



DIGITAL TRANSFORMATION OF UKRAINIAN LIBRARIES: CURRENT STATE AND PROSPECTS.

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ABSTRACT

Purpose: Researching the current state and prospects of the digital transformation of libraries in Ukraine is relevant to understanding and addressing the challenges that libraries face amidst the rapid development of technologies and changes in ways of perceiving and disseminating information.

Design/Methodology/Approach: For this study, the sample was drawn from the population of public libraries in Ukraine (11338 in total). The sample included libraries selected by random sampling. A structured questionnaire was designed to collect information about the availability of computers and Internet connections in Ukrainian libraries. The questionnaire was distributed electronically and by mail to library representatives. Descriptive statistics, including percentages, were calculated to summarise the prevalence of computers and Internet access in Ukrainian libraries.

Findings: The findings revealed that the low level of computerisation poses a barrier to the implementation of modern technologies and access to digital resources. Furthermore, financial difficulties hinder the ability to invest in digital initiatives and innovative projects.

Research Limitation/Implications: This study includes issues related to the digitalisation of Ukrainian libraries and can be applied to the digitalisation of libraries as a whole.

Social Implication: The digital transformation of Ukrainian libraries has profound social implications that extend beyond the realm of information access and technological advancement. This democratization of information promotes lifelong learning, promotes research efforts, and promotes informed decision-making by citizens.

Practical Implication: In this context, it is necessary to digitally transform libraries to ensure effective access to information and meet the needs of users in the digital environment.

Originality/ Value: The study focuses on the social consequences of digital transformation increasing the availability of information and reducing the digital divide, which makes it important for understanding the modern challenges of Ukrainian libraries and their impact on society.

Keywords: *Computerisation. digital. information systems. libraries. web archiving*



INTRODUCTION

Libraries play a crucial role in providing free access to knowledge and cultural heritage in today's information society. The growing significance of digital technologies makes it imperative for libraries to undergo digital transformation as a strategic direction for their development (Sakharova, 2023). Research on the current state and prospects of digital transformation of libraries in Ukraine can help to understand the impact of information technologies on the development of the library sector and to identify optimal strategies for further improvement of the library sphere in response to contemporary challenges.

Digital transformation can improve the quality of service in libraries, increase access to knowledge, and enhance the information literacy of the population. These include developing online platforms, and electronic resources and using innovative technology to enhance information interaction between libraries and readers. Transitioning to effective digital infrastructure also involves considering the use of analytics to enhance services and respond to evolving public needs (Kostyrko, 2022).

Achieving full digital transformation in the library field requires not only expanding access to electronic resources but also adapting libraries to the changing conditions of life and work. One of the key challenges is increasing digital literacy among librarians and users to effectively utilise modern information resources (Shilo, 2023). Concurrently, it is important to maintain a balanced approach to preserving traditional library values while implementing innovations.

This research article aims to analyse and systematise information on the current state of digital transformation of libraries in Ukraine. The article focuses on the key challenges and opportunities that arise in the context of information technology implementation. In addition, the purpose of this study is to analyse the current state and prospects of the digital transformation of Ukrainian libraries. Specific objectives include assessing the availability of computers and Internet access in libraries, determining the level of automation of processes, and analysing the social consequences of digital transformation. The research findings will serve as a basis for developing recommendations aimed at supporting the digital modernisation of Ukrainian libraries and their positive impact on society.

THEORIES UNDERPINNING THE STUDY

Mostova and Karakoz (2023) explore the modern concept of library services, which extends beyond the traditional role of libraries as document repositories. The authors highlight the library sector's adaptation to the digital age, expanding its capabilities for accessing information and services. The use of modern technologies and virtual spaces enables libraries to be more flexible and efficient in meeting the informational, educational, and cultural needs of users. The authors note that the digital transformation of libraries is taking place in the context of rapid technological advancements and changes in societal perceptions of the role of libraries in the modern world. Libraries are increasingly taking part in the networked environment, providing users with new opportunities to access and process information. According to Ageyenko (2021), the main purpose of the electronic library is to ensure the right to access to information, in particular public access to electronic library resources, to ensure



equal access to information for all citizens of Ukraine and the preservation of library and information resources using end-to-end digital technologies.

Khrushch et al. (2023) identified key aspects of immersive technologies in digital libraries, including virtual reality and augmented reality, which are likely to become more prevalent in the future. They also considered the ethical and legal challenges associated with these technologies. The authors highlighted the potential for these technologies to enrich and enhance knowledge accessibility. They analysed the use of various digital technologies in digital libraries. The transformative influence of these technologies reshapes engagement with digital resources and redefines educational frameworks.

In the work of Barabash, et al. (2023) the processes of evolution of the activities of libraries of institutions of higher education under the influence of innovative transformations of modern times were investigated, in particular the formation of an open information space, the complex combination of various information, and the presentation of modern automated library and information systems as a tool for supporting the educational and scientific activities of institutions of higher education. Dobrovolska & Cherednyk (2023) claim that in the conditions of a digital society, the activities of libraries are transforming, turning into centers of not only scientific, but also socially significant information. New forms of user service, such as virtual exhibitions, online tours, presentations, video lectures, and electronic libraries with ubiquitous and round-the-clock access to various documents, are gaining popularity, which indicates the need to implement the latest information technologies and create information-library networks to satisfy the information needs of users. In a study by Perchuk, et al. (2023) identified key challenges facing public libraries and archives during digital transformation, including preserving the value of information, ensuring data privacy, and integrating with legacy systems.

Lomachynskiy (2023) identified the main transformative directions of information culture in modern libraries in their educational work. The study uncovered the characteristics of information culture in the digital age and clarified the concepts and content of digital competencies for library staff. This provides a basis for concluding that raising the level of digital competencies is crucial for the development of modern libraries and ensuring access to knowledge in the information society. The work's conclusions indicate that the library's contemporary information culture is a system of standardised measures for digitising, preserving, popularising, and transmitting a set of material and spiritual values to users. The author emphasises the importance of the development of digital competencies among librarians for expanding access to relevant information in digital format, as well as for promoting self-realisation and preserving human dignity.

In his scientific work, Khrushch (2023) identified that in the era of digital transformations, the key competencies of a librarian include information literacy, digital media skills, and professional communication. This allows librarians to provide innovative services and meet the information needs of users using modern technologies, including interactive and multimedia. It is evident from a review of pertinent scholarly works that the theory of digital transformation entails the adaptation of contemporary libraries to emerging digital technologies, aiming to enhance operational efficiency and cater to user demands within digital



landscapes. Moreover, in alignment with the theory of innovative management, the successful digital evolution of libraries necessitates the adoption of innovative managerial strategies encompassing strategic planning, utilisation of cutting-edge technologies, and resource optimisation. Consequently, the research underscores the imperative of devising and implementing innovative approaches to digital technology utilisation within library domains to facilitate seamless and efficacious information access for all users. Furthermore, noteworthy emphasis is placed on the methodological aspects of integrating innovative management practices tailored to support libraries' digital transformation initiatives and bolster their competitive edge within the contemporary information milieu.

The study's strengths lie in its broad overview of current trends in the development of the library industry, particularly in the context of digital transformation. In addition, the key challenges facing libraries in the digital environment were analysed in detail, focusing on the ethical, legal, and socio-cultural aspects of the use of digital technologies. The key competencies of library staff needed for successful adaptation to digital changes were also identified. However, the limited geographical perspective and the lack of analysis of the latest technologies, such as artificial intelligence and analytical systems, affected the research results negatively. The literature review identified gaps in some aspects of digital transformation, such as the impact of social media and online communities on library development. A deeper analysis of these aspects could enhance the comprehensiveness of the research.

METHODS

A comprehensive assessment of the state of information technologies in the libraries of Ukraine was carried out. To understand the availability of information technologies, in particular computers and Internet connections, data from the public libraries of Ukraine (11338 in total) was collected in these libraries. The sample included libraries selected by random sampling method. This approach ensured that each library in the general population had an equal chance of being included in the sample, which increased the representativeness of the results.

A structured questionnaire was designed to collect information about the availability of computers and Internet connections in Ukrainian libraries. The questionnaire was distributed electronically and by mail to library representatives. In addition, follow-up communication was initiated to encourage participation and ensure data completeness. Descriptive statistics, including percentages, were calculated to summarise the prevalence of computers and Internet access in Ukrainian libraries. An analysis was conducted to evaluate the dynamics of library informatisation in Ukraine. Interpreting the results involved placing the findings within the broader context of library modernisation efforts in Ukraine. Key trends and patterns were identified to shed light on the challenges and opportunities inherent in the process of informatisation. This contextualisation enabled stakeholders to gain insights into the underlying dynamics shaping the modernisation landscape of Ukrainian libraries.

FINDINGS AND DISCUSSION

Libraries in the modern digital world are not only repositories of books but also centres of information and knowledge that actively adapt to contemporary demands. The digital



transformation of libraries in Ukraine is a relevant and integral stage of their development, impacting all aspects of their activities. Adapting the library sector to the demands of the digital age involves providing access to information through modern technologies, creating open digital resources, and developing electronic library services.

Digital transformation, or digitisation, in Ukraine is a strategic and phased transition of the information space to digital technologies, encompassing all spheres of society. In the context of modern challenges and realities, the conversion of the library sector is an important adaptation to the present, ensuring effective interaction between the virtual and physical worlds. The process is influenced not only by challenges faced by civilisation but also by the state's economic policies, which consider the country's development specifics and the transformation of the library sphere under changing conditions, especially during the pandemic period.

The implementation of digital transformation in Ukraine involved the establishment of the Ministry of Digital Transformation (Ministry of Digital). The Ministry is responsible for developing digital infrastructure, promoting digital development and innovation, enhancing digital skills, and protecting citizens' rights (Nekrasov, 2020). The government-initiated "Concept for the Development of Digital Competencies and Approval of the Action Plan for its Implementation" aims to provide nationwide broadband internet coverage and digitise educational processes (Verkhovna Rada of Ukraine, 2021). Another significant step in Ukraine's digital transformation was the Ministry of Digital Transformation and the Ukrainian Library Association's (ULA) initiative to engage libraries in the national "Stay Tuned!" digital literacy campaign and implement the "Diia. Digital Education" project. Cooperation involves transforming libraries into project hubs and providing free access to learning on the national online platform. Library staff were trained on "Digitization of Library Affairs: Tools and Implementation Methods", addressing digital transformation issues, information technology usage, and digital and information literacy of users.

The digital transformation of the library sector involves several important aspects, including the need to revise external communication. Rather than the traditional approach of creating a product and then attempting to persuade the user, it is more effective to develop a product that caters to specific categories, needs, and consumption situations. Enhanced communication processes are necessary, including gathering information about user needs and orientation, and should occur at every stage of interaction.

It is important to understand that digital transformation is a systematic process. This involves abandoning outdated technologies and action schemes that consume resources and focusing on thriftiness and optimisation of library processes, including time, resources, and staff. The application of artificial intelligence is crucial, as it allows for decision-making in conditions of incomplete and asymmetric information. Successful digital transformation requires preparing employees for new technologies and changes in workflows. Additionally, creativity should be employed as a driver of further adjustments. The direction of digital transformation is also determined by new strategies for obtaining previously unavailable financial revenues.



Informatisation is a crucial stage in the development of modern Ukrainian libraries. It is reflected in the implementation of technological innovations to improve access to information and expand the range of services for users. However, this represents the first and most significant challenge. The number of public libraries with computers, let alone Internet connectivity, is very low. Currently, the number of libraries automating their processes is unknown, but in the course of the study, a sample of various public libraries in Ukraine (11338 in total), selected by random sampling, was formed and the percentage of certain automation factors, namely, the availability of computers and access to fast Internet, was calculated (Figure 1).

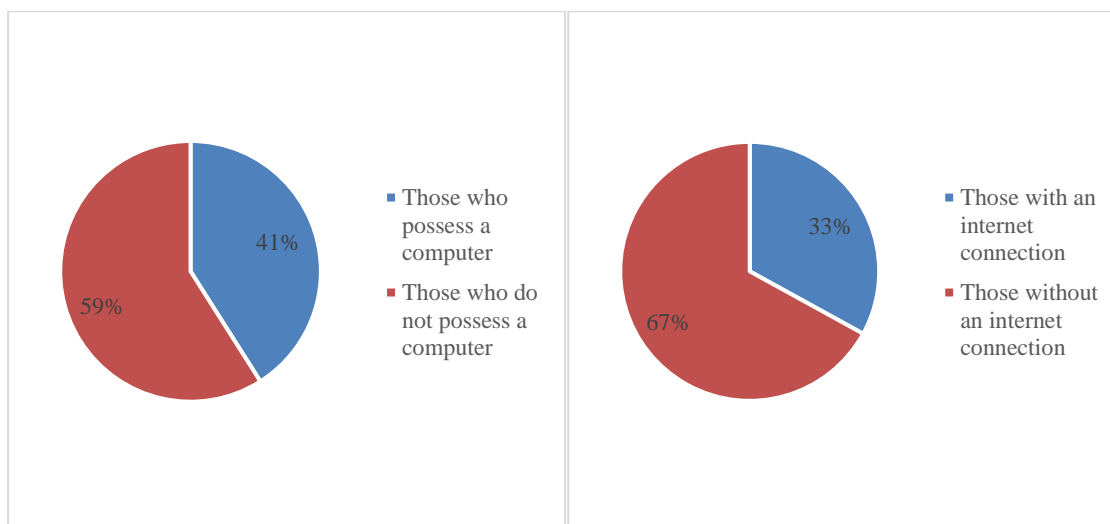


Figure 1: Informatisation of Public Libraries in Ukraine

Source: Compiled by the author

Thus, informatisation plays a decisive role in the development of modern Ukrainian libraries. However, significant challenges remain, especially regarding the low prevalence of computers and Internet connectivity in public libraries. A study conducted on a sample of 11,338 public libraries in Ukraine showed that only 41% of libraries have computers, and only 33% have access to high-speed Internet. In addition, Ukrainian libraries are almost two decades behind foreign libraries in the implementation of information technologies, mainly due to outdated library systems. Despite these challenges, recent progress has been made in the adoption of international standard information systems. The obtained results emphasise the urgent need for Ukrainian libraries to apply modern information technologies to improve access to information and services for users.

Currently, Ukrainian libraries face significant challenges in implementing information technologies, lagging behind foreign counterparts by almost two decades. Most libraries in Ukraine lack automated systems and rely on outdated Russian library systems. However, Ukrainian libraries have made progress in implementing IT recently. This includes the use of information systems that meet international standards and have been tested for effectiveness. In light of this situation, the Ukrainian Library Association (ULA) concludes that to provide quality library services, every Ukrainian library must have access to modern information



technologies and use specialised information systems that support international standards (Table 1). The ULA is founded on extensive expertise in applying IT in library affairs.

Table 1: Specialised information systems for libraries.

Type of system	Function
Automated library information systems (ALIS)	Management of library collections and creation of electronic catalogues
Systems for automating the process of digitising documents	Conversion of materials into digital format and creation of electronic resources
Software for working with electronic databases	Access control to full-text documents and integration with electronic resources
Integrated library management systems	Integrated management of all aspects of library activities in a single software environment
Search and navigation tools	Simplifying access to resources and facilitating navigation for users through an intuitive web interface

Source: Compiled by the author

Automated library information systems (ALIS) are considered an essential element of the information and telecommunications landscape and have become an integral part of user service and library resource management. The software is designed to efficiently process and organise large volumes of information, including electronic documents, databases, and other resources. The use of ALIS in library activities contributes to the creation of a unified information space and enables efficient processing and access to information. This allows libraries to actively influence the global information landscape by presenting their resources on the global network and providing access to knowledge for a wide range of users.

ALIS has key functions that ensure the stable and efficient operation of the library as a modern information centre, covering a wide range of tasks. The library offers a range of services including bibliographic and analytical processing of documents, automated preparation of bibliographic publications, collection development and book exchange, provision of reference and bibliographic services based on databases, maintenance of an electronic catalogue, accounting and control of lending and return of literature, as well as collection and analysis of statistical data. These systems allow libraries to monitor document circulation and optimize storage organisation. This can be achieved by transferring documents from archival repositories to zones of operational access.

Each library has the right to independently determine which specific information systems to use. However, it is important to make well-founded decisions, as the implementation of specialised software is a long-term investment. Therefore, it is crucial to make informed choices when allocating state funds for libraries. Mistakes at the beginning can lead to ineffective use of state funds and hinder the development of libraries, as well as their integration into the national and global information environment.

Currently, there is a broad selection of software solutions available for libraries, including both commercial and open-source options. These solutions adhere to modern international standards

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and are suitable for implementation in Ukrainian libraries. Ensuring compliance with relevant international standards is crucial for implementing these software products. This guarantees technological compatibility, interoperability, and participation in national and international projects, such as centralised cataloguing, union lists, and national electronic libraries. Library information systems should support several standards, including but not limited to MARC 21, RDA, DC/MODS, z39.50/OAI PMH. In addition, it is important to continuously improve software and keep up with emerging standards.

Modern libraries are adopting advanced approaches to managing electronic resources, such as creating electronic catalogues for both print and electronic publications, as well as user databases. Annual statistical and informational reporting is also transitioning to a digital format. The collection development process is gaining new opportunities through the use of Internet technologies for selecting and ordering necessary literature. In particular, libraries are actively enriching their collections with electronic documents, gaining access to electronic versions of periodicals, materials from scientific conferences, congresses, and more.

This approach differs significantly from the traditional method as it involves using internet resources, computer networks, and telecommunication means to gather and disseminate information. The main difference between this approach is the rejection of physical carriers for each document and the shift towards using web resources and computer technologies for storing and exchanging information. This allows libraries to effectively utilise global network resources to meet user needs and improve the quality of information services.

Web archiving is a valuable tool for libraries in the contemporary digital landscape. It involves collecting, archiving, and preserving online resources from the Internet for future access and use. Web archiving enables libraries to create electronic archives of web content, making information access resilient to time and available for future generations.

It is important to note that web archiving can be carried out in various ways. One such method is manual selection and archiving of web pages and other resources. This approach is used to select specific resources that are important for the library. Another method is automated web archiving using crawlers or web scrapers. Crawlers are programs that automatically scan the internet to gather information based on certain criteria, such as keywords, URLs, or other parameters. This approach enables the efficient collection of large volumes of data and automates the archiving process. Thus, one of the significant advantages of web archiving is its ability to provide long-term access to important information from the Internet. This is particularly important for preserving cultural heritage and digital research. Web archiving enables libraries to collect and archive resources for future use in education, research, and other fields.

Given the current state of the library network in Ukraine, which faces issues such as funding problems, insufficient computerisation and digitisation, a low level of material-technical base, and a vague understanding of their role by society, strategic changes are needed in the Ukrainian library system. In this context, libraries should function as unifying forces for Ukrainian society and adjust to the demands and requirements of the modern information era



To meet the needs of the information society, the transformation of libraries in Ukraine prioritises the following tasks: developing appropriate legislative frameworks, democratising the national library development program, overcoming asymmetry in state policy in this area, and ensuring the protection of library activities in the context of forming electronic collections and conducting activities related to electronic document delivery. Furthermore, an urgent matter is the legislative regulation and protection of libraries' rights regarding copyright and related rights.

Discussion

We agree with Mostova and Karakoz (2023) on the significance of the modern concept of library services, which is based on changes in the perception of the library's functions. It is no longer limited to document storage but is open to providing a wide range of services that meet users' information, educational, and cultural needs. This means that libraries are expanding their activities beyond physical space, using digital technologies to ensure access to information regardless of users' time and location. It is important to note that the digital transformation of the library sector is taking place in the context of rapid technological development and the replacement of existing stereotypes regarding information perception.

Libraries become active participants in this process by adapting to the requirements of the networked environment and providing new, innovative services to their users. The application and search for innovative technologies, such as digitising information resources, have a positive impact on the development of library affairs, promoting not only the transformation and enhancement of the prestige of the library profession but also improving the overall status of libraries in society, reflected in their role as indispensable information centres in modern socio-cultural infrastructure. The study agrees with the opinion of Ageyenko (2021) because the main purpose of the electronic library is to ensure the right to access information. This includes public access to electronic library resources and the creation of equal access opportunities for all citizens of Ukraine using digital technologies to preserve library and information resources.

Khrushch et al. (2023) corroborate with the finding, that immersive technologies make an important contribution to the development of digital libraries, creating an accessible and appealing knowledge landscape. However, it is important to note that the use of virtual and augmented reality in libraries raises ethical and legal concerns that must be addressed to ensure their safe and effective application. The study partially coincides with the findings of Barabash et al. (2023) regarding the need to create an open information environment in the libraries of higher education institutions, promoting wide access to various information resources to meet the information needs of users. Nevertheless, as noted by Chumak (2022), the development of modern automated library and information systems may require significant investment and time commitment for their deployment.

Dobrovolska & Cherednyk (2023) is in alignment of the finding, regarding the transformations taking place in library activities in the context of a digital society, where libraries are turning into centres of not only scientific but also socially significant information. There are indeed changes in the forms and methods of interaction with the user. Emerging service formats



include virtual exhibitions, online tours, presentations, video lectures, and open access to digital collections. In addition, such innovative approaches as bookcrossing, book trailers, library events, quests, library flash mobs, information briefings, co-working spaces, coaching sessions, etc. are becoming widespread. However, global experience emphasises the importance of creating information and library networks, as well as learning and implementing new ways of working, as important steps in the development of libraries and in meeting the information needs of users.

Lomachynskyi (2023) is in an agreement with the findings that revealed the main directions of the transformation of information culture in libraries in the modern digital era, paying attention to the methodological aspects of the research. The author employs a wide range of scientific methods, such as logical, analytical, semantic, and comparative analysis, allowing for a deeper examination of the essence of information culture. However, it is important to examine the digital competencies of library workers in more detail to better understand their impact on the development of the library sector in contemporary conditions.

The findings of the study agree with Khrushch (2023), because the need to develop the key competencies of a library specialist in the conditions of digital transformations, including information literacy, digital media skills, and professional communication, is determined. However, a possible obstacle to the implementation of these competencies is the lack of resources or access to the necessary support for the professional development of staff. Perchuk, et al. (2023) corroborates with the result by drawing attention to the main challenges that arise in public libraries and archives in the process of digital transformation, including preserving the value of information and ensuring the confidentiality of data. However, our opinions differ on approaches to solving these challenges. While they recommend developing a transformation strategy and investing in technical infrastructure, we believe there is also a need to focus on upskilling staff and collaborating with partners to successfully implement digital technologies.

CONCLUSION

Considering the latest trends in the development of the information society, the digital transformation of the library sphere in Ukraine is important for ensuring access to knowledge and cultural heritage. Based on the results of the research, it becomes obvious that the libraries in Ukraine face significant problems in the implementation of information technologies. The results showed that only 41% of public libraries have computers, and only 33% have access to high-speed Internet. This highlights a glaring gap in the technological infrastructure of the Ukrainian library system. The establishment of the Ministry of Digital Transformation and the development of strategies for digital competencies demonstrate the importance of this direction for the country. It is important to emphasise that the digital transformation of libraries requires a systematic and targeted approach, which includes not only technological changes but also a review of communication approaches and organisational processes.

In this context, libraries can adapt to the digital environment and ensure access to information for all segments of the population by using tools such as automated library systems, artificial intelligence, electronic resources, and web archiving. However, successful implementation of digital transformation requires legislative and investment support, as well as the development



of human resources. Libraries can play a crucial role in shaping the information society and providing access to knowledge for all citizens, but only if they operate under objective conditions.

The study provides specific data on the availability of computers and Internet access in Ukrainian libraries, which helps to fill the gaps in research on this topic. In addition, the study focuses on the social consequences of digital transformation increasing the availability of information and reducing the digital divide, which makes it important for understanding the modern challenges of Ukrainian libraries and their impact on society. Studying this topic can help determine strategies and tools for successfully adapting libraries to the requirements of the digital society, enhancing their role in education, cultural development, and access to knowledge. To achieve a successful digital transformation of libraries in Ukraine, it is important to address several key issues, which are described in this study.

REFERENCES

- Ageyenko, T.M. (2021). Distribution and storage of book information: informational and legal aspect. *Scientific legal journal. Legal amendments*, 13(2), 27-36. <https://doi.org/10.32847/ln.2021.13.2.04>
- Barabash, V., Hlyebova, L., & Kolomiyets, O. (2023). Innovative Transformations of Libraries of Higher Education Institutions. *Society. Document. Communication*, 19, 10-36. <https://doi.org/10.31470/2518-7600-2023-19-10-36>
- Bruy, O. (2021). 20 years behind the digital transformation of libraries and the real possibilities for change. *Chytomo*. Available at: <https://chytomo.com/vidstavannia-na-20-rokiv-tsyfrova-transformatsiia-bibliotek-ta-realni-mozhlyvosti-zmin/> (Accessed: 22 April 2024).
- Chumak, E. (2022). Transformation of information resources of public libraries of Ukraine in modern conditions. *Ukrainian Journal of Library Science and Information Sciences*, 10, 36-48. <https://doi.org/10.31866/2616-7654.10.2022.269445>
- Dmytrenko, T. (2023). Network connections of the University of Freiburg library at the regional, national and international levels. *Bulletin of the Book Chamber*, 2, 39-43. [https://doi.org/10.36273/2076-9555.2023.2\(319\).39-44](https://doi.org/10.36273/2076-9555.2023.2(319).39-44)
- Dobrovolska, V.V., & Cherednyk, L.A. (2023). Innovative activities of libraries in the conditions of a digital society', *Library science. Documentary science. Informatology*, 1, 5-11. <https://doi.org/10.32461/2409-9805.1.2023.276758>
- Horbach, K. S. (2022) Ways of transformation of public libraries of Ukraine in the information society. Bachelor's thesis. Kyiv National University of Culture of Art. p. 73. Available at: <http://surl.li/srhdm> (Accessed: 22 April 2024).
- Hrebenyk, S., Hrebenyk, M., & Denysenko, A. (2020). Be on time. Social advertising campaign for the Ministry of Digital Transformation of Ukraine. Tequila Creative House. Available at: <https://tequila.house/diya> (Accessed: 22 April 2024).
- Ivashkevych, O. (2021). Digital transformation of Ukrainian libraries: present and prospects. *Library science. Documentary science. Informatology*, 2, 50-56. Available at: http://nbuv.gov.ua/UJRN/bdi_2021_2_8 (Accessed: 22 April 2024).
- Kashtanova, T. (2022). System of document supply of funds of NNSGB NAAS. *Grail of Science*, 17, 538-540. <https://doi.org/10.36074/grail-of-science.22.07.2022.093>



- Khrushch, S. (2023). Competences of a library specialist as a factor in the formation of an innovative media space. *Library science. Documentary science. Informatologia*, 4, 156-164. <https://doi.org/10.32461/2409-9805.4.2023.294101>
- Khrushch, S., Kushnaryev, V., Lyuty, A., & Onishchenko, I. (2023). Immersive technologies for electronic libraries. *Digital platform: information technologies in the socio-cultural sphere*, 6(2), 341-352. <https://doi.org/10.31866/2617-796X.6.2.2023.293605>
- Kostyrko, T.M. (2022). Resources and services of the university library in the conditions of digital transformations. *Library Mercury*, 1(27), 105-113. [https://doi.org/10.18524/2707-3335.2022.1\(27\).256413](https://doi.org/10.18524/2707-3335.2022.1(27).256413)
- Logvynenko, V.M., & Hrytsanyuk, V.V. (2022). Digital transformation of society and information and communication technologies in the professional activity of social work specialists: modern challenges. *Scientific journal of the National Pedagogical Dragomanov University. Pedagogical sciences: realities and prospects. Helvetica Publishing House*, 5(87), 53-57. Available at: <https://sci.ldubgd.edu.ua/jspui/handle/123456789/10942> (Accessed: 22 April 2024).
- Lomachynskiy, B.H. (2023). Information culture in the library space: challenges of Digitization. *Library science. Documentary science. Informatology*, 4, 75-83. <https://doi.org/10.32461/2409-9805.4.2023.294077>
- Mostova, Y., & Karakoz, O. (2023). The library as a modern information institute: today's challenges. *Proceedings of the MCND conferences*, 297-299. February 24, 2023. Kyiv, Ukraine. Available at: <https://archive.mcnd.org.ua/index.php/conference-proceeding/article/view/447> (Accessed: 22 April 2024).
- Nekrasov, V. (2020). 10 new electronic services: the state service "Diya" received a large-scale upgrade. *Economic Truth*. Available at: <https://www.epravda.com.ua/> (Accessed: 22 April 2024).
- Perchuk, O., Vovchenko, R., & Artyukh, O. (2023). Characteristics of implementation of document transfer digitalization in public institutions (Example of libraries and archives)', *Economy and society*, 53, 6. <https://doi.org/10.32782/2524-0072/2023-53-70>
- Pronkin, O. (2023). Navigating the Digital Frontier: Building a Global Services Company for Digital Transformation. Master's thesis. Lviv: Ukrainian Catholic University. 72 p. Available at: <https://er.ucu.edu.ua/handle/1/4006?locale-attribute=en> (Accessed: 22 April 2024).
- Radko, H.G. (2020). Electronic archive: structure and functioning. Master's thesis. Zaporizhzhia: Zaporizhzhia National University. 85 Available at: <https://dspace.znu.edu.ua/jspui/handle/12345/1544> (Accessed: 22 April 2024).
- Sakharova, M. P. (2023). Information and communication strategies of public libraries of Ukraine: responses to challenges. In search of new meanings of the multicultural world. *Postwar dialogue of cultures: materials of the International Scientific and Practical Conference*, 106-109. February 2-3, 2023 Kyiv, Ukraine. Available at: https://elib.nakkkim.edu.ua/bitstream/handle/123456789/4637/Mater_konf_2_3_liuto_ho_2023_Diachuk_V_P.pdf?sequence=1#page=106 (Accessed: 22 April 2024).
- Shaharyar L. (2022). Top 10 Most Popular Java Web Crawling and Scraping Libraries. *Xperti*. Available at: <https://xperti.io/blogs/java-web-crawling-and-scraping-libraries/> (Accessed: 22 April 2024).



- Shilo, O. A. (2023). The need for the transition of Ukrainian libraries to ABIS Koha. Formation of online virtual collections of electronic educational resources in the conditions of Russian aggression: a collection of materials of the round table. Writings, 46-47. May 17, 2023. Kyiv, Ukraine. Available at: https://lib.iitta.gov.ua/737218/1/Shylo_Formuvannya_onlaynovykh-2023_46-47.pdf (Accessed: 22 April 2024).
- Ukrainian Library Association. (2021). Implementation and use of information systems in libraries. Statement of the Ukrainian Library Association, dated February 1, 2021. 3 . Available at: <https://ula.org.ua/en/documents/dokumenti-uba/4731-zaiava-vho-ukrainska-bibliotechna-asotsiatsiia-vprovadzhennia-ta-zastosuvannia-informatsiinykh-system-u-bibliotekakh> (Accessed: 22 April 2024).
- Verkhovna Rada of Ukraine. (2021). Order On the approval of the Concept of the development of digital competencies and the approval of the plan of measures for its implementation. № 167 Legislation of Ukraine. Available at: <https://zakon.rada.gov.ua/laws/show/167-2021-%D1%80#Text> (Accessed: 22 April 2024).