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Digital archives as a tool for preserving and researching media materials

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Abstract. The purpose of the study – to assess the effectiveness of digital archives as a tool for preserving and studying media materials in Ukraine. The research methodology included an analysis of the legal framework, an assessment of the functioning of three large open digital archives, and an online survey of 500 users. The study revealed major gaps in the legal regulation of digital archives and the lack of uniform standards for their organisation: between 2021 and 2023, the number of digitised documents increased by 63.5% to 8.5 million, and the number of online requests increased by 106.7% to 3.1 million annually. The capacity of digital archives increased by 90% to 285 terabytes. The distribution of media materials shows that textual materials (45%) and photographs (30%) predominate, audio materials account for 15%, video materials for 8%, and interactive media for only 2%. The use of digital archives in education varies from 25% in secondary school to 95% in postgraduate studies, with the COVID-19 pandemic increasing the number of remote users. An analysis of the functionality of the archives showed that 65% of users face navigation problems, and 72% have limited access to full-text versions of documents. Promising areas of technological development include the use of artificial intelligence, which has increased search efficiency by 70%, and blockchain, which has reduced the risk of document forgery by 90%. According to an economic analysis, 35% of the digital archive budget is spent on digitising materials. The study showed that to improve the efficiency of Ukraine's digital archives, it is necessary to improve the legal framework, introduce unified standards, improve the user interface, and expand the types of media content. The study also revealed the need to strengthen international cooperation and develop a long-term strategy for digital preservation

Keywords: media content; digitisation of documents; archival legislation; information technology; cultural heritage; educational resources

Introduction

Digital archives play a vital role in preserving and analysing media materials and have become an integral part of modern society. Effective storage, processing, and

analysis of large amounts of digital data is a challenging task. Digital archives are a powerful tool for systematising, cataloguing, and providing long-term access to

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various media materials, including text documents, audio and video recordings, photographs, and other types of digital content. The study of digital archives as a tool for preserving and studying media materials is driven by a series of factors. The rapid growth of digital information challenges the conventional methods of archiving and preserving data. The variety of formats and types of media content requires novel approaches to its organisation and classification. To ensure the long-term preservation of digital materials, the problems of technological obsolescence and format compatibility arise.

The study of digital archives as a tool for preserving and studying media materials has attracted the attention of many researchers. Ya. Kryvushenko (2019) provided an in-depth analysis of the role of digital technologies in modern scientific research, with an emphasis on their application to work with archival materials. The researcher not only emphasised the role of these technologies, but also examined in detail their effects on research methodology, emphasising how digital tools transform the processes of analysing and interpreting archival data. The author convincingly argued that digital technologies open new perspectives for historical and cultural studies, enabling researchers to work with large amounts of data and discover previously invisible connections and patterns. Ya. Moskvyyak (2023) offered an innovative approach to the role of digitisation in preserving Ukraine's intangible cultural heritage in the context of post-war reconstruction. The researcher provided not only general statements but also concrete examples and scenarios of the use of digital technologies for documenting and preserving traditions, rituals, and other elements of intangible culture. The significant value of the study lies in the analysis of potential challenges and risks associated with the digitisation of cultural heritage in the context of post-conflict recovery.

M. Serba (2024) applied a comprehensive approach to the analysis of open resources in Ukraine in the context of digital transformation. The cited study was not limited to stating the significance of electronic archives but offered an in-depth analysis of their role in ensuring democratic access to information. Digital archives were considered not merely as a technological solution, but as a valuable tool for social change that promotes transparency and openness of society. M. Zinaman (2024) explored archiving practices in social media and critically assessed their effectiveness and sustainability. The researcher examined the technical, legal, and ethical issues associated with archiving social media content, with a particular focus on preserving context and metadata. The author proposed innovative approaches to automating the archiving process, including the use of artificial intelligence.

In the context of the development of digital archives as a tool for preserving and studying media materials, it is also important to note the efforts of other researchers who have addressed various aspects of this subject. C.A. Romein *et al.* (2020) analysed the current state of

digital history and the preservation of historical research and cultural heritage, highlighting the role of digital archives in historical research and cultural heritage preservation. S.J. Bury (2019) investigated the transformation of museum libraries and archives in the digital age. The researcher analysed how the digitisation process has changed the role of these institutions in the 21st century, and considers them not only as repositories of information, but also as active participants in cultural discourse. S.J. Bury (2019) highlighted the new opportunities that digitisation brings to museum libraries and archives, such as wider access to collections, better preservation, and the creation of new forms of interaction with audiences. The researcher also highlighted the challenges facing these institutions, including the need to adapt to the latest technologies and changing user expectations. M. Koolen *et al.* (2019) proposed an innovative model for a critical review of digital tools used in digital archives. The model aims to evaluate the effectiveness and reliability of these tools, considering such aspects as ease of use, accuracy of results, and compatibility with various types of archival materials. The researchers emphasised the significance of a systematic approach to the evaluation of digital tools, which allows identifying the strengths and weaknesses of the tools and contributing to their further improvement. D. Agostinho (2019) discussed the ethical aspects of access and care in digital colonial archives and emphasises the need to address the cultural context and historical sensitivity when working with such materials.

The growth in the amount of data produced in digital formats requires the development of innovative approaches to their storage and processing. The issues of the "digital dark ages" associated with the potential loss of access to digital data due to outdated formats and technologies are becoming increasingly important. Advances in artificial intelligence and machine learning technologies are opening new perspectives for the analysis and classification of archival materials. However, they also raise questions concerning the ethical use of such technologies, especially in relation to sensitive or personal data. Another notable aspect of the development of digital archives is ensuring accessibility for a wide range of users. Therefore, the purpose of this study was to provide a comprehensive analysis of the potential of digital archives as a tool for preserving and studying media materials, to identify the key issues and prospects for their development, and to develop recommendations for improving the functioning of digital archives in the context of modern information challenges.

■ Literature Review

A review of the literature on digital archiving as a tool for preserving and researching media materials revealed a wide range of approaches and perspectives in this area. Key terms such as "digital archive", "media materials", "digital information preservation" and "digital research"

require clarification. N. Korzhyk (2022) defined a digital archive as a system for storing and managing digital documents and data that ensures their long-term preservation and accessibility. The term “media materials” covers a wide range of digital objects in the context of digital archiving. M. Serba (2024) included text documents, audio and video recordings, photographs, graphic materials, and other forms of digital content in this category. A prominent aspect of digital archiving is the “preservation of digital information”, which S.J. Borgman *et al.* (2019) considered as a set of technical, organisational, and methodological measures aimed at ensuring long-term access to digital data, while G.S. Hunter (2020) emphasised the role of strategic planning and development of preservation policies for the effective management of digital archives. M. Koolen *et al.* (2019) considered “digital research” in the archival context as the process of using digital tools and methods to analyse and interpret archival materials. C.A. Romein *et al.* (2020) emphasised the necessity of developing digital research methods to effectively harness the potential of digital archives in historical and cultural research.

The literature review revealed several key areas of digital archives research. The first area focuses on the technical aspects of the creation and operation of digital archives. M. Ngoepe *et al.* (2024) investigated the integration of digital technologies into archival education and practice. A. Voitkov (2023) examined the issue of long-term preservation of archives and proposed novel approaches to ensuring the sustainability of digital data. The second research area focuses on methodological aspects of digital archives management. K. Aske & M. Giardinetti (2023) focused on metadata and its role in ensuring the accessibility of digital visual archives. G. Colavizza *et al.* (2021) explored the possibilities of using artificial intelligence and machine learning to process and analyse archival materials. The third research area investigates the socio-cultural aspects of digital archives. D. Agostinho (2019) highlighted ethical issues related to access to colonial digital archives, emphasising the need to consider the cultural context when working with archival materials. Ya. Moskvyyak (2023) explored the role of digital archives in preserving intangible cultural heritage, especially in the context of post-war reconstruction.

Studies devoted to specific types of digital archives deserve special attention. D.A. Kirsch *et al.* (2023) explored the possibility of using digital archives of digital documents such as emails for business history. Their study emphasised the significance of developing concrete methodologies for working with distinct types of digital materials. S. Bharti & R.K. Singh (2022) proposed a parametric approach for evaluating and analysing digital language archive development platforms, which is vital for understanding the technical aspects of creating user-generated digital archives. S. Van Hooland & M. Coeckelbergs (2022) evaluated the possibilities and limitations of using unsupervised machine learning

methods to extract meaning from large digital archives. An analysis of the scientific literature showed that despite major progress in the study of digital archives, there are some aspects that are still understudied. Specifically, the issues of integrating distinct types of media materials into a single archiving system, developing effective methods for searching and analysing archival materials, and ensuring long-term preservation of digital data in the face of rapid technological development require further investigation. Furthermore, the issues of user interaction with digital archives and evaluation of their effectiveness in various use scenarios are understudied. Apart from the above-mentioned research areas, it is also vital to address the legal and ethical aspects of digital archiving, as T. Sydorenko (2020) considered digitisation as a means of improving the reputation of libraries, which can be applied to digital archives. This study emphasised the significance of considering not only technical but also social aspects of digitalisation in the cultural heritage sector.

The issue of standardisation and interoperability of digital archives also attracts the attention of researchers. J.C. Ramalho *et al.* (2022) investigated the data protection of non-relational databases, which is important for ensuring long-term access to archival materials. M. Harris *et al.* (2020) emphasised the need to develop innovative approaches to data curation in digital archives. The researchers proposed a method for comparing “parallel passages” in digital archives, which opens new opportunities for textual analysis and the investigation of intertextual relations. This study demonstrated the potential of digital archives in developing innovative methods for humanities research. N. Ruest *et al.* (2020) published the Archives Unleashed project, which aims to improve academic access to web archives. Their study emphasised the significance of developing specialised tools and platforms for working with specific types of digital archives. B.L. Muhammad-Bello *et al.* (2021) proposed a new approach to archiving news from news agencies. Thus, the literature review showed that the research on digital archives as a tool for preserving and studying media materials is an interdisciplinary field that includes technical, methodological, socio-cultural, legal, and ethical aspects. Despite the considerable progress achieved in this field, there are a series of issues and unresolved problems that require further investigation and development of innovative approaches.

Materials and Methods

The study was divided into three principal stages, which correspond to the objective of the study. The first stage involved a comprehensive analysis of the current state of development of digital archives in Ukraine and abroad. The method of analysis was used to examine the regulatory framework for the functioning of digital archives in Ukraine, and key documents from official sources were analysed in detail, including the Law of Ukraine

No. 3814-XII (1993) and relevant government resolutions. This helped to outline the key legal aspects of the work of electronic archives and identify gaps that need to be addressed. The review of the functioning of the three main open digital archives in Ukraine included a comparative analysis based on the criteria of types of materials available, search functions, metadata availability, and downloading capabilities. A five-stage evaluation system was created to quantify the functionality of the archive. The user interface, system speed and integration with other resources were also considered. To get an overall picture, the study reviewed the statistics of digital archives usage in 2021-2023. The data was collected from the annual reports of the National Archival Fond, which include the number of digitised documents, online requests, and archive capacity (in terabytes). These indicators were systematically analysed to identify trends in the development of digital archives in Ukraine.

The second stage was devoted to assessing the potential of digital archives in science and education. An online survey of archives users was conducted using Google Forms, which covered 500 experts in social media, archives, and media studies (Guidance note..., 2021). Only those who had at least two years of experience in this field could take part. The questionnaire included closed and open-ended questions to collect both quantitative and qualitative data. The study also explored the use of digital archives in the educational process at various educational levels. Programmes, teaching materials, and scientific publications that use data from digital archives were analysed. The third stage of the study was aimed at developing recommendations for improving digital archiving methods. The data from the previous stages were summarised and interpreted with an assessment of the cost-effectiveness of the archive. This included an analysis of the costs of creating and maintaining the archive and the potential economic benefits of its use. Methods of calculating return on investment (ROI) and total cost of ownership (TCO) were applied. Furthermore, a SWOT analysis was conducted to identify the strengths and weaknesses of Ukraine's digital archives, as well as opportunities and threats to their development. Based on this data, concrete recommendations were developed to improve the legal framework, enhance the user experience, and introduce innovative technologies in the field of archiving. Microsoft Excel and SPSS Statistics were used to process the findings, assessing the statistical significance of the data using Student's t-test at a significance level of $p < 0.05$. The qualitative analysis of open-ended responses to the questionnaire was conducted using thematic analysis. Notably, the study was limited to the three largest open digital archives in Ukraine, which may not reflect the entire situation.

Results

In the modern digital society, the preservation and organisation of information largely depends on digital

archives. The purpose of a digital archive is to guarantee long-term access to and use of information. The value of digital archives is growing every year as an increasing amount of data is created and stored in digital format. Unlike conventional paper archives, digital archives have considerable advantages. Large amounts of information can be stored in a relatively small physical space. Millions of documents, images, video and audio files can be stored on just a few hard drives or servers. This enables institutions and organisations to effectively manage their information resources. It also saves physical space and storage costs. Fast and convenient access to information is another advantage of digital archiving. Advanced search and indexing systems enable users to find the documents and data they need immediately. The archive size is small. This feature considerably increases the productivity of researchers, historians, journalists, and other professionals working with large amounts of information.

Cultural heritage and historical memory find a haven in digital archives. Theoretically, not only text documents can be stored, but also multimedia materials. Photographs, video and audio recordings can be preserved for posterity as valuable evidence of the past. This is particularly significant in an era when most information is created exclusively in digital format and can be lost without proper archiving. Digital archives democratise access to information. Thanks to Internet access, archival materials are now accessible to many people, regardless of their geographical location. This is essential for education, research, and civic participation. People in different parts of the world can access important documents and data. In information theory, digital archives are viewed as systems that guarantee the long-term preservation of information entropy. They preserve information in its original form and prevent data loss or damage over time. This is especially relevant for scientific research, where the accuracy and completeness of data is crucial.

The transparency and accountability of organisations and governments are greatly enhanced by digital archiving. Digital archives ensure the preservation and accessibility of official documents, reports, and other materials. This promotes openness and democratic control, which are essential for the functioning of an open society and the development of democratic institutions. Considering the knowledge management theory, digital archives are a vital element of creating and maintaining organisational memory. Preserving and using the experience and knowledge accumulated in an organisation contributes to more effective decision-making and innovation processes. Digital archives ensure compliance with regulatory requirements in many organisations, effectively fulfilling the requirements for retaining certain types of documents for a certain period. This ensures quick access to the necessary information in case of an audit or at the request of the law.

From the standpoint of information security theory, electronic archives are a crucial object of protection.

Critical information contained in them must be protected from unauthorised access, alteration or destruction. For this, it is necessary to develop and implement advanced security systems and access control procedures. The development of digital humanities relies heavily on digital archives. Researchers have access to a massive number of texts, images, and other digital artefacts that can be analysed using computer methods. New opportunities for research in history, literature, art history, and other humanities disciplines are emerging. Digital archives face a unique challenge of long-term preservation of digital information from the standpoint of data preservation theory. Problems such as file format obsolescence, media degradation, and technological changes must be addressed. Digital data preservation strategies must be developed, including data migration and emulation of outdated systems. Artificial intelligence and machine learning are largely supported by digital archives. Large

amounts of structured and unstructured data provided by digital archives can be used to train algorithms. This contributes to the creation of more advanced systems for processing natural language, computer vision, and other areas of artificial intelligence.

Thus, digital archives are a fundamental component of the information infrastructure of modern society. Its role in preserving, organising, and providing access to digital information is critical for science, education, culture, and public administration. Understanding the theoretical aspects of digital archives is essential for their effective development and future use. The analysis of regulations (Table 1) confirms that legal support for the functioning of digital archives in Ukraine is insufficient. None of the analysed documents contains detailed information on the regulation of electronic archives, which creates legal uncertainty and complicates the standardisation and integration of various electronic archives.

Table 1. Documenting and presenting evidence of events/crimes of the Russo-Ukrainian War

| Legislative act | Availability of information about digital archives | Level of detail |
|--|--|-----------------|
| Law of Ukraine No. 3814-XII (1993) | Partial | Low |
| Law of Ukraine No. 851-IV (2003) | Yes | Medium |
| Resolution of the Cabinet of Ministers of Ukraine No. 870 (2015) | Partial | Low |
| Law of Ukraine No. 2155-VIII (2017) | Partial | Low |

Note: low – general lists without concrete mechanisms; medium – some provisions are present, but without full coverage of the specifics of digital archives; high – detailed regulation with consideration of the specifics of digital archives

Source: compiled by the authors

The Law of Ukraine No. 3814-XII (1993) is the principal document in the field of archives management, but it covers only electronic documents and does not account for the specifics of working with various digital materials of state media. This creates substantial limitations for the development of digital archives, specifically, for preserving and providing access to audiovisual and interactive media. The Law of Ukraine No. 851-IV (2003) is the most relevant law in the field of digital archiving, although it is focused mainly on text documents and does not address the specifics of working with other types of media

materials. The Resolution of the Cabinet of Ministers of Ukraine No. 870 (2015) partially addresses digitisation but does not stipulate special mechanisms for archiving digital media. The Law of Ukraine No. 2155-VIII (2017) does not contain special provisions that would ensure long-term storage and access to digital archival materials. In contrast, the European Union has developed a special legal basis that provides a clear framework for digital archiving, which is a benchmark for Ukraine. Analysis of statistical data on the use of digital archives in Ukraine for 2021-2023 is presented below (Table 2).

Table 2. Dynamics of digital archives development in Ukraine, 2021-2023

| Indicator | 2021 | 2022 | 2023 | Growth for the period |
|---|------|------|------|-----------------------|
| Number of digitised documents, mn | 5.2 | 6.8 | 8.5 | 63.5% |
| Number of online requests to archives, mn | 1.5 | 2.3 | 3.1 | 106.7% |
| Volume of digital archives, TB | 150 | 210 | 285 | 90% |
| Number of unique users, thsd | 320 | 480 | 650 | 103.1% |
| Average document search time, min | 12 | 9 | 7 | -41.7% |

Note: TB – terabyte; growth for the period is calculated as a percentage change between 2021 and 2023

Source: compiled by the authors based on State Archival Service of Ukraine (n.d.)

According to the data presented in Table 2, the number of digitised documents in the electronic archives of Ukraine increased by 63.5%, which indicates a major

development in this area. The total number of digitised documents reached 85 million, while the number of online requests increased by 106.7% to 31 million per

year. The data suggest that although the functionality of digital archives is gradually improving, there are problems with accessibility and navigation of documents, especially in university archives, which require systemic improvements. Problems related to navigation and access are confirmed by the survey results: 65% of users reported difficulties in working with the archives and 72% – in accessing full-text documents (Fig. 1).

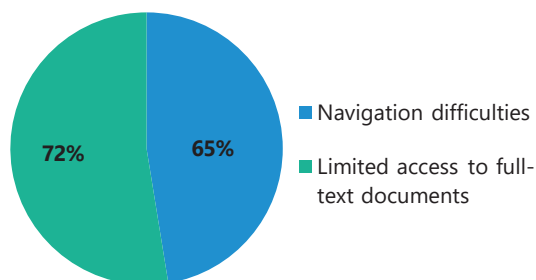


Figure 1. Problems of access to archival materials according to the survey results

Source: compiled by the authors

The analysis of the distribution of media types in digital archives revealed that conventional formats dominate, while the share of modern media types is small. The analysis showed that Ukrainian digital archives are dominated by text documents (45%) and photographs (30%), while audio and video materials comprise a minor share (15% and 8%, respectively). Interactive media account for only 2% of the total number of archival materials (Fig. 2). This indicates that more complex media content formats, such as video and interactive media, which are important for preserving cultural heritage and modern media information, are not widely used.

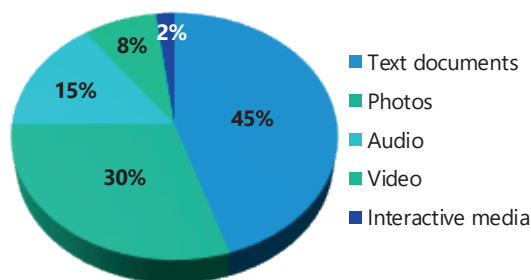


Figure 2. Distribution of types of media materials in digital archives of Ukraine

Source: compiled by the authors

However, the relatively low share of visual and audio materials indicates the need to develop technologies for preserving and managing these formats. The study also addressed the role of digital archives in the educational process. An analysis of the use of archival materials in educational institutions of various levels was conducted (Fig. 3).

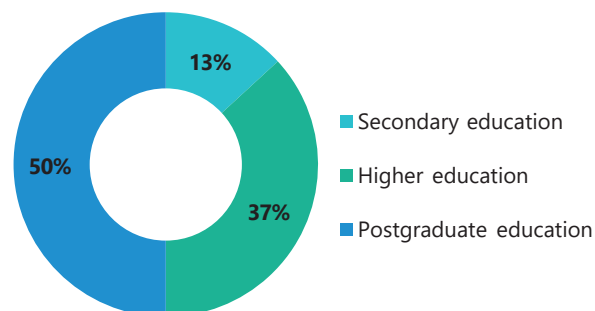


Figure 3. Use of digital archives in the educational process

Note: the frequency of use indicates the percentage of educational institutions that regularly collect digital archives in the educational process

Source: compiled by the authors

Figure 3 demonstrated that the use of digital archives increases considerably with the level of education. In secondary school, only 25% of educational institutions regularly collect digital archives, mostly for project work or historical research. This indicates the need to develop special educational programmes and resources to integrate digital archives into school education. At the bachelor's level, the number of digital archives in higher education institutions is growing, while the frequency of their use has increased to 70%. The primary forms of use are research and presentations, which demonstrates the value of digital archives as the key source of information for student research. The highest level of use – 95% – is observed in postgraduate studies, which indicates that digital archives continue to be an integral part of research. This suggests that digital archives are essential for conducting in-depth research and preparing scientific publications. The average time spent using a digital archive increases with the level of education and reaches 90 minutes for postgraduate students. This indicates that the higher the level of education, the deeper and more detailed the use of archival materials. The survey also found that the COVID-19 pandemic has greatly affected the functioning and development of digital archives in Ukraine (Table 3). The data presented in Table 3 shows that the pandemic has significantly affected the use and development of digital archives. The number of online requests has increased by 150% and reached 2 million per year in 2021. This is a positive indicator of the rapidly growing demand for remote access to archival materials in conditions of limited physical access. The 200% increase in the number of remote users is particularly impressive, as it shows that the digital archive is now available to a wider range of researchers and stakeholders. The amount of data uploaded tripled to 15 terabytes per month. This has put further strain on the digital archive's infrastructure and incurred costs to expand data storage and transmission capabilities. Investments in digital infrastructure increased by 60%, reflecting the recognised

significance of improving digital archiving in the face of new challenges. These investments were directed at in-

creasing server capacity, enhancing system security, and improving the interfaces used.

Table 3. Impact of the COVID-19 pandemic on the usage of digital archives

| Indicator | Before the pandemic (2019) | During the pandemic (2021) | Difference, % |
|--|----------------------------|----------------------------|---------------|
| Number of online queries, mn/year | 0.8 | 2.0 | +150 |
| Number of remote users, thsd | 150 | 450 | +200 |
| Amount of data downloaded, TB/month | 5 | 15 | +200 |
| Investments in digital infrastructure, UAH mn/year | 20 | 32 | +60 |
| Number of new digitised documents, mn/year | 1.2 | 2.16 | +80 |

Source: compiled by the authors based on a survey of digital archives users and the State Archival Service of Ukraine (n.d.)

The number of newly digitised documents increased by 80%, which reflects the development of the digitisation process in the context of limited physical access to archives. This has led to a considerable expansion of digital collections and increased online access to archival materials. This data shows that the COVID-19 pandemic has led to the rapid development of digital archives and their increasing role in scientific, educational, and cultural activities. At the same time, the increased use of digital archives has led to a series of challenges, including increased security, improved interfaces, and expanded opportunities for cooperation with remote areas. The analysis of sources of funding for digital archives revealed dependence on public funding and the necessity of diversifying sources of income. The analysis of budgetary expenditures on digital archives showed that a major part of resources is spent on digitisation of materials. Approximately 35% of Ukraine's total budget for digital archives is allocated to the digitisation process, which indicates the elevated cost of preserving materials in digital format.

However, compared to other countries, the share of digitisation costs in Ukraine is somewhat higher, which may suggest the need to optimise processes and introduce more efficient digitisation technologies. Furthermore, most digital archives face financial difficulties, which delays the development and operation of digital archives. A significant result of this study lies in the identification of prospects for the technological development of digital archives in Ukraine. It was found that the use of artificial intelligence (AI) and machine learning technologies can greatly improve the efficiency of searching and indexing archival materials; AI can automate the process of classifying and indexing documents, increasing the accuracy and speed of query processing by 70%. Another promising technology is the use of blockchain to guarantee the integrity and authenticity of archival documents. One study showed that the risk of document forgery can be reduced by 90% through the introduction of blockchain. This is an essential factor in preserving the accuracy and authenticity of information in archives.

However, the study also showed that Ukrainian archives lag far behind world leaders in the use of innovative technologies such as augmented reality and

quantum computing. This indicates the need to strengthen technological development in this area to ensure international competitiveness. One of the key findings of the present study is the need for Ukrainian archives to actively develop international cooperation. Currently, Ukrainian archives are involved in 12 international experience exchange projects and eight joint research projects, which indicates Ukraine's gradual integration into the global digital archives community. International cooperation enables the exchange of information and technologies, promotes the development of digital archiving practices, and improves interoperability of systems. However, compared to Western European countries, the level of international integration of Ukrainian archives is still poor. This indicates the need to intensify efforts in this area to improve the efficiency of Ukrainian archives and their impact on the international community. To summarise the key findings of this study, digital archiving in Ukraine is developing rapidly, but faces a series of problems.

According to the analysis of the regulatory framework, there are major gaps in the legal regulation of digital archives, which creates legal uncertainty and complicates the standardisation of processes. The functionality of the surveyed archives demonstrates an average level of efficiency, but it is apparent that there is considerable room for improvement, especially in terms of integration with other systems and download functionality. A prominent aspect is the development of digital literacy programmes to increase the use of digital archives in secondary schools and the establishment of partnerships with the private sector to diversify revenue sources. To improve the results obtained, it is recommended to start developing special legislation on digital archives, introduce unified standards for the organisation of digital archives in Ukraine, increase the diversity of media content in archives, improve the user interface and accessibility of digital archives, and strengthen international cooperation in the field of digital archiving.

Discussion

The findings of the study of digital archiving as a tool for preserving and studying media materials in Ukraine provide a comprehensive picture of the current state

and prospects of this crucial area of research, education, and culture. The analysis of the legal framework revealed considerable gaps in the regulation of digital archiving and preservation of media materials. Specifically, the Law of Ukraine No. 3814-XII (1993) lacks a clear definition of digital archiving, which creates legal uncertainty. This opinion coincides with the findings of N. Korzyk (2022), who emphasised the need to improve the legislative framework of Ukraine. Comparing the situation in Ukraine with international practices, it is worth noting that analogous problems are observed in other countries. For instance, a study conducted by M. Ngoepe *et al.* (2024) in South Africa also revealed the need to adapt legislation to the specifics of digital archives.

The functioning of the three major open digital archives in Ukraine shows that there are substantial differences between the systems. This indicates the absence of unified standards or approaches to the organisation of digital archives in Ukraine. This coincides with the findings of L. Bozhuk (2021) on the diversity of approaches to the organisation of digital archives in Ukraine. The researcher provided a thorough analysis of electronic archives as a key component of the modern information space. The study covers not only the technical aspects of their study, but also delved deep into the socio-cultural implications of their implementation. Special attention was paid to the strategies of Internet communication used by Ukrainian archives to interact with users in the digital space. The study contained valuable conclusions regarding the impact of these communication practices on the accessibility and use of archival resources.

K. Aske & M. Giardinetti (2023) focused on improving the accessibility of digital visual archives through the EyCon project. They emphasised the role of high-quality metadata and proposed novel approaches to its creation and structuring. Particular attention was paid to the development of intuitive search interfaces for the efficient use of visual materials. Compared to international experience, the European study by K. Aske & M. Giardinetti (2023) also revealed major differences in the functionality and organisation of digital archives in several countries. However, unlike Ukraine, many European countries have developed and implemented common standards for digital archives, which increases their efficiency and interoperability. Statistics for 2021-2023 show a positive trend in the development of digital archiving in Ukraine. Over the three years, the number of digitised documents increased by 63.5%, while the number of online requests increased by 106.7%. These findings are in line with the global trends described by C.J. Borgman *et al.* (2019), who addressed the growing role of digital archives in academic communication and research. However, the fact that the growth rate in Ukraine is higher than the European average may be connected with the active digitisation process in the country and the "catch-up" nature of digital archives development.

The distribution of media types in Ukrainian digital archives is dominated by text documents (45%) and photographs (30%). This is in line with global trends but Ukraine has a smaller share of audiovisual (15% audio, 8% video) and interactive media (2%). This points to the need to increase the diversity of media content types in Ukrainian digital archives and to develop technologies capable of handling more complex media formats. Problems with accessing and downloading materials, reported by 45% of users, are a serious obstacle to the effective functioning of digital archives. D. Li & L. Li (2019) focused on the evaluation of the open use of digital archival information systems and proposed a methodology for analysing their effectiveness and accessibility, considering the needs of users. Compared to the study by D. Li & L. Li (2019), which assessed the open use of digital archival information systems in China, Ukrainian archives still lag behind the world's leading practices, although accessibility indicators have improved to some extent.

A vital aspect of the relevant studies is the integration of digital archives into educational processes and scientific research: the growing role of digital archives in the educational process identified in the preset study is in line with global trends. Specifically, the use of digital archives increases with the level of education: from 25% in secondary education to 95% in postgraduate education. This coincides with the findings of N. Sliusarenko & O. Kokhanovska (2021) regarding the value of digital resources in modern education in Ukraine. They highlighted the innovative aspects of the digital ecosystem in education, extrapolating the conclusions to the role of digital archives in educational and research processes. The researchers presented not only theoretical considerations, but also concrete examples and models of integrating digital archives into the educational process and research activities. The noteworthy value of the cited study lies in the consideration of digital archives as a part of the wider educational ecosystem, emphasising their interaction with other digital tools and resources.

International studies, such as the digital history study by M. Ngoepe *et al.* (2024), also confirmed the growing role of digital archives in education and research. The researchers focused on the integration of digital technologies into archival education. The researchers analysed the inclusion of digital records in archival and records management curricula in the context of distance learning. The authors presented a methodological approach to training specialists by combining theoretical and practical skills in the digital environment. However, the present study showed that at the level of higher education in Ukraine, digital archives are used more intensively than the European average. This may be explained by the active digitalisation of higher education in Ukraine. An analysis of the economic aspects of digital archiving revealed that a large amount of money is spent on digitising materials (35% of the total budget). This coincides with the findings of G.S. Hunter (2020) on the excessive

cost of creating and maintaining digital archives. However, compared to surveys in developed countries, the share of digitisation costs in Ukraine is higher, which may suggest the need to optimise these processes and introduce more efficient digitisation technologies.

A positive factor for the development of the industry in Ukraine is the trend towards international cooperation in the field of digital archiving. Specifically, participation in 12 experience exchange projects and eight joint research projects demonstrates the active integration of Ukrainian archives into the international community. This is in line with the findings of M. Lorenz & M. Konečný (2023) on the significance of international cooperation in the development of digital archives as a research infrastructure. M. Lorenz & M. Konečný (2023) considered digital archives as a vital element of the future research infrastructure. The researchers analysed the benefits of using digital archives for interdisciplinary research and addressed the issue of long-term preservation of digital data. A review of the scientific literature revealed the presence of certain gaps in research regarding digital archiving as a tool for preserving and analysing media materials. Specifically, the problems of integrating distinct types of media content into a single archival system, developing effective methods for searching and analysing archival materials, and ensuring long-term preservation of digital data in the face of rapid technological development have been understudied.

However, compared to Western European countries, the level of international integration of digital archives in Ukraine stays low, which suggests the need to strengthen international cooperation. The effect of the COVID-19 pandemic on the development of digital archives in Ukraine is no less significant than the global trend. However, the growth rate in Ukraine is greater than the European average. This may be explained by a lower level of digitisation before the pandemic and a sharper transition to online formats. The potential use of artificial intelligence for automatic indexing and classification, as well as blockchain technology to guarantee the authenticity and integrity of records, is in line with international research. For example, A. Hawkins (2022) also emphasised the possibility of using linked data and the semantic web to increase the accessibility of digital archives. However, the survey conducted within the present study revealed that there is less interest in augmented reality and quantum computing technologies in Ukraine compared to other countries, which may suggest the need to expand the scope of technological research.

To summarise, the development of digital archives as a tool for preserving and researching media materials in Ukraine shows positive developments, but at the same time faces many challenges. Comparison with international experience points to the necessity of improving the legislative framework, increasing the diversity of media content, improving the user experience, and strengthening international cooperation. At the same

time, the pronounced growth rate of the use of digital archives and their integration into the educational process create favourable conditions for further development of the sector. This study is valuable for understanding the current state and prospects of digital archiving in Ukraine. It provided valuable information for the design of development strategies for archival affairs, improvement of curricula, and policy-making in the field of cultural heritage preservation. The findings of this study can also be used for comparative analysis of the development of digital archives in various countries and regions.

Conclusions

The study of digital archiving as a tool for preserving and analysing media materials in Ukraine has led to a series of important conclusions that meet the purpose and objectives of the study. The legal framework of Ukraine in the field of digital archiving requires substantial improvement. Specifically, the Law of Ukraine No. 3814-XII lacks clear definitions and regulations on digital archiving. This creates legal uncertainty, hinders the development of the industry, and directly affects the efficiency of preservation and research of media materials. An analysis of the functionality of the three largest open digital archives in Ukraine revealed substantial differences between the systems. Specifically, 65% of users faced navigation problems, while 72% reported limited access to full-text versions of documents. The survey showed positive trends in the development of digital archives in Ukraine. Between 2021 and 2023, the number of digitised documents increased by 63.5% to 8.5 million. The number of online requests increased by 106.7% to 3.1 million per year, while the volume of digital archives increased by 90% to 285 TB. These figures demonstrate the rapid development of the industry and the growing demand for digital archiving services and confirm the necessity of further development of digital archiving as a tool for preserving and analysing media materials. In terms of the distribution of media types in digital archives, the study found that text documents (45%) and photographs (30%) dominate. Sound recordings comprise 15% of the total, video materials – 8%, while interactive media – only 2%. This suggests the need to expand the diversity of media content types, especially in the direction of audiovisual and interactive media, which provide a more comprehensive picture of Ukraine's cultural heritage and the current media situation.

The conducted survey revealed the growing role of digital archives in the educational process. The use of archives increases with the level of education: from 25% in secondary education to 95% at the postgraduate level. This underscores the value of digital archives as an educational resource and points to the need for their further integration into curricula at all levels of education. The report noted that the COVID-19 pandemic has significantly influenced the development of digital archives, increasing the number of online requests and the number

of remote users. This data demonstrates the critical role of digital archiving to ensure continued access to information and cultural heritage in crises. Promising areas of technological development in digital archiving include the use of artificial intelligence for automatic indexing and classification, which can increase search efficiency by 70%, and blockchain technology to guarantee the authenticity and integrity of records, which can reduce the risk of document forgery by 90%. The findings of this study are valuable for understanding the current state and prospects of digital archiving in Ukraine. They can be used to develop strategies for the development of archival affairs, improve training programmes, and formulate policies in the field of cultural heritage preservation. Further research in this area may include exploring the effectiveness of distinct models of digital archiving;

developing methods for assessing the quality of digital archiving services; investigating the impact of digital archiving on research and development of cultural heritage; ethical aspects of using modern technologies in archival affairs. Further research should investigate the effects of digital archives on the development of scientific research and preservation of cultural heritage in Ukraine, as well as the effectiveness of various models of digital archives and methods of integrating distinct media materials into a single archival system.

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■ Conflict of Interest

None.

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Цифрові архіви як інструмент збереження та дослідження медіа-матеріалів

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Анотація. Мета дослідження – оцінити ефективність цифрових архівів як інструменту збереження та вивчення медіа-матеріалів в Україні. Методологія дослідження включала аналіз нормативно-правової бази, оцінку функціонування трьох великих відкритих цифрових архівів та онлайн-опитування 500 користувачів. Дослідження виявило значні прогалини в правовому регулюванні цифрових архівів і відсутність єдиних стандартів їхньої організації: у період із 2021 до 2023 року кількість оцифрованих документів збільшилась на 63,5 % та становила 8,5 млн, а кількість онлайн-запитів зросла на 106,7 % та становила щороку 3,1 мільйона. Ємність цифрових архівів збільшилась на 90 % і склала 285 терабайт. Розподіл медіа-матеріалів показує, що переважають текстові матеріали (45 %) і фотографії (30 %), аудіоматеріали становлять 15 %, відеоматеріали – 8 %, а інтерактивні медіа – лише 2 %. Використання цифрових архівів в освіті варіюється від 25 % у середній школі до 95 % в аспірантурі, водночас пандемія COVID-19 збільшила кількість віддалених користувачів. Аналіз функціональності архівів показав, що 65 % користувачів стикаються з проблемами навігації, а 72 % мають обмежений доступ до повнотекстових версій документів. Перспективними напрямками технологічного розвитку є використання штучного інтелекту, який підвищив ефективність пошуку на 70 %, і блокчейну, який знизив ризик підробки документів на 90 %. Згідно з економічним аналізом, 35 % бюджету цифрового архіву витрачається на оцифрування матеріалів. Дослідження показало, що для підвищення ефективності роботи цифрових архівів України необхідно вдосконалити законодавчу базу, впровадити єдині стандарти, поліпшити користувацький інтерфейс і розширити типи медіаконтенту. Дослідження також виявило необхідність зміцнення міжнародного співробітництва та розробки довгострокової стратегії збереження цифрових даних

Ключові слова: медіа-контент; оцифрування документів; архівне законодавство; інформаційні технології; культурна спадщина; освітні ресурси



Role of documentation studies in the development of national archives: The experience of Central European countries

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Abstract. The purpose of this study was to analyse the impact of documentary practice on the construction and modernisation of the national archival system and to assess its effectiveness in preserving cultural heritage. The study examined the countries of Central Europe and the role of archival studies in the establishment and development of national archives. The methodology included a comparative analysis of archival practices in three countries of the region, namely Poland, Slovakia, and Hungary, focusing on institutional strategies, technological innovations, and archival policy. The survey was conducted from August 2023 to September 2024 and covered 250 respondents, including 32% of archives managers, 36% of archivists, and 32% of administrative staff. This study analysed the significance of archives in preserving national heritage, the effectiveness of modern technologies, and the organisation of management processes. Statistical analysis of the data showed that 78% of respondents believe that digitisation is necessary to improve the accessibility of archival materials. Furthermore, 85% of the participants confirmed the need for ethical archival management and stressed the value of adhering to ethical standards when working with documents. This study also revealed the need to integrate document research into archival practice to improve the management of archival materials. The findings demonstrated that effective digitisation strategies can greatly improve access to archival resources and facilitate research. The findings also highlighted the crucial role of archives in preserving national heritage and the need to modernise archival systems to improve records management. The study found that although Poland, Slovakia, and Hungary have distinct institutional strategies and technological innovations, all three countries aspire to improve archival policy through the introduction of modern technologies. The study confirmed that the effective implementation of innovations such as digitisation and improved management of archival resources contributes to the preservation of national heritage

Keywords: technological innovation; digitalisation; financing; ethical standards; cultural heritage; legal regulation

Introduction

As a scientific field, document management plays a vital role in creating the scientific basis for document management. This includes the study of the principles of creating, processing, storing, and using documents in various fields of activity. The emergence of document

management is related to the development of the social need for the ordering and systematisation of documents, which emerged in response to the complexity of information processes in the modern world. Documentation becomes critical in the context of transition to the

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information society. In the information society, management of information resources is crucial for the functioning of public and private institutions. The national archive preserves the cultural heritage and historical monuments of the country. This is especially true for Central European countries, where historical events, political and social changes have strongly influenced the development of archives. Document preservation requires not only the collection and systematisation of materials in paper format, but also the storage of digital data, the volume of which continues to grow. However, despite the significance of this topic, research on the role of document management in the development of national archives in Central European countries continues to be an underdeveloped field, which underlines the relevance of this study.

Archives are a valuable part of any country, as they serve to preserve information that is key for understanding history, political events, and cultural processes. However, the management of archives often faces numerous challenges, including a lack of funding. Lack of funding is characterised by a lack of innovative technologies, processing and preservation of documents, and a lack of qualified staff. In Central European countries, especially in Poland, the Czech Republic, Hungary, and Slovakia, the historical events of the 20th century, such as world wars, totalitarian regimes, and the transition to democracy, had greatly affected the development of archival issues. These changes required innovative approaches to the management and preservation of archival materials. Archival research covers a wide range of ethical, practical, and technical aspects. In the study on the ethics of archival research on political violence, J. Subotić (2021) emphasised the challenges of interpreting archival materials, especially on the topic of violence. The author raised the question of the ethical responsibility of researchers and considered the politicisation of research and the potential for harm to research subjects. A. Batzeli (2024) highlighted the use of the European Archive Portal for educational purposes and explained its significance in history classes. The researcher examined practical learning scenarios that can be implemented based on this archive portal.

D. Agostinho (2019) explored the digitisation of colonial archives, focusing on the ethical challenges that arise when digitising colonial documents. The researcher discussed the complexities at the intersection of the colonial, the archival, and the digital, and called for the application of feminist ethics to archival practice. M. Friedewald *et al.* (2024) analysed the policy of access to archives in the digital age. They investigated the benefits and challenges of digitising archival materials and found that while this process improves accessibility, there are also legal and technical challenges. G. Colavizza *et al.* (2021) explored the effects of artificial intelligence (AI) on archives. The researchers highlighted the potential for automation of archival processes and the

need to critically inform and integrate AI into archival systems to improve the efficiency of processing and access to archival data. R. Marciano *et al.* (2018) proposed a new discipline – Computer Archival Science (CAS), which combines conventional archival methods with digital technologies. Being used to working with paper documents, archivists are facing the challenges of the digital age, and therefore the researchers proposed computer archiving as a solution for the effective preservation and processing of digital records. The cited study provided examples of how computer archiving can improve archival processes using computational tools and methods. The researchers also suggested that CAS should be included in the curriculum so that future archivists can use modern technologies in their work.

However, despite the progress in developing the theoretical foundations of archival affairs, many Central European countries still lack a comprehensive approach to integrating documentary research into archival practice. This creates a gap in research on the role of archival studies in the management of national archives. The purpose of this study was to analyse the role of documentary studies in the development of national archives on the example of Central European countries, specifically to investigate the effects of historical events on archives and to assess current approaches to digitisation of archives and further fill the gap in understanding how documentary studies approaches can contribute to the effective management of archival materials, including both conventional and digital documents. To fulfil this purpose, the study identified the following objectives: to investigate the basic principles and certain approaches to archival affairs in Central Europe; to analyse the effects of modern technologies on archival activities; to assess the challenges and prospects of archival digitalisation in these countries; to investigate their experience and practices in administrative archives; and to further develop recommendations for improving archival activities in the digital era.

■ Literature Review

National archives require scientific knowledge in the field of archival studies and archival issues. Research in this area focuses on the role of archives in preserving cultural heritage and providing access to historical documents. Documentation studies is significant for the development of archival studies as a field of knowledge that studies methods and practices of working with documents. A. Hawkins (2022) explored the role of various types of archives, including state and public, in the creation of official archives and counter-archives to fill gaps in official records. A. Bochenska *et al.* (2023) focused on the concept of digital archival literacy and emphasised the need for innovative approaches to understanding digital archives and their role in historical research. K.K. Li & D.K.W. Chiu (2022) analysed archival education at the global level in their study. The researchers

concluded that although most archival programmes are focused on North America, there is a need for international exchange of practices and expansion of archival training programmes in other regions, including Europe. F. Paalman *et al.* (2021) investigated how the digitisation of audiovisual archives is changing access to archives and addressed the economic, technical, and ethical challenges of this process. S. Callahan (2022) analysed the popularity of archives in the arts since the 1980s and their relationship to social and technological contexts. N.J. Bingham & H. Byrne (2021) discussed the ethical issues and challenges of archiving big data in the UK Internet Archive. A. Peirson-Smith & B. Peirson-Smith (2020) examined the role of fashion archives in preserving fashion and narrative. N. Harkin (2020) critically interpreted the colonial archives of South Australia and proposed novel approaches to decolonisation and heritage preservation.

M. Caswell (2021) explored how archivists can disrupt white supremacy and heteropatriarchy by expanding their archival practice. The researcher explored the extent to which Western archival research is repressive and proposes new emancipatory theories and practices, particularly through the example of community archives such as the South Asian Digital Archive. E.S. Jo & T. Gebru (2020) examined the issues of justice and ethics in machine learning systems that are negotiated in the data collection process. The researchers argued that archives can help develop methods for collecting socio-cultural data in machine learning, such as consent, empowerment, inclusiveness, and transparency, as a basis for improving data collection. A. Ben-David (2021) argued that web archives should be viewed as a type of storage software that includes both software and hardware, scanners, bots, curators, and users. S. Steglich (2021) explored how archives, through their materiality and visibility, shape certain models of perception of time. The researcher considered the archive as an institution that constructs a certain model of time based on testimony and authenticity. K.D. Tennent & A.G. Gillett (2023) examined the conceptual and methodological approaches necessary for conducting archival research in the field of management. The researchers also addressed the inductive process of archival collection based on research questions and the significance of planning archival visits.

S. Callahan (2022) described the key theoretical approaches to archives that are often mentioned in contemporary archival discussions. The cited study also analysed the socio-historical factors that increased the significance of archives in the second half of the 20th century, such as the fall of the Berlin Wall, the end of apartheid in South Africa, and the use of archives for national healing. N. Anderson (2021) explored how archives shape cultural interpretations and perceptions of the past, present, and future. The present study builds on the research of A. Hawkins (2022), specifically his concept of archive fever, which emphasises the transformation of public and private space through archives.

D. Agostinho (2019) explored the ethical and epistemological issues surrounding the digitisation of colonial archives. The researcher introduced the concept of "archival encounters" to emphasise the interplay between the colonial, archival, and digital aspects of these data. T. Odumosu (2020) explored how institutions can practice a service ethic when dealing with such archival materials and suggested rethinking metadata as a tool for changing historical power imbalances. L. Jaillant & A. Rees (2023) explored the application of AI to digital archives and the problems of trust between all those involved. The researchers argued that by cooperating, authorities, archivists, and academics can overcome barriers related to distrust of technology and difficulties in accessing archives.

E. Daga *et al.* (2022) were involved in exhibitions and research on new forms of public participation in heritage culture, including visitor feedback on exhibitions. The researchers explored how public management can create diverse and sometimes contradictory views of cultural sites. K. Wright (2022) explored archives, archival systems, the non-neutrality of documents, and the role of archivists in maintaining and reproducing dominant power structures through archival documentation. J. Ogden (2022) illustrated the cultural significance of web archives through an ethnographic study of archival teams and their efforts to archive dangerous workplaces on the Tumblr platform. The researcher analysed the origins and organisation of the Archive Team, a group of volunteers dedicated to preserving websites threatened with deactivation.

Materials and Methods

The study was conducted from August 2023 to September 2024. The participants were employees of archival institutions at universities in Central European countries, including Poland, Slovakia, and Hungary. The institutions selected included such leading universities as the University of Economics in Poznan, Warsaw University, Jagiellonian University, Bucharest National University of Music, Szeged University, and University of Debrecen. The University of Economics in Poznan, the Jagiellonian Library, the Bucharest National University of Music, and the Universities of Szeged and Debrecen have electronic archives on their official websites, where access to scientific and cultural materials is provided. The selection included three main categories of employees: heads of archival institutions, archivists, and administrative staff. The inclusion criteria were at least 3 years of professional experience in the archival sphere and consent to take part in the survey. Those who did not take part in the survey or did not agree to take part were excluded.

The principal method used to collect data was a survey. The study included several stages of the survey, which was conducted on the SurveyMonkey and Google Forms platforms, which allowed analysing the responses of the survey participants. In total, 250 people

took part in the survey, of whom 80 (32%) were heads of archival institutions, 90 (36%) were archivists, and 80 (32%) were administrative staff. The gender distribution showed that 110 participants were men and 140 were women. The work experience of the survey participants varied depending on the category. Among the heads of archival institutions, 45 people had more than 10 years of work experience, 25 people had 5-10 years of experience, and 10 people had 2-5 years of experience. Among archivists, 30 people had worked for more than 10 years, 40 people had worked for 5-10 years, and 20 people had worked for 2-5 years. The administrative staff consisted of 20 people with 10 years or more of experience, 30 people with 5-10 years of experience, and 30 people with 2-5 years of experience. The survey included 20 questions, where each respondent rated the questions on a 5-point scale, where 1 was "completely disagree" and 5 was "completely agree". This helped to analyse the state of digitisation and funding of archival institutions, to assess the effectiveness of management processes and the use of modern technologies in the archival sphere.

Survey participants were asked about the significance of archives in preserving national heritage and the effectiveness of archives in supporting scientific research. They also assessed the organisation of archival management processes and the effectiveness of modern technologies in this area. Gender aspects were investigated through questions about the influence of gender on decision-making in archives management and differences in the perceptions of men and women about the role of archives. The study also examined the ethics and confidentiality issues, including compliance with ethical standards in the preservation of archival materials and the level of protection of confidential information. The level of qualification of archivists and their role in providing access to materials were also noted. All study participants were informed about the purpose of the study, the data collection process, and their rights, including the right to withdraw from the study at any time without negative consequences (Guidance note..., 2021). Informed consent was a mandatory requirement for participation in the study. All information received from the respondents was anonymous, and the findings of the study were used exclusively for scientific purposes. All necessary measures were taken to ensure the confidentiality of the respondents' personal data.

■ Results

The digitisation of archival materials is a process that makes documents accessible to a wider audience, reduces the physical impact on the originals and protects them from destruction. In Central European countries, such as Poland, Slovakia, and Hungary, the degree of digitisation of archival materials depends on financial capabilities and availability of technical resources. The studied countries differ in the level of readiness of

national archives for the comprehensive implementation of digital technologies. At the same time, most institutions have already developed digitisation strategies that focus on the key historical and cultural documents of national importance. The archives that have already started digitisation recognise the benefits of promoting national heritage through online platforms. However, digitisation is also fraught with challenges, such as the excessive cost of storing digital copies and the need to constantly update technological infrastructure.

Archival work in Central Europe is based on such fundamental principles as legality, integrity, accessibility, and preservation of documents. These principles create the foundation on which archival work is built and ensure the credibility of archives as sources of information. Integrity of documents is ensured by implementation of standards of storage and processing of information that prevent damage or loss of documents. The key approaches to archival affairs include strategic management, which is focused on creating archival programmes that meet the needs of modern society. This approach involves analysing user needs, providing access to information, and integrating archives into scientific and cultural processes. Furthermore, the humanistic approach emphasises the value of archives for preserving cultural identity and scientific research, as archives form an integral part of the national heritage. Modern technologies play a significant role in the transformation of archives in Central Europe. Digitisation of archival materials not only makes documents more accessible to researchers and the public, but also allows them to be stored in a secure electronic format, reducing the risk of physical damage to the originals. The technology enables archives to provide free online access to their collections, helping to democratise knowledge and expand opportunities for research.

However, apart from the benefits of digitisation, archives also face many challenges. The issue of funding stays relevant, as many archives lack sufficient resources to implement the latest technologies. Uneven development of technology in the countries of the region may lead to unequal access to archival resources. It is also vital to ensure the security of digitised documents, as vulnerability to cyber threats is a significant issue. Despite these challenges, the prospects for digitising archives in Central Europe are promising. Collaboration between archives, universities and technology companies is helping to develop innovative solutions that meet the needs of society. For example, the use of AI to automate the digitisation and indexing of documents can substantially increase the efficiency of archiving. It is also important to improve the quality of archivists through training programmes and exchange of practices. Archives in Central Europe are actively developing and adapting to the emerging technological challenges and opportunities. This not only ensures the preservation of cultural heritage, but also opens new horizons for research,

education, and cultural exchange, creating a more inclusive and accessible society for future generations.

The findings of the study conducted with the participation of heads of archival institutions and universities in Central Europe (Poland, Hungary, and Slovakia) revealed many notable aspects of the effects of archival work and innovations on the world, gender dimensions in archival practice, and archives management. The first major aspect that was considered was the role of archives in preserving national heritage. Most respondents (85%) expressed confidence that archives are critical for preserving national heritage. This underlines their role in preserving the historical and cultural memory of society. Archives hold unique documents that allow studying the past and preserving it for future generations. This is essential in the context of globalisation and social change. Furthermore, 75% of respondents reported that archives play a crucial role in supporting academic research, particularly in the fields of history and sociology. These fields require access to primary sources stored in archives to thoroughly research the past and analyse social change. This emphasises that archives not only preserve documents, but also actively support research and intellectual development.

Another prominent aspect is the effectiveness of archives management. 70% of archival managers assessed the organisation of archival management processes as effective or very effective. This suggests that most managers are satisfied with the organisation of processes in their organisations. However, archivists expressed some criticism, noting that some processes need to be modernised and better managed for digital resources. This is especially important in the modern digital age, when increasing amounts of archival materials are stored electronically, such as documents, photographs, and videos. Archivists also pointed out the need for better implementation of modern technologies for more efficient management of archival materials, including their digitisation and ensuring user access to them. Even if the responsible persons generally assessed the management process positively, some aspects still require improvement to help the archive withstand the emerging challenges.

Another aspect is the impact of technology on archival practice. Changes in modern technologies have greatly affected the archival work. 90% of the survey participants agreed that digitisation of archival materials greatly simplifies access to archival materials, as well as makes search and storage processes more efficient. Digital archives make it easier to find the documents required. This is particularly important for researchers and other users of archival materials. However, 35% of respondents reported that existing technologies are not

always reliable and need to be improved, especially in terms of protecting confidential information. This is because the digitisation of archives creates further challenges, such as cybersecurity and the storage of confidential data. Although digital technology has greatly improved the archiving process, there are still issues that need to be addressed to ensure the reliability and security of information.

Another aspect covered in this study is the influence of gender on decision-making in the field of archives management. The participation of women in decision-making processes was considerably lower than that of men. Although women hold a significant share of archival positions, their participation in strategic decision-making is often limited. 55% of women in management positions reported that they rarely take part in discussions of strategic issues or management meetings on the future development of the archive. At the same time, only 25% of men reported an analogous experience. Digitisation of archives has become a prominent issue that affects archival activities in the modern context. The introduction of digital technologies into archival processes has revolutionised the approach to work and requires new skills from employees. However, the analysis revealed that men are more likely to be trained in the latest technologies and have more opportunities to take part in such projects. 70% of male archivists are involved in archival digitisation projects, compared to only 45% of women. This suggests a certain gender inequality in access to new opportunities and professional development in the field of archival digitisation. The data also revealed different approaches of men and women to the preservation of national heritage and the perception of the role of archives in scientific research.

Women (80%) more often than men (60%) consider archives to be important institutions for preserving cultural heritage and supporting research projects. Men focused more on the technical aspects of archival affairs, emphasising the significance of digitisation and modern methods of archival document management. Women often emphasised the social and cultural role of archives, viewing them as a means of preserving national identity and collective memory. Based on the data obtained, even though women constitute the majority of employees in archival institutions, they face many challenges in terms of equal access to career advancement and professional development opportunities. While many institutions have made some advances towards gender equality, barriers to full gender equality still exist, particularly in access to leadership positions and technology projects. Table 1 provides a detailed breakdown of the respondents.

Table 1. Distribution and differences in respondents' answers

| Question | Men, % | Women, % |
|---|--------|----------|
| Value of archives for heritage preservation | 60 | 80 |
| Impact of gender on career development | 25 | 60 |

Continued Table 1.

| Question | Men, % | Women, % |
|---|--------|----------|
| Participation in archives digitalisation projects | 70 | 45 |
| Access to management decision-making | 75 | 45 |
| Impact of digital technologies on professional activities | 85 | 70 |
| Obstacles to promotion to senior positions | 15 | 55 |

Source: compiled by the author

Despite these challenges, the survey also revealed positive developments in the archival sector. Specifically, respondents noted a gradual increase in the number of women in leadership positions in archival institutions, as well as the expansion of training and digital training opportunities. This suggests that the archival industry is gradually adapting to modern challenges and that efforts to achieve gender equality are ongoing. The participants of the study shared their opinions on archives management, the effects of digital technologies and gender issues in the field. Most Polish respondents, approximately 90%, assessed the role of archives as important for the preservation of national heritage. Poland has a rich historical past that is preserved in numerous archival materials. The University of Warsaw emphasised that its archives are a source for studying not only national history, but also world history, including the events of World War II. Respondents from the Jagiellonian University stressed the significance of archival preservation of Polish cultural heritage, especially in the context of the Polish Renaissance and other historical events. Universities are actively using the latest technologies to preserve their archives.

In Poland, archival activities have profound historical roots, which determine the significance of preserving national documents for the cultural identity of the country. Polish respondents noted that digitisation includes not only public documents but also other prominent historical materials such as personal archives. However, the digitalisation process is often limited by a lack of funding and the complexity of the technical infrastructure. According to the survey, 40% of respondents reported that more public funding is needed to support the digitisation of documents. Most archivists (70%) believe that the introduction of modern technologies can greatly simplify access to archival materials, but approximately 45% of archives managers believe that there are not enough specialists to implement this process. Approximately 65% of respondents also reported the issue of legal regulations that need to be updated to meet the challenges of the digital age. Archivists in Poland emphasised the need for systematic organisation of documents. The key criterion of archival affairs is the chronological principle. This makes it easy to trace the sequence of historical events and keep culturally significant documents in the correct order. Polish archives usually categorise documents by type (public, private, scientific) and by subject matter, e.g., political, social, or cultural. In terms of document preservation, Polish archives are actively introducing new methods of protecting paper archives from

external influences such as temperature and humidity (Centre of Community Archives, n.d.). 55% of respondents reported that existing document storage technologies have major drawbacks, including a lack of resources to keep archives in good working order. Among the proposed solutions, respondents pointed to the need to attract further resources to preserve digital archives. Polish archives actively use digital platforms to disseminate materials. According to the survey, about 80% of archives already have online resources where one can view digital copies of documents representing vital parts of the country's history.

The University of Warsaw noted that digitisation has greatly simplified access to historical documents for researchers and students. However, some respondents reported that the archiving system used could be improved in terms of security. 40% of respondents believe that the existing technological solutions are not reliable enough and pose a risk when storing confidential documents. The gender aspects of archives management in Poland revealed inequality in archives management. Respondents from the Jagiellonian University reported that men hold positions of national leadership in archives. At the same time, women often work in lower-level positions and as administrative staff. Universities have expressed great interest in the topic of archival management and its effects on research.

Like Poland, Slovakia is also actively digitising its archival materials. However, limited financial resources and insufficient government support have slowed down the process. In the survey, 65% of respondents named lack of funding as the main obstacle to full digitalisation. Still, most archival institutions are working on digitising the key historical documents, especially those related to the country's history and culture. According to the survey, 75% of respondents agreed that digital technologies considerably improve access to archival documents, but there is a lack of qualified personnel to carry out high-level digitisation. Only 35% believe that their institution has enough qualified staff to implement high-level digitisation. Many archivists pointed to the need for advanced training for staff working with the latest technologies. In Slovakia, as in other Central European countries, archival documents are grouped according to chronology, subject, and function. Special attention is paid to national documents related to national independence and political events of the 20th century. The survey showed that 60% of respondents believe that their existing document storage systems are outdated

and require substantial infrastructure upgrades. Even though some archives have already transitioned to digital preservation, this process is hampered by a lack of funding and insufficient support from the state. The survey showed that most respondents believe that digital archives can be a valuable tool for historical research, but it appears that extra resources are required to create the suitable infrastructure.

In Hungarian archives, the preservation of national heritage is a crucial element. 85% of the respondents at the University of Szeged reported that the archives are critical for researching the eras of the Ottoman and Austro-Hungarian empires. The documents stored in these archives help scholars to study the impact of this empire on the development of Hungary. The digitisation of archives in Hungary has been remarkably successful. 70% of respondents at the Budapest University of Technology and Economics reported that digitisation has greatly simplified access archival materials. However, 30% reported some difficulties related to data security and confidentiality. At the same time, research participants from the University of Debrecen stressed that the introduction of modern technologies has significantly accelerated the process of searching for documents, making it easier for researchers. Gender equality in archival matters has made some progress in Hungary. At universities such as the University of Szeged, the share of women in senior positions has increased to 40%. However, researchers from the University of Debrecen found that women still face obstacles to reaching high positions.

This study showed that further efforts are required to remove these barriers and ensure equal opportunities for women and men in the archival sector. Another

prominent aspect of the study was the issue of ethics and confidentiality. Archival materials often contain confidential and personal information that needs to be kept secure. 80% of respondents said that ethical standards of archival materials preservation are maintained at a high level, demonstrating a responsible approach to preserving historical documents. However, 20% of respondents expressed concern regarding the level of protection of confidential information, especially in the context of data digitisation. This is because the digitisation of archives creates new risks to privacy, as electronic data can be vulnerable to hacking and misuse.

Therefore, especially in the context of digital transformation, the issue of protecting confidential data in archives requires further improvement. The level of qualification of the archivist is important. Respondents highly appreciated the professional training of archivists. 85% of the survey participants believe that archivists possess sufficient knowledge to work with modern technology. This is important in terms of digitising archival processes. However, some respondents noted that archivists need constant professional development, particularly in the field of innovative technical approaches to working with archival materials. This underscores the need for ongoing education and training of archivists to enable them to work effectively in the context of digital transformation and prepare for new challenges. Table 2 summarises the key findings of the survey, including the significance of archives in preserving national heritage, support for research, efficiency of archival management, effects of digital technologies, gender aspects, and ethical standards in the archival sector.

Table 2. Results of the study on the work of archival institutions and the impact of technology and gender aspects

| Topic | Question | Respondents, % | Key findings |
|---|--|----------------|---|
| Value of archives for heritage preservation | Do you think archives are important for preserving national heritage? | 85% | Archives play a key role in preserving the historical and cultural memory of society. Most respondents support this view |
| Support for scientific research | Do archives play a significant role in supporting academic research? | 75% | Archives are the basis for scientific research, especially in such fields as history and sociology |
| Efficiency of archive management | How do you assess the organisation of management processes in your archival institution? | 70% | Heads of archives are satisfied with the level of organisation, but archivists pointed out the need to modernise digital resources |
| Need for modernisation | Does archive management need to be modernised? | 30% | Archivists point out the need to improve digital resource management and introduce the latest technologies to optimise the work of archives |
| Effects of digital technologies | Has digitisation simplified access archival materials? | 90% | Digitisation has simplified access to archival materials, which has positively influenced the efficiency of the archives |
| Challenges of digital technologies | Are there any problems with the reliability and protection of confidential information? | 35% | Respondents reported that existing technologies need to be improved, especially in terms of protecting confidential information |
| Gender aspects of management | Are there any gender-related differences in career opportunities in archival institutions? | 60% (women) | Women reported limited career opportunities due to gender barriers, which indicates the existence of inequality in leadership positions |
| Ethics and confidentiality | Are ethical standards observed when preserving archival materials? | 80% | The respondents noted that ethical standards in archives are maintained at a strong level, but certain problems persist |

Continued Table 2.

| Topic | Question | Respondents, % | Key findings |
|-----------------------------------|---|----------------|--|
| Professional level of archivists | How do you assess the professional level of archivists? | 85% | Archivists are well prepared to work with modern technologies, but some reported the need for ongoing professional development |
| Need for professional development | Is there a need for advanced training for archivists? | 15% | Archivists pointed to the need for continuing education and professional development in the face of rapid technological change |

Source: created by the author

Based on the findings of research conducted by the heads of archival institutions and universities in Central Europe, several methods can be identified that can help to increase the efficiency of archives management, ensure equal opportunities for all employees regardless of gender, and maintain high ethical standards of practice. The study revealed that 70% of archives managers rate the organisation of archives management processes as effective or very effective. This suggests that most managers are satisfied with the situation in their organisation. However, archivists and administrative staff pointed out certain shortcomings in the organisation, specifically, the need to modernise digital resource management processes. Several measures are required to improve the situation.

Standardised procedures for the management of archival materials, including paper and digital documents, should be developed. This will unify requirements and enhance coordination between archives in different countries and institutions. It is recommended to use special software to work with archives. This improves the efficiency of storage and access to documents and reduces the risk of data loss. It is important to regularly train archivists to learn the latest technologies and methods of managing archival resources. This will help them successfully meet arising challenges and introduce innovations into their practice. Digitisation is crucial for modern archival work. According to the survey, 90% of respondents believe that digitisation of archival materials has greatly simplified access to them, with the process of search and preservation becoming more efficient. However, 35% of respondents reported that existing technologies are not always reliable and need to be improved, especially in terms of protecting confidential information. To ensure a prominent level of security, archives should have enhanced cybersecurity, including the use of modern encryption methods and regular security audits.

It is crucial to back up data regularly to avoid data loss due to technical failures or cyberattacks, and it is important to improve access to digital archives by creating user-friendly online platforms. This helps to increase access to archival materials and facilitates research that requires such access. Gender inequality in the archival sector is a major issue that needs to be addressed. The study revealed that 60% of women archivists have limited professional development opportunities due to gender discrimination. To remedy this situation, it is necessary to ensure equal conditions for all employees. This may include creating initiatives to support women in

leadership positions and implementing training programmes to improve women's skills and avoid gender stereotypes. It is also essential to ensure a transparent recruitment process to avoid discrimination and increase women's motivation to pursue a career in archives. Furthermore, it is necessary to promote the development of professional networks for women that allow for the exchange of practices and support professional development.

The findings of this study proved that documentary studies actually play a significant role in the formation of national archives, especially in the context of Central European countries. One of the key findings of this study was the confirmation that the adaptation of archival practice to national needs and historical context affects the quality of archival management. The studied countries have developed their archival systems according to their specific cultural and legal features, which allows for more efficient innovation and positive outcomes. In Poland, digital technologies are actively used, which really help to reduce the cost of archival materials and increase the efficiency of the storage process. The findings of the study showed the role of archives in preserving national heritage and supporting scientific research. Changes in technology have strongly influenced the archival work, making materials more accessible and improving storage processes. However, there are some important challenges when it comes to technology reliability and the protection of confidential information. One of the key conclusions of this study was that the adaptation of archival practices to national needs and historical context affects the quality of archival management.

The present study found that documentary studies play a vital role in the creation and maintenance of national archives in Central Europe. It was found that the development of an effective archival system contributes to the preservation of historical heritage and provides access to important documents for future generations. This study emphasised the need to integrate modern technologies that are much more efficient than archives, such as digitisation of archives and automation of data storage and retrieval processes. The qualitative results showed that Central European countries are already actively using digital approaches in their archival activities, which contributes to the preservation of more documents and simplifies their processing. The significance of international cooperation in the archival sphere was emphasised, enabling the exchange of experience and best practices. This study also highlighted certain

limitations in the development of archival systems, specifically, the insufficient legal framework for regulating modern digital approaches and training staff to work effectively in the new context was highlighted.

Discussion

One prominent aspect mentioned by respondents in all countries was the value of archives in preserving national heritage. Respondents recognised archives as being instrumental for preserving cultural and historical memory. This is particularly important for countries with complex history, such as Poland and Slovakia. The archives of these countries contain documents related to key historical events, especially the World War II, the communist era, and the modern state-building process. This is of great significance for national identity and cultural heritage. Poland emphasised the value of preserving documents related to the Polish Renaissance, the struggle for independence, and post-war history. Although Slovakia had less acute problems with preserving its national heritage, archives also play a vital role. For instance, respondents from Slovakia consider archives to be important for studying the cultural heritage of the Habsburg period. Slovakia has historical documents from the Ottoman and Austro-Hungarian empires. Digitalisation is another aspect discussed in this study. All respondents from these countries agreed that the digitisation of archives is a great step forward, as it has greatly facilitated access to documents and reduced the time needed to find them. In Poland the digitisation of archives has enabled students and researchers to access historical documents more efficiently. At the same time, Poland has faced problems with funding for archival infrastructure, which has led to a lack of resources for proper protection of digitised materials. The Czech Republic and Hungary face analogous problems. The Czech archives are only partially digitised, which hinders a full-fledged transition to digital archives. In Hungary, respondents reported that although the introduction of the latest technologies has accelerated archival work, data security continues to be a major problem.

M. Manoff (2019) emphasised that libraries and archives are part of a complex network of social, political, and economic forces. The study focused on the effects of digital technologies and globalisation on archival practice, as well as on how librarians and archivists understand their position in systems of power and politics. M. Manoff (2019) also emphasised the importance of expanding access to marginalised materials and exposing biases in information systems. This is consistent with the present findings, which emphasised the role of digitisation and access to archives in the context of national heritage and gender equality. However, the present study revealed that digitalisation is still a challenge for some countries, such as Poland, due to a lack of resources and funding. J. Pickett & P. Sartori (2019) investigated Islamic archives and critiqued the concept of the "archive" from

a Eurocentric perspective. They proposed the concept of "document culture" to describe textual practices in the pre-industrial Islamic world as an alternative to the European archival model. This study approached the subject from a different angle and showed that archival work differs depending on the cultural context. In the case of Central European archives, archives reflect national priorities and become instruments of cultural memory preservation. However, the idea of a "document culture" helps understanding that approaches to archives depend on the historical and social context.

I.A. Carbajal & M. Caswell (2021) focused on the issue of digital archives and the blurring of boundaries between historians and archivists. The researchers identified seven key themes in archival practice: materiality, evaluation, context, use, scope, relationships, and sustainability. This study considered not only the technical aspects of digital archives, but also their effect on historical research and the role of archivists in ensuring the long-term preservation of information. Digitisation is also a prominent aspect of this study, and comparable problems were observed in the preservation and contextualisation of archival documents. The issue of sustainability of digital archives is particularly important, as highlighted by respondents from Poland and Slovakia. R. Rydén (2019) explored archivists' perceptions of time and long-term preservation of information. The researcher emphasised that archivists work with the concept of "deep time" and have a broad view of the past, but at the same time have a limited view of the future. This study was important for understanding how archivists think about their role in preserving information over time. In the study, archivists also emphasised the role of long-term preservation of national heritage, but challenges related to digitisation and insufficient funding hinder the achievement of this goal.

D.D. Mayrl & N.H. Wilson (2020) explored the archive as a social world and challenge the conventional view of the archive as an isolated space for individual research. They showed that archivists and researchers work in social interaction with archival communities, which helps to expand opportunities for creative research approaches. B. Campanotti (2021) considered the role of digital archives and preservation of media holdings. The researcher emphasised that preservation in library and archival science should involve the active use of data at all stages of the media life cycle. M. Fenner (2023) focused on the archiving of academic blogs, providing tools for preserving and transferring content to other platforms. The significance of a universal format for easy access and reuse of academic blogs should be emphasised. C.L. Liew & A. Lipscombe (2024) considered a new community-based archive model focused on ethics of care. The researchers emphasised the role of paying attention not only to artefacts but also to the communities whose knowledge is stored in archives and called for changes in archival policy to maintain relationships.



S.S. Ganesh & S. Gauri (2024) analysed a project to archive queer history in India. The researchers addressed the impact of digital technologies on issues of historical preservation and access to information. They noted that while digitisation offers new opportunities for preserving and researching queer histories, it also poses risks in terms of privacy and access to sensitive content. The researchers emphasised that the growing role of the digital humanities is affecting archival practice, especially in the context of digitisation, online publication, and unrestricted access to historical data. At the same time, queer narratives often contain sensitive and personal aspects that require special care when publishing or accessing such archives, thus creating a gap between the private and public spheres. Apart from technical issues, the researchers noted the need to develop an ethical policy that addresses issues of confidentiality, consent to publish material, and ethical curation. A prominent aspect is to rethink the inequalities in the relationship between archives, users, and archivists. These links should be viewed as part of improving access to information, but ethical standards in the handling of materials should also be considered. According to S.S. Ganesh & S. Gauri (2024), queer archives have become valuable tools for preserving marginalised histories and challenging hegemonic narratives. However, the digitisation of such archives is associated with risks of privacy violations and possible data misuse. Therefore, it is essential to develop an archival policy that accommodates all these aspects, including ethical curation, privacy protection, and access to knowledge. Adopting such an approach can help archives become more equitable and inclusive, contributing to a more ethical and responsible historical heritage for future generations.

■ Conclusions

The study identified the role of archival studies in the development of national archives in Central European countries. Valuable documents about major historical events were found in the archives of these countries. This underlines the value of digitisation and access to archival materials in the context of preserving national cultural heritage. The qualitative and quantitative indicators determined as a result of the survey indicated a difference in the level of experience and knowledge of the respondents in the field of archival affairs. The assessment of the effectiveness of modern technologies

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in archival activities and the attitude towards the significance of archives in preserving national heritage confirms the need for further implementation of digital solutions. The recommendations arising from the findings include the development of a comprehensive approach to integrating documentary research into archival practice, including digitisation of archival materials and improving access for researchers and the public. Furthermore, it is vital to focus on ethical aspects when working with archives to ensure the protection of privacy and human rights. The study of how Central European countries shape national memory through their archives can provide valuable insights for other countries that are currently developing their archival systems. However, possible limitations should be considered when implementing the recommendations. Financial constraints may prevent a full-fledged implementation of the latest technologies or expansion of archival services. Cultural and organisational barriers may slow down the modernisation and integration of archival systems.

The findings showed that documentary studies provide a systematic approach to national heritage and improve the accessibility of archival materials to the public. Future research could be enriched by analysing the experience of other parts of Europe and studying the effectiveness of the latest technological solutions for archival management. Further work in this area could focus on developing strategies for the integration of national and international archival systems that improve information exchange and ensure a greater level of document preservation. To improve the outcomes achieved, attention should be paid to the development of human resources in the archival sector and modernisation of archival infrastructure, which will facilitate access to archival documents and improve their preservation. Future research areas include the introduction of the latest technologies for digitising archives, comparative analysis of archival practices in Central Europe, study of ethical aspects of archival management, development of strategies for promoting archives, and research of archival documents.

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■ Conflict of Interest

None.

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Роль документознавства в розбудові національного архіву: досвід країн Центральної Європи

Сергій Улько

Аспірант

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Анотація. Метою дослідження було проаналізувати вплив документальної практики на побудову та модернізацію національної архівної системи й оцінка її ефективності в збереженні культурної спадщини. У дослідженні розглянуто країни Центральної Європи та роль архівознавства в становленні та розвитку національних архівів. Методологія включала порівняльний аналіз архівної практики в трьох країнах регіону, зокрема Польщі, Словаччини та Угорщини, зосереджуючись на інституційних стратегіях, технологічних інноваціях й архівній політиці. Опитування проводилося з серпня 2023 року по вересень 2024 року та охопило 250 респондентів, серед яких 32 % керівників архівів, 36 % архівістів та 32 % адміністративного персоналу. У цьому дослідженні проаналізовано значення архівів у збереженні національної спадщини, ефективність сучасних технологій та організації процесів управління. Статистичний аналіз даних показав, що 78 % респондентів вважають оцифрування необхідним для покращення доступності архівних матеріалів. Крім того, 85 % учасників підтвердили необхідність етичного управління архівами та наголосили на важливості дотримання етичних стандартів під час роботи з документами. Це дослідження також виявило необхідність інтегрувати дослідження документів в архівну практику для покращення управління архівними матеріалами. Результати продемонстрували, що ефективні стратегії оцифрування можуть значно покращити доступ до архівних ресурсів і полегшити наукові дослідження. Результати дослідження підкреслили важливу роль архівів у збереженні національної спадщини та необхідність модернізації архівних систем для покращення управління документами. Дослідження виявило, що хоча Польща, Словаччина та Угорщина мають різні інституційні стратегії та технологічні інновації, усі три країни демонструють бажання покращити архівну політику шляхом впровадження сучасних технологій. Дослідження підтвердило, що ефективне впровадження інновацій, таких як оцифрування та покращене управління архівними ресурсами, сприяє збереженню національної спадщини.

Ключові слова: технологічні інновації; цифровізація; фінансування; етичні стандарти; культурна спадщина; правова регуляція



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Archival policy as a tool for ensuring access to information and preservation of cultural heritage

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Abstract. The purpose of the article was to explore the key aspects of archives, their role in the protection of cultural heritage and their impact on social development. Particular attention was paid to the problems of access to archival data in the context of digitalisation and the development of strategies to address them. This article analysed the web platform of the State Archival Service of Ukraine, which is one of the tools for preserving and disseminating the cultural heritage of Ukraine. Special attention was paid to the analysis of modern approaches to digitalisation of archival documents. The prospects of using the latest technologies to create online museums, which increase the efficiency of people's access to cultural heritage, are investigated. The article analysed one of the websites of the online museums of Ukraine, which stores the intangible cultural heritage of Ukraine, and considers the archival policy in the field of preservation of intangible cultural heritage. A list of immovable monuments of cultural heritage in Ukraine was found on the website of the State Archives, which helped to consider how the number of preserved intangible cultural heritage is controlled. The results were obtained from statistical data on requests for access to archival documents. The study provided data on the most frequent requests to the archives, as well as the methods of application. The study of online museums confirmed the relevance of modernising museums and their transition to online mode. Further improvement of the archival policy is important to ensure the preservation of cultural property and historical data. The results of the study indicate that archival policy is crucial for maintaining national memory, and the effectiveness of archival institutions has a significant impact on the preservation of cultural heritage

Keywords: document management; national heritage; protection of historical data; reference apparatus; digitalisation

Introduction

Archival policy is not only an essential aspect of cultural heritage management, but also one of the elements that directly affects access to historical, cultural and

social sources. In the 21st century, where the preservation of national memory is becoming increasingly relevant, archives are becoming an integral part of this process.

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At the same time, the rapid digitalisation of society raises new challenges for the preservation of and access to archival materials. The problem is to understand the role of archival policy as a tool that strikes a balance between conservation of cultural heritage and its accessibility for future generations. The relevance of this study necessitates an in-depth study of archival policy as a means of ensuring access to information and protection of cultural heritage. One of the questions raised is the possibility of adapting traditional approaches to archiving in the new digital environment, what legal and administrative mechanisms need to be developed to ensure effective access to archival materials and the preservation of national heritage.

The current state of research in the field of archival policy shows considerable interest in this topic, but the search for sources for the study revealed that most scientific works focused on specific aspects, such as the legal framework of archival activities or technological challenges of digitalisation. For example, the researcher O. Maksymchuk (2018), emphasised the importance of archival management and the fact of its preservation as a national treasure, but his work did not address the issues of interaction between archives and society in the new conditions of digitalisation transformation, and aspects of the impact on the efficiency of archives after the intervention of the aggressor country, the consequences of which affected the efficiency of preservation of cultural heritage and contributed to the acceleration of digitalisation of documents.

M. Kulyk (2022) considered ways to improve the work of the state archive. The researcher noted that the activities of the archives' system are regulated at the stage of targeted development by government agencies, lawyers and archivists, which makes it possible to comprehensively address issues that arise when working with archival materials. Basic facts are determined in accordance with the legislation of each country. This has a specific historical context and depends on such factors as the socio-political structure of the state, political system, development of civil society institutions, level of development of market relations, technological support of society, traditions of record keeping, level of literacy of the population and national cultural peculiarities. The system of archives is a set of basic principles of organisation and methods of archival activity, which ensure orderly and integral functioning of all archival institutions.

L. Johnston & B. Lawlor (2020) emphasised that there are problems in state archives, such as unsuitable premises for storing archival materials (the size of the area does not correspond to the volume of storage, insufficient preparation for storing documents, lack of shelving, non-compliance with temperature and humidity conditions), which leads to damage to documents. M. Condrón (2019) analysed the legal regulation of information activities of state archival institutions in Ukraine. The author noted that the system of state archives

functioned as a separate sphere with a governing body that had significant powers. Also, T. Batanova *et al.* (2021) emphasised that Internet technologies are becoming one of the key ways to popularise archival materials. The researchers noted that archives are actively organising online exhibitions that provide an opportunity to get acquainted with unique documents without having to leave home. For employees, such online projects are also useful, as there is no need to allocate space for the exhibition, risk original documents or limit the time of its holding and control the number of visitors. It is enough to scan the documents once and post them on the official website, so that anyone interested in history can have constant access to them.

The previous studies analysed lacked a comprehensive approach that would analyse archival policy as a holistic system that takes into account legal, administrative and technological aspects. It is important to note that previous studies also dealt with the specific conditions of archival activities in Ukraine, which indicates the national context of the topic. The purpose of the study was to examine the process of transition of Ukrainian archives to online preservation of cultural heritage, to identify gaps in this process, and to analyse the disadvantages and advantages of online museums. The objectives of this study were as follows: assessing the functionality of archival policy under martial law and its impact on the preservation of cultural heritage; exploring ways in which archival institutions can effectively combine traditional methods with new digital technologies to balance preservation and access to information; analysing existing approaches to preserving national heritage; and proposing new solutions that will facilitate its accessibility for future generations. The modern mechanisms for the protection of cultural heritage in Europe, in particular in Ukraine, Italy, Poland, and France, were examined, and the relevance of the research in view of the threat to Ukraine's cultural heritage due to the numerous negative consequences of the war was emphasised.

Materials and Methods

Various sources were used for the research, including international regulations and national legislative documents governing the activities of archives, in particular The Universal Declaration on Archives (2011). These documents are key in understanding modern archival policy and define the basic principles of archival preservation and access to them. The study included a comparative analysis of archival policies of different countries such as Italy, Poland, France, Germany, and Ukraine, including methods of drafting legal documents. For this purpose, the UNESCO's Records of the General Conference (2012) were used. These documents were analysed in terms of their impact on national archival legislation and archival management practices. The study also examined the European Convention ETS No. 143 (1992), which defines the importance of archival materials related to archaeological

sites. In particular, attention was paid to the mechanisms for preserving archives that are important for the protection of archaeological heritage and measures to reduce the risk of their destruction. The study included an analysis of UNESCO's Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016), which contribute to the preservation of cultural heritage and mutual understanding between cultures. This made it possible to assess international approaches to the exchange of archival data and their adaptation in the Ukrainian context. The scientific work of O. Maksymchuk (2018) was used for comparative analysis with the electronic archives of Ukraine. The work of M. Kulyk (2022) helped to study the essence and types of state archives.

In addition to analysing legal documents, the researchers studied the modern digital information society, which plays an important role in preserving cultural heritage. Digital archives and databases allow preserving the authenticity of documents and expanding communication opportunities for their use. This study focused on analysing the activities of the State Archival Service of Ukraine, which is responsible for the digitalisation of archives in the country and ensuring their accessibility. The results of the study were achieved by using Wilcoxon's test to compare statistical data between the years 2019 and 2023. For this purpose, the reports on consideration of requests for information in the State Archives of Ukraine from 2019 to 2023 were used (Report on satisfaction..., 2019; n.d.). The materials and methods used provided a comprehensive approach to the analysis of archival policy, allowing to evaluate its effectiveness and identify potential areas for improving archival management.

Results

The history of Ukrainian archival practice

In the 18th and 19th centuries, scientific activity in Ukraine aimed at collecting and preserving manuscript, archival, and museum heritage, as well as at creating memorial collections in private collections, libraries, and museums, reached a significant stage of development. The most extensive and valuable manuscript collections were created in different lands of Ukraine by prominent scholars, educators, statesmen and religious figures. Significant family libraries and archives were formed, and archives, manuscripts, old books, documentary collections and museum values were actively collected, studied and described. Due to the absence of its own statehood, the first official national memory institutions – archives, libraries, and museums – appeared in Ukraine only during the Ukrainian Revolution of 1917-1921. In 1918, the Vernadsky National Library of Ukraine was founded by great scientists, including S. Yefremov, A. Krymskyi, V. Vernadsky, V. Kordt, H. Zhytetskyi, and other Ukrainian elite representatives. The Museum-Archive of the War and Revolution of 1914-1917 was founded in 1917 by the Cultural and Educational Committee of the All-Ukrainian

Committee of Military Deputies. To preserve the collections, they were transferred or created under the auspices of the Ukrainian Academy of Sciences as museum institutions of Ukraine, which were to become the basis of the future national museum. Other institutions encompass: The Museum of Ukrainian Theatre, the F. Vovk Cabinet Museum of Anthropology and Ethnology, The Kyiv Art Gallery, The Khanenko Museum of Art (1921-1934), and others.

P. Potocki gathered a special collection of art in the Museum of Ukraine. Thanks to the intellectual efforts of O. Hrushevskyyi, V. Miyakovskyyi, V. Modzalevskyyi, and others, in 1917-1918, as part of the development of such a project to preserve the archival heritage, the concept of the National Archives of the Ukrainian State was formulated. This archive was to include a specialised library, archives and archival commissions in the field, a central archaeological commission, and a specialised higher education institution. The concept envisaged the creation of a central institution for the storage of documents of national importance. The main idea of the archival reform was the principle of neutrality of archives, which ensured the preservation of historical documents. The stage of institutional development of national memory institutions – archives, museums, and libraries during the stalinist dictatorship was halted by the imposition of Soviet ideology. The 20th century witnessed socio-political catastrophes that destroyed the previous system and the integrity of archival, library and museum collections stored in various educational, cultural, religious and scientific organisations. Numerous unique collections from liquidated or reorganised institutions were concentrated in a few main centres that had the right to store historical documents and build archives. These institutions ensured the preservation of cultural heritage. In the 21st century, cultural heritage is protected by the Law of Ukraine No. 1805-III (2000). About 170,000 immovable cultural heritage monuments located on its territory are registered in the state register.

Analysis of the legal and regulatory framework

The Law of Ukraine No. 3814-XII (1993) is one of the main documents regulating archival policy in Ukraine. The law defines the principles of organisation, functioning and preservation of the National Archival Fond, as well as the rights and obligations of archival institutions. This law is based on international standards related to the preservation of documentary heritage (Cossack's songs..., 2016). The rules of operation of archival institutions of Ukraine regulate the activities of archival institutions at the level of organising the process of working with documents (Kyseliova *et al.*, 2013). They also provide access to archival materials. This indicates the importance of ensuring a standardised approach to archival management. Law of Ukraine No. 1398/5 (2022) regulates access to archival documents owned by the state and territorial communities. This document has

a direct impact on the exercise of the right to access information. The law was adopted on the basis of European Convention ETS No. 143 (1992), The Universal Declaration on Archives (2011) and the Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016). The recommendation concerns the preservation of and access to documentary heritage, including its digital forms. The procedure reflects the need to comply with these principles in Ukrainian archives and takes into account modern approaches to providing access to information, including in digital form.

The Law of Ukraine No. 1805-III (2000) regulates the preservation of cultural heritage, including archival heritage. The law emphasises the importance of protecting cultural resources, including archival documents, which are part of the national heritage. The law defines mechanisms for ensuring the protection, restoration, and storage of archival materials, as well as sets requirements for their accounting and use. In addition, the law promotes the development of a system of public administration in the field of cultural heritage protection, ensuring cooperation between government agencies, scientific institutions and the public to preserve cultural heritage for future generations. The law was adopted

on the basis of the Recommendation concerning the preservation of, and access to, documentary heritage, including in digital form (2016). The recommendation defines the principles for regulating the preservation of and access to archival materials in Ukrainian legislation (Law of Ukraine No. 3814-XII, 1993). The Universal Declaration on Archives (2011) emphasises the importance of archives for society and guarantees their accessibility for future generations, and this document also highlights the need to protect archival information at the international level. Ukraine works with these international norms when formulating its own archival policy. European Convention ETS No. 143 (1992), an international document on the protection of archaeological artefacts, covers the preservation of archival data relating to archaeological finds and other aspects of cultural heritage. Ukrainian legislation in the field of archival management is largely based on international standards, in particular, the UNESCO's The Universal Declaration on Archives (2011) and the Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016). The data in Table 1 show that Ukrainian legislation compares favourably with the UNESCO standards and meets international criteria.

Table 1. Compliance of Ukraine's legal framework with international criteria

| Document | Basic principles | Compliance with international standards | International documents |
|---|--|---|---|
| Law of Ukraine No. 3814-XII (1993) | Regulation of organisation and functioning archival institutions; rights and obligations of archives; preservation of documentary heritage | Complies with the principles of UNESCO on the importance of archives for society and accessibility of information | The Universal Declaration on Archives (2011); Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016) |
| Rules of operation of archival institutions of Ukraine (Kyseliova <i>et al.</i> , 2013) | Standardisation of document management processes; providing access to archival materials | Consistent with UNESCO conservation recommendations of documentary heritage and archive management | European Convention ETS No. 143 (1992); The Universal Declaration on Archives (2011); Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016) |
| Law of Ukraine No. 1398/5 (2022) | Regulation of access to documents belonging to the state and territorial communities | Complies with the principles of openness and access to information; takes into account modern approaches to digital documents | European Convention ETS No. 143 (1992); The Universal Declaration on Archives (2011); Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016) |
| Law of Ukraine No. 1805-III (2000) | Protection of cultural heritage, including archival documents; protection of cultural resources | Complies with recommendations UNESCO on preservation of cultural heritage and access to archives | The Universal Declaration on Archives (2011); Recommendation concerning the preservation of, and access to, documentary heritage, including in digital form (2016) |

Source: compiled by the authors

The data in Table 2 show that the Ukrainian archival policy generally meets international standards, but

needs to be improved in terms of practical implementation of some recommendations.

Table 2. Compliance of Ukrainian archives with international standards

| Regulatory act | Main points | Compliance with Ukrainian legislation |
|---|---|---------------------------------------|
| The Universal Declaration on Archives (2011) | Principles of preservation and access to archival documents | High |
| Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016) | Preserving and providing access to documentary heritage | Partial |

Continued Table 2

| Regulatory act | Main points | Compliance with Ukrainian legislation |
|--|---|---------------------------------------|
| European Convention ETS No. 143 (1992) | Protection of cultural and natural heritage | High |
| European Convention ETS No. 143 (1992) | Protection of archaeological heritage | Medium |

Source: compiled by the authors

In 2024, this area remains a priority. This includes further deepening of cooperation with the International Council on Archives (n.d.) and the archival community of the world, continuation of the process of withdrawal from the Commonwealth of Independent States agreements in the field of archives, and promotion of new international agreements, increasing representation of the state archives of Ukraine in the EU archival organisations, active presentation of Ukrainian history and culture through archival documents about the past and present of Ukraine at international archival forums and online on external resources of the state archives of Ukraine and partner foreign resources. The maintenance of the register of elements of the intangible cultural heritage of Ukraine began in 2012 on the basis of Order of the Ministry of Culture of Ukraine No. 1521 (2012). New elements are included in the National Register on the basis of recommendations of the Expert Council on Intangible Cultural Heritage, which functions under the Ministry of

Culture and Information Policy of Ukraine, by amending the annex to the order.

The data presented in Table 3 demonstrate that Ukrainian mechanisms for the protection of cultural heritage are in line with European standards. Italy, France, Poland, and Ukraine, each of these countries, demonstrates specific approaches and faces different problems in the field of cultural property protection. Italy attaches considerable importance to institutional support for the protection and restoration of heritage, actively cooperating with specialised organisations. France has a robust system for the preservation and restoration of national monuments, encouraging public participation and cooperation with international organisations. Poland is dynamically developing and funding heritage protection programmes in partnership with international institutions and local non-governmental organisations (NGOs). Ukraine faces challenges related to insufficient funding and insufficient coordination of cultural heritage protection activities.

Table 3. Mechanisms for the protection of cultural heritage in Europe

| Criterion | Italy | France | Poland | Ukraine |
|---------------------------|--|---|---|---|
| Institutional support | Specialised organisations, coordination and control over the preservation of cultural heritage | System security and recovery on national and at the local level is well-developed. Availability of specialised organisations and agencies | Local organisations play a key role in preserving cultural heritage | Limited support at the state level |
| Legal regulation | Developed legal framework for the protection and restoration of cultural heritage | Many laws defining legal status cultural monuments and the rules for their use | Availability of legal standards organisations in the preservation of cultural heritage | Insufficient legal regulation of the protection and use of cultural heritage |
| Financial support | A significant number of investors for preservation and restoration | Financing of programmes and projects heritage protection and co-financing by the European Union | Financing of national and regional programmes, co-financing from international organisations | Insufficient financial support that can lead to deterioration objects heritage and limit opportunities recovery |
| Public involvement | Active role of the public in heritage preservation and project implementation | Active role of the public in conservation heritage and development projects in the cooperation with the state | NGOs are actively cooperate with security cultural heritage and restoration authorities | NGOs and experts cooperate in the preservation of heritage and project implementation |
| International cooperation | Cooperation with international organisations, exchange of experience | Active participation in international initiatives, joint projects in cooperation with the state | Partnerships with international organisations and countries for preservation of the common heritage | Cooperation with international organisations and the implementation of joint projects |

Source: compiled by the authors

During the meeting of the 8th session of the Intergovernmental Committee of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, it was decided, based on the consideration of the Ukrainian element "Petrykivka painting – Ukrainian

decorative and ornamental art of the 19th and 20th centuries", to include this element in the Representative List of the Intangible Cultural Heritage of Humanity (Petrykivka decorative painting..., 2013). In 2016, the list included Cossack's songs of Dnipropetrovsk Region (2016).

Table 4 shows that intangible cultural heritage includes oral folk art, music, singing, dancing, theatre, customs, rituals, and holidays related to nature and the universe, and folk medicine. The intangible cultural heritage is

connected with the tangible cultural heritage and is an important component of the traditional life of the Ukrainian people, and is a carrier of historical memory and a source of cultural diversity around the world.

Table 4. Key elements of the intangible cultural heritage of Ukraine and their brief description

| Intangible cultural heritage | Brief description |
|---|--|
| The tradition of Kosiv painted ceramics | A unique style of painted ceramics that includes traditional ornaments, symbols and rich colour |
| Krolevets weaving | Traditional weaving with distinctive geometric patterns, known for its red and white colour scheme |
| Opishnia ceramics | A type of ceramic art that uses ancient techniques and various folk motifs |
| Petrykivka painting is a Ukrainian decorative and ornamental painting of the 19 th -21 st centuries | A vivid pictorial style of painting with floral motifs, symbolising life, prosperity, and the beauty of nature |
| Cossack songs of the Dnipropetrovsk Region | Historical songs celebrating the exploits and life of the Ukrainian cossacks are preserved in the folklore tradition |
| The song tradition of Luka Village, Kyiv-Sviatoshyn District, Kyiv Region | A local musical tradition that includes ceremonial and folk songs passed down from generation to generation |
| The technology of white-on-white embroidery in Reshetylivka Village | A special type of embroidery where only white threads are used to create delicate textured patterns |
| Traditions of vegetable carpet weaving in Reshetylivka Village | Traditional weaving of vegetable carpets from natural materials with floral motifs |
| Ornek – Crimean Tatar ornament and knowledge about it | A Crimean Tatar ornament symbolising the traditions, beliefs, and nature of the Crimean Tatars |
| The tradition of ornamental painting of Bubnivka ceramics | A type of ceramic painting with bright floral patterns typical of Bubnivka |
| Bordering | An ancient craft of wild honey harvesting that requires knowledge of the nature and behaviour of bees |

Source: compiled by the authors based on National list of elements of intangible cultural heritage of Ukraine (2023)

On 26 February 2024, the Ministry of Culture and Strategic Communications added 4 new elements to the National List of Intangible Cultural Heritage of Ukraine: traditions of cooking and eating “zozuli” porridge in Vinnytsia Region; the tradition of making “zatyрка” in the Kryva Luka Village in Donetsk Region; the coffee tradition of the Crimean Tatars; “Agyr ava ve Kaitarma” is a traditional dance of the Crimean Tatars. As of 2023, 93 elements of intangible cultural heritage were recorded in Ukraine (National list..., 2023). The Order of the Ministry of Culture and Information Policy of Ukraine No. 158 (2024) was signed by the Minister of Culture and Information Policy of Ukraine R. Karandiev. The new elements are included based on the recommendations of the Expert Council on Intangible Cultural Heritage under the Ministry of Culture and Information Policy of Ukraine (Order of the Ministry of Culture of Ukraine No. 1521, 2012).

In 2018, to ensure the implementation of the UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions, the Internet project “Virtual Museum of the Intangible Cultural Heritage of Ukraine” was presented. The digital archival structure is as follows: digital archives, main components of the system, data storage system, databases, storage servers, backup, Integration of new documents, upload procedures, quality control, metadata, document security, encryption, role-based access, access audit, technical support, helpdesk, error correction, system updates (Batanova *et al.*, 2021). The system of the Virtual Museum of Intangible Cultural Heritage of Ukraine has a well-developed structure for data storage, but there are problems

with the integration of new documents and ensuring their security. Figure 1 shows an increase in the number of requests, which indicates an increase in interest in archival documents in 2020. In 2022, the number of decreased requests for archival documents shows a sharp decline. In 2022, in order to preserve archives, they were evacuated from combat zones and dangerous areas. To control the preservation of cultural heritage during the period of hostilities, the state of preservation of documents of the National Archival Fond in state archives was regularly monitored, this event has been held since 2022 in April. During this period, the study recorded the acceleration of the process of digitalisation of archival information resources with their subsequent publication.

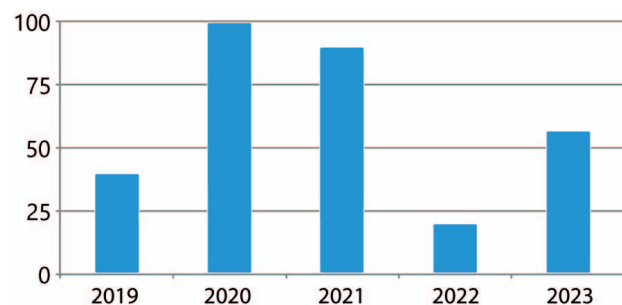


Figure 1. Statistics of requests for access to archival documents

Source: compiled by the authors based on Report on satisfaction of requests for public information in December 2019 (2019), Report on satisfaction of requests for information (n.d.)

Also, with the help of foreign partners, cloud storage was used to preserve digital information. The analysed results of the evacuation of archival documents to safe regions revealed that 11,758 storage units (93%) of documents of the National Archival Fond of the State Archives of Donetsk Region were moved from Kostiantynivka and 31,298 storage units (90%) of documents of the National Archival Fond of the State Archives of Luhansk Region were moved from Siverskodonetsk. A part of documents of the National Archival Fond of the Central State Scientific and Technical Archive of Ukraine, which were stored in Kharkiv, were transferred for temporary storage to the State Archives of Cherkasy Region. The study also found that the aggressor country had caused damage to archival documents. Despite the problem, the archival institutions replaced eleven buildings with a total area of 1,124.6 m² and added fifteen additional facilities with an area of 2,636.6 m². In 2022, archival institutions implemented measures to strengthen security and fire protection (Report on satisfaction..., n.d.). Despite significant challenges, archival institutions made substantial efforts to safeguard and preserve Ukraine's historical documents, ensuring their protection through evacuation, secure storage, and infrastructure improvements.

Consideration of the web platform of the State Archival Service of Ukraine

The web platform of the State Archival Service of Ukraine is a tool for preserving and accessing documents and archival materials. Through this platform,

users can access various archival resources, including digital copies of documents, as well as information about archives and their collections. The platform of the State Archival Service of Ukraine provides access to numerous archival documents and digital resources, which contributes to the preservation of historical materials. The information resource was developed as part of a project to create electronic resources for online access to the funds of state archives of Ukraine on the ARCHIUM platform, which was first presented on 30 June 2020 at the Central State Archive of Public Associations of Ukraine. On 11 May 2022, Ukrinform hosted a presentation of the Interarchival Search Portal, which operates on this platform and provides access to digital archival resources. Further work in this direction will continue, and all state archives of Ukraine are expected to join the process.

The Pshenychnyi Central State Film and Photo Archive of Ukraine and the Central State Electronic Archive of Ukraine were reorganised through their cooperation to form the Central State Audiovisual and Electronic Archive. As a result of this optimisation, the number of employees of central state archival institutions decreased by 6%. Indicators from Tables 5-6 show a decrease in funding and expenditures of the State Archival Service of Ukraine and its subordinate institutions. In particular, the decrease in expenditures for the general fund is 9.0%, and for the special fund – 32.7%. In 2022, the utilisation of the general fund reached 99.0%, which encompasses expenses for salaries and wages, utilities, and accounts payable that arose at the end of 2022.

Table 5. Analysis of expenditures of the general fund under budget programmes 3609000 "State Archival Service of Ukraine", 2021-2022, UAH thousand

| No. | KPKVK | Approved in 2021 | Cash expenses in 2021 | Approved in 2022 | Cash costs in 2022 | Reduced allocations |
|----------|---------|------------------|-----------------------|------------------|--------------------|---------------------|
| 1 | 3609010 | 26,755.7 | 26,692.1 | 25,527.1 | 24,846.4 | 2,836.3 |
| 2 | 3609020 | 10,223.9 | 10,224.5 | 9,764.5 | 9,689.8 | 1,073.8 |
| 3 | 3609030 | 23,334.0 | 232,513.9 | 212,317.4 | 210,619.7 | 23,590.8 |
| Together | | 270,329.6 | 269,430.5 | 247,609 | 245,155.9 | 27,500.9 |

Source: compiled by the authors based on State Archival Service of Ukraine (2022)

Table 6. Analysis of expenditures of the special fund under budget programmes 3609000 "State Archival Service of Ukraine", 2021-2022, UAH thousand

| No. | KPKVK | Approved in 2021 | Cash expenses in 2021 | Approved in 2022 | Cash costs in 2022 | Reduced allocations |
|----------|---------|------------------|-----------------------|------------------|--------------------|---------------------|
| 1 | 3609010 | 3,113.5 | 3,099.9 | 144.1 | 144.1 | 144.2 |
| 2 | 3609020 | 331.3 | 247.5 | 372.9 | 272.3 | 0 |
| 3 | 3609030 | 23,410.2 | 18,689.5 | 20,363 | 14,419.6 | 5,641.2 |
| Together | | 26,855.0 | 22,036.9 | 20,880 | 14,836.6 | 5,785.4 |

Source: compiled by the authors based on State Archival Service of Ukraine (2022)

On the occasion of the Independence Day of Ukraine, the State Archival Service of Ukraine presented documents from the National Archival Fond, which cover the process of formation of Ukrainian statehood. These materials are stored in the Central State Archive of Supreme Authorities and Governments of Ukraine. Among the presented documents, a special place is

occupied by Decree of the Verkhovna Rada of the Ukrainian SSR No. 1427-XII (1991). This important political and legal act marks a key moment in the history of Ukraine, laying the foundations for the further development of sovereign Ukraine. The resolution was adopted by a majority vote at an extraordinary session of the Verkhovna Rada on 24 August 1991. As a sign of independence,

at the suggestion of Member of Parliament V. Chornovil, blue and yellow flags were brought into the session hall and raised above the dome of the Verkhovna Rada.

These documents can be viewed on the web portal of the State Archival Service of Ukraine in the relevant section, which confirms the convenience of the archive's online work and the provision of access to information and preservation of cultural heritage. It was found that, despite the growing problems and increasing threats caused by the aggressor's military aggression against Ukraine, archival institutions, through the implementation of initiatives to protect and provide access to documentary evidence of the past, contribute to the development of the state and Ukrainian society, as well as strengthen its identity. The research has shown that archives of Ukraine continue their activities in the field of creation, accumulation, storage, and use of archival information resources that serve the legitimate interests of citizens, promote sustainable development of cultural and socio-economic life.

In August 2024, American partners delivered and installed equipment in one of the archives to implement a project to digitise genealogy-related documents of the National Archival Fond of Ukraine and create a fund for their use. This project involves the creation of colour images from about 2.5 million pages of documents in metric books stored in Uzhhorod and Berehove (State Archival Service of Ukraine, 2022). In addition to the metric books, filtration, district insurance, thematic, and personal files will also be digitised, which is approximately 100,000 cards. The archives inform about the project through its official website and provides an opportunity to follow updates on the website of the State Archives of Zakarpattia Region.

Analysing the impact of archives on the preservation of cultural heritage

Archives play an important role in shaping national memory and maintaining cultural traditions. Archival policy defines the legal and organisational framework for providing access to archival documents. One of the main principles of modern archival policy is openness and accessibility of information. This principle is implemented through the establishment of clear access criteria, digitalisation of archives, and the introduction of innovative technologies for digitalisation and information retrieval. However, ensuring access to archival information faces certain challenges. These include issues of confidentiality, personal data protection, and the preservation of physical and digital media (Boshner *et al.*, 2020; De Bari, 2024).

Many countries have developed special legislation regulating these aspects, but their effectiveness depends on proper implementation and updating in accordance with modern requirements. The Heritage Code of France (2004) defines the legal framework for preservation and access to archival materials, especially

emphasising the importance of ensuring public access to documents of cultural value. In the United States of America, there is The Freedom of Information Act (FOIA) (2016), which provides citizens with access to federal archival documents, except when this information is subject to restrictions due to national security or confidentiality issues. Federal Law of Germany BGBl. I p. 410 (2017) defines the procedure for access to archival documents, including their digitalisation. This law also protects personal data and strikes a balance between openness and protection of confidential information.

Preservation of cultural heritage is one of the key tasks of archives. This includes both physical preservation of documents and their digitalisation to reduce the risk of information loss. Archival policy involves the development of standards and norms for the storage of archival materials that take into account the specifics of different types of media (Gorbul, 2022). The digitalisation of archives has become an important step in preserving cultural heritage, as it allows storing information in new formats and providing access to it regardless of the location of users. However, it also poses new challenges to archival policy, such as ensuring long-term preservation of digital documents and protecting them from tampering (Zahara & Salim, 2022). The use of information resources of archival funds becomes extremely important at the stage of archival growth. The use of information content becomes extremely crucial. The need for 2024 is to provide users with access to archives through information databases and reading rooms. The basic terms about documentary information and archival documentation, systematisation of documents have acquired a certain history and knowledge in different fields of science. In the field of electronic information technologies, along with the concepts of "electronic information", "electronic documents" and "electronic document information systems", related terms such as "web document", "web resource" and "website" are increasingly used. A website is a type of document information system created as a collection of documents and links between documents.

Based on the results, the following recommendations were developed to improve archival policy: expanding the possibilities of digitalising archives – it is necessary to increase the pace of digitalisation, ensuring the preservation of information in case of damage to physical media; updating the policy of personal data protection in digital archives to meet modern security requirements, for example, as in the national data protection laws of Germany (Federal Law of Germany BGBl. I p. 410, 2017); improving the processes of cataloguing and integrating metadata to facilitate search and interaction with archival documents; establishing cooperation networks with international archival institutions to share experience and best practices in the digitalisation and preservation of archives; using artificial intelligence and machine learning to automate the processes of

classifying, analysing and searching for documents in archives; updating the legislation governing access to archival documents to meet technological changes and modern requirements for confidentiality and accessibility.

This study confirmed that archival policy is a key tool for ensuring access to information and the preservation of cultural heritage. The thought about the effectiveness of digital archives systems has proven to be effective, but needs to be improved in technical and organisational aspects. The recommendations developed in this study will help improve archival management and ensure proper preservation of the national heritage. This article provided a comprehensive overview of the research findings, including an analysis of the legal framework, an assessment of the digitalisation of archives, the functionality of the web platform, and the impact of archival policy on national identity. The study demonstrated the importance of archival policy for the preservation of cultural heritage and suggests ways for further improvement.

Discussion

The results obtained in this study of archival policy as a tool for ensuring access to information and preservation of cultural heritage indicate the importance of a comprehensive approach to archival management in the context of digital transformation. The results of the study confirmed that archival policy is a key element not only for preserving cultural heritage, but also for ensuring access to it in the context of rapid digitalisation. In particular, the analysis has shown that existing archival platforms, such as the website of the State Archival Service of Ukraine, play a significant role in preserving historical materials and making them accessible to users. This research helped to identify archival issues that emerged in 2022 and clearly reduced requests to the archives. This problem was the clash between Ukraine and the aggressor country. But it was also found that despite the martial law, Ukrainian archives did not stop their work, but rather increased their efforts to preserve cultural heritage and showed their mobility.

In 2022, archives from the occupied territories were transported to the territories of free cities and directly transferred to local archives. The study confirmed the findings of other researchers in this area. For example, the study by O. Maksymchuk (2018) emphasised the importance of archival management for the preservation of national heritage, but their work is more focused on the legal aspects of archival activities. This study extended this knowledge by including practical aspects of archival digitalisation and assessing the effectiveness of existing platforms by including their accessibility and usability in the analysis. After analysing the work of M. Kulyk (2022), the theoretical foundations of archival science were considered, but they do not fully cover the current challenges of the digitalisation of archival systems. This study integrated these theoretical foundations with the practical aspects of digitalisation, which allowed to draw

conclusions about the effectiveness of archival policy in the context of new technological realities.

Through the analysis of the legal framework, the results demonstrate a high level of compliance of Ukrainian legislation in the field of archival management with international standards, in particular, the European Convention ETS No. 143 (1992) and the Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016). This demonstrates Ukraine's efforts to integrate international norms to ensure preservation of and access to documentary heritage. For example, the Law of Ukraine No. 3814-XII (1993) clearly regulates the legal aspects of archival management, which is in line with international approaches, such as the Recommendation concerning the preservation of, and access to, documentary heritage including in digital form (2016). The importance of these results lies in the fact that they show Ukraine's commitment to the implementation of universal standards for the preservation of information, especially in digital form. This meets the current challenges of globalisation and the rapid development of digital technologies, which require new approaches to archival preservation and management. In addition, the compliance of the regulatory framework with international standards creates opportunities for closer cooperation with international archival organisations (Noonan, 2021; 2022).

The data revealed regarding the inclusion of Ukrainian elements in the Representative List of the Intangible Heritage of Humanity emphasises the role of archival materials in ensuring the continuity of cultural traditions and maintaining historical memory. It is also worth noting that the process of preserving intangible heritage, as demonstrated by the example of the Petrykivka painting, is carried out in close cooperation with international organisations such as UNESCO, which reflects the integration of Ukrainian traditions into the global context (Petrykivka decorative painting..., 2013). However, as M.A.D. Mendoza *et al.* (2023) indicated, Ukraine faces problems at the level of practical implementation of these standards. Lack of funding and insufficient technical support for archival institutions create barriers to the full implementation of legal requirements, which requires further improvement. M.A.D. Mendoza *et al.* (2023) research also showed that Ukraine may face challenges related to the return of cultural heritage that was exported or stolen during the war. This process requires coordination between institutions, organisations and international partners, as well as financial support (Boboc *et al.*, 2022).

The preservation of cultural heritage during and after the war is becoming a challenge that requires the consolidation of efforts of the whole society to protect historical memory and cultural diversity. In this context, the introduction of a digital archiving system for cultural monuments can be an effective mechanism for preventing losses and providing access to cultural heritage,

contributing to its preservation. The study revealed significant changes in the number of requests for archival documents during the war, which indicates the importance of external factors, such as military conflicts, on the work of archival institutions and access to cultural heritage. The decline in the number of requests in 2022 is a logical consequence of the outbreak of aggression against Ukraine and the need to evacuate archives from dangerous areas. This study confirmed the findings of researcher M.G. Masciotta *et al.* (2022), who also noted the impact of military conflicts on access to cultural heritage. Their work showed that war significantly complicates access to historical documents, but at the same time stimulates new approaches to their preservation, in particular through digitalisation.

The results are consistent with the findings of V. Montalto *et al.* (2019) and M.M. Salameh *et al.* (2022), who emphasised that cultural archives play a pivotal role in maintaining the cultural and creative vitality of cities, even in crisis situations. The authors pointed out that archives not only preserve historical memory, but also contribute to the formation of the identity of local communities through access to cultural heritage. Their study pointed out that in times of crisis, such as economic downturns or natural disasters, archives become important resources for restoring and sustaining cultural activity. The analysis of the impact of archives on the preservation of cultural heritage has shown that archives facilitate the transfer of knowledge between generations and the formation of national memory. The impact of archival policy on national identity is also confirmed by the example of the opening of the Ukrainian Museum in Bologna, which emphasises the importance of archives for cultural diplomacy and the dissemination of national values abroad, providing access to Ukrainian heritage both in Ukraine and abroad (Ojamaa & Torop, 2020; Petti *et al.*, 2020).

The findings of the study also revealed clear parallels with the conclusions presented in the work by K.M. Rebec *et al.* (2022). In particular, the study confirmed the effectiveness of the use of digital technologies in archival institutions, which is also an essential aspect in the context of integrating the latest approaches to the preservation of cultural heritage. The study emphasised that the digitalisation of archival resources not only ensures the preservation of information, but also greatly facilitates access to it for users. The results of the study of the impact of archives on the preservation of cultural heritage highlight the pivotal role of archival documents in shaping national memory and providing access to key historical moments. For example, the document recording the declaration of Independence of Ukraine is preserved in the National Archival Fond. This demonstrates the importance of archival materials as a critical source for understanding the historical context and political development of the state. Archival documents are the foundation for studying and promoting historical events that shape national identity. The im-

portance of this study is the demonstration of how archival materials not only preserve important historical facts, but also facilitate their integration into contemporary culture through digital platforms, which greatly facilitates access to them.

The study also confirmed the findings of international experts such as T. Giannini & J.P. Bowen (2023) and L. Jaillan & A. Rees (2023), who drew attention to the importance of digital tools and cloud technologies in preserving cultural artefacts in crisis situations. The use of cloud storage for preserving archival documents, which was implemented with the support of international partners, is in line with current trends in global archival affairs and highlights the prospects for further research in the area of digitalisation of archives. The importance of these results lies in the fact that they confirm the effectiveness of digitalisation and international cooperation in providing access to archival information. The study has confirmed that archival policy is a critical strategic tool for the effective preservation of cultural heritage and access to archival materials. The findings are consistent with previous studies, but also significantly expand the existing knowledge about the impact of digitalisation on archival policy in the face of modern challenges. The results of the study are of significant practical importance for further improvement of archival management in Ukraine and may be useful for other countries facing similar challenges in the context of globalisation.

■ Conclusions

The study determined the effectiveness of the use of digital technologies in archival institutions of Ukraine, as well as their accessibility for future generations. It was found that the archival policy of Ukraine meets international standards in the field of preservation and access to archival materials, but requires further improvement. The study revealed that despite the restrictions caused by the war, the international activities of the State Archives of Ukraine and archival institutions have become more intensive compared to previous years. In 2024, this direction remains one of the priorities. This involves further strengthening cooperation with the International Council on Archives and the global archival community, continuing the process of existing agreements related to archives within the Commonwealth of Independent States, and advancing new international agreements. It also includes enhancing the representation of the State Archives of Ukraine in EU archival organisations, actively showcasing Ukrainian history and culture through archival documents about Ukraine's past and present at international archival forums, as well as on external platforms of the State Archives of Ukraine and its international partners.

Based on the reporting documents of the Ukrainian State Archives for 2022, it was found that in the first days of the aggression against Ukraine, the main measures to

preserve the documents of the National Archival Fond were the provision of methodological recommendations that facilitated the evacuation of documents from state archives from combat zones and dangerous areas. The result of the link between archival policy and national identity confirmed that archives contribute to the preservation of cultural heritage, and they help to increase national identity and pride, which is important for the transmission of cultural values to the future generation. The study revealed the need to explore the

integration of archival data with other cultural resources, such as libraries and museums. This will create a unified information system that will provide expanded access to cultural heritage.

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■ Conflict of Interest

None.

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Архівна політика як інструмент забезпечення доступу до інформації та збереження культурної спадщини

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Анотація. Метою статті було дослідити ключові аспекти функціонування архівів, їхньої ролі в охороні культурної спадщини та впливу на соціальний розвиток. Особлива увага була приділена проблемам доступу до архівних даних в умовах цифровізації та розробці стратегій їх вирішення. Проаналізовано вебплатформу Державної архівної служби України, яка є одним зі знарядь для збереження та розповсюдження культурного надбання України. Окрему увагу приділено аналізу сучасних підходів до діджиталізації архівних документів. Досліджено перспективи використання новітніх технологій для створення онлайн музеїв, що підвищує ефективність доступу людей до культурної спадщини. Проаналізовано один із вебсайтів онлайн музеїв України, на якому зберігається нематеріальна культурна спадщина України, а також була розглянута архівна політика у сфері збереження нематеріальної культурної спадщини. Був знайдений перелік нерухомих пам'яток культурної спадщини України на сайті Державного архіву, що допомогло розглянути, яким чином контролюється кількість збережених нематеріальних культурних спадщин. Отримано результати зі статистичних даних про запити на доступ до архівних документів. Досліджено дані найбільш актуальних запитів до архіву, а також методи звернень. Дослідження онлайн музею підтвердило актуальність у модернізації музеїв і їх переходу в онлайн режим. Подальше вдосконалення архівної політики є важливим для забезпечення збереження культурних цінностей та історичних даних. Результати дослідження вказують на те, що архівна політика має вирішальне значення для підтримки національної пам'яті, а ефективність діяльності архівних інститутів значно впливає на збереження культурної спадщини

Ключові слова: управління документами; національне надбання; захист історичних даних; довідковий апарат; цифровізація



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Effects of social communications on identity development in the online environment: Theoretical and historical perspectives

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Abstract. The purpose of this study was to comprehensively investigate the mechanisms of interaction between online communications and identity development processes, analyse the specifics of these processes in various regions of Ukraine, and examine the impact of modern technologies on identity transformation in the digital space. The study was conducted using mixed methods, including an online survey of 2,000 social media users, in-depth interviews with 50 active users, content analysis of 100 Facebook and Instagram accounts, and a netnographic study of 10 Ukrainian online communities. The results revealed that 78% of respondents consider their online identity to be a significant part of their overall identity. It was found that social media algorithms substantially influence the shaping of users' information environment, with 67% of content in news feeds matching users' preferences. It was found that virtual communities play a significant role in shaping collective identity, especially among young people aged 18-25. The analysis of regional differences showed that the level of digital inequality affects the specific features of online identity development, with the greatest differences observed between urban and rural users. The study showed the need to develop innovative approaches to digital identity management and increase the level of media literacy in Ukrainian society. The study also revealed a growing trend towards the development of multiple online identities, especially among users aged 18-35. 62% of respondents in this age group reported having different "versions" of themselves for separate social platforms. The analysis of discourse in online communities showed that language practices and the use of specific Internet memes play a major role in the development of group identity. A correlation was found between the intensity of social media use and the level of subjective well-being of users ($r = 0.43$, $p < 0.01$). The study also discovered the growing influence of virtual and augmented reality (AR) technologies on self-presentation and identification processes, with 35% of respondents regularly using AR filters to create an online image. The findings have major implications for the development of digital literacy education programmes and social media regulation policies in Ukraine

Keywords: virtual communities; digital inequality; multiple online images; media literacy; algorithmic content generation; digital well-being

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Introduction

Social communications and identity development in the online environment have become key topics of research in the social sciences. The development of information and communication technologies and the proliferation of social media have led to substantial changes in the ways people interact and form their identities. The online environment has created new opportunities for self-expression, socialisation, and building social connections, which has influenced the processes of identification and self-identification of the individual. Social communications in the context of the online environment can be defined as the process of sharing information, ideas, and feelings between individuals and groups through digital technologies and platforms. These communications are characterised by high-speed information transfer, global outreach, and the possibility of creating virtual communities. Despite the extensive research in this area, some aspects of the impact of social communications on identity development in the online environment are still understudied.

A. Ruban (2021) examined the impact of social media on the identity development of adolescents and young adults. The researcher focused on the specific features of young people's self-presentation in the online space and their influence on the development of real identity. Yu. Skriabina (2024) analysed the specific features of self-presentation in social networks. The researcher examined strategies for creating an online image and their effects on identity development. Ye. Kaluzhna (2023) considered virtual space as a factor in the development of social identity. The researcher analysed the mechanisms of influence of online communication on identification and self-identification processes. G. Balbi & P. Magaouda (2018) examined the history of digital media and its effect on identity development in a global context.

R. Spears (2021) examined the processes of social influence and group identity development in the online environment. The researcher analysed the mechanisms of social categorisation and self-categorisation in the digital space. A.Y. Kim *et al.* (2018) investigated the development of young women's STEM identity from the perspective of social identity theory. The researchers analysed the role of online communities in overcoming gender stereotypes. A. Caliandro (2018) proposed an analytical concept for ethnographic research in the social media environment. The researcher considered the specific features of identity development in the context of digital ethnography. E. Khazraee & A.N. Novak (2018) analysed the role of social media in the development of collective identity in digitally mediated protests. The researchers considered the potential of social platforms for mobilising and coordinating collective action. K. Phiran-gee & A. Malec (2019) examined the "alienation" process in online learning and its effects on the development of identity, social presence, and sense of community. The

researchers analysed strategies for overcoming alienation in the digital learning environment.

The mechanisms of interaction between online and offline identities, the effects of specific features of various social platforms on identity development, and the role of virtual communities in identification processes in the Ukrainian context require further exploration. Furthermore, there is a need to investigate the identity development features in the online environment in various regions of Ukraine, considering cultural and socio-economic differences. The impact of advanced technologies, such as artificial intelligence (AI) and virtual reality (VR), on the processes of identity development in the online environment in Ukrainian society has also been insufficiently explored. These technologies have created new challenges for conventional concepts of identity and require theoretical understanding. Considering the identified gaps in scientific knowledge, the purpose of this study was to comprehensively examine the effects of social communications on identity development in the online environment, considering theoretical and historical perspectives in the context of contemporary Ukrainian society.

Literature Review

The issue of the influence of social communication in the online environment on identity development has attracted the attention of many researchers. This is connected with the rapid development of information and communication technologies and their integration into all spheres of modern society. Yu. Polovynchak (2017b) studied the transformation of Ukrainian national identity in the modern information and communication environment. The researcher explored the convergence processes in the communication space and their effects on the development of collective identity, especially among young people. According to S. Horova (2017), digital identity is "a set of information traces left by a user in the Internet space, which form their virtual image". This virtual image can either correspond to the user's real personality or differ substantially from it. The study of the effects of social communications on the development of identity in the online environment has become particularly relevant in the context of globalisation and digitalisation of Ukrainian society. The study of this issue helped to better understand the mechanisms of identity development in the digital age and identify the factors that influence this process.

N. Bilan (2014) proposed the concept of "network identity", which the researcher defined as "a dynamic, multiple self-presentation of an individual in the Internet space, formed under the influence of communication practices and social interactions in the virtual environment". The researcher also proposed the concept of the "networked public", which she defined as "a set of active users of social media who take part in generating and

disseminating socially significant information". This concept offers a better understanding of the mechanisms of collective identity development in the online space. The impact of social media on identity development has been the subject of investigation by many Ukrainian researchers. Yu. Polovynchak (2017a) studied the specific features of self-presentation and building social connections in the virtual space. The research showed that the online environment provides users with the opportunity to experiment with various aspects of their identity and create multiple identities. O. Onyshchenko *et al.* (2011) examined the effects of the network society on the development of national identity in the Ukrainian context. They found that global communication networks contribute to the development of new forms of collective identity that transcend conventional geographical and cultural boundaries.

The role of social media in shaping the identity of young people has become a central topic of research by V. Kyrychenko (2015). The researcher addressed how social media algorithms affect the information environment of users and, accordingly, their perception of themselves and others. V. Kyrychenko (2015) also highlighted the psychological aspects of identity development in the digital environment. The researcher proposed the term "digital competence of the individual", which he defined as "the ability to effectively use digital technologies for self-fulfilment and development, critically evaluate information, and manage one's personal digital identity". This concept is vital for understanding the individual's adaptation to the requirements of the digital society. D. Dubov & M. Ozhevan (2011) considered the issue of cybersecurity in the context of digital identity development. They noted that "the protection of personal data and digital identity is becoming a critical task for both individual users and the state overall". This issue is particularly relevant in the context of growing cyber threats and information wars. The literature review indicated the multidimensional nature of the problem of the impact of social communication on identity development in the online environment and the need for further research in this area, especially in the context of Ukrainian reality.

Materials and Methods

The study of the impact of social communications on the development of identity in the online environment was conducted from September 2023 to March 2024 at the Institute of Social and Political Psychology of the National Academy of Pedagogical Sciences of Ukraine. The study was comprehensive and included several stages. An online survey of social media users was conducted. The sample was formed using a stratified random sampling method, considering the age groups, gender, and region of residence of the respondents. The total number of survey participants was 2,000 people aged 18 to 65, of whom 52% were women and 48% were men. The inclusion criteria for the sample were residence in Ukraine, an

active social media account, and Internet time spent at least 2 hours a day. Exclusion criteria were age under 18, lack of experience in using social media. The survey was conducted using the online platform SurveyMonkey. The questionnaire contained 35 questions developed based on the digital identity scale developed by V. Kyrychenko (2015). The reliability of the questionnaire was tested using Cronbach's alpha coefficient, which was 0.87.

All participants of the study provided informed consent for participation and use of their data in an impersonal form according to the American Sociological Association's code of ethics (1997). In-depth interviews were conducted with 50 active users of social media. The sample for the interviews was formed using the quota sampling method, considering age, gender, and level of activity on social media. The interviews were conducted online using the Zoom platform and lasted an average of 60-90 minutes. The interview guide contained 15 open-ended questions aimed at identifying the specific features of identity development in the online environment. Descriptive statistics, correlation, and factor analysis were used to analyse the data obtained from the survey. Statistical data processing was performed out using SPSS Statistics 26. The Student's t-test for independent samples was employed to determine the statistical significance of differences between the groups. The level of statistical significance was set at $p < 0.05$. The qualitative data obtained from the in-depth interviews were analysed using thematic analysis using NVivo 12 software. Two independent researchers coded interview transcripts to ensure the reliability of the analysis.

To investigate the effects of social media algorithms on the development of users' information environment, the content of news feeds of 100 Facebook and Instagram accounts was analysed. The accounts were randomly selected from the database of online survey participants who agreed to take part in the study. The content was analysed using a specially developed coding matrix, which included categories of topics, types of content, and emotional colouring of messages. To study the impact of virtual communities on the development of collective identity, a netnographic study was conducted of 10 Ukrainian online communities on Facebook and Telegram with more than 50,000 members. Activity in these communities was monitored for 3 months. The discourse and interactions of community members were analysed according to the methodology developed by Yu. Polovynchak (2017a). To investigate the problem of digital inequality and its influence on identity development, the researchers analysed statistical data on Internet access and the use of digital technologies in different regions of Ukraine provided by the State Statistics Service of Ukraine (Use of information..., n.d.). The ethical aspects of the study were reviewed and approved by the Ethics Committee of the Institute of Social and Political Psychology of the National Academy of Pedagogical Sciences of Ukraine.

Results

Virtual space has become an integral part of everyday life. The rapid social development of platforms such as Facebook, X (Twitter), and Instagram has substantially affected social interaction. It can be argued that the Internet has lost its place as an open platform for personal and cultural expression. Analysing trends in the development of users' virtual identities is of particular significance. This is connected with the desire to maintain a positive social image, considering socialisation as a multi-level process. History knows many cases when personal information resources have gained wide acceptance among online communities. However, attitudes towards social media are still ambiguous. On the one hand, society is fascinated by the new communication opportunities offered by the virtual space. On the other hand, the media are increasingly drawing attention to the possible risks of the digital environment's impact on the psychological development of individuals. Online communication has its specific features that affect its forms, methods, and means, and albeit it has many similarities with real-life communication and friendship, it also has substantial differences. The advantages of virtual communication include anonymity, emotional emancipation, the use of special slang, and the possibility of creating an alternative image. However, there are also

disadvantages, such as limited emotional expression due to the lack of full sensory contact. In the digital age, blogs and social media have become a powerful tool for self-expression. However, it is not always easy to interpret an individual's online presentation, which can be seen by friends and strangers alike. To maintain privacy, users often resort to various methods: choosing special codes, restricting access to their profile, or allowing posts to be shared only with a select circle of friends.

Thus, virtual space has become an integral part of life, influencing the way people communicate, present themselves, and interact socially. This opens new opportunities, but also creates challenges related to balancing openness and protection of personal space online. A study of the impact of social communications on identity development in the online environment revealed a series of interesting trends and patterns that can provide a better insight into the identity transformation process in the digital age. An analysis of online survey data from two thousand social media users showed that most respondents (78%) consider their online identity to be an essential part of their overall identity. This suggests a strong integration of digital space into the everyday life of Ukrainians. At the same time, there are noticeable differences in attitudes towards online identity depending on age (Fig. 1).

Percentage of respondents who consider online identity important

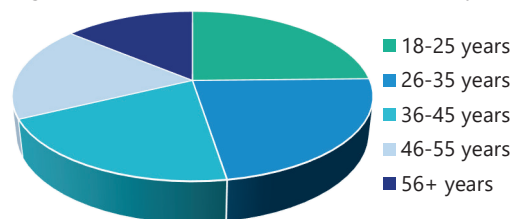


Figure 1. Importance of online identity for different age groups

Source: compiled by the authors

As Figure 1 shows, younger users are more concerned about their online identity than older users. This may be because younger generations have grown up in the digital age and perceive the online space as an integral part of their reality. In-depth interviews with 50 active users of social media helped to identify the key factors affecting the development of online identity. The top three were social recognition, professional self-fulfilment, and artistic expression. Many respondents noted that the online space provides an opportunity to test the absolute aspects of a personality and find like-minded people, which is challenging to achieve in the offline environment. An analysis of the content of 100 Facebook and Instagram accounts showed that social media algorithms significantly influence the information flow of users. On average, 67% of the content in news feeds corresponds to users' existing preferences, creating a so-called "information bubble". This phenomenon restricts

access to differing viewpoints, influences personality development, and can create a one-sided perception of reality. Users who actively interact with a variety of content have a more balanced news feed.

Only 52% of such users have content that matches their preferences, which cannot be overcome by limited algorithms due to the user's active position. Non-graphical studies of 10 Ukrainian online communities on Facebook and Telegram show the role of this platform in shaping collective identity. Virtual communities create a unique environment for the development of collective identity through shared interests, values, language habits, and specific slang. The effect of virtual communities on the formation of collective identity is particularly pronounced among young people aged 18-25. 82% of respondents in this age group reported that participation in online communities greatly influenced their worldview and self-identification. An analysis of the content of the

communities showed that discussions of political and social issues, events, educational, and cultural opportunities have the greatest impact on the development of collective identity. The distribution of topics that had the greatest effect on the development of collective identity is presented in Figure 2.

An analysis of specific regional features of online identity development revealed certain differences related to both the level of digital inequality and cultural characteristics of the region. The most significant differences were observed between urban and rural users. In urban areas, the level of social media activity and the value of online identity is on average 15% higher than in rural areas. This is explained by wider access to the Internet and digital technologies in cities. Specific

regional features of online identity development are presented in Table 1.

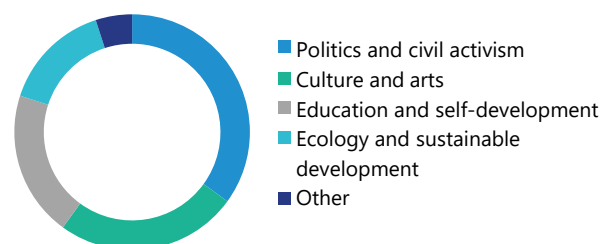


Figure 2. Distribution of topics that influence the development of collective identity in online communities

Source: compiled by the authors

Table 1. Regional features of online identity development

| Region | Level of activity on social media | Importance of online identity |
|-------------------|-----------------------------------|-------------------------------|
| Kyiv and region | High (92%) | Very high (88%) |
| Centre of Ukraine | Medium (78%) | High (76%) |
| West of Ukraine | Medium (75%) | Medium (72%) |
| East of Ukraine | High (85%) | High (82%) |
| South of Ukraine | Medium (80%) | High (78%) |

Source: compiled by the authors

The study found a growing trend towards multiple online identities, especially among users aged 18-35. 62% of respondents in this age group reported having "different versions of themselves" on different social platforms. The primary reasons for creating multiple online identities include the desire to meet the specifications of certain platforms, separation of work and personal life, experimentation with certain aspects of one's personality, and protection of privacy. An analysis of the discourse in online communities revealed that language practices and the use of specific online memes play a role in shaping the collective role of identity. 78% of active participants in online communities choose specific slang and linguistic constructions that are characteristic of their community. 68% of respondents claim that the use of these language practices strengthens the sense of membership in the community. The study found a correlation between the intensity of social media use and the well-being of users ($r = 0.43, p < 0.01$). This relationship is non-linear: moderate use of social media is associated with a higher level of subjective well-being, while moderate use is associated with a lower level of this indicator. This may be related to the fact that more active use of social media leads to greater social connectedness and access to information, while more active use leads to information overload and reduced time for real communication.

Another interesting aspect of the study was the impact of VR and augmented reality (AR) technologies on self-presentation and identification. 35% of respondents reported that they regularly use AR filters to create online images. 72% of AR filter users said that these

technologies help them express aspects of their personality that are not easily expressed in real life. The data analysis also showed that online communications play a significant role in shaping professional identity, especially among young professionals: 68% of respondents aged 22-35 reported that online professional communities on social media significantly influence their professional identity, with platforms such as LinkedIn and professional groups on Facebook playing a particularly prominent role in this process. The study showed that online activism strongly influences the development of civic identity. An analysis of user activity during major socio-political events showed that participation in online discussions and virtual actions helps to strengthen a sense of civic responsibility and involvement in social processes. This influence is particularly pronounced among young people, for whom social media is often the first step on the path towards civic engagement.

Another relevant aspect of the study was the examination of digital inequality and its effects on online identity development. The data analysis showed that users with limited access to the Internet and digital technologies have the least opportunities to shape and expand their online identity. This poses a risk of digital exclusion and can lead to increased social inequality in the digital age. The data study also revealed the role of visual content in shaping online identity. An analysis of Instagram and TikTok user profiles showed the growing significance of visual self-presentation in shaping online identity, especially among young users. At the same time, a tendency to create idealised images and

compare reality with the desired is observed, which can lead to cognitive dissonance between online and offline identities. The study found a connection between online and offline identities. For many users, their online identity is an extension of their offline identity, as opposed to a completely independent entity. At the same time, online environments provide opportunities for experimentation that would otherwise be unlikely to realise in real life.

Data analysis has also led to AI playing an increasingly significant role in shaping online identities. The use of AI algorithms to personalise content and recommendations affects not only the user's information environment, but also their worldview and self-identity. This raises critical ethical questions regarding the transparency of algorithms and their effect on identity development.

In this study, attention was drawn to the problem of cyberbullying and its effect on identity development. It was found that negative experiences gained in the online environment can reduce self-esteem and alter user behaviour in the digital space. This highlights the necessity of developing effective mechanisms to protect users and create a safe online environment. This study examined the impact of the COVID-19 pandemic on online identity development. The data analysis showed that the period of quarantine restrictions has led to an intensification of online communication and an increase in the role of digital identity. Many respondents reported that during the pandemic, online identity has become more meaningful and multifaceted. Changes in the use of social media before and during the pandemic based on a survey of 2,000 respondents are presented in Table 2.

Table 2. Changes in social media usage before and during the COVID-19 pandemic

| Indicator | Before the pandemic | After the pandemic | Difference |
|--|---------------------|--------------------|------------|
| Average time spent on social media (hours/day) | 2.5 | 4.2 | +68% |
| Number of active social platforms per user | 2.8 | 3.6 | +28% |
| Percentage of users who consider online identity important | 65% | 82% | +17% |
| Frequency of content creation (posts/week) | 3.2 | 5.7 | +78% |

Source: compiled by the authors

The study also showed the growing role of online education and its impact on personal development: 72% of respondents aged 18-35 reported that participation in online courses and webinars significantly influenced their professional self-determination and skill development. This suggests that online education is becoming one of the factors shaping identity in the digital age. Data analysis shows that an increasing number of users are accessing online resources to find information about health. 65% of respondents stated that they regularly use social media and professional platforms to get advice on healthy lifestyles, which influences the development of their identity as "conscientious consumers" and "supporters of healthy lifestyles". The most common reasons for this are listed below. Online games continue to be a place of identity development, especially among younger users: 42% of respondents aged 18-25 said that game characters are a significant part of their online identity. This highlights the need to consider the gaming space when exploring identity development in the digital age. The survey revealed a growing trend towards the use of cryptocurrencies and blockchain technology, which is influencing the development of new aspects of online identity. 28% of respondents said that participation in cryptocurrency communities and ownership of digital assets is a vital part of their online identity. The study showed the growing role of online dating platforms in shaping users' romantic and sexual identities: 55% of respondents aged 18-35 said that the use of dating apps had influenced their self-perception and approach to romantic relationships.

The use of financial applications and online banking has influenced the development of users' financial identity. 70% of respondents stated that regular use of financial applications has changed their attitude towards personal finance management and influenced their self-perception of themselves as financially literate people. It was found that online volunteering is becoming one of the aspects of social identity formation. 45% of respondents reported that they had taken part in online volunteering projects in the past year, which influenced their self-perception as a socially active citizen. The data analysis also shows the growing role of podcasts in identity development. 38% of respondents stated that regular listening to certain podcasts influenced their views, interests, and self-perception. Overall, the findings demonstrate the complexity and multidimensionality of identity development in the online environment. Social communication in the digital space strongly influences users' self-perception and self-presentation, creating new forms of identity and transforming the existing ones. This emphasises the need to further investigate these processes and develop strategies for managing digital identity in the modern information society.

The findings of the study also point to the need to develop innovative approaches to media education and digital literacy that address the complexity of identity development in the online environment. It is crucial to create educational programmes aimed at developing critical thinking and digital identity management skills. The study highlighted the necessity of further exploring the ethical aspects of the use of AI and algorithms

in social media, including their effect on user identity development. Ethical standards and regulatory mechanisms can be developed to ensure that algorithms are transparent, and that users' rights are protected. Overall, the findings of this study demonstrated a comprehensive approach to the study of identity development in the online environment, which considers the technical, social, psychological, and cultural aspects of this phenomenon. The study revealed the phenomenon of "digital detox" and its effect on online identity development. Approximately 35% of respondents reported that they regularly engage in digital detox, deliberately limiting the use of social media and other online platforms for a certain time. Interestingly, after the period of "digital detox", many users reported reconsidering their online identity and changing their approach to self-expression in the digital space. There is a tendency to use closed and private online communities to build a more authentic and intimate online identity. 42% of respondents reported being members of closed groups or communities in messengers, where they can express their thoughts and feelings more freely. This indicates that users need a more controlled and secure online environment where they can form and express their identity.

The study also highlighted the role of memes and online humour in the development of group identities and subcultures in the online environment. According to the data collected, 68% of respondents aged 18 to 30 systematically use memes as a means of communication, self-expression, and self-identification. They emphasise that memes are an essential element of their personal identity. This emphasises the significance of studying visual and humorous communication in the identity development process in the digital space. According to the study, there is an interesting tendency to create so-called "alternative" or "secret" accounts on social media. Specifically, 30% of respondents in the 18-25 age group admitted to having separate accounts that allow them to express aspects of their personality that are not disclosed in their main profile. This highlights the complexity and diversity of online identities and the value of multiple platforms for self-expression. The data analysis also showed the growing role of online tasks and flash mobs in shaping group identity and awareness of involvement in global trends. 62% of respondents reported that they had attended such events in the past year and viewed them as a way to express their identity and connection to the global community.

This study emphasised the role of influencers and opinion leaders in shaping the identity of social media users. It was found that 48% of respondents systematically follow certain influencers who greatly affect their views, lifestyle, and self-determination. This highlights the significance of exploring the mechanisms by which digital opinion leaders influence the process of identity development in the online environment. The data analysis showed that online communities are playing an

increasingly significant role in supporting the identity development of people with physical or mental disabilities. 52% of respondents with disabilities reported that participation in these communities had a significant impact on their self-perception and helped them to build a positive identity. There is a growing tendency to use digital tools for self-monitoring and self-improvement. 65% of respondents reported that they regularly use applications that track physical activity, sleep, mood, and productivity, which affect their self-perception and help them to form the identity of a "mindful person". The findings of the data analysis indicate the growing role of online platforms in creating and storing consumer content that influences the development of creative identity. According to the survey, 70% of respondents regularly create and interact with user-generated content, considering it a vital form of self-expression and creative activity.

The data study demonstrates the growing significance of online platforms for freelancing and remote work in developing professional identity. It was noted that 48% of respondents involved in remote work or freelancing believe that their online presence on professional platforms is an essential element of their professional identity. The study also highlighted the impact of online reputation and reputation systems in the digital sphere on identity development. 55% of respondents emphasised that their online reputation (on platforms such as freelance platforms, online games, etc.) influences their self-perception and motivation. The generalised findings of the study suggest that identity development in the online environment is a complex and multidimensional process that simultaneously stimulates social, cultural, and technological changes in society. Social interaction in the digital space opens new opportunities for self-expression and experimentation with identity, but also raises new challenges and ethical issues. These findings underscore the critical need to continue interdisciplinary research into the identity development process in the digital era. Specifically, this involves the development of innovative approaches to media education and digital literacy. Furthermore, it is crucial to establish ethical standards and regulatory mechanisms that will help create a safe and inclusive online environment. This approach also emphasises the relevance of strategies aimed at overcoming digital inequality to ensure equal opportunities for the development and expression of identity in the digital space.

Discussion

The study of the impact of social communication in the online environment on identity development revealed a complex picture of human interaction with the digital space. These data not only confirm some existing theories, but also highlight new aspects of this phenomenon, especially in the Ukrainian context. The study pointed to the growing role of "digital empathy" (the ability to

understand and empathise with others in the online space). This is particularly significant in the context of online support communities and self-help groups. This raises the question of how to develop and nurture this skill in the digital environment. The "digital nostalgia" currently observed opens interesting prospects for studying the temporal aspects of online identity. This phenomenon can exist in the context of I. Granic *et al.* (2020) study of identity development in the digital age. They raised the question of the influence of past "digital selves" on modern identity and the possibility of considering "digital autobiography" as a new type of self-presentation. The study also examined the phenomenon of "digital detox" as a way of redefining one's online identity. Users who temporarily stop using social media are often reluctant to change their attitude towards their online presence when they return. This raises the question of the role of regular "disconnections" in the healthy construction of digital identities. I. Granic *et al.* (2020) also proposed to go beyond the concept of "screen time" and consider the development of identity in the digital age as a complex process. The researchers emphasised the need to consider the qualitative aspects of interaction with the digital environment. A notable aspect that needs further exploration is the impact of online identity on offline narratives. The study showed that many users transfer elements of their digital identity to real life, which can have both positive and negative consequences.

The trends in personal branding and self-marketing in the online space identified in this study can be presented in the context of P.K. Masur (2019) study on situational privacy and self-presentation on the Internet. The researcher analyses personal information management strategies in the context of digital identity development. This study raised the question of the potential commercialisation of identity elements and how authenticity is preserved in a world where every life can become "content". The study showed that the development of an online identity often includes "digital rituals" – behaviours that are repeated in the online space and have symbolic meaning for the user. This can be a daily status update, regular unfriending, or participation in a particular online challenge. These rituals require further research as an essential element of digital culture. A significant aspect of this study is the influence of "digital influencers" on the development of online identity. These can be well-known bloggers and influencers, as well as anonymous users whose posts go viral. This raises the question of identity development and support mechanisms in a decentralised digital environment. The impact of cryptocurrencies on online identity development opens new research horizons. Questions arise about how decentralised technologies change the understanding of identity and privacy. This phenomenon can be understood in the context of the study by J.L. Davis *et al.* (2019) on the development of collective social identities in the digital space. The present study raised the question of how

distributed technologies are changing the understanding of identity and privacy in the online environment. Notably, the study had certain limitations. Although the sample is representative of active social media users in Ukraine, it may not fully reflect the experiences of people with limited access to the Internet. Furthermore, the present study was conducted in a specific time period and therefore cannot track changes over time.

The findings of a non-linear relationship between intensive use of social media and subjective well-being partially confirms the findings of R. Nowland *et al.* (2018) on the complex relationship between internet use and loneliness. The researchers analysed the potential of digital technologies to overcome social isolation. However, the present study also showed that moderate social media use is associated with higher well-being, which may be connected with an adequate balance between online and offline social interactions. Thus, the present study not only confirmed existing theories, but also opened new avenues for understanding the process of identity development in the online environment. This emphasises the need for a comprehensive and interdisciplinary approach that considers both global trends and local specifics in the study of this phenomenon. The findings of this study have important practical implications and can be used to develop more effective digital literacy education programmes that address the complexities of online identity development. The data can also help to create more ethical and inclusive digital platforms that foster positive identity development among users. For policymakers and regulators, this finding underscores the need for a more nuanced approach to regulating the digital space. Instead of generalised rules, policies should consider the diversity of online experiences and the needs of different user groups. This study is a reminder that identity development in the online environment is not merely a technical process, but a profoundly human experience. Understanding these experiences is key to creating a digital future that enriches, rather than limits, understanding of self and others.

It turned out that 78% of respondents consider online identity to be a significant part of their overall identity. This more clearly confirms the opinion of V. Kyrychenko (2015) that digital technologies are deeply integrated into the psychological processes of a modern person. V. Kyrychenko (2015) discussed the psychological aspects of human interaction with the information environment, specifically the process of forming digital competence of an individual. The researcher defined digital competence as the ability to effectively use digital technologies for self-fulfilment and competence development, to critically evaluate information and manage one's personal digital identity. However, based on V. Kyrychenko (2015) general conclusions, the study showed that there are major differences between age groups. For example, 92% of young people aged 18-25 attach great significance to their online identi-



ty, compared to 52% of users aged 56 and older. This indicates the need for a differentiated approach to exploring the digital identity of different age groups. The ethical aspects of online identity development also deserve a separate study. Questions arise regarding the need to ensure privacy and trust in the digital space, as well as the need for a new digital ethics. The identified phenomenon of multiple online identities (62% of users aged 18-35 have different "versions" of themselves on different platforms) coincides with the ideas of N. Bilan (2014) on the multiplicity of aspects of social communication in the information society. This phenomenon requires further research in the context of psychological well-being and personal authenticity. The relationship between online identity and mental health is another important topic for future research. It raises the question of how digital technologies can be used to promote psychological well-being. The role of online identity in the development of social capital and civic engagement in the digital age is a topic that requires further investigation, especially in the context of the development of democratic institutions.

Confirming the impact of social media algorithms on the development of "information bubbles" (67% of the content of the news feed corresponds to the current preferences of users), O. Onyshchenko *et al.* (2013) expressed concerns over the risks that social media pose to the development of civil society. However, the data also show that active users can counteract this effect and open new perspectives for research on digital literacy and critical thinking in the online space. The study also revealed an interesting phenomenon known as "digital fatigue". Some users, especially those who have been active on social media for a long time, reported feeling tired due to the need to maintain a constant online presence. This phenomenon requires further investigation and may have significant scientific implications for mental health and social interaction. Another aspect worth addressing is the role of language habits in shaping online identity. In the Ukrainian context, the dynamics of the use of Ukrainian, Russian and English in different online contexts is interesting. This raises the question of the impact of language choice on self-identification and perception of others in the digital space. The study also pointed to the growing role of "digital legacy" in identity development. Users are increasingly thinking about what will happen to their online presence after they die. This raises new ethical and legal questions about managing the digital identity of deceased people. The findings also point to the need to develop innovative methodological approaches to the study of online identity. Conventional psychological and sociological research methods do not always reflect the complexity and dynamism of digital experience adequately. Innovative, interdisciplinary approaches combining methods from computer science, psychology, sociology, and cultural studies are needed.

The findings of the study highlighted the need for a comprehensive and nuanced approach to understanding the identity development process in the online environment. It pointed to the significance of considering cultural, social, and technological contexts when studying this phenomenon.

■ Conclusions

Having analysed the effects of social communication in the online environment on identity development, the study fulfilled its purpose. For most Ukrainian social media users, online identity has become an integral part of their overall identity, which indicates a profound integration of digital space into their daily lives. Significant differences in attitudes towards online identity were found depending on age, which suggests the need for a differentiated approach to the exploration of digital identity for different age groups. The analysis of social media content has confirmed that algorithms significantly influence the shaping of the information environment of users. At the same time, the ability of active users to counteract this effect was identified, which opens new perspectives in digital literacy research. The study confirmed the role of virtual communities in the development of collective identities, especially among young people. It was found that there is a growing trend towards the development of multiple online identities, which reflects the complexity of the modern digital environment. The analysis of specific local features showed the impact of digital inequality on the development of online identities and highlighted the necessity of devising strategies to bridge this gap. A non-linear relationship between the intensity of social media use and the subjective well-being of users was found, indicating the complexity of the interaction between online activity and psychological state.

The findings of this study also showed that online communities play a valuable role in the development of collective identity, especially among young people. The analysis of discourse in online communities showed that language practices and the use of specific online memes play a significant role in the development of collective identity. The study highlighted the growing role of online education and its effects on professional identity development. 72% of participants aged 18-35 reported that online courses noticeably influenced their professional identity. The study also revealed a growing trend towards the use of digital tools for self-monitoring and self-improvement and their impact on the development of a "mindful" identity. This study showed the significance of exploring the effect of innovative technologies, such as AI and cryptocurrencies, on the development of new aspects of online identity. These findings highlight the need to constantly update the approaches to studying digital identity and develop innovative strategies for managing online presence in a rapidly changing digital environment.

The study revealed the growing influence of virtual and AR technologies on self-presentation and identification processes, as well as the significant role of online communication in shaping professional identity. These findings are vital for understanding the transformation of identity in the digital age. The findings also have major practical implications, as they expand the scientific understanding of identity development processes in the online environment. They can be used to develop effective digital literacy education programmes, set ethical standards for social platforms, and develop strategies to overcome digital inequality. Based on this study, it is recommended to introduce differentiated media education programmes for different age groups, develop initiatives aimed at developing critical thinking online, and create mechanisms to protect users from the negative impact of algorithmic systems. These measures will contribute to the development of a healthy digital

identity and increase the overall level of media literacy in Ukrainian society. Further research in this area will considerably expand the understanding of human identity in the digital age and help to develop positive strategies for personal development in the online space. To improve the findings in the future, it would be useful to expand the research area and conduct a comparative analysis with other countries or conduct a longitudinal study to track the dynamics of changes in online identity over time. This would allow for a better understanding of global trends and specific cultural features of digital identity development.

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■ Conflict of Interest

None.

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Вплив соціальних комунікацій на формування ідентичності в онлайн-середовищі: перспективи теорії та історії

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Анотація. Метою роботи було провести комплексне дослідження механізмів взаємодії онлайн-комунікацій та процесів формування ідентичності, аналіз особливостей цих процесів у різних регіонах України, а також вивчення впливу нових технологій на трансформацію ідентичності в цифровому просторі. Дослідження проводилося з використанням змішаних методів, включаючи онлайн-опитування 2,000 користувачів соціальних мереж, глибинні інтерв'ю з 50 активними користувачами, аналіз контенту 100 акаунтів у Facebook та Instagram, нетнографічне дослідження 10 українських онлайн-спільнот. Результати показали, що 78 % респондентів вважають свою онлайн-ідентичність важливою частиною загальної ідентичності. Виявлено, що алгоритми соціальних мереж суттєво впливають на формування інформаційного оточення користувачів, з 67 % контенту у стрічках новин, що відповідає вже існуючим уподобанням користувачів. Встановлено, що віртуальні спільноти відіграють значну роль у формуванні колективної ідентичності, особливо серед молоді віком 18-25 років. Аналіз регіональних відмінностей показав, що рівень цифрової нерівності впливає на особливості формування онлайн-ідентичності, з найбільшими відмінностями між міськими та сільськими користувачами. Дослідження демонструє необхідність розробки нових підходів до управління цифровою ідентичністю та підвищення рівня медіаграмотності в українському суспільстві. Результати дослідження також виявили зростаючу тенденцію до формування множинних онлайн-ідентичностей, особливо серед користувачів віком 18-35 років. 62 % респондентів цієї вікової групи зазначили, що мають різні «версії» себе для різних соціальних платформ. Аналіз дискурсу в онлайн-спільнотах показав, що мовні практики та використання специфічних інтернет-мемів відіграють значну роль у формуванні групової ідентичності. Встановлено кореляцію між інтенсивністю використання соціальних мереж та рівнем суб'єктивного благополуччя користувачів ($r = 0,43$, $p < 0,01$). Дослідження також виявило зростаючий вплив технологій віртуальної та доповненої реальності (AR) на процеси самопрезентації та ідентифікації, з 35 % респондентів, які регулярно використовують AR-фільтри для створення онлайн-образу. Отримані результати мають важливе значення для розробки освітніх програм з цифрової грамотності та політики регулювання соціальних медіа в Україні.

Ключові слова: віртуальні спільноти; цифрова нерівність; множинні онлайн-образи; медіаграмотність; алгоритмічне формування контенту; цифрове благополуччя



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Using information systems to automate the document processing process

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Abstract. The relevance of the study is due to the growing need to optimise document processing in modern organisations. With the introduction of information systems, automation of document processing becomes a key factor in improving management efficiency, reducing costs and increasing processing speed. The purpose of the study was to create a comprehensive understanding of how various information systems can improve document processing processes, as well as to identify ways in which these systems contribute to automation and efficiency. The article examined the role of information systems in optimising document processing and examines their impact on the automation of these processes in order to improve the efficiency of document management. To achieve this goal, a detailed analysis of existing information systems used to automate document processing was conducted, including an assessment of various technologies that help automate document processing, their functionalities, and specifications. The impact of automation on organisational productivity was investigated. An assessment of how automation can reduce costs, increase the speed of document processing and improve workflows, including an analysis of how automation can contribute to more efficient resource management and improve overall organisational productivity, was conducted. The article identified potential problems that may arise when implementing information systems for automating document processing, including the identification of possible difficulties and barriers, such as technical issues, the need for staff training, or integration issues. The article provided a comprehensive overview of the role of information systems in optimising document processing, identified their advantages and disadvantages, and analysed their impact on organisational productivity and potential implementation challenges. The study provided specific recommendations for the selection and adaptation of automation technologies, which will allow organisations to reduce costs, shorten document processing time,

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reduce errors and increase employee productivity. The results can be used to improve the efficiency of document management in organisations through the implementation and optimisation of information systems

Keywords: information technology; document information processing; management processes; document management; document flow; office workflow; electronic signature

■ Introduction

Modern, dynamic world, where the speed of change and demands for efficiency are increasing, makes efficient document management critical to the success of any organisation. Traditional document processing is often time-consuming and resource-intensive, resulting in delays, errors and excessive costs. These problems arise from the use of paper-based media, routine manual processes, and insufficient integration of data processing systems. In order to overcome these challenges and increase efficiency, more and more companies and organisations are turning to the implementation of information systems to automate document processing. Automation of this process includes the use of advanced technologies such as electronic document management systems (EDMS), optical character recognition (OCR), robotic automation processes and integration solutions. These technologies not only automate routine tasks, but also provide more flexible and efficient information management. The introduction of such systems can significantly reduce dependence on paper, which is an important step towards environmental sustainability and reducing the cost of storing and transporting documents. In addition, automation increases the speed and accuracy of information processing, reduces the likelihood of human error, and optimises administrative processes. This allows organisations to reduce costs, speed up data processing and improve customer service. Research in this area is particularly relevant as it allows to assess the effectiveness of various automation technologies, as well as to identify potential problems and barriers that may arise during the implementation of such systems. Analysing the impact of automation on organisational processes helps to understand how these technologies can optimise business processes, increase productivity, and ensure compliance with regulatory requirements and standards. It is also important to estimate the costs of implementing and maintaining information systems, as well as to identify best practices for integrating them into the organisation's existing infrastructure.

The other authors' research in this area plays a key role in shaping the current understanding of the problem and developing innovative approaches to solving it. Studying the work that has already been done in this area allowed to identify the main trends, methods and tools used to automate document processing, as well as to understand the challenges organisations face when implementing them. The analysis of scientific papers is an important step in building a holistic view of this issue, as well as helping to identify knowledge gaps and outlining areas for further research, which is a prerequi-

site for improving existing systems and developing new approaches. Having reviewed the study of O.V. Sikora *et al.* (2022) on the development and implementation of information systems, it was found out that these information systems have functional capabilities. The authors' work described the creation of systems that ensure the collection, processing, storage and delivery of information resources, as well as their modification or development of new ones if necessary. The role of information and communication technologies and their impact on various areas of activity, including offices, enterprises, educational institutions and libraries, were considered. The subject of the study of Y. Hrybovska & Z. Kononenko (2023) were the peculiarities of implementation and use of information systems for accounting and management of an enterprise. The article focused on the essence of the concept of "information system" and the definition of its tasks. It is established that information systems include software products that ensure the collection, storage and processing of data used by internal users. I. Piatnychuk (2022) analysed and systematised the most popular online project management platforms and services that allow for effective task setting, task monitoring, and resource allocation. The services were compared according to criteria such as task display, mobile versions, opportunities for communication between colleagues, and total cost, taking into account the needs of the organisation. However, the author rightly pointed out that new platforms appear on the market every day, characterised by the presence of more functionality, so it is necessary to constantly research them. The subject of the study conducted by S. Holovatska (2021) was to identify the main advantages of electronic document management at enterprises, types of EDMS and areas it can be used. The study also covered the analysis of the taxonomy of financial reporting in Ukraine, the organisational basis for the administration of electronic financial and tax reporting, the systematisation of electronic document management and reporting services, and the role of government agencies in the development and adaptation of national electronic reporting standards.

The study of other authors' research has provided a key understanding of current trends and approaches to the processing, accounting and storage of documentary information in the context of globalisation and informatisation of society. The analysis of the papers allowed to identify the main methods and tools for automating document management and to identify the challenges faced by organisations in implementing new information technologies. The purpose of this study was to create a

comprehensive understanding of the role of information systems in optimising document processing, as well as to study the impact of information systems on the automation of document processing in order to improve the efficiency of their management. This included assessing the advantages and disadvantages of various automation technologies. The objectives of the work are: analysis of existing information systems for automating document processing; assessment of their advantages and disadvantages; evaluation of the impact of automation on organisational productivity, cost reduction, increased document processing speed and improved workflows; identification of potential problems that may arise when implementing such systems. The research was conducted using a set of general scientific methods, such as induction and deduction, analysis and synthesis, systemic and functional approaches, classification and systematisation, observation and description, explanation and generalisation. The methodological basis of the study was the use of analysis and synthesis, which allowed to identify trends and cause-and-effect relationships in the implementation of information systems for automating the document processing process in organisations. The conceptual basis of the study is based on establishing the relationship between the use of such systems and improving the efficiency of document management, reducing costs and increasing productivity. The study is based on the analysis of primary sources and modern scientific works, which allowed to create a comprehensive overview of the problem and propose effective approaches to solving problems related to the automation of document processes.

■ Efficiency of Automating Document Processing with the Help of Information Systems

The use of information systems to automate the document processing process significantly increases the efficiency of enterprises, institutions and organisations. Automation allows to optimise document flow, speed up the processes of creating, storing, searching, sorting and archiving documents, which reduces errors and ensures control at all stages of the document lifecycle. It also improves access to information, as employees are able to quickly find the documents they need, view their modification history, and process them according to established procedures. In addition, automation helps to significantly reduce the costs associated with manual processing of paper documents, including paper, printing, storage and transport costs, and reduces the need for physical storage space. Information systems provide a high level of data protection through the use of modern encryption and access control methods, which helps protect documents from unauthorised access and ensure compliance with confidentiality standards. Modern information systems can also integrate with other systems, such as accounting software, CRM and ERP systems, to create integrated solutions for all aspects of an

organisation's operations. This increases the efficiency of decision-making, as documents are processed faster and more accurately, and managers and employees have access to up-to-date information, which helps them make informed and timely decisions. Information systems also facilitate document management by providing clear control at every stage of the document workflow, from creation to archiving and destruction. In addition, automating the document processing process helps organisations comply with legal requirements for the storage and processing of documents, including tax and financial statements, which is an important aspect of modern management.

According to B. Molnár & A. Benczúr (2015), the concept of business documents has two important functions. On the one hand, a business document (for example, a text file or a spreadsheet) can be used as a tool to describe requirements or specifications, and on the other hand, a business document is an integral part of business processes and therefore an important element of business information systems. The current trend shows that most of these documents remain in a semi-structured format, with only a small proportion being converted into structured database schemas. Semi-structured documents can be stored and processed in modern database management systems in accordance with the requirements of business processes. The study emphasised the importance of integrating documents into business processes and reflects the trend towards the use of semi-structured document formats, which allows for greater flexibility and adaptability in data management. H. Puriy (2019) pointed out that there is an opinion that an information system is implemented exclusively with the help of computer technology. However, in practice, enterprises often need information technologies based on both computer solutions and without them. A modern enterprise information system should be viewed as a software package consisting of separate modules that cover all areas of an organisation's activities and interact in real time. This allows for timely and informed decision-making at various levels of management. The information system should be based on a software product that meets the requirements for efficient document management and information exchange to the maximum extent possible.

R.L. Baskerville *et al.* (2022) noted that the close relationship between information systems and information technology creates difficulties for researchers, as it is difficult to clearly distinguish between them. According to the authors, from a practical point of view, information systems encompass both technical and social subsystems, while an IT system focuses mainly on technical aspects. This distinction provides useful insights, as information security professionals are often involved in the acquisition and integration of IT systems into an organisation's overall information system. According to O. Larchenko (2020), in general terms, an information

system is a complex of hardware, software and organisational support, as well as qualified personnel that provides users with the necessary information at the appropriate time. An information system is defined as a set of information stored in databases and processed using information technology and technical means. The definitions of N. Chernyashchuk *et al.* (2020), who believed that an information system is an integrated set of data, equipment, software, personnel and standard procedures that ensure the collection, processing, distribution, storage and presentation of information in accordance with the organisation's goals. The author argued that information systems are becoming increasingly automated. They include data processing equipment, software and personnel. The main elements of information systems include tools for recording and collecting information, tools for data transmission, tools for storing information, and tools for analysing, processing and presenting data.

In agreement with I. Petrov (2022), who believed that the continuous development of computing technologies increases the requirements for improved methods and tools for assessing the performance of information systems. This applies to aspects such as reliability, compliance with standards, and quality of service. Improved assessment methods allow not only to ensure stable operation of information systems, but also to increase their efficiency in the face of increasing workload and complexity of the tasks they perform. In addition, it is important to take into account the impact of the latest technologies on the overall architecture and integration of systems, which further improves their performance and reliability. Information systems for automating the document processing process include not only electronic document management. Electronic document management is one of the main components of information systems, which also include content management systems, DMS, business process automation (BPA) systems, corporate information resource management systems, OCR systems, electronic archiving systems, electronic signature systems, case management systems, etc. Each of these systems plays a role in ensuring the efficiency and transparency of document processing, storage, transfer and management within an organisation.

■ Categories of Information Systems for Automating Document Processing

The main categories of information systems designed to automate the document processing process should be considered in more detail in order to understand its functionality, advantages, and role in improving efficiency and optimising document flow in organisations. *EDMS* is a key component of modern information systems that automates the processes of creating, storing, processing and exchanging documents in electronic format. L. Prokopets *et al.* (2021) highlighted numerous advantages of electronic document management. These

include instant access to documents and prompt changes, which significantly increases the speed of work. Effective document management simplifies the activities of companies with branches or representative offices in different cities or countries. All structures of the company can work in a single information environment, which speeds up document approval and decision-making, and therefore document processing software has been actively developed and improved in recent years. The benefits also include improved performance discipline due to the ability to identify those responsible for the execution of documents at any time and increased employee productivity. The security and safety of documents is ensured through data encryption, which protects information from unauthorised use. Electronic document management also eliminates duplication of documents, reduces the cost of document management and office work, improves the processes of preparing, submitting, recording and storing documents, their authentication, ensuring their integrity, confidentiality and inviolability. In addition, it provides fast and reliable exchange of electronic documents with partners and contractors, regardless of their location.

I. Nazarova (2020) included the following in the main functions of internal electronic document management: generating documents using templates or uploading documents of various formats created in other systems; automatic creation of new documents based on existing ones; reviewing and signing documents using a qualified electronic signature or other identifiers; sending documents for review or approval within the enterprise according to an approved sequence; controlling the approval process with the ability to track changes in the status of documents; storing documents electronically for quick retrieval and review; saving resources by storing documents on servers instead of printing and maintaining archives; and the ability to remotely create and use documents from anywhere in the world using various devices. The main function of external electronic document management is the remote exchange of documents with buyers, customers, suppliers, regulatory authorities and other counterparties. However, many software solutions for external document management also include functions for internal accounting, such as creating, reviewing and signing documents, or allow to download ready-made electronic documents from internal systems.

T. Korolyuk & N. Rapa (2021) noted that electronic document management has become a key element in the formation of the modern information society. Electronic documents are now equal in importance to paper-based media. At the current stage of economic development, electronic document management technologies with uniform standards and regulations are being introduced. Supporting the opinion of J. Han *et al.* (2021), who noted that with the development of information technology, cloud computing has greatly simplified work. The growth of electronic governance

and electronic commerce has led to an increase in the number of electronic documents, which have become a key tool in these areas. Effective management of electronic documents is an important task for governments and businesses, as it helps to increase efficiency, protect confidential information and reduce costs. This article discussed the use of cloud technologies in the creation of an electronic file management system, proposed an architecture for such a system, and discussed key technologies and implementation methods. A cloud-based file management system allows users to upload, share, check and retrieve files using various access modes, ensuring reliable and secure management.

DMS provide storage, organisation, management and access to documents in digital form. They allow to control document versions, perform searches, automatically archive documents and provide a level of security for access to documents. I. Matiienko-Zubenko (2023) noted that business processes generate a large amount of data, such as contracts, employee information, process documentation, and financial statements. Manually managing this data is time-consuming and can lead to low productivity and the risk of losing information confidentiality. Therefore, special attention should be paid to electronic document management, which includes a set of procedures for creating, processing, adjusting, transmitting, receiving, using, storing and destroying electronic documents. The system also controls data integrity and confirms receipt of documents, which is ensured by modern *DMS*. These systems optimise all technological procedures for working with electronic documents, from data collection to file usage.

BPA systems automate routine and repetitive processes, including document processing. They allow to model business processes, manage tasks, automatically route documents based on predefined rules and conditions, and track the status of tasks. S. Obikhod (2021), studying the introduction of information and communication technologies into the business process management system, concluded that *BPA* is a key digital tool for improving the efficiency of daily routine tasks of staff. These solutions help to systemise and unify specific business processes, such as order processing, dispatch, customer interaction, etc., which greatly facilitates their implementation and optimises the company's operations.

Enterprise content management (ECM) systems for managing corporate information resources combine different types of information resources into a single platform, including documents, email, multimedia and other data. They provide an integrated approach to information management across an organisation, improving accessibility and control over data (Huzhva, 2021). The main purpose of *ECM* systems is to support the full life cycle of information, from its creation or receipt to the moment when it loses its value and needs to be destroyed. Unlike traditional *EDMS*, *ECM* systems have the ability to work not only with documents, which make

up only a small part of corporate content, but also with any other types of data, such as emails, graphics, photos, audio and video files, and web pages. As noted by N. Hocine & I. Bokhari (2021), due to the widespread adoption of the remote work business model, employees can work anytime and from anywhere, sometimes using their own devices due to limited financial resources of companies. This raises many security and access control issues for *ECM* systems. In particular, access control must be adapted to the context of employees' work, their devices, and their profiles and situations to increase the usability of the system. However, most access control models do not take into account user profiles and the diversity of their devices in open networks. They also depend on constant intervention by administrators to manage the system, add new devices, and configure settings. In a remote work environment, with its diversity of devices and contextual conditions, access control needs to be managed dynamically to minimise the need for human intervention.

OCR systems are used to automatically recognise and digitise text from paper documents or document images. This allows to convert printed or handwritten texts into editable electronic documents, which facilitates their further processing and storage. Ye. Chichkarov *et al.* (2023) noted that *OCR* systems help to avoid errors and save time. They are used to solve a wide range of practical problems, such as converting printed academic records into text for storage in electronic databases, decoding ancient inscriptions and texts, and automatic data entry by optical scanning of cards or bank cheques. M. Sirajudeen & R. Anitha (2020) rightly argued that manual authentication of physical documents (identity cards, certificates, passports, legal documents) increases administrative costs and is time-consuming. Automated document authentication using convolutional neural networks, *OCR* and other image processing methods significantly increases the accuracy of counterfeit detection compared to traditional methods. As defined by N. Sarika *et al.* (2021), the process of converting images of handwritten, typewritten, or printed text into a format that can be recognised by a computer is called *OCR*. This technology allows for editing, indexing, searching, and reducing storage space. This is achieved by scanning an image of text character by character, then processing the scanned image and converting the characters into text codes such as ASCII. An *OCR* system is used to convert image text into a text format. It is based on three main stages, namely pre-processing, character recognition, character segmentation, and data representation.

Electronic archiving systems are designed for long-term storage of electronic documents and data. They provide structuring, indexing and access to archived documents, as well as guarantee their integrity and availability over time. By definition of V.O. Yaruta & G.G. Aseyev (2020), an electronic archive is a set of software and hardware tools and business procedures that

ensure the performance of basic archival operations, such as value assessment, classification, categorisation, determination of retention periods, destruction of unnecessary documents and transfer of documents for long-term storage to other archives. Electronic archiving systems are designed to store, index, classify and manage electronic documents and data, ensuring their safety and integrity throughout their life cycle. H. Okhrimenko & O. Fedoruk (2023) noted that such systems must comply with regulatory requirements so that the stored data cannot be altered or damaged, allowing them to be created as certified copies of the originals for audit or legal purposes. The lifecycle of an electronic document begins with the receipt or creation of the document, that is, its entry into the system, after which it is processed and archived. Archived documents are available for organisational purposes and further use through central databases. Modern archiving systems show whether a document is still being processed, has been published, can be edited, or can no longer be changed. Documents go through a lifecycle that may include different stages depending on the type, format and purpose. In order to find the best solution for digital document management, each stage of the lifecycle needs to be carefully followed and it is important to check whether the software you choose provides all the necessary functions.

Electronic signature systems ensure the legal force of electronic documents by signing them with a digital signature. This confirms the authenticity of the signatory and the integrity of the document. Such systems are often integrated with other information systems to simplify the process of signing contracts, agreements and other important documents. A. Mosevnina & L. Polovenko (2022) defined an electronic digital signature as electronic data obtained as a result of cryptographic transformation that is attached to other data or documents. An electronic signature system ensures the security of the information it contains and also confirms the authenticity of the key holder, which can be obtained from specialised key certification centres. The certificate confirms the authenticity of the owner's data and contains a public key signed by a trusted person. It is virtually impossible to forge an electronic signature. This system protects the key from being tampered with, which allows it to be approved at the legislative level. The main goal of introducing electronic digital signatures in Ukraine, according to U. Vatamanyuk-Zelinska & V. Sushko (2020), is to use it in practice to simplify and accelerate the document flow between business entities. This, in turn, increases the competitiveness of Ukrainian enterprises, as the procedures for concluding civil and commercial contracts, processing export-import transactions, providing electronic banking services and other operations are faster. The digital signature not only optimises most document management processes, but also contributes to the development of business practices, their approximation to European standards and the

improvement of the business environment through digital transformation.

An overview of the main categories of information systems designed to automate document processing showed their importance in improving the efficiency of document management in organisations. Electronic document management, DMS, BPA, corporate information resource management, and OCR systems provide speed, security, convenience, and control in document processing, reducing costs and increasing productivity. These technologies help to optimise business processes, support remote work and ensure efficient information exchange.

■ Challenges and Risks of Implementing Information Systems for Automation of Document Processing: Management Aspects and Strategic Solutions

It should be noted that organisations may face a variety of challenges when implementing information systems to automate document processing, regardless of the specific type of system. Although such systems can significantly increase efficiency and productivity, their integration may be accompanied by a number of common risks and barriers. These include the following aspects. The high upfront costs of acquiring, implementing and maintaining systems, including software, hardware and staff training, can be a significant challenge for many organisations. The implementation of new systems can be complex and require significant resources, including integration with existing systems, process adaptation and data migration. Compatibility issues can prevent the new system from working effectively. Possible technical issues or software bugs can affect the system's performance and lead to delays in operations. Employees may be unprepared or unwilling to change their usual work processes. Resistance from users may lead to problems with the adoption of the new system and reduce its effectiveness. Employees may require significant training to use the new system effectively. Insufficient training can lead to errors and reduced productivity. Ensuring the confidentiality and protection of data is critical. Risks include possible data leaks, unauthorised access or cyber-attacks that could compromise the integrity and confidentiality of information. Problems with proper data storage and archiving can lead to data loss or corruption, which can negatively impact the availability and integrity of information. Risk of dependence on the system vendor for technical support, updates and bug fixes. These common issues require careful management and planning to ensure the successful implementation of information systems and the achievement of expected results.

According to A. Abecker *et al.* (2000), the clear modelling of business processes and their implementation in DMS has proven to be extremely important for improving the overall performance of organisations. It is authors' contention that implemented business processes, which include DMS, provide a solid foundation

for ensuring adequate information support for complex and knowledge-intensive operations. This is confirmed by the results of two different projects that illustrate the successful use of these systems to optimise management and information flows in organisations. In the modern business environment, as noted by L. Dolgova & H. Yamnenko (2021), the choice of a corporate information system is becoming a key strategic decision that significantly affects the company's efficiency. The information systems market is developing dynamically, with new solutions emerging that meet different business needs. Most of the information about these systems, about 80-90% of market data, can be obtained through the analysis of open sources of information. This allows companies to make informed choices based on up-to-date and detailed data on market offerings.

O. Hostryk (2021) believed that the choice of an information system and the setting of tasks should be based on long-term economic planning of the organisation's activities. The structure and functional purpose of the information system should be aligned with the specific goals of the organisation. The process of implementing new information technologies should take into account the speed of their changes, emergence of new versions or types. Ignoring this aspect can lead to rapid obsolescence of the technology and require its modernisation, which will affect the efficiency and costs of the organisation. To avoid such problems, it is necessary to regularly review and update the information system in accordance with current requirements and market trends. Implementing information systems to automate document processing can therefore be fraught with numerous challenges, such as high upfront costs, technical problems and employee resistance to change. Successful integration requires careful management and planning, as well as regular market analysis to ensure compliance with the latest requirements. Clear business process modelling is critical to improving the overall efficiency of organisations.

■ Conclusions

The use of information systems to automate document processing significantly improves the efficiency of enterprises, institutions and organisations. Automation optimises document flow, speeds up the creation, storage, search, sorting and archiving of documents, reducing errors and ensuring control at all stages of their lifecycle. It also improves access to information, allowing employees to quickly find the documents they need, view

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the history of changes, and process them according to procedures. Automation helps to reduce the cost of manual processing of paper documents by reducing the need for physical storage space. Information systems provide a high level of data protection through modern encryption and access control methods, which protects documents from unauthorised access and maintains confidentiality. In addition, they can integrate with other systems to create end-to-end solutions for an organisation's operations, which improves decision-making through faster and more accurate document processing. Information systems also simplify document management by providing control at all stages, from creation to archiving and destruction.

A modern enterprise information system should be viewed as a software package consisting of individual modules that cover all areas of an organisation's activities and interact in real time, allowing timely and informed decisions to be made at various levels of management. Each of the system included in the electronic document management plays a role in ensuring the efficiency and transparency of document processing, storage, transfer and management. Implementing information systems to automate document processing can face several challenges. These include difficulty integrating with existing systems, high purchase, training and support costs, employee resistance to change, data security issues, technical difficulties and limited access to resources. All of these factors can complicate the implementation process and require careful planning. For a successful information systems implementation, it is important to plan the integration carefully, defining clear objectives and creating a detailed action plan with milestones and timelines. It is also necessary to estimate the budget and resources and ensure that they are available for the project. It is important to train employees to increase their readiness to work with the new system and reduce resistance to change. Ensuring data security is critical, so security policies should be developed, including protection against unauthorised access, data backup, and data integrity monitoring. Regular monitoring and support of the system will help to quickly resolve technical issues and ensure stable operation of the system.

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■ Conflict of Interest

None.

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Використання інформаційних систем для автоматизації процесу обробки документів

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Анотація. Актуальність дослідження обумовлена зростаючою потребою в оптимізації процесів обробки документів у сучасних організаціях. З впровадженням інформаційних систем автоматизація обробки документів стає ключовим фактором для підвищення ефективності управління, зменшення витрат і підвищення швидкості обробки. Мета дослідження полягала в створенні комплексного розуміння, як різні інформаційні системи можуть покращити процеси обробки документів, а також у визначенні способів, якими ці системи сприяють автоматизації та підвищенню ефективності. У статті досліджено роль інформаційних систем в оптимізації процесів обробки документів і вивчено їх вплив на автоматизацію цих процесів із метою підвищення ефективності управління документацією. Для досягнення цієї мети проведено детальний аналіз існуючих інформаційних систем, що використовуються для автоматизації обробки документів, що включало оцінку різних технологій, які допомагають в автоматизації обробки документації, їх функціональних можливостей та специфікацій. Досліджено вплив автоматизації на організаційну продуктивність. Оцінено, яким чином автоматизація впливає на зниження витрат, підвищення швидкості обробки документів та покращення робочих процесів, що включає аналіз того, як автоматизація може сприяти більш ефективному управлінню ресурсами і покращенню загальної продуктивності організації. Виявлено потенційні проблеми, які можуть виникнути під час впровадження інформаційних систем для автоматизації обробки документів, що включає ідентифікацію можливих труднощів і бар'єрів, таких як технічні проблеми, потреба в навчанні персоналу або інтеграційні питання. У статті надано комплексний огляд ролі інформаційних систем в оптимізації обробки документів, визначено їх переваги та недоліки, а також проаналізовано їх вплив на організаційну продуктивність і потенційні проблеми при впровадженні. Надано конкретні рекомендації щодо вибору та адаптації технологій автоматизації, що дозволить організаціям знизити витрати, скоротити час обробки документів, зменшити кількість помилок та підвищити продуктивність працівників. Результати можуть бути використані для підвищення ефективності управління документами в організаціях через впровадження та оптимізацію інформаційних систем.

Ключові слова: інформаційні технології; обробка документної інформації; управлінські процеси; управління документами; документообіг; діловодство; електронний підпис

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