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THE STATE OF DIGITIZATION OF DOCUMENTARY HERITAGE IN SCIENTIFIC LIBRARIES OF UKRAINE

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Summary. *Based on the survey results of the leading scientific libraries of Ukraine, the article reveals the current trends in the digitization of library collections. The authors explore the current state of search services for digitized documents by libraries; user access modes to digital copies of documents (public, restricted, local); the ways to register the users for access to full-text digital repositories. The necessity of adopting the National Program for Digitization of Documentation Heritage and its implementation at the corporate level is substantiated. Recommendations for improving the efficiency of digitization of documents by libraries of Ukraine, improving search tools and user-friendly access to digital repositories are given.*

Keywords: *scientific libraries of Ukraine, documentation heritage, digitization, digital libraries, National Program for Digitization of Documentary Heritage.*

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Dokumentinio paveldo skaitmeninimo būklė Ukrainos mokslinėse bibliotekose (anglų k.)

Santrauka. *Straipsnio autorės, remdamosi veikliausiose Ukrainos mokslinėse bibliotekose atliktais tyrimų rezultatais, atskleidžia dabartines bibliotekų fondų skaitmeninimo tendencijas. Taip pat yra aptariama dabartinė bibliotekose suskaitmenintų dokumentų paieškos sistemų būklė; vartotojų priegios prie suskaitmenintų dokumentų būdai (vieši, riboti, vietos); būdai, kaip registruoti vartotojus, suteikiant jiems visatekstę prieigą prie visų suskaitmenintų dokumentų fondų. Straipsnyje yra pagrindžiama būtinybė priimti Nacionalinę dokumentinio paveldo skaitmeninimo programą ir ją įgyvendinti korporatyvinio valdymo lygmeniu. Galiausiai yra pateikiamos rekomendacijos, kaip padidinti Ukrainos bibliotekų dokumentų skaitmeninimo efektyvumą, tobulinti paieškos priemones ir didinti prieigos prie suskaitmenintų dokumentų fondų patogumą.*

Reikšminiai žodžiai: *Ukrainos mokslinės bibliotekos, dokumentinis paveldas, skaitmeninimas, skaitmeninės bibliotekos, Nacionalinė dokumentinio paveldo skaitmeninimo programa.*

INTRODUCTION

The occurrence of a qualitatively new information and communication environment has led to the modernization of libraries. Libraries are mastering recent trends and forms of work. One of such activity areas of the libraries is the digitization of documents. This has allowed libraries to adopt and master new technologies for preserving, presenting and disseminating documentary heritage. Digital copies provide greater opportunities for work than the ‘traditional’ documents. Thus, digitization makes it possible to: protect original documents, provide the broad public audience with an easy access to the documentary heritage, expand the information space of libraries, promote the national documentary heritage, integrate it into the global digital space, etc.

The *State Targeted National Cultural Program Creating a Unified Information Library System ‘Library – XXI’* (2011) has become the impetus for digitizing the libraries of Ukraine¹. A number of activities, in particular, digitizing rare and

1 *Pro zatverdzhennia Derzhavnoi tsilovoi natsionalno-kulturnoi prohramy stvorennia yedynoi informatsiinoi bibliotechnoi systemy “Biblioteka — XXI”*. Postanova Kabinetu Ministriv Ukrainy vid 17 serpnia 2011 roku [interactive]. [accessed 09 September 2020]. Access online: <<https://zakon.rada.gov.ua/laws/show/956-2011-%D0%BF#Text>>.

valuable publications, creating a digital archive of the Historic Preservation Foundation were provided by the program. Taking into account the worldwide trends in global digitalization in Ukraine, *Development Concept of the Digital Economy and Society of Ukraine for 2018–2020 and Implementation Plan Approval*² has been adopted. This Concept is aimed at the digitalization of the economy, public and social services, which is recognized as an important factor in the further development of the state.

In this context, the digitization of documentary heritage by the leading scientific libraries of Ukraine is identified as one of the priority areas of their activities, but the practical implementation of these projects has not achieved the desired effect. There is a wide gap between the existing digital repositories offered by libraries in Ukraine and the expectations of users who need not only fine content, but also the availability of user-friendly tools for working with it.

The article is concerned with the study of the current state of digitization of documentary heritage by the scientific libraries of Ukraine.

The object of research is a part of the national documentary heritage which is stored in the libraries of Ukraine and covered in various types of documents denoted by historical and cultural significance.

The specific objectives of the present study are to perform the content analysis of projects on digitization of documentary heritage by the leading scientific libraries of Ukraine, and to determine the status and trends of increasing the efficiency of their implementation.

LITERATURE REVIEW

The issues of the digitization of documentary heritage have been of worldwide scientific interest for more than a decade. The academic papers of the following researchers touch upon the issues of the digitization as a technology for preserving original documents and access to their content: P. Astle, A. Muir³; M. Berger⁴; D. Correa⁵; K. Matusiak, T. Johnston⁶, etc. Thus, P. Astle

- 2 *Pro skhvalennia Kontseptsii rozvytku tsyfrovoy ekonomiky ta suspilstva Ukrainy na 2018–2020 roky ta zatverdzhennia planu zakhodiv shchodo ii realizatsii*. Rozporiadzhennia Kabinetu Ministriv Ukrainy vid 17 sichnia 2018 roku [interactive]. [accessed 21 January 2020]. Access online: <<https://zakon.rada.gov.ua/laws/show/67-2018-%D1%80>>.
- 3 ASTLE, Peter and MUIR, Adrienne. Digitization and preservation in public libraries and archives. *Journal of Librarianship and Information Science*, 2002, vol. 34, iss. 2, p. 67–79. DOI: <https://doi.org/10.1177/096100060203400202>.
- 4 BERGER, Marilyn. Digitization for preservation and access: a case study. *Library Hi Tech*, 1999, vol. 17, iss. 2, p. 146–151. DOI: <https://doi.org/10.1108/07378839910275623>.

and A. Muir⁵ remarked⁶ that, with the development of technology, digitization itself is a reliable means of accumulating the unique documentary heritage by providing an easy access to digital copies of documents⁷. M. Berger uses the example of the digitization project of the journal *The Canadian Architect and Builder* to prove the justification for the digitizing to ensure the storage of printed copies and online access to the content⁸. A similar view is expressed by K. Matusiak and T. Johnston who suggest that digitization, although not able to slow down the deterioration of the quality of the original materials, still provides an opportunity to restore the content of unstable negatives, expand access to them, and restore their information usefulness⁹.

The study of international experience (B. Bednarek-Michalska¹⁰, E. Gore, M. Bitta, D. Cohen¹¹; M. Lhoták¹²; T. Pääkkönen, J. Kervinen, K. Kettunen¹³;

- 5 CORREA, Dale. Digitization: Does it Always Improve Access to Rare Books and Special Collections?. *Preservation, Digital Technology & Culture*, 2017, vol. 45, iss. 4, p. 177–179. DOI: <https://doi.org/10.1515/pdct-2016-0026>.
- 6 MATUSIAK, Krystyna and JOHNSTON, Tamara. Digitization for preservation and access: Restoring the usefulness of the nitrate negative collections at the American Geographical Society Library. *The American Archivist*, 2014, vol. 77, iss. 1, p. 241–269. DOI: <https://doi.org/10.17723/aarc.77.1.gr125w680h64u277>.
- 7 ASTLE, Peter and MUIR, Adrienne. Digitization and preservation in public libraries and archives. *Journal of Librarianship and Information Science*, 2002, vol. 34, iss. 2, p. 67–79. DOI: <https://doi.org/10.1177/096100060203400202>.
- 8 BERGER, Marilyn. Digitization for preservation and access: a case study. *Library Hi Tech*, 1999, vol. 17, iss. 2, p. 146–151. DOI: <https://doi.org/10.1108/07378839910275623>.
- 9 MATUSIAK, Krystyna and JOHNSTON, Tamara. Digitization for preservation and access: Restoring the usefulness of the nitrate negative collections at the American Geographical Society Library. *The American Archivist*, 2014, vol. 77, iss. 1, p. 241–269. DOI: <https://doi.org/10.17723/aarc.77.1.gr125w680h64u277>.
- 10 BEDNAREK-MICHALSKA, Bożena. Polish digital libraries and repositories. Origins, operation and usage. *Przegląd Biblioteczny*, 2017, vol. 85, special issue, p. 46–69 [interactive]. [accessed 19 December 2019]. Access online: <<http://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.desklight-4f2436a0-a9da-4308-80aa-8bcf464c1c0d>>.
- 11 GORE, Emily, BITTA, Michael Della and COHEN, Dan. The Digital Public Library of America and the National Digital Platform. *D-Lib Magazine*, 2017, vol. 23, No. 5/6. DOI: <https://doi.org/10.1045/may2017-gore>.
- 12 LHOTÁK, Martin. Česká digitální knihovna. *Duha: Informace o knihách a knihovnách z Moravy*, 2016, ročník 30, číslo 3 [interactive]. [accessed 12 January 2021]. Access online: <<http://duha.mzk.cz/clanky/ceska-digitalni-knihovna>>.
- 13 PÄÄKKÖNEN, Tuula, KERVINEN, Jukka and KETTUNEN, Kimmo. Digitisation and Digital Library Presentation System – A Resource-Conscientious Approach. *Proceedings of the Digital Humanities in the Nordic Countries 3rd Conference*. Helsinki. 2018, vol. 2084, p. 297–305 [interactive]. [accessed 13 November 2020]. Access online: <<http://ceur-ws.org/Vol-2084/short4.pdf>>.

U. Preuss¹⁴, etc.) revealed the current worldwide trends in the field of digitization: 1) forming a distributed document resource which is based on the use of meta-data; 2) initiating large-scale digitization projects by national libraries acting as coordinators; 3) state support for national digitization projects through funding and legal regulation. An important feature is the corporatism that should be used in Ukraine in providing the digitization of the documentary heritage.

A powerful theoretical framework for the study of the digitization of various types of documents comprises the scholarly works as follows: rare books (H. Kovalchuk)¹⁵, periodicals (M. Georgieva¹⁶, E. Klijn¹⁷, D. Summerlin¹⁸), audiovisual documents (K. Matusiak, T. Johnston¹⁹, T. Yemelianova²⁰), three-dimensional objects (T. Johnson²¹, G. Pavlidis, A. Koutsoudis, F. Arnaoutoglou, V. Tsioukas, C. Chamzas²²).

- 14 PREUSS, Ulf. Sustainable Digitalization of Cultural Heritage – Report on Initiatives and Projects in Brandenburg, Germany. *Sustainability*, 2016, vol. 8, iss. 9, 891. DOI: <https://doi.org/10.3390/su8090891>.
- 15 KOVALCHUK, Halyna. Kryterii vidboru knyzhkovykh pamiatok dlia pershocherhovooho potsyfruvannia. *Naukovi pratsi Natsionalnoi biblioteky Ukrainy imeni V. I. Vernadskoho*. Kyiv, 2010, iss. 28, p. 141–148 [interactive]. [accessed 03 March 2019]. Access online: <http://nbuv.gov.ua/UJRN/npnbuimviv_2010_28_14>.
- 16 GEORGIEVA, Marina. Successful Management of an Outsourced Large-scale Digitization Newspaper Project. *Journal of Archival Organization*, 2019, vol. 16, iss. 1, p. 52–74. DOI: <http://dx.doi.org/10.1080/15332748.2019.1642701>.
- 17 KLIJN, Edwin. The Current State-of-art in Newspaper Digitization: A Market Perspective. *D-Lib Magazine*, 2008, vol. 14, No 1/2. DOI:10.1045/january2008-klijn.
- 18 SUMMERLIN, Donnie. Selecting Newspaper Titles for Digitization at the Digital Library of Georgia. *D-Lib Magazine*, 2014, vol. 20, No 9/10. DOI:10.1045/september2014-summerlin.
- 19 MATUSIAK, Krystyna and JOHNSTON, Tamara. Digitization for preservation and access: Restoring the usefulness of the nitrate negative collections at the American Geographical Society Library. *The American Archivist*, 2014, vol. 77, iss. 1, p. 241–269. DOI: <https://doi.org/10.17723/aarc.77.1.gr125w680h64u277>.
- 20 YEMELIANOVA, Tetiana. Audiovizualni kolektsii: otsyfruvannia ta dustup (na prykladi Tsentralnoho derzhavnoho kinofotofonoarkhivu Ukrainy imeni H. S. Psenychnoho). *Visnyk Kyivskoho natsionalnoho universytetu imeni Tarasa Shevchenka*. Istoriiia, 2016, iss. 3, p. 33–35 [interactive]. [accessed 03 March 2019]. Access online: <http://nbuv.gov.ua/UJRN/VKNU_Ist_2016_3_9>.
- 21 JOHNSON, Tanya. Let's Get Virtual: Examination of Best Practices to Provide Public Access to Digital Versions of Three-Dimensional Objects. *Information Technology and Libraries*, 2016, vol. 35, No. 2, p. 39–55. DOI: <https://doi.org/10.6017/ital.v35i2.9343>.
- 22 PAVLIDIS, George, KOUTSOUDIS, Anestis, ARNAOUTOGLU, Fotis, TSIOUKAS, Vasiliios and CHAMZAS, Christodoulos. Methods for 3D digitization of Cultural Heritage. *Journal of Cultural Heritage*, 2007, vol. 8, iss. 1, p. 93–98. DOI: <http://dx.doi.org/10.1016/j.culher.2006.10.007>.

Worldwide trends in the field of digitization of documentary heritage have found significant scientific development in Ukraine as well. A number of theses of Ukrainian researchers (V. Dobrovolska (2020)²³, I. Lobuzin (2017)²⁴, O. Marina (2018)²⁵) focusing on various aspects of digitization address the development of the theoretical, methodological and practical principles of creating digital repositories, while also investigating the problems of their organization, use, as well as the integration into the world communication space.

Thus, V. Dobrovolska in her doctoral thesis covering the perspective of shaping the digital cultural space of Ukraine focuses on the generalization of the criteria for selecting objects of the historical and cultural documentary heritage for digitizing. Among them, the main criteria are: value, uniqueness, rarity of documents; documents that are objects of national heritage; documents of research value; documents of unsatisfactory physical condition; documents in danger of losing information; documents of higher demand and limited edition. It has been proven that the selection of documents for digitization is a task to maintain a balance between the national importance of holdings for the history of states and humanity in general, users' requests, and the task of retaining the holdings²⁶.

O. Marina has done research work on the digital modernization of libraries in Ukraine. She focused on the main incentives of integrating libraries into the digital media space and designed a content strategy for the development of libraries in the digital media space, one of the components of which is the digitization of documents. In the national library science, O. Marina is the first to consider the potential of crowdsourcing as a socio-communication technology, more particularly, its application in library work, the opportunities and benefits for Ukraine, including in the projects of digitization of documents when users take an active part in creating the content²⁷.

- 23 DOBROVOLSKA, Viktoriia. *Informatsiino-komunikatsiine zabezpechennia rozvytku sotsio-komunikatsiinoho prostoru kultury Ukrainy v epokhy tsyfrovoho suspilstva* (dys. d-ra nauk iz sots. komunikatsii). Kyiv. 2020. 442 p.
- 24 LOBUZIN, Ivan. *Tsyfrovii koleksii naukovoii biblioteky: orbanizatsiia informatsiinykh resursiv ta merezhevoi komunikatsii* (dis. ... kand. nauk iz sots. komunikatsii). Kyiv. 2017. 258 p.
- 25 MARINA, Olena. *Biblioteki Ukrainy v tsyfrovomy mediaprostori: teoretyko-metodolohichni zasady rozvytku* (dis. ... d-ra nauk iz sots. komunikatsii). Kharkiv. 2018. 513 p.
- 26 DOBROVOLSKA, Viktoriia. *Informatsiino-komunikatsiine zabezpechennia rozvytku sotsio-komunikatsiinoho prostoru kultury Ukrainy v epokhy tsyfrovoho suspilstva* (dys. d-ra nauk iz sots. komunikatsii). Kyiv. 2020. 442 p.
- 27 MARINA, Olena. *Biblioteki Ukrainy v tsyfrovomy mediaprostori: teoretyko-metodolohichni zasady rozvytku* (dis. ... d-ra nauk iz sots. komunikatsii). Kharkiv. 2018. 513 p.

I. Lobuzin has developed and revealed the essence of the modular digital complex which was successfully tested at Vernadsky National Library of Ukraine in the course of the implementation of the digital project. The components of this complex are the following interconnected modules (subsystems): creation of digital copies; administration and management of the digital repository; description of and accounting for digital resources; their processing and management; search and publication of digital resources. Each of these subsystems corresponds to a certain stage of the life cycle of the formation of the digital research holding. The author examined in depth the technological aspects of creating and organizing digital collections (in particular, the description of digital objects according to uniform standards; metadata and identifiers of digital objects while taking into account international description standards for further effective integration into international projects; long-term storage of a vast amount of information, etc.)²⁸.

Thus, I. Lobuzin, on the grounds of researching the experience of implementing international and national digital library projects, concludes that major digital projects are implemented at the corporate level and with the involvement of other institutions in addition to libraries, with the development of the common standards and harmonization at the technological level²⁹. H. Kovalchuk³⁰; O. Shcherbina, O. Shevchuk³¹ explore the cooperation of libraries of Ukraine in the field of preservation of the national documentary heritage. In particular, H. Kovalchuk specifies three main areas of cooperation in preservation: summarizing information on the digitized documents to avoid duplication, creating the State Register of National Cultural Heritage relating to 'Rare Books of Ukraine', and information sharing about the egregious cases of theft of rare books³².

28 LOBUZIN, Ivan. *Tsyfrovi koleksii naukovoï biblioteky: orhanizatsiia informatsiinykh resursiv ta merezhevoi komunikatsii* (dis. ... kand. nauk iz sots. komunikatsii). Kyiv. 2017. 258 p.

29 LOBUZIN, Ivan. Tekhnolohii intehratsii mizhnarodnykh ta natsionalnykh biblioteghnykh tsyfrovyykh resursiv. *Bibliotekozaustvo. Dokumentoznaustvo. Informolohiia*, 2017, No. 1, p. 66–78 [interactive]. [accessed 12 July 2019]. Access online: <<http://irbis-nbuv.gov.ua/everlib/item/er-0002182>>.

30 KOVALCHUK, Halyna. Diialnist bibliotek zi zberezheniia natsionalnoi dokumentalnoi spadshchyny: problemy kooperatsii. *Bibliotekna planeta*, 2010, No. 3, p. 9–11 [interactive]. [accessed 01 February 2019]. Access online: <<http://irbis-nbuv.gov.ua/everlib/item/er-0000000516>>.

31 SHCHERBINA, Olha and SHEVCHUK Olesia. Kooperatsiia bibliotek Ukrainy v napriami zberezheniia natsionalnoi dokumentalnoi spadshchyny. *Bibliotekozaustvo. Dokumentoznaustvo. Informolohiia*, 2019, No. 4, p. 32–37. DOI: <https://doi.org/10.32461/2409-9805.4.2019.189844>.

32 KOVALCHUK, Halyna. Diialnist bibliotek zi zberezheniia natsionalnoi dokumentalnoi

The researchers point out that these digitization strategies should be based on consolidated digital resources and remote services, in particular, on the corporate body of digital libraries and on the improvement of the user-friendliness of online library services³³. This judgment can be applied not only to the network of educational libraries, but also to other types of libraries in the country.

However, despite the presence of a powerful scientific background for developing the organizational, methodological and technological aspects of the digitization of documents, the practical implementation of such projects is developing slowly in Ukraine. The tools for providing the user-friendliest access to digitized documents require special attention of specialists.

METHODOLOGY AND RESEARCH MATERIALS

The research methodology is based on the application of a systematic approach whose potential has made it possible to study the projects of libraries for the digitization of the national heritage as components of corporate interaction in the context of the National Electronic Library of Ukraine.

14 national and state libraries of Ukraine were polled online. There are 14 nationwide libraries in Ukraine (of which, 8 libraries are national (universal and subject library holdings in composition) and 6 state libraries (universal and subject library holdings in composition)).

This study gives preference to the national and state libraries as their holdings retain the most valuable part of the country's documentary resource (more than 60 million stored items):

- Vernadsky National Library of Ukraine – more than 15 million accumulated items (the library possesses the most complete collection of cultural artefacts of the Slavic writing system, manuscripts and printed books in the country with the total scope of about 600 thousand stored items);
- Yaroslav the Wise National Library of Ukraine – more than 4.7 million copies (specifically, the Collection of Old Prints, Rare and Valuable Editions has more than 44 thousand stored items);

spadshchyny: problemy kooperatsii. *Bibliotechna planeta*, 2010, No. 3, p. 9–11 [interactive]. [accessed 01 February 2019]. Access online: <<http://irbis-nbuv.gov.ua/everlib/item/er-0000000516>>.

- 33 HUMENCHUK Anatoly, MICHANYN Natalia, NOVALSKA Tetyana and TRACH, Olha. Strategy of the Scientific Educational Libraries of Ukraine Network Digitalization. *Proceedings of the 2nd International Workshop on Control, Optimisation and Analytical Processing of Social Networks (COAPSN 2020)*. Lviv. 2020, vol. 2616, p. 237–246 [interactive]. [accessed 21 April 2021]. Access online: <<http://ceur-ws.org/Vol-2616/paper20.pdf>>

- National Historical Library of Ukraine – more than 700 thousand stored items (of which, more than 26 thousand rare documents);
- National Scientific Agricultural Library of the National Academy of Agricultural Sciences of Ukraine – approximately 1 million publications (whereas the Collection of Rare and Valuable Books features roughly 10 thousand copies);
- National Scientific Medical Library of Ukraine – more than 1.6 million copies;
- National Library of Ukraine for Children – more than 500 thousand copies (notably, the Collection of Rare and Valuable Editions contains more than 15 thousand stored items);
- Odesa National Scientific Library – more than 5 million documents (of which, about 200 thousand rare editions, manuscripts, etc.);
- V. Stefanyk Lviv National Scientific Library of Ukraine – more than 7 million stored items;
- Kharkiv Korolenko State Scientific Library – more than 7 million copies;
- V. H. Zabolotny State Scientific Architectural and Construction Library – more than 420 thousand copies;
- V. O. Sukhomlynskyi State Scientific and Pedagogical Library of Ukraine – approximately 600 thousand documents (including more than 28 thousand rare editions);
- State Scientific and Technical Library of Ukraine – almost 16 million copies;
- State Library of Ukraine for Youth – more than 300 thousand documents;
- Central State Scientific and Technical Library of the Mining and Metallurgical Complex of Ukraine – more than 1.5 million copies.

It is the cooperation of these libraries that can be considered as a basis for setting up a national consolidated Internet portal – the unified access point to the national documentary heritage of Ukraine.

The current study was conducted from March to June 2021. The questionnaire was created by using Google Forms in the state language. The online questionnaire consisted of 11 open, semi-closed and closed questions which enabled to identify: the year of the beginning of digitization of holdings in the library participating in the survey; the number of digitized documents; a composition of digital collections and their information-retrieval apparatus; the access mode to digital copies of documents, etc.

In total, three groups of questions were singled out (Question 1 – the name of the library):

Questions 2 and 3 – to obtain statistics;

Questions 4 and 5 – to study the approaches of libraries to the organization of digital copies of documents;

Questions 6–11 – to enable users to access and search digital documents.

The questionnaire was sent to the national and state libraries of Ukraine – 14 libraries (to the e-mail addresses of the directors, deputies and/or relevant departments). The responses were received from 10 libraries, which accounted for 71.4% of the total number of respondents.

Additionally, in the period from April to July 2021, a survey of regional universal scientific libraries (RUSL) of Ukraine was conducted. The previous questionnaire was supplemented with a block of questions (3 questions) related to the participation of libraries in corporate projects. The online questionnaire was sent to 23 RUSL (2 regional universal scientific libraries were not studied, as they are located in the temporarily occupied territories of Ukraine). The returns were received from 16 RUSL (69.6% of the total number of respondents). According to the results of the survey, the scope of digital library collections was determined along with the information-retrieval apparatus, the access mode to digital copies of documents, and the participation in corporate national and international digitization projects.

Besides, the data obtained during the survey of the national/state libraries and the regional universal scientific libraries of Ukraine (in June and July 2019) was used to conduct this study, as a result of which, the scope of the digital collections, the sources of the financing of digitization projects as well as the organizational principles were determined and specified.

In June 2021, content analysis of university library sites was conducted to identify the availability and scope of digital collections of documentary heritage. The libraries of the leading universities of Ukraine (libraries of higher education institutions, HEI libraries) were selected for the analysis; these were included in the list of ‘Libraries that Have Rare and Valuable Editions in Their Holdings’ (http://www.library.univ.kiev.ua/ukr/for_lib/lib-rare.php3) (120 libraries) posted on the website of the Maksymovych Scientific Library – the main scientific library of Taras Shevchenko National University of Kyiv.

The following methods of scientific knowledge processing were used in the course of research: questionnaires and surveys (to collect data on digitization projects), content analysis (to determine the typo-species composition of digital library collections), statistical analysis (to analyze quantitative data and identify changes in the figures of the completeness of digital collections), analysis and synthesis (to identify the general trends of modern digitization

in Ukraine), generalization (to establish the general features and patterns of the current state of digitization and to give recommendations), forecasting (to predict the future areas of the development of projects for the digitization of library holdings).

RESULTS

With the development of the modern information and communication space, the libraries of Ukraine began to adopt and master digital technologies more actively, in particular, digitization technologies for the formation of digital repositories of documentary heritage.

All national and state libraries that have filled in the questionnaire are digitizing documents from their own holdings. The obtained data shows that the beginning of digitization in the national and state libraries of Ukraine can largely be traced back to the late 2000s and the early 2010s. Based on the generalization of this data, the following chronology of the involvement of the leading scientific libraries of the country in digitization projects can be given (see Table 1).

TABLE 1. Digitization project start chronology by the leading libraries of Ukraine

Year	Name of libraries
1999	Vernadsky National Library of Ukraine ³⁴
2004	Yaroslav the Wise National Library of Ukraine ³⁵
2004	State Scientific and Technical Library of Ukraine (Department of the results of intellectual activity)
2004	Kharkiv Korolenko State Scientific Library
2006	V.O. Sukhomlynskyi State Scientific and Pedagogical Library of Ukraine (rare editions holding)
2007	Odesa National Scientific Library

34 BARKOVA, Olha, OSTAPOVA, Iryna and MORDVYNOV, Yurii. Prezentatsiia rukopysiv i starodrukiv u tsyfrovomu seredovyshchi. *Bibliotechna planeta*, 2010, No. 1, p. 20–24 [interactive]. [accessed 27 January 2021]. Access online: <http://nbuv.gov.ua/UJRN/bp_2005_1_8>.

35 VYLEHZHANINA, Tamara. Natsionalna elektronna biblioteka Ukrainy: mriia chy realnist?. *Bibliotechna planeta*, 2010, No. 3, p. 4–5 [interactive]. [accessed 29 November 2020]. Access online: <http://nbuv.gov.ua/UJRN/bp_2010_3_1>.

Year	Name of libraries
2009	National Scientific Agricultural Library of the National Academy of Agricultural Sciences of Ukraine
2010	V.O. Sukhomlynskyi State Scientific and Pedagogical Library of Ukraine (books from V.O. Sukhomlynskyi's collection)
2010	V. H. Zabolotny State Scientific Architectural and Construction Library
2011	National Historical Library of Ukraine
2012	Central State Scientific and Technical Library of the Mining and Metallurgical Complex of Ukraine
2013	National Library of Ukraine for Children
2017	State Scientific and Technical Library of Ukraine (Fund of normative-technical and industrial documents)
2019	National Scientific Medical Library of Ukraine

Nowadays, most national and state libraries in Ukraine organize and develop their own digital repositories/electronic libraries. 8 respondents to the question "Are digitized documents presented in a separate collection (DB, EL), which is specially formed? (Yes, No, Other)" have returned the positive answer. For example, Vernadsky National Library of Ukraine has launched the electronic libraries (EL) *Ukrainica* (<http://irbis-nbuv.gov.ua/cgi-bin/ua/elib.exe?C21COM=F&I21DBN=NAV&P21DBN=UKRLIB>) and *Digital Library of Historical and Cultural Heritage* (http://irbis-nbuv.gov.ua/cgi-bin/irbis_ir/cgiirbis_64.exe?C21COM=F&I21DBN=NAV&P21DBN=ELIB); whereas the National Historical Library of Ukraine has launched EL *Historical Heritage of Ukraine* (<https://nibu.kyiv.ua/greenstone/cgi-bin/library.cgi?a=p&p=homepage&l=uk&w=utf-8>); National Library of Ukraine for Children has launched *Electronic Library* (<https://chl.kiev.ua/ELIBRARY/Book/Index>), etc. A number of libraries are showcasing digitized documents in the appropriate thematic or type-specific databases (DB). Thus, V. H. Zabolotny State Scientific Architectural and Construction Library showcases DB *Graphic Content*, *Periodicals Database*, *Rare Book Collection*, *Postcards*, etc. (http://catalog.dnabb.org/cgi-bin/irbis64r_14/cgiirbis_64.exe?C21COM=F&I21DBN=BD1&P21DBN=BD1&LNG=uk); Kharkiv Korolenko State Scientific Library has developed *Electronic Documents Repository* (http://91.222.248.189/CGI/irbis64r_12/cgiirbis_64.exe?LNG=&C21COM=F&I21DBN=IFOND&P21DBN=IFOND&S21FMT=&S21ALL=&Z21ID=&S21CNR), etc. Consequently, most digital repositories of documentary heritage of the national and state libraries of Ukraine are presenting the documents of the relevant profile and field from their own holdings.

Let us pay more attention to the projects of the two national libraries of Ukraine which have universal holdings in composition: Vernadsky National Library of Ukraine and Yaroslav the Wise National Library of Ukraine.

In particular, EL *Ukrainica* (<http://irbis-nbuv.gov.ua/cgi-bin/ua/elib.exe?C21COM=F&I21DBN=NAV&P21DBN=UKRLIB>) was established by Vernadsky National Library of Ukraine in order to accumulate documents on the history and culture of Ukraine and provide user-friendly access to the general public. As V. Dobrovolska remarks, the repository core of EL comprises digitized documents on Ukrainian studies from the holdings of Vernadsky National Library of Ukraine, digital sources of the national heritage (manuscripts, chronicles, Ukrainian old prints, rare editions)³⁶.

The composition of EL *Ukrainica* by the type of resources (the document format) (as of February 4, 2022) is ‘Internet’ (139); ‘Books’ (9,998 titles); ‘Newspapers’ (23 titles); ‘Magazines and continuing editions’ (42 titles); ‘Manuscripts’ (38 titles); ‘Maps’ (74 titles); ‘Printed music’ (97 titles); ‘Images’ (560 items). For the ease of reference and the drilldown of digital documents, it is possible to use the options ‘Subject’ and ‘Subject heading’. From the above data, it can be noted that this digital resource contains more books and periodicals.

Vernadsky National Library of Ukraine also presents digitized documents in other own projects, in particular, in the *Digital Library of Historical and Cultural Heritage* (http://irbis-nbuv.gov.ua/cgi-bin/irbis_ir/cgiirbis_64.exe?C21COM=F&I21DBN=NAV&P21DBN=ELIB). It has developed its own typo-species composition, which is based on: ‘Books’ (1190 titles), ‘Old prints’ (163 titles), ‘Newspapers’ (27 titles), ‘Magazines’ (23 titles), ‘Manuscripts’ (81 titles), ‘Maps’ (59 titles), ‘Printed music’ (24 titles), ‘Images’ (58 objects), ‘Photo’ (8 albums). The user-friendly access is also provided by subject headings and the collection principle.

In 2021, Yaroslav the Wise National Library of Ukraine presented its own project – *Open Electronic Library* (<https://web.nlu.org.ua/>) which contains digitized publications from various fields of study stored in its repository. The documents are divided into collections: ‘Reference Publications’; ‘Philosophy. Psychology’; ‘Religion. Theology’; ‘Social Sciences’; ‘Mathematics. Natural Sciences’; ‘Applied Sciences. Medicine. Engineering’; ‘Art. Games. Sport’; ‘Linguistics. Literature’; ‘Geography. Biology. History’. As of August 23, 2021,

36 DOBROVOLSKA, Viktoriia. Elektronna biblioteka “Ukrainika” — unikalnyi intehrovanyi resurs tsyfrovoi dokumentalnoi spadshchyny. *Bibliotekoznavstvo. Dokumentoznavstvo. Informolohiia*, 2020, No. 1, p. 79–87. DOI: <https://doi.org/10.32461/2409-9805.1.2020.205424>

there were 448 documents there. During the content analysis, it was found that even though most of the documents are book editions, there are also some digital copies of periodicals and printed music. Book editions are presented in various forms (educational (textbooks, manuals); scientific (monographs); reference (guides, dictionaries, encyclopaedias); popular science, literary and artistic, etc.).

The number of documents digitized by other national and state libraries of Ukraine is provided in Table 2. These statistics give grounds to speak about the slow pace of digitalization of the library collections in Ukraine, as there is a significant gap between the number of accrued items in the rare and valuable documents and the number of their digitized copies.

TABLE 2. Quantitative data of digitized documents by national and state libraries of Ukraine

Library	Number of digitized documents
V. H. Zabolotny State Scientific Architectural and Construction Library	300 000
State Scientific and Technical Library of Ukraine	More than 112 000
Central State Scientific and Technical Library of the Mining and Metallurgical Complex of Ukraine	10 000
National Historical Library of Ukraine	More than 1 500
V.O. Sukhomlynskyi State Scientific and Pedagogical Library of Ukraine	1 289
Kharkiv Korolenko State Scientific Library	976
National Library of Ukraine for Children	727
National Scientific Agricultural Library of the National Academy of Agricultural Sciences of Ukraine	700
Odesa National Scientific Library	620

Some positive steps in establishing cooperation between libraries on the asset provision at the national level are still worth mentioning.

However, it is necessary to dwell in more detail on the consideration of the EL *Culture of Ukraine* (<https://elib.nlu.org.ua/>) (webmaster – Yaroslav the Wise National Library of Ukraine), which is a striking example of a national corporate project in Ukraine (April 2021 – 114 participants, of which there are 28 libraries). This EL is comprised of publications on culture, art, and ethnog-

raphy. The analysis of the documents presented in the EL *Culture of Ukraine* gives grounds to claim the diversity of its typo-species composition. It involves text, music, and art publications. More than 80% of this resource is books, the rest are magazines and sheets (newspapers, posters, billboards), etc. Among the book editions according to the intended purpose, the following types are presented: scientific (monographs, collections of research papers, etc.); popular science; educational (textbooks); reference (directories, guides); literary and artistic publications, etc. Of peculiar interest are digital copies of art publications (paintings, graphics, postcards, photographs, etc.); archival documents, in particular the epistolary legacy of the prominent figures of Ukraine. There are also some photographs of decorative and applied arts, sculptures, etc. Figure 1 illustrates the dynamics of provisioning EL with documents.

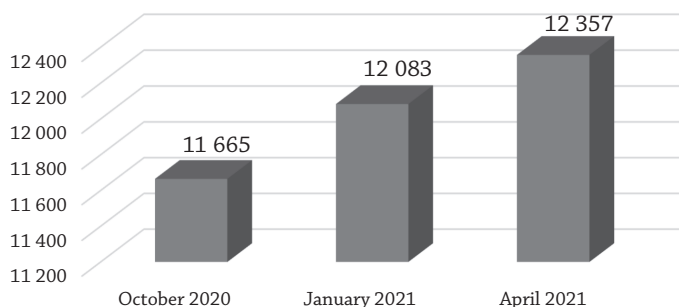


FIGURE 1. The dynamics of provisioning EL *Culture of Ukraine* with digitized documents

The diagram illustrates that 692 documents were added to the EL in six months. In comparison with the provisioning rate of digital libraries of other countries (for example, *Gallica* – 7,637,941 documents (October 2020); 8,461,164 (April 2021) – enriched by 823,223 in six months; *Polona* – 3,331,141 items (available online 1,815,908) (October 2020); 3,435,454 items (April 2021) – in half a year, an increase of 104,313 was observed), the current rate of digitization in Ukraine borders on unsatisfactory. This is a consequence of the fact that scientific libraries of Ukraine conduct activities without the proper financial support of the state.

In addition to the national and state libraries of Ukraine (Kharkiv Korolenko State Scientific Library – 232 objects; National Library of Ukraine for Children – 171 objects; Odessa National Scientific Library – 18 objects;

National Historical Library of Ukraine – 11 objects), RUSL are involved in developing EL *Culture of Ukraine* (the site provides information on 18 libraries, in particular, N. K. Krupska Donetsk RUSL and Ivan Franko Crimean Republican Universal Scientific Library, which are currently in the temporarily occupied territories of Ukraine). Based on the above data, the top five leaders in the provision of digitized documents are listed in Table 3.

TABLE 3. Regional universal scientific libraries leaders in providing digital storage facilities to EL *Culture of Ukraine*

№	Library	Number of objects
1.	The First Slavic Teachers Cyril and Methodius Dnipropetrovsk Regional Universal Scientific Library	323 items
2.	Luhansk RUSL	283 items (digitized before the evacuation)
3.	F. Potushniak Zakarpatska Regional Scientific Library	244 items
4.	K. A. Timiriaziev Vinnytsia Regional Universal Scientific Library	59 items
5.	Rivne RUSL	39 items

According to statistics from the acquisition plans (2017–2021) in which libraries provide information on the number of digitized documents, the top ten were identified (see Table 4).

TABLE 4. Libraries leaders in the rate of digitization of documents

№	Library	The planned number of documents	Execution period
1.	Yaroslav the Wise National Library of Ukraine	2759	5 years
2.	National Historical Library of Ukraine	263	4 years
3.	Mykolaiv RUSL	204	5 years
4.	The First Slavic Teachers Cyril and Methodius Dnipropetrovsk Regional Universal Scientific Library	132	2 years
5.	Kharkiv Korolenko State Scientific Library	128	5 years
6.	K. A. Timiryaziev Vinnytsia Regional Universal Scientific Library	123	4 years

№	Library	The planned number of documents	Execution period
7.	National Library of Ukraine for Children	117	5 years
8.	Oleh Olzhych Zhytomyr Regional Universal Scientific Library	58	5 years
9.	Lesya Ukrainka Public Library for Adults, Kyiv	54	2 years
10.	V. H. Korolenko Chernihiv Regional Universal Scientific Library	40	3 years

Other libraries have reported plans to digitize from 5 to 39 documents over the five-year period.

It is essential to single out the libraries providing their digitization plans annually throughout the entire period of 5 years (2017–2021) (see Table 5).

TABLE 5. Acquisition plans of EL *Culture of Ukraine* by the libraries participating in the project

Library	2017	2018	2019	2020	2021	Total
Yaroslav the Wise National Library of Ukraine	529	461	508	821	440	2759
Mykolaiv RUSL	36	46	46	39	37	204
Kharkiv Korolenko State Scientific Library	24	27	36+5	13+4	15+4	128
National Library of Ukraine for Children	23 + 20	15	34	11	11	117
Oleh Olzhych Zhytomyr Regional Universal Scientific Library	8	10	16	13	11	58

This statistics shows that the digitization of documentary heritage in general, and the participation in the national corporate project of most libraries in Ukraine is at a fairly low level, and, consequently, it does not meet the pace and objectives of the information society.

At the same time, most RUSL form their own repositories of the local lore which are available on their websites. Based on the responses received in June–July 2019 (11 out of 23 libraries filled in the questionnaire), questionnaires in

April–July 2021 (16 out of 23 libraries completed the questionnaire) and self-monitoring of the sites, the following data can be provided (Table 6).

TABLE 6. Digital repositories of regional universal scientific libraries of Ukraine

Library	Base	Year of digitization	Number of digitized documents
D. I. Chyzhevskiy RUSL	Digital Library (https://library.kr.ua/elib/)	1998	684
F. Potushniak Zakarpatska RUSL	Electronic Library (https://www.biblioteka.uz.ua/e-library/)	2009	85
I. Franko Ivano-Frankivsk RUSL	For EL Culture of Ukraine (https://elib.nlu.org.ua/uchasnyky.html?id=4)	2017	27
I. P. Kotliarevskiy Poltava RUSL	There is no separate database; access through the electronic catalogue (https://library.pl.ua/jirbis2/index.php?option=com_irbis&view=irbis&Itemid=115)	2018	241 books; 3907 copies of newspapers
Kharkiv RUSL	There is no separate database		4 (unavailable to the general public)
Khmelnysk RUSL	Electronic Library (http://ft-ounb.ounb.km.ua:8080/)	2004	368
K. A. Timiriaziev Vinnytsia RUSL	E-Library (https://library.vn.ua/e-library)	2000	825
Lesya Ukrainka Public Library for Adults, Kyiv	Digital Library Kyiv (https://dlib.kiev.ua/)	2015	722
Luhansk RUSL	Digitization was carried out until the summer of 2014 within the project EL Culture of Ukraine		
Lviv RUSL	In the section Rare editions (http://www.lounb.org.ua/index.php/links-mainmenu-23/ancient)		(20 editions; 19 leaflets)
M. Ivasiuk Chernivtsi RUSL	Presented in the section Electronic Books (http://www.library.cv.ua/elektronni-knigi)		approximately 150
M. S. Hrushevskiy Odesa RUSL	Pilot scheme Digital Library (https://biblioteka.od.ua/tsyfrova-biblioteka/)	(implemented during 2016 – 2017)	17

Library	Base	Year of digitization	Number of digitized documents
Mykolaiv RUSL	Electronic resource web-library Heritage of Arkas (https://arkasfamily.mk.ua/), Publications (local) of the 19 th – early 20 th centuries (http://www.reglibrary.mk.ua/index.php/elektronna-biblioteka-mistsevikh-vidan/elektronna-biblioteka-mistsevikh-vidan-v-flippingbook), etc.	2015	505
Oleh Honchar Kherson RUSL	E-Library (https://lib.kherson.ua/e-lib.htm)	2003	1066
Oleh Olzhych Zhytomyr RUSL	LIBO (http://libo.lib.zt.ua/jspui/index.jsp?locale=uk)	2013	approximately 300
Olena Pchilka Volyn state RUSL	There is no separate database, presented in the section Publications (http://ounb.lutsk.ua/?do=vud)	2005	
Rivne RUSL	Famous people of Rivne region. Digital Collections (http://libr.rv.ua/ua/read/43-cifrovi-kolekcii)		8 collections
Ternopil RUSL	Electronic library of Local Lore editions of Ternopil region (https://irbis.library.te.ua/cgi-bin/irbis64r_15/cgiirbis_64.exe?LNG=uk&C21COM=F&I21DBN=ELKKN&P21DBN=ELKKN&S21FMT=&S21ALL=&Z21ID=&S21CNR=); Periodicals of Ternopil region (https://irbis.library.te.ua/cgi-bin/irbis64r_15/cgiirbis_64.exe?LNG=uk&C21COM=F&I21DBN=RGAZ&P21DBN=RGAZ&S21FMT=&S21ALL=&Z21ID=&S21CNR=)	2004	854; 2909 issues of newspapers
The First Slavic Teachers Cyril and Methodius Dnipropetrovsk RUSL	EL of Local Lore (https://www.lib.dp.ua/?do=fullkr); EL Collections (https://www.lib.dp.ua/?do=collections)	2008	928
V. H. Korolenko Chernihiv RUSL	Electronic Library (http://libkor.com.ua/plugin?type=lib)	2012 p.	books – 534 files, periodicals – 16037 files
Zaporizhzhia RUSL	E-Library (https://zounb.zp.ua/resource/books)	2009	1 800

The monitoring of the library sites of higher education institutions has revealed that these libraries present digitized documents in DB, repositories, or EL (either online or in the local mode). In particular, HEI libraries create the following digital collections:

- 1) Collections of various types of documents:
 - Scientific Library of Odesa I. I. Mechnykov National University – *Electronic Library of Rare Editions* (<http://rarebook.onu.edu.ua:8081/>);
 - Scientific Library of National University Kyiv-Mohyla Academy – *Digital Collection of the National University Kyiv-Mohyla Academy* (<https://dlib.ukma.edu.ua/>);
- 2) Collections of specific types of documents:
 - Central Scientific Library of V. N. Karazin Kharkiv National University – Electronic archive of periodicals *Back2News* (<http://back2news.org/>);
 - Maksymovych Scientific Library of Taras Shevchenko National University of Kyiv — digital repository of European rarities *Old Printed Book* (<http://www.rare.univ.kiev.ua/ukr/>);
- 3) Special library collections:
 - Scientific and Technical Library of Dnipro National University of Railway Transport named after Academician V. Lazaryan — *DB Railway Ukrainica* (<http://ecat.diit.edu.ua/zu/index.html>);
 - Scientific Library of Yaroslav Mudryi National Law University (Kharkiv) — *Library of Electronic Copies of Rare Editions* (<http://oldlib.nlu.edu.ua/>);
- 4) Signature collections:
 - Maksymovych Scientific Library of the Taras Shevchenko National University of Kyiv — *Creative legacy of M. P. Drahomanov* (<http://www.library.univ.kiev.ua/ukr/elcat/dragomanov.php3>) and *Creative legacy of M. O. Maksymovych* (<http://www.library.univ.kiev.ua/ukr/elcat/maksymovych.php3>);
 - Scientific Library of the National Pedagogical Dragomanov University (Kyiv) – *Shevchenko belongings in the holdings of the Scientific Library of the National Pedagogical Dragomanov University* (<http://old.lib.npu.edu.ua/new-collections/documents/view/12>); *Mykhailo Drahomanov – a prominent figure of Ukraine* (<http://old.lib.npu.edu.ua/new-collections/documents/view/1>).

The development of digital collections of documentary heritage provides new opportunities for unlocking the potential of HEI library holdings and shaping the quality and comfortable educational as well as the scientific space.

However, shaping digital repositories aims not only to preserve the documentary heritage, but also its integration into the global communication space. Researchers remark that digital transformations lead to changes in the management policy of archival information resources, one of the areas of which is the digitization of documents and providing online access to them³⁷. Therefore, the development of user-friendly tools for working with digital repositories for users is an urgent matter. This paper advises to consider this experience as illustrated by the national and state libraries of Ukraine.

Concerning the search for digitized documents by users (Figure 2), 8 libraries have responded – *Through the general electronic catalogue of the library (choice – Full-Text Availability). The ability to search the database / EL digitized documents* (6 libraries) was the second most popular choice. Some libraries provide multiple search methods simultaneously. For example, the National Historical Library of Ukraine offers EL query support, through an electronic catalogue and a global search on the website. This provides a better ability for users to find the necessary documents.

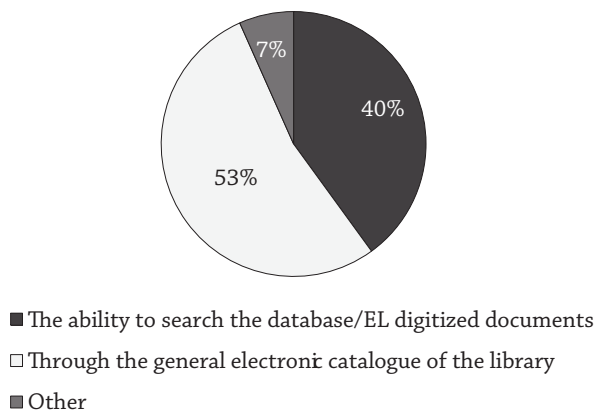


FIGURE 2. Options for searching for digitized documents by users

Having got acquainted with the functionality of digital repositories of Ukraine, it can be concluded that, eventually, the national libraries are begin-

37 TIURMENKO Iryna, BOZHUK Ludmyla, SMOLNIKOV Yurii and SYEROV Yuriy. Digital Communications of Ukraine Archival Institutions. *Proceedings of the 2nd International Workshop on Control, Optimisation and Analytical Processing of Social Networks (COAPSN 2020)*. Lviv. 2020, vol. 2616, p. 296–307 [interactive]. [accessed 21 April 2021]. Access online: <<http://ceur-ws.org/Vol-2616/paper25.pdf>>

ning to pay more attention to its improvement, expanding the tools to work with them and providing a number of search filters.

The organization of access to documents is also an important step in shaping digital repositories. First of all, it should be pointed out that one of the factors on which the access to documents depends is copyright. The libraries of Ukraine, in compliance with the copyright and related rights legislation, are focusing more on digitizing documents that are no longer protected by any copyright. Thus, *EL Ukrainica* states that the featured information resources are placed for non-commercial use (educational, scientific). Documents that are still under copyright protection can be used by libraries with the relevant consent of the copyright holder. Therefore, most libraries have responded by providing public access to documents (8 libraries) (Figure 3).

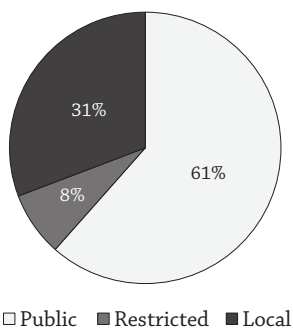


FIGURE 3. Data access mode to documents

However, some libraries are offering some other access modes. For example, Kharkiv Korolenko State Scientific Library reported in the questionnaire that the access to electronic copies of documents created in 2019–2021 is provided only on the library’s local network (the reason is the lack of a file server). Similarly, the State Scientific and Technical Library of Ukraine also reported certain restrictions – specifically, it provides access through the administrator in the reading room of the library without the right to download/copy.

Some libraries offer registration/authorization for access to documents. when conducting the survey, it was found that 5 libraries do not require registration (Kharkiv Korolenko State Scientific Library (except for the access to documents on the local network which only the ‘physically attending’ library readers have), the National Library of Ukraine for Children, the National Scientific Medical Library of Ukraine, the Central State Scientific and Technical Library of

the Mining and Metallurgical Complex of Ukraine, and the National Scientific Agricultural Library of the National Academy of Agricultural Sciences of Ukraine). At the same time, 5 libraries answered 'Yes' in the sense that they are offering access to all digitized documents or 'Yes' (access only to some digitized documents) (the National Historical Library of Ukraine, V.O. Sukhomlynskyi State Scientific and Pedagogical Library of Ukraine, V. H. Zabolotny State Scientific Architectural and Construction Library, the State Scientific and Technical Library of Ukraine, Odesa National Scientific Library). In particular, the National Historical Library of Ukraine invites to register on the site so that to use its further capabilities.

Discussion and conclusions

Thus, the results of the analysis of digitization projects showed that the libraries of Ukraine are gradually embracing digital technologies to expand and strengthen their own information and communication potential.

The following characteristic features of digitization in Ukraine can be indicated: 1) the preference is given to the most valuable books and periodicals, which is explained by a number of objective reasons (in particular, the insufficient government funding); 2) only the documents belonging to the 'public domain' are digitized; 3) most projects are local; 4) corporate cooperation within the national project including *EL Culture of Ukraine* and several regional projects – *EL local lore editions of Ternopil Region*, the *Digital Library Kyiv*, etc. is insignificant.

The analysis showed that each library works at developing its own strategy for digitizing documents, presenting digital repositories online and promoting them, as well as other related activities individually. Inasmuch as digital library collections are fragmented and not linked by a single access point, the users are being given fairly limited opportunities to efficiently search for digitized documents. Therefore, in Ukraine, the primary task is to unite the efforts of libraries and to implement a national digitization program based on the principle of corporatism. It is on the coordinated cooperation of national and state libraries that the development and formation of a single national digital library of Ukraine should be based.

In order to improve the digitization in Ukraine, it is necessary to draw from the international experience, as a number of national corporate digital projects have proven the high level of efficiency of their implementation. Such projects as *Trove* (Australia), *DigitalNZ* (New Zealand), *Polona* (Poland), *Deutsche Digitale Bibliothek* (Germany) as well as many others represent objects from the repositories of many different institutions (libraries, museums, archives, etc.).

In view of the above outlined information, the following recommendations can be provided to increase the efficiency of digitization of documentary heritage in the libraries of Ukraine. It is essential to:

1. Identify institutions that should be responsible for digitizing documents at the state level. First of all, this applies to ministries concerned – the Ministry of Culture and Information Policy of Ukraine and the Ministry of Digital Transformation of Ukraine. It is also necessary to appoint administrators who would coordinate the work among libraries, archives, and museums. For example, this function among libraries can be performed either by Vernadsky National Library of Ukraine (as the main library institution of the country which forms the national resource *Ukrainica*), or Yaroslav the Wise National Library of Ukraine (which has already developed experience in webmastering the only national project in Ukraine *EL Culture of Ukraine*).
2. Shape a national program for the digitization of documentary heritage, as well as develop strategic plans for its implementation (for a period of 3 –5 years).
3. Set up a national digital library. There are 2 models of organization in the research literature [16, 18]: centralized (the *World Digital Library* works on this principle) and distributed (e.g., *Europeana*). The authors believe that a comprehensive model is appropriate for implementation in Ukraine that will have the characteristic features of these two. For example, it is possible to create a repository of documents that are assigned to the State Register of National Cultural Heritage in a centralized way, whereas all other digitized documents can be distributed.

In such a case, even during the design phase it is important to study the demand of the potential user audience and develop models of presentation of resources which should be the user-friendliest. The three following components should be particularly highlighted:

- user-friendly access (a set of advanced search parameters for the holdings of different libraries), for example, in the form of a single access point and search based on the provision of metadata by the participating libraries;
- access to documents (public – for documents with the status of the ‘public domain’, limited – for documents protected by copyright; all the relevant decisions should be taken by libraries depending on the specific needs and capabilities);
- work with documents in the digital library (viewing in the browser, a set

of tools for viewing and working with documents, the ability to create one's own account (to create one's own collection, add bookmarks and notes, etc.)).

Areas of further research are to examine the substantive aspect of digitization and to determine the criteria for prioritizing the selection of documents for digitization.

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