination object; also, the expert is obliged to accept for execution this or that examination entrusted to him and others.

Section 4 of the Instructions is also important, which defines the specifics of the examination, its organization and the proper registration of the results obtained as a result of the expert's activities. Thus, the expert is appointed by the head of the relevant expert institution, who can set the necessary deadline for the completion of the task. During the examination, the person authorized to conduct it must use all means that will preserve the object under investigation; if it is not possible to save the object, then the written consent of the head of the institution is requested for its damage or destruction. Also, documentary materials that were examined by an expert or provided for comparative research must be marked with appropriate stamps (Kulyk, 2022). As for the conclusion, it must contain such mandatory details as: the name of the document, the relevant type of examination and its category. As for those items that were the object of the examination and were preserved, they are returned to the person who ordered the relevant examination.

The Recommendations, which are part of the above-mentioned Instructions, describe in detail how all types of forensic examinations should be conducted, in particular the technical examination of documents, fixed in point 3. In particular, these recommendations contain indicative lists of issues that the expert should focus on when conducting one or another type of technical examination of documents. For example, during the technical examination of props, the expert must provide answers to the following questions:

1. Have changes been made to the text of the document? What exactly were the changes made (modification, addition, removal)? What was the original text?
2. Was the photo card in the document replaced?
3. Have the sheets in the document (contract, notebook, book, medical card) been replaced?
4. What was the meaning of the text that was masked (painted, dirty, smeared)?
5. What was the original meaning of the text that was discoloured?
6. Does the document contain hidden text?
7. Is there any text or image on the document that has been exposed to fire?

It is quite interesting to consider recommendations for documents that were produced with the help of computer technology. Yes, this equipment for research must be provided complete, it is not allowed to use this equipment before it is sent for examination, the change of removable parts of equipment (cartridges) is also

investigated. To emphasize the importance of understanding the research topic, it is worth citing some statistical data in Figure 1.

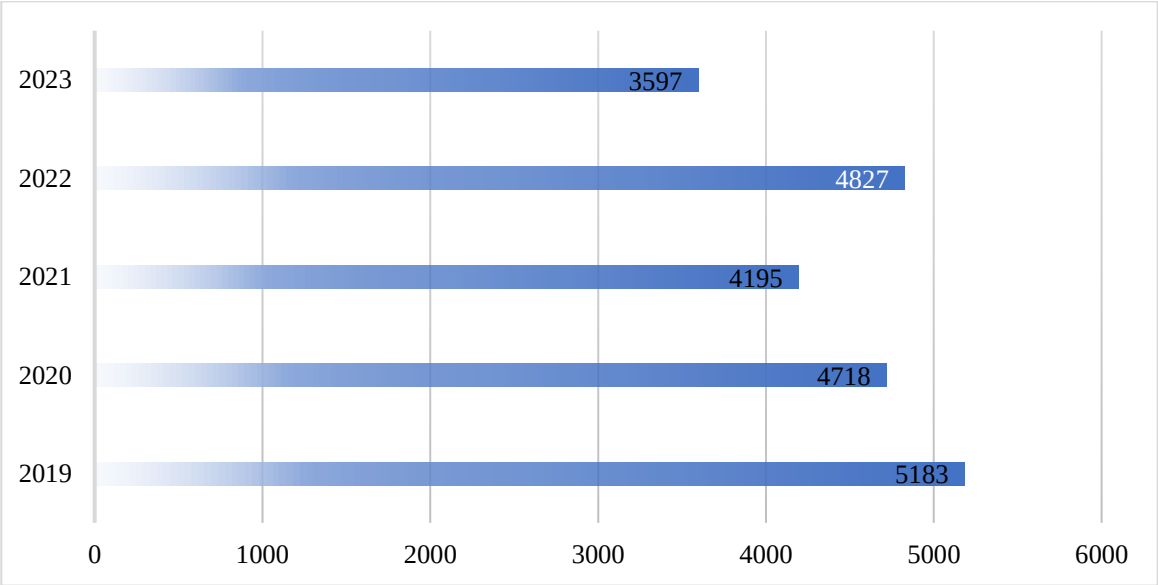

Figure 1 *Criminal offences registered under Article 358 of the Criminal Procedure Code of Ukraine in the reporting period February-January 2019-2023 Source: (*About registered criminal offenses and the results of their pre-trial investigation, 2023*).*

Statistical data indicate the existence of a problem in the relevant field, which is why it is advisable to take a closer look at its features in such countries as Germany, the USA, France, and Poland. In Germany, technical and forensic examination of documents is carried out by federal and state agencies criminal investigation bodies. Specialists in this field have extensive experience in forensic examination and use advanced methods to analyse and confirm the authenticity of documents (Massini et al., 2021). In the United States, forensic examination of documents is carried out by private forensic laboratories and government agencies such as the FBI and the National Security Agency. In recent years, digital forensic methods have become increasingly important in the investigation of documents, since many documents are now created and stored electronically, so the country pays more attention to this direction (Hicklin et al., 2022). In France, the forensic examination of documents is carried out by the Institute of Criminal Research of the National Gendarmerie. French specialists in this field have made a significant contribution to the research of ink analysis, they have developed methods for the

analysis of its various types, such as ballpoint, gel, and fountain pen inks. As for Poland, specialists in this field have made a significant contribution to the development of methods for analysing printing processes, such as offset printing and xerography, and have also developed methods for analysing documents that have been altered or falsified (Geistova Cakovska et al., 2021).

With the widespread use of electronic devices and digital documents, forensic examiners in the US have had to adapt their methods to incorporate digital analysis (Revak & Gren, 2022; Yesimov & Borovikova, 2023). For example, in cases involving digital documents, experts can use specialized software to analyse metadata, such as the dates of creation and modification of files, to determine the authenticity and integrity of the document. In addition, digital forensics can also help in detecting the alteration or forgery of digital documents. For example, digital image analysis can be used to detect changes in colour, lighting, or texture that may indicate a forgery of a digital image. Therefore, currently, Ukrainian experts and legislators should pay attention to the above-mentioned aspects regarding the improvement of the procedure for examining documents created using computer technologies.

Discussion

For a deeper analysis of the relevant topic, it is also necessary to analyse the works of other authors on the relevant subject of research. For example, edited by M. Angel and J.S. Kelly (2020) published a book containing the opinions and work of leading experts in the field discussing various aspects of document forensics, such as handwriting analysis, ink analysis, and digital document forensics. The book emphasizes the importance of implementing technological progress in the examination of documents. The authors also recognize the challenges associated with the increased use of digital documents and the need for specialized training and equipment for their analysis. The results of the authors coincide with the results of this work, in particular, in terms of recognition of the need to take into account modern trends in the study of documents within Ukraine in order to reduce the level of crime in the relevant field.

In their article, I.E. Dror et al. (2021) investigated potential issues regarding expert bias and reliability during document examination. The research focuses on whether contextual information affects examiners' judgments and whether this affects their reliability. The study used a simulated crime scenario where participants were asked to examine a document and determine whether it was genuine or forged. They were given either neutral information or information that could influence their judgments. The results showed that when participants were given contextual information, such as the suspect's motives, they were more likely

to make judgments that were consistent with that information. The authors suggest that this may be due to confirmation bias, where people seek information that confirms their prior beliefs. The study also found that the reliability of examiners varied widely, with some examiners consistently making accurate judgments while others were less reliable. This suggests that there may be individual differences in experience and cognitive processes that affect examiner reliability. The results of the authors only partially coincide with the results of this work, in particular, in terms of the need to involve professional experts in conducting a forensic investigation. However, it is worth agreeing and taking into account the considerations and data given by the authors regarding the likelihood of individual and contextual influence on the reliability of the expert evaluation. This problem can be solved through the obligatory involvement of information and communication technologies during the study of documents.

In the article, author S. Willis (2022) discusses the problem of professionalism in the field of forensic examination. The author outlines the main principles of professionalism in forensics, including competence, objectivity, honesty, and accountability; discusses the importance of continuing education and training for forensic scientists and the need for clear ethical principles and codes of conduct. The article also examines some problems faced by experts during the performance of their duties, in particular, the problem of certainty in the legislative regulation of the implementation of expertise and the need to improve quality control and standardization. Although the author's results only partially coincide with the results of this work, it is worth agreeing with the reasoning of S. Willis and noting that there is also a problem in Ukrainian legislation regarding the precise and comprehensive regulatory regulation of the organization of the examination, in particular, it needs to be improved in terms of the study of documents created under using computer technologies. It is also appropriate to note that, both in Ukraine and in most European countries, there is a problem of inconsistency of legislation with modern realities and technologies. For example, the emergence of digital documents and electronic signatures has created new challenges for forensic experts and legislators, who must adapt to new technologies and develop new methods of research and verification of these documents (Krasiuk, 2022). In addition, the legislation often lacks clarity and specificity regarding the qualifications and training requirements of experts, as well as the methods and procedures for forensic examination of documents. Thus, the legal regulation of forensic examination of documents both in Ukraine and in European countries faces several problems related to the uniformity of legislation, technological progress, qualifications and training, as well as the admissibility of evidence.

Also, authors T.V. Hryhorovych and L.V. Kravets (2019) considered the possibilities of using forensic handwriting examination and technical examination of documents during the investigation of crimes in the field of economic activity. The authors emphasize that crimes in the economic sphere are often associated with the forgery of documents, therefore it is important to use forensic handwriting examination and technical examination of documents to detect forgeries and establish the authenticity of documents. The article presents the main methods of forensic handwriting examination, including comparative analysis of handwriting, analysis of gaps on paper, study of sizes and proportions of letters, determination of violations in writing and other signs of authenticity of documents. The works of the authors only partially coincide with the results of this work, but they are an important contribution to the understanding of the importance and relevance of the forensic investigation of documents as evidence in a number of criminal violations, which are most often associated with the forgery of documents for material gain.

Such authors as S. Gupta and M. Kumar (2020) proposed the development of a system of forensic examination of documents using machine learning algorithms. In particular, the authors emphasize the use of an automated system that can analyse handwriting and signature samples, which are often important pieces of evidence in forensic investigations. The authors evaluate the performance of their system using a dataset of 1500 handwriting and signature samples. They report 98.6% accuracy for the signature verification task and 96.3% accuracy for the handwriting verification task; note that their system has potential for use in real-world forensic research, as it can provide fast and accurate analysis of handwriting and signature samples.

A similar work is presented by the authors of T. Dieb et al. (2020), who propose a novel biometric system for document forensics, which aims to improve the accuracy of document authentication and identification using several biometric characteristics derived from the handwritten text. The proposed system uses image processing techniques to recognize various features from the handwritten text, including texture, shape, and stroke features. It is worth noting that, although the results of the study do not coincide with the results of this work, the authors' approach to the development and improvement of the field of forensic investigation of documents, in particular through the involvement of machine learning and biometric systems, deserves attention. It is also worth adding that the use of machinery and automated systems is impossible without the involvement of human presence (experts) (Medvedska, 2022).

It is also quite important to highlight the issue of the role of computer technologies in the process of forensic examination of documents. On the one hand, computer technology has facilitated the analysis and comparison of different types

of documents, including electronic files, with greater accuracy and speed. Computer software can now be used to detect forgeries or alterations in digital documents that were previously much more difficult to identify (Petersone et al., 2021; Boiko, 2023). However, the growing use of digital documents and the rapid pace of technological change have created significant challenges for experts. One of the main problems is the correspondence of the methods of document research to modern technologies, according to which they are created. In addition, the development of "deepfake" technology, which uses artificial intelligence (Getman & Karasiuk, 2014)) to manipulate audio and video content, creates even more challenges for experts and specialists (Sezonov et al., 2022; Yukhno et al., 2023). Only a systematic improvement of the legislation, as well as a change in the organization of the forensic investigation of documents with the introduction of new methods and ways of researching data carriers, can prevent a gap between the qualitative activities of experts and the activities of criminals regarding forgery and other manipulations of documents.

Conclusion

The conducted scientific and research work made it possible to highlight important aspects related to the organization and regulatory regulation of the forensic examination of documents as evidence. The historical aspect of the development of the relevant industry both during the times of the Roman Empire and in the period of the 19th-20th centuries on the territory of Ukraine was clarified. The current state of the forensic investigation of documents is clarified and the determining role of the Ministry of Justice of Ukraine in the development of the industry is indicated.

The concept of a document as an object of forensic research was singled out and defined, in particular, the legislative definition and main features, classification grounds were indicated. The types of forensic examination have been clarified: technical forensic examination, handwriting examination, examination of props and examination of materials. The specific features of each of them are characterized. The normative legal acts regulating the relevant industry were analysed: Law of Ukraine "On Information" No. 2657-XII, Law of Ukraine No. 4651-VI, as well as regulatory act No. z0705-98. As a result of the analysis of these regulatory documents, the specifics of conducting the relevant examination, the peculiarities of the design of the results of its conduct, and the recommended list of issues that should be guided by the expert during the performance of one or another examination of documents are indicated. Foreign experience in this field is also indicated, in particular, the experience of Germany, the USA, France, and Poland. The main achievements worth borrowing were the achievements of the United

States of America in the field of application and implementation of computer technologies and the harmonization of technological progress with the forensic examination.

For further research on the related topic, it is suggested to find out the following questions: determination of the peculiarities of the study of various types of documents (for example, documents using different types of paper or printed symbols) and the development of methods for their identification; research on various aspects of working with electronic documentation, such as analysis of electronic signature, e-mail, data purpose and other digital traces; automated analysis of documents: opportunities and limitations.

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