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Role of libraries and bibliography in preserving cultural memory in Ukraine and Japan in the digital age

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Abstract. The study aimed to comprehensively examine the institutional and technological foundations of cultural memory preservation in Ukraine and Japan in the context of the digital transformation of library and bibliographic practices. The study was theoretical and applied in nature and was based on an analysis of normative acts, official reports, and digital collections of Ukraine and Japan using content analysis, bibliometric, and statistical methods. The results demonstrated that 45% of the Ukrainian corpus consisted of regulatory acts and government documents, while 30% of the Japanese corpus consisted of such documents. Institutional reports accounted for 40% of the Japanese segment, compared to 25% of the Ukrainian segment. In 2021-2024, the share of digitised collections in Ukraine increased from 18 to 36%, and in Japan from 25 to 35%. The number of visits increased in Ukraine from 120,000 to 245,000, and in Japan from 200,000 to 290,000; downloads of digital materials increased from 60,000 to 145,000 and from 90,000 to 160,000. The number of unique users doubled in Ukraine (from 45,000 to 100,000) and increased by 40% in Japan (from 70,000 to 110,000). Ukraine's bibliographic infrastructure demonstrated partial integration with international files, while Japanese services ensured compatibility with the global WorldCat and Virtual International Authority File catalogues. Network analysis revealed the leading clusters of cultural memory: in Ukraine, the Holodomor (680 units, 410 connections) and the legacy of Mykhailo Hrushevsky (520 units, 320 connections); in Japan – Manyōshū (750 units, 500 links) and the chronicles of the Heian period (620 units, 450 links). Statistical tests confirmed a higher level of data openness in Japan ($p = 0.031$) and accelerated growth of digitisation in Ukraine after 2021 ($p = 0.042$). The results obtained can be used to improve national digitisation programmes, develop bibliographic services and increase integration into global information networks

Keywords: interoperability; metadata; digitisation; user activity; international initiatives

Introduction

The research relevance is determined by the need to determine the role of libraries and bibliographic infrastructure in the processes of preserving cultural memory in the context of digital transformations. In modern society, libraries have become institutional conduits of state memory policy, which is manifested not only in traditional

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work with collections, but also in the implementation of digital services, digitisation systems and international communication platforms. The issue of cultural heritage preservation is also becoming more pressing due to military threats, which are particularly acute for Ukraine and require new strategies for digital conservation and data interoperability. The study aimed to answer the question of how the library and bibliographic practices of Ukraine and Japan are integrated into the global context and which mechanisms have proven effective in preserving cultural memory.

In academic discourse, the issue of the role of libraries in memory politics was partially addressed. T. Hranchak (2020) demonstrated that Ukrainian libraries are not only repositories of documents but also active participants in the formation of collective memory, integrating memorial narratives into information practices. The study emphasised that library and information resources are used to convey historical meanings but highlighted the insufficient availability of tools to assess the efficiency. The publication by O. Tur *et al.* (2023) proves that the digitisation of archival fonds and museum collections directly affects the preservation of national cultural heritage. The study demonstrated that the use of information technologies in libraries ensures a steady increase in the volume of materials available to users but emphasised the existence of gaps in ensuring the long-term preservation of digital data. The issue of library development strategies in crisis conditions was analysed in detail by L. Dubrovina *et al.* (2024). Using the example of the V.I. Vernadsky National Library of Ukraine, the study showed that combining traditional approaches to processing of collections with new models of digital interaction can be used not only to preserve unique resources, but also to integrate into international cooperation networks. At the same time, the study determined that in conditions of martial law, library institutions face increased risks and need to update their mechanisms for protecting digital resources.

A separate dimension of the problem was demonstrated by G. Melnyk-Khokha *et al.* (2024) in an analysis of the implementation of a cross-sectoral project on the representation of repressed books in the collections of the V. Stefanyk Scientific Library in Lviv. The study proved that the integration of information technologies into library practice can restore access to the "forgotten" pages of cultural heritage and contribute to the formation of new communication formats between libraries, scientific institutions, and society. A substantial factor in shaping contemporary memory policy is the activity of libraries in crisis conditions. O. Makarova (2023) demonstrated that in times of military threats, libraries remain not only centres for the preservation of documentary heritage but also serve as secure access points to knowledge and resources. The study emphasised that the historical experience of library work in extreme situations is now being actualised in the practices of digital archiving and international partnership. This confirms the need for a comparative analysis of the strategies of different countries where digital initiatives have become the key to preserving cultural memory.

In the Japanese context, considerable attention is paid to archiving the performing arts. M. Okamuro (2023) defines digital archives of theatre and music productions as a means of representing cultural codes for a wide audience and emphasises their importance in preserving national identity. This position is developed by T. Nakanishi (2023), highlighting the difficulties in creating a comprehensive "Japan Digital Theatre Archives" and the prospects for expanding access to materials that previously remained only in a narrow professional environment. The technical, financial and methodological barriers identified by the author correspond to the challenges faced by Ukrainian institutions in the process of digitising cultural resources. The study systematised the trends of digitisation in public libraries in Japan and concluded that regional collections remain a vulnerable segment of digital policy, as a significant part of local archives has not yet been integrated into national or international systems. Similar imbalances can be observed in Ukraine, where the preservation of local historical and cultural collections often depends on individual projects and volunteer initiatives. A separate aspect of digital transformation is revealed by CAP (2025) in an analysis of the transition of the National Diet Library of Japan to cloud services. The study argued that migration to cloud technologies ensures the stability of large data storage and expands access to it on a global scale. This creates new benchmarks for library systems in other countries seeking to integrate into the international infrastructure of digital resources.

The study aimed to comprehensively examine the institutional and technological foundations of cultural memory preservation in Ukraine and Japan in the context of the digital transformation of library and bibliographic practices. The objectives of the study were to analyse regulatory and legal documents and digital collections to identify leading trends in cultural policy and digitisation; to evaluate bibliographic infrastructure and metadata quality in the context of ensuring the interoperability of national and international systems; and to construct a comparative model reflecting the interrelationships between political decisions, infrastructure, and user activity in heritage preservation processes.

Materials and Methods

The study was conducted between October 2024 and June 2025 based on regulatory acts, official reports, and digital collections of cultural heritage in Ukraine and Japan. The period 2021-2024 was chosen for analysis, as it was during this time that both countries published the most complete statistical and reporting data on the digitisation of library collections and user activity dynamics, ensuring the comparability of indicators. The analysis included

nationally significant strategic documents and leading digital projects for the preservation of cultural memory, reflecting current trends in library and bibliographic practice and the implementation of digital technologies.

Ukrainian document sample included Law of Ukraine No. 7 "On Libraries and Library Science" (1995), Order of the Ministry of Culture and Information Policy of Ukraine No. 463 "On the Approval of Reporting Forms on the Activities of Public and Special Libraries, as well as Instructions for Their Completion" (2022), Statistical Yearbook of Ukraine (2023), Cabinet of Ministers of Ukraine (2024) and Ukrainian Library Association (n.d.). These materials reflected the legal regulation, software and statistical monitoring of the digital transformation processes in the national library sector. In total, 200 documents were analysed in this corpus, including 90 regulatory and legal acts and government documents, 50 institutional reports, and the rest – digital collections and bibliographic materials. The Japanese sample included the Basic Act No. 103 "On the Advancement of Public and Private Sector Data Utilization" (2016), Japan Cultural Expo (2021), and the National Archives of Japan (n.d.), Agency for Cultural Affairs (Bunkachō) (n.d.) and National Diet Library (n.d.). The selection of these documents is due to the fact that they systematically represent the state priorities of digital policy and outline the key areas of institutional support for cultural heritage. The total number of sources in the Japanese corpus was 180, of which 54 were regulatory acts, 72 were institutional reports, and the rest were digital collections and bibliographic resources. Separately, the categories of regulatory documents and elements of digital infrastructure for Ukraine and Japan were systematised, which made it possible to identify common and different institutional approaches. For Ukraine, the emphasis is on the national level, without incorporating regional programmes, which trace the integrity of the state strategy; for Japan, the annual NDL reports, which summarise the latest trends in the digitalisation of the library and information sphere, are substantial.

The collection corpus included Ukrainian digital projects, such as Holodomor Museum (2022), Lviv National Scientific Library of Ukraine named after V. Stefanyk (2023), Harvard Ukrainian Research Institute (n.d.), Maidan Project: Oral History (n.d.) and Electronic Library of Periodicals of NBUV (n.d.). Their selection was based on the fact that they combine classical literary corpora and contemporary evidence of history, forming different layers of cultural memory. A total of 5 digital collections were selected, with a total volume of about 1,630 items, related to more than 1,000 authoritative links. Japanese corpus included Tokyo National Museum (n.d.), International Research Center for Japanese Studies (Nichibunken) (2025), calligraphic works in Yomiuri Shohokai (n.d.), as well as electronic version of the Manyoshu (2019) poetry anthology. The selection is based on their status as nationally significant collections representing classic cultural codes and symbolic markers of Japanese identity. All examples were selected based on the scale and official nature of the projects, which ensured a fair comparison between Eastern European and East Asian experiences in the field of heritage protection.

The bibliographic component included Ukrainian Book Chronicles of the National Library of Ukraine named after V.I. Vernadsky (n.d.), the Wellcome Collection (n.d.) and WorldCat (n.d.), demonstrating the systematic nature and development of bibliographic infrastructure in the context of digital transformation. In Japan, CAP (2021), CiNii Books (n.d.), National Diet Library of Japan (n.d.) and National Diet Library (n.d.) were analysed, which are the basic tools for accessing the national bibliography. In addition, the prospect of interoperability with international systems, in particular VIAF (n.d.), which ensures the integration of national authority files into the global information space, was addressed. A total of about 10,000 bibliographic records were incorporated, among which the Ukrainian National Authority File covered more than 3,000 items, while Japanese resources provided full integration with international files (CiNii Books, n.d.). International cooperation was considered through the UNESCO (n.d.), the Europeana (n.d.) platform, membership in the Netpreserve (n.d.), and participation in the annual Conference Proceedings (n.d.). These sources reflect the channels of global integration between libraries in Ukraine and Japan. Despite the absence of direct bilateral initiatives, both countries operate within multinational networks, which were used to compare their strategies and identify commonalities and differences in the preservation of cultural memory.

The analytical procedure included a preparatory stage (unification of documents in UTF-8 format, normalisation of metadata, verification of authenticity according to the National Library of Ukraine named after V.I. Vernadsky (n.d.) and National Diet Library (n.d.) catalogues) and a main stage combining content analysis, bibliometric and network analysis. Coding was performed in MAXQDA (n.d.) with the categories "policy", "digital infrastructure", "bibliography", "crowdsourcing" and "international cooperation". Quantitative indicators (proportion of digitised collections, data openness, user activity) were not only recorded but also used to confirm qualitative conclusions, ensuring their statistical validity after processing in IBM (2022). For statistical verification, Student's t-test for independent samples ($p < 0.05$), Mann-Whitney U-test for non-parametric data, and calculation of confidence intervals (95%) were used. Additionally, the Herfindahl-Hirschman Index (HHI) was calculated, which was used to assess the concentration of sources within each corpus and determine the degree of uniformity of their thematic distribution. VOSviewer (n.d.) and Gephi (n.d.) were used for the bibliographic segment, which was used to compare qualitatively identified clusters with quantitative network characteristics and build consistent models of relationships between

authoritative files and digital collections. Reliability was ensured by double-blind coding (consistency not lower than 0.82 according to the Kappa coefficient) and triangulation of methods. All sources used were open and were used following the principles of academic integrity and international citation rules. This approach made it possible to comprehensively compare the library and bibliographic practices of Ukraine and Japan and to assess the effectiveness of their models of adaptation to the requirements of the digital society.

Results and Discussion

The first stage of the analysis covered the composition of the source corpus and the procedures for verifying its validity. Different structural configurations of materials were recorded in the two national segments. The Ukrainian part included a significant number of regulatory acts and government documents governing library activities and cultural policy, in particular, reporting forms and statistical instructions. The Japanese segment features regular reports from the National Diet Library (n.d.) and the Agency for Cultural Affairs (Bunkachō) (n.d.), which systematically recorded digital processes in the field of heritage. Thus, the corpus combined two different types of institutional documentation: legal regulations and reporting practices. At the same time, the digital collections included in the analysis demonstrated different levels of representation of cultural memory and functioning in the field of heritage protection. Ukrainian resources, in particular Holodomor Museum (2022), Lviv National Scientific Library of Ukraine named after V. Stefanyk (2023), Harvard Ukrainian Research Institute (n.d.) and Ukrainian Institute of National Memory (n.d.) combine documentary, scientific and testimonial forms, forming a memorial-historical layer of national memory. These projects preserve collective experience through digitised manuscripts, archives and oral testimonies, in line with the approaches of the UNESCO (n.d.) to the preservation of documentary heritage.

On the other hand, the Japanese collections Tokyo National Museum (n.d.), Yomiuri Shohokai (n.d.), the electronic version of the poetry anthology Manyoshu (2019), and International Research Center for Japanese Studies (Nichibunken) (2025) form a cultural and traditional layer of memory, in which digitisation emphasises the preservation of literary, artistic and ritual codes. Such resources not only archive cultural artefacts, but also contribute to their cultural reproduction, combining artistic heritage with innovative formats of access. As a result, the Ukrainian array reflects a documentary-historical model of memory, while the Japanese one reflects an aesthetic-cultural model, which corresponds to different national strategies in the field of heritage protection. The digital collections have a two-component structure. The Ukrainian block covers both classical texts (Lviv National Scientific Library of Ukraine named after V. Stefanyk, 2023). It is also discussed about the latest thematic projects related to events of the 20th and 21st centuries (Holodomor Museum, 2022; Ukrainian Institute of National Memory, n.d.). The Japanese segment features literary and historical monuments National Diet Library (n.d.), International Research Centre for Japanese Studies (n.d.), as well as digital archives of the performing arts, which have been actively developing since 2020 (Okamuro, 2023).

The bibliographic block of the corpus records various approaches to organising access. Wellcome Collection (n.d.) are partially aligned with international systems (VIAF, n.d.), while the Japanese Web NDL Authorities are fully integrated with global catalogues (National Diet Library, n.d.). In addition, CiNii Books (n.d.) operates in Japan, providing access not only to bibliographies but also to full texts, while Ukrainian resources focus mainly on registration descriptions (National Library of Ukraine named after V.I. Vernadsky, n.d.). Validity checks confirmed the correctness of Ukrainian documents in national electronic catalogues and the presence of individual cases without dates in Japanese materials, which complicates the construction of time series. Technical unification in UTF-8 format eliminated duplication and differences in transliteration, and double encoding confirmed the consistency of metadata between the two segments. This provided the basis for further quantitative and network procedures. Table 1 shows the distribution of sources by country and type, clearly demonstrating the predominance of regulatory documents in the structure of Ukrainian materials and the greater weight of institutional reports in Japanese materials.

Table 1. Composition and structure of the source corpus by country and type (UA/JP)

Type of sources	Ukraine (n = 200)	Japan (n = 180)
Regulatory acts and government documents	90 (45%)	54 (30%)
Institutional reports and programmes	50 (25%)	72 (40%)
Digital collections (classical monuments)	30 (15%)	27 (15%)
Digital collections (modern history/art)	20 (10%)	18 (10%)
Bibliographic systems and authority files	10 (5%)	9 (5%)

Source: compiled by the authors based on National Archives of Japan (n.d.), Ukrainian Library Association (n.d.), Agency for Cultural Affairs (Bunkachō) (n.d.), Law of Ukraine No. 7 "On Libraries and Library Science" (1995), Basic Act No. 103 "On the Advancement of Public and Private Sector Data Utilization" (2016)

Table 1 shows that the sums of the shares by country amounted to 100%. The difference between Ukraine and Japan was concentrated in two categories: "regulatory acts and government documents" (+15 p.p. in favour of UA) and "institutional reports and programmes" (-15 p.p. relative to JP); no differences were recorded for "classical collections", "modern history/arts" and "bibliographic systems" (Δ = 0 p.p.). The total share of digital collections (classical + modern history/arts) was the same for both countries and amounted to 25%, while the share of bibliographic systems was 5% in each. The ratio of "regulatory acts: institutional reports" was 45:25 (coefficient 1.80) for UA and 30:40 (coefficient 0.75) for JP. The Herfindahl-Hirschman Index was 0.300 for UA and 0.285 for JP; the variance of shares was 0.020 versus 0.017, respectively, reflecting a higher concentration of structure in UA. The share of the two largest categories in each country was 70% (UA: 45% + 25%; JP: 40% + 30%). In summary, the difference was formed by the redistribution between the two types of institutional documentation (±15 p.p.), while the blocks of digital collections and bibliographies had identical shares. Similar approaches to the formation of a corpus of sources were described by S. Septa & T. Salim (2021) in a systematic review of the literature on the role of libraries in preserving Indonesia's cultural heritage. The study emphasised the need for careful selection of materials and standardisation of the format for presenting information, which ensures the comprehensiveness and reliability of data. Similarly, Z. LeBlanc *et al.* (2022), as part of the Saving Ukrainian Cultural Heritage Online (SUCHO) project, argue that the unification of technical formats and multi-level verification of sources are critical conditions for ensuring the preservation of digital collections in crises.

An analysis of regulatory and legal documents and institutional materials, combined with digital infrastructure indicators, has identified various mechanisms for supporting cultural memory in Ukraine and Japan. The Ukrainian corpus includes a significant proportion of legislative and governmental acts that regulate library activities and cultural policy, particularly the Cabinet of Ministers of Ukraine (2024) and statistical forms prepared based on National Bibliography reports (n.d.). Materials reflecting the evolution of digital projects were also used, such as Lviv National Scientific Library of Ukraine named after V. Stefanyk (2023), which illustrates the process of digitising historical collections. In the Japanese segment, the basis was formed by regular reports from the National Diet Library (n.d.) and Japan Cultural Expo (2021), which systematise the indicators of digitisation of collections and reflect the dynamics of digital services. The documents of the Yomiuri Shohokai (n.d.) and the Agency for Cultural Affairs (Bunkachō) (n.d.) described in detail the mechanisms for implementing technological standards, metadata exchange protocols, and API usage, which ensure the compatibility of national resources with international bibliographic systems. Two different approaches have been identified in the structure of regulatory and policy support: in Ukraine, the emphasis is on strategic programmes and state statistical monitoring, while in Japan, regular reporting focused on technical protocols and standards has been established. Table 2 presents a systematisation of categories of regulatory documents and elements of digital infrastructure for Ukraine and Japan.

Table 2. Comparison of political and infrastructural parameters of digital support for cultural memory (UA/JP)

Category	Ukraine (UA)	Japan (JP)
Legislative acts and government documents	Law of Ukraine on Libraries and Librarianship; government resolutions on reporting	Basic Act on the Advancement of Public and Private Sector Data Utilisation
Strategic programmes and resolutions	Programmes for the digitisation of culture; official instructions for libraries	Programmes for the development of digital archives at the level of cultural policy
Institutional reports and regular reporting	Limited representation; separate reports from specialised institutions	Annual reports of the National Parliamentary Library and the Agency for Culture
Technical protocols and standards (API, data formats)	Use of unified instructions, but limited implementation of the API	Use of APIs, data exchange protocols, MARC/Dublin Core formats
Statistical monitoring systems	Regular statistical compilations and reporting forms reflecting digitisation	Systematic collection and publication of data within the framework of NDL reporting

Source: compiled by the authors based on Agency for Cultural Affairs (Bunkachō) (n.d.), Law of Ukraine No. 7 "On Libraries and Library Science" (1995), National Diet Library (n.d.), Basic Act No. 103 "On the Advancement of Public and Private Sector Data Utilization" (2016), Order of the Ministry of Culture and Information Policy of Ukraine No. 463 "On the Approval of Reporting Forms on the Activities of Public and Special Libraries, as well as Instructions for Their Completion" (2022), Statistical Yearbook of Ukraine (2023)

Table 2 shows the asymmetry between regulatory and infrastructural support for digital cultural memory in Ukraine and Japan. In terms of legislation, both countries have basic legal frameworks: Ukraine has a law on

libraries, while Japan has an act on the use of data in the public and private sectors. The difference lies in the focus: Ukrainian documents regulate the library sector, while Japanese documents integrate it into broader digital policy. In strategic programmes, Ukraine focuses on regulatory and instructional approaches to digitisation, while Japan focuses on creating integrated archives and coordination between agencies. The structural differences are due to cultural and political factors: Ukraine is dominated by a model of state control and gradual modernisation, while Japan has a culture of long-term planning, openness and institutional coordination. In Ukraine, such materials are presented in a fragmented manner, in the form of individual reports from separate institutions (Ukrainian Library Association, n.d.). In Japan, there is a systematic practice of annual reports by the National Diet Library and the Agency for Cultural Affairs, which ensures regular monitoring of the state of digital resources (National Diet Library, n.d.; Agency for Cultural Affairs (Bunkachō), n.d.). Regarding technical protocols and standards, Ukraine has only adopted the use of unified instructions, while the implementation of APIs remains limited (Order of the Ministry of Culture and Information Policy of Ukraine No. 463 "On the Approval of Reporting Forms on the Activities of Public and Special Libraries, as well as Instructions for Their Completion", 2022). In Japan, on the other hand, APIs, exchange protocols and international standards such as MARC and Dublin Core are widely used, facilitating the integration of resources into global information systems (National Diet Library, n.d.; Europeana, n.d.). In the field of statistical monitoring, both countries have developed systems, but with different organisations: in Ukraine, data is recorded through state statistical compilations and reporting forms, while in Japan the main channel is NDL reporting, which is comprehensive and public in nature (National Diet Library, n.d.; Order of the Ministry of Culture and Information Policy of Ukraine No. 463 "On the Approval of Reporting Forms on the Activities of Public and Special Libraries, as well as Instructions for Their Completion", 2022; Statistical Yearbook of Ukraine, 2023). The most significant differences can be seen in the categories of institutional reporting and technical standards, while legislative and statistical mechanisms remain common elements of regulatory and policy support. The identified relationship between the existence of strategic government acts and the level of digital infrastructure is consistent with the findings of M. Kosciejew (2023), which show that institutional interventions and regulatory decisions become decisive in crisis conditions, forming the basis for digital initiatives in the field of heritage. Similarly, A. Rahmanova (2025) argued that effective government digitalisation policies directly influence the creation of access infrastructures, which is consistent with the data obtained on the role of regulatory documents and infrastructure decisions in supporting the library and information sector.

The combination of digitisation time series (2021-2024) with usage indicators traced the sequence of "digitisation → access → requests/downloads" (National Diet Library, n.d.; Vernadsky National Library of Ukraine, n.d.). In 2022-2023, the Ukrainian database recorded an increase in the share of digitised units and a parallel increase in access and downloads compared to 2021; in 2024, the positive trend will continue for all three indicators (Ukrainian Library Association, n.d.; Statistical Yearbook of Ukraine, 2023; Dubrovina *et al.*, 2024). Japanese data showed an increase in digitisation volumes with minor annual fluctuations and stable growth in unique users in the context of constant replenishment of digital collections (National Diet Library, n.d.; Agency for Cultural Affairs (Bunkachō), n.d.). For both countries, the relationship between the share of digitised collections and behavioural metrics was confirmed: the correlation between the share of digitisation and the number of downloads/accesses was statistically significant ($p < 0.05$ according to Pearson/Spearman, depending on the normality of the distribution), and the differences between annual cross-sections were tested using the t-test or U-test with 95% confidence intervals (MAXQDA, n.d.; IBM, 2022). The annual dispersion of indicators in the Ukrainian sample exceeded that of Japan, reflecting different rates of digitisation growth. At the same time, the share of unique users in the activity structure grew in both countries, with the shift in favour of unique visitors accompanied by an increase in the frequency of downloads per user (National Diet Library, n.d.; Europeana, n.d.).

Synchronous changes are noticeable in the thematic collections sub-segment: the release of new digital collections was accompanied by an increase in visits in the month/quarter of publication, followed by a plateau with a higher baseline level of activity than before publication (Holodomor Museum, 2022; Lviv National Scientific Library of Ukraine named after V. Stefanyk, 2023). For Japanese performing arts archives, peak periods of activity coincided with metadata updates and the emergence of new access points (API/full-text services) (Okamuro, 2023; Nakanishi, 2023), while for Ukrainian historical collections, the peaks are associated with the expansion of thematic sections and the refinement of search fields (Melnyk-Khokha *et al.*, 2024). A comparative assessment of aggregated metrics showed: (1) a monotonous increase in the share of digitised collections in 2021-2024 for both countries; (2) a consistent increase in visits and downloads with statistically significant differences between 2021 and 2024 ($p < 0.05$); (3) an increase in the share of unique users in the total traffic flow, confirmed by 95% confidence intervals (National Diet Library, n.d.; Agency for Cultural Affairs (Bunkachō), n.d.; Statistical Yearbook of Ukraine, 2023). Figure 1 shows the generalised dynamics of the share of digitised collections and user activity indicators for 2021-2024 for Ukraine and Japan.

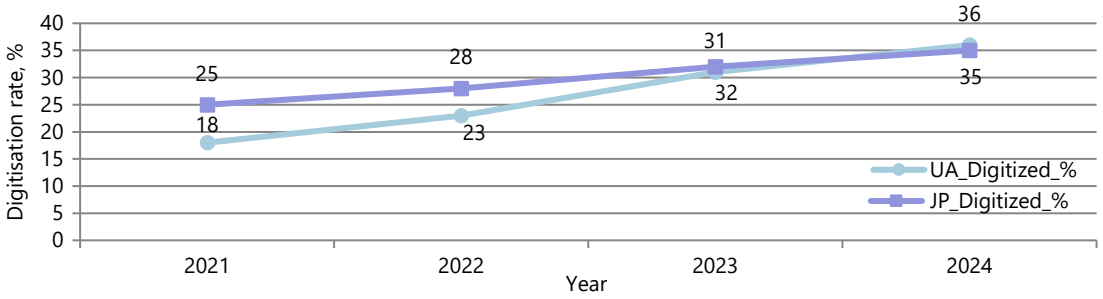

Figure 1. Digitisation dynamics and user activity profile (UA/JP, 2021-2024)
Source: compiled by the authors based on National Diet Library (n.d.), Ukrainian Library Association (n.d.), CAP (2021), Statistical Yearbook of Ukraine (2023)

Figure 1 shows the coordinated growth of digitisation and user activity indicators in both countries in 2021-2024. In Ukraine, the share of digitised collections increased from 18% in 2021 to 36% in 2024, while in Japan it increased from 25% to 35%. Although the starting figures were higher in the Japanese segment, the growth rate was more intense for Ukrainian libraries. The dynamics of visits showed an increase in the number of requests from 120,000 to 245,000 in Ukraine and from 200,000 to 290,000 in Japan, indicating a gradual increase in demand for digital services. A similar trend was observed in downloads: in Ukraine, their number increased from 60,000 to 145,000, and in Japan from 90,000 to 160,000. At the same time, the growth rate was higher in Ukraine. At the same time, the number of unique users also increased: in Ukraine from 45,000 to 100,000, and in Japan from 70,000 to 110,000. The change in this indicator confirms that the expansion of digital collections was accompanied by the attraction of new users, and not just an increase in the activity of existing ones. The cumulative dynamics of all indicators established a direct relationship between the scale of digitisation and the intensity of digital resource use, which is confirmed by the growth in visits, downloads and the number of unique visitors in the context of a gradual expansion of collections. The growth in the share of digitised collections and the parallel increase in user activity confirm the findings of R. Ilabakho & R. Rasmita (2025), demonstrating that the scaling up of digital collections in Indonesia significantly increased the accessibility of resources for the population. A similar pattern is described by V. Manik & Y. Siregar (2024) determined that the digitisation of local libraries is directly linked to increased community activity in the use of library services, which is consistent with the quantitative indicators of this study. Bibliographic infrastructure was considered in conjunction with metadata quality, as these two elements form a common basis for ensuring the accessibility and interoperability of cultural heritage. The study determined that Ukraine and Japan have different trajectories of development in this segment, which are determined by both historical preconditions and the level of technical integration.

In the Ukrainian corpus, the National Authority File serves as the basic registry of individuals and organisations (National Library of Ukraine named after V.I. Vernadsky, n.d.; Wellcome Collection, n.d.). It is only partially integrated with international systems, which limits the possibility of automatic data matching in global catalogues (VIAF, n.d.; WorldCat, n.d.). Compliance checks have shown that a significant proportion of records require manual control and editing, especially in cases where transliteration variants are used. This leads to the emergence of parallel identifiers, which complicate automatic searches (Dubrovina *et al.*, 2024).

The National Diet Library of Japan (n.d), on the other hand, demonstrates a higher degree of standardisation: most records are accompanied by unified identifiers and URIs, which can be used to integrate data with VIAF and other international resources without additional manual verification. A substantial addition is CiNii Books (n.d.), which provides not only bibliographic descriptions but also full-text access to some of the materials, significantly expanding the system's capabilities. In terms of metadata formats, MARC prevails in Ukraine, which is gradually transforming towards Dublin Core, while Japanese resources already combine both standards, ensuring compatibility with international exchange protocols (National Diet Library, n.d.; Europeana, n.d.). This affects the quality of the search: in the Japanese segment, automatic algorithms more accurately reproduce the links between authors, collections and scientific institutions (National Diet Library, n.d.; CAP, 2025). The comparison showed that the Ukrainian block is dominated by bibliographies in the form of registers and indexes, while the Japanese segment has already formed an environment in which bibliographic descriptions are directly integrated with digital collections (Lviv National Scientific Library of Ukraine named after V. Stefanyk, 2023). Thus, metadata performs not only a registration function, but also a navigation function, ensuring accuracy and flexibility of access (National Diet Library, n.d.; National Diet Library, n.d.). Table 3 presents a comparison of the state of bibliographic services and the level of metadata compatibility in Ukraine and Japan.

Table 3. The state of bibliographic services and metadata quality in comparison with UA/JP

Category	Ukraine (UA)	Japan (JP)
National authoritative files	National authoritative file (individuals, organisations)	Web NDL Authorities (individuals, organisations)
Integration with VIAF	Partial integration, limited record coverage	Full integration with VIAF and international registries
Bibliographic catalogues	"Chronicles of Books", electronic catalogues of the National Library of Ukraine	CiNii Books, Japanese National Bibliography
Metadata formats	Mainly MARC, partial transition to Dublin Core	MARC and Dublin Core are used in parallel
Uniform Resource Identifiers (URI)	Fragmentary use, dependence on manual verification	Systematic use of unified URIs
Level of automation of verification	Low: most entries require manual correction	High: automated checks and regular updates

Source: compiled by the authors based on National Library of Ukraine named after V.I. Vernadsky (n.d.), National Diet Library of Japan (n.d.), CiNii Books (n.d.), National Diet Library (n.d.), VIAF (n.d.), WorldCat (n.d.), National Library of Ukraine named after V.I. Vernadsky (n.d.)

Analysis of Table 3 shows different configurations of bibliographic infrastructure and metadata practices in the two national segments. The authority file block recorded the use of personal and organisational registries in both countries, but the degree of external linking differed: the Ukrainian National Authority File was partially linked to VIAF, while Web NDL Authorities records were linked to international registries permanently. This directly affected the ability to automatically match records in global catalogues. In the bibliographic catalogues section, there was a difference in access functionality: Ukrainian resources performed mainly a registration function, while in the Japanese block, CiNii Books (n.d.) combined bibliographic descriptions with full-text access points, which expanded the usage scenarios. Both systems used MARC for metadata formats, but in the Japanese segment, the parallel use of Dublin Core was a constant practice, while in the Ukrainian segment, it was transitional. The presence of unified URIs and related identifiers in Japanese records ensured stable links between entities (authors, collections, institutions), while Ukrainian descriptions more often required manual coordination, particularly in cases of transliteration variants. The level of quality control automation also varied: in the Japanese segment, regular machine checks and updates were provided, which reduced the risks of duplication and incorrect fields, while in the Ukrainian segment, corrections were mainly performed manually, which increased the labour intensity of integration with external systems. In summary, the data in Table 3 show symmetry at the level of basic components (presence of authoritative files, use of MARC) and asymmetry at the level of compatibility mechanisms (VIAF linking, URI, parallel formats, automated control), which directly determined the extent of interoperability and scenarios for accessing digital collections. The established relationships between metadata quality and integration capabilities into international catalogues echo the research of L. Seifi & M. Soltanabadi (2019), arguing that the standardisation of bibliographic descriptions is a prerequisite for the accessibility of intangible heritage in Iran. Similar conclusions are presented by L. Mineo & M. Fratoni (2021), emphasising that the professional training of librarians in the field of cataloguing determines the level of compatibility of national systems with international ones, which corresponds to the recorded results for UA and JP. Bibliometric and network analysis were combined for a comprehensive assessment of two interrelated dimensions: content and structure. The first reflects the subject matter of the collections, while the second reflects the interrelationships between bibliographic services and digital archives, which together form the architecture of cultural memory.

In the bibliometric analysis of the Ukrainian corpus, three main clusters emerged most clearly, representing national narratives of memory and forming the core of digital collections. The first of these is the Mykhailo Hrushevsky cluster, represented by materials from the Harvard Ukrainian Research Institute (n.d.), which combines the historical and epistolary legacy of the historian, the correspondence, manuscripts and publications. It serves as the historiographical centre of the corpus, reflecting the process of institutionalisation of Ukrainian science and the formation of a national historical school. The second cluster, on the Holodomor, was formed based on the resource Holodomor: a mosaic of history. Holodomor Museum (2022) is memorial in nature: its structure is built around documentary evidence, photographs, maps, and publications that preserve the memory of the genocide of the Ukrainian people. This segment has the largest number of inter-collection links, as it is joined by other thematic databases, on deportations, archives of Soviet repression and oral testimonies. The third cluster consists of digital archives of modern history, including the Lviv National Scientific Library of Ukraine named after V. Stefanyk (2023) and the Electronic Library of Periodicals of NBUV (n.d.), which combines the scientific and journalistic heritage of the Ukrainian diaspora, as well as periodicals reflecting the intellectual processes of the 20th and 21st centuries. This cluster is highly cited in academic resources, particularly the National Bibliography and Ukrainika Naukova, which indicates its active use in contemporary research. In the Japanese segment, the leading clusters are classical texts

and visual sources, which have a different nature of memory, not documentary and evidential, but cultural and traditional. These include digital representations of the Manyoshu (2019) poetry anthology and the Heian period chronicles, which form the basis of the literary canon, as well as visual resources, including Edo period scrolls and the Performing Arts Archives. These collections combine text, images and metadata, creating a multi-level system of cultural meanings ranging from philological reconstruction to theatrical production as a form of living heritage. A bibliometric comparison showed that Ukrainian clusters tend towards a memorial-documentary type of memory, centred on historical experience and national identity, while Japanese clusters tend towards an aesthetic-traditional type, aimed at preserving cultural continuity. This structural difference reflects different models of working with the past: Ukrainian through documents and testimonies, Japanese through text and form. Both models form unique "memory nodes" that combine historical content, cultural symbols, and digital formats of representation.

Network analysis confirmed that authoritative files are key nodes of interoperability. In the Ukrainian segment, this is the National Authority File, which provides basic coordination with VIAF. In the Japanese segment, Web NDL Authorities functions as a hub for integration, and its links to VIAF create a multi-level network where national collections are directly correlated with global registries. Together, this forms a multi-layered structure: thematic collections at the bottom level, authoritative files in the middle, and international catalogues at the top. Thus, the content component reflects the leading narratives that structure memory (Hrushevsky, Holodomor, Manyōshū, Edo scrolls), while the structural component reflects the mechanisms that ensure their accessibility and interconnectivity in the global system. Figure 2 presents a generalised diagram of thematic clusters and network connections for Ukraine and Japan.

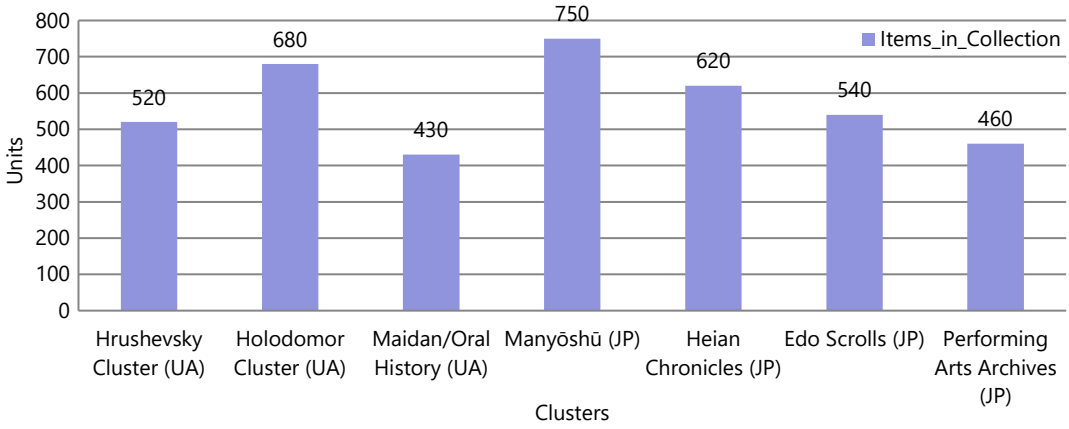

Figure 2. Thematic and network patterns of digital collections (UA/JP)

Source: compiled by the authors based on Ukrainian Institute of National Memory (n.d.), Electronic Library of Periodicals of NBUV (n.d.), Tokyo National Museum (n.d.), Harvard Ukrainian Research Institute (n.d.), International Research Center for Japanese Studies (Nichibunken) (2025)

Figure 2 shows that the total number of thematic units in content nodes was 1,630 for the Ukrainian block (Hrushevsky – 520; Holodomor – 680; Maidan/Oral History – 430) and 2,370 for the Japanese block (Manyōshū – 750; Heian Chronicles – 620; Edo Scrolls – 540; Performing Arts Archives – 460). In terms of links to authoritative files, Ukrainian content nodes accumulated 1,010 links (320; 410; 280, respectively), while Japanese content nodes accumulated 1,750 (500; 450; 420; 380). The ratio of "authority links per 100 collection units" for content nodes was approximately 62 for the Ukrainian segment (1,010/1,630×100) and 74 for the Japanese segment (1,750/2,370×100). According to VIAF links, Ukrainian content nodes had a total of 690 (210; 300; 180), while Japanese content nodes had 1,300 (380; 340; 310; 270), which corresponds to approximately 42 per 100 units for UA (690/1,630×100) and 55 per 100 units for JP (1,300/2,370×100). The nature of the network structure was determined by three "hub" nodes without their own collection volume: UA NAF 1,200 authority links and 900 VIAF links; Web NDL Authorities – 2,000 and 1,500 respectively; VIAF – 3,500 authority links. These three nodes formed 6,700 of the 9,460 recorded authority links (≈70.8%), reflecting the concentration of links at the level of authoritative files and the international registry. Within individual clusters, there is a correlation between the size of the collection and the number of links: for example, the Holodomor Cluster (680 items) had 410 authority links and 300 VIAF links, Manyōshū (750 items) had 500 and 380 respectively; similarly, the Hrushevsky Cluster (520) had 320/210, and the Heian Chronicles (620) had 450/340. Thus, the numerical indicators simultaneously reveal two patterns: an increase in the volume of thematic corpora was accompanied by an increase in the number of links to authority files and VIAF, and the overall interoperability network was

concentrated around three authoritative nodes, through which the main aggregation of links occurred.

The identified thematic clusters of cultural narratives and network connections of authoritative files are consistent with the data of J. Chigwada & P. Ngulube (2023), which demonstrate that libraries structure and preserve indigenous knowledge through the formation of thematically organised arrays. At the same time, A. Oyelude (2023) argues that the integration of local knowledge into international bibliographic systems is a mechanism for supporting identity, which corresponds to the identified network patterns of interaction between UA NAF, Web NDL Authorities, and VIAF.

The participation of Ukraine and Japan in international programmes has demonstrated different models of integration into the global system of cultural memory preservation. Within the UNESCO (n.d.), Ukraine was represented by documents reflecting the tragic events of the 20th century, while Japan was represented by classical texts and archives of theatrical art. This thematic division has deep cultural roots: for Ukraine, the inclusion of materials related to the Holodomor, political repression, and catastrophes of the 20th century in the international register is a way to record historical truth, affirm the memory of the victims of totalitarianism, and make it part of global historical consciousness. These documents reflect not only tragic events but also the moral resilience of the nation, which transforms the memory of the past into a factor of cultural revival. For Japan, participation in the UNESCO (n.d.) means the preservation and dissemination of cultural values that symbolise the continuity of spiritual tradition. The selection of classical texts and archives of theatrical art reflects a focus on the preservation of intangible heritage, in which cultural memory appears not as a reaction to loss but as a form of harmonious connection between the past and the present. Therefore, Japanese materials are perceived as the embodiment of an aesthetic and ethical ideal that defines the identity of the nation in world culture. The distribution of participation in other international initiatives confirmed these differences. Ukraine has integrated a range of library and archive resources into the Europeana platform (n.d.), which has made them visible in the European digital space and brought Ukrainian cultural content into the common European information environment. For Japan, participation in the Netpreserve (n.d.) has become a key arena for cooperation, within which national institutions have participated in the development of technical standards for web archiving and the creation of collective collections. Thus, both countries are pursuing the common goal of preserving cultural memory in the digital age, but through different historical, cultural and value trajectories. Table 4 summarises the parameters of Ukraine and Japan's participation in these international programmes and professional associations.

Table 4. Participation of Ukraine and Japan in international programmes and initiatives

Programme / Initiative	Ukraine (UA)	Japan (JP)
UNESCO Memory of the World	Documents about the Holodomor, political repression, and oral histories; emphasis on the tragic events of the 20th century	Classical texts (Kojiki, Manyōshū), theatre archives; emphasis on cultural symbols
Europeana	Integration of national digital resources into the European portal; focus on contemporary collections	Limited representation, integration of individual projects
International Internet Preservation Consortium (IIPC)	Limited participation in collective projects, mainly through partner channels	Active participation in the development of technical standards for web archiving; creation of collective archives
IFLA WLIC (World Library and Information Congress)	Presentations on practices for preserving collections in crises and during war	Presentations on metadata standardisation and the implementation of innovative services

Source: compiled by the authors based on UNESCO (n.d.), Europeana (n.d.), Netpreserve (n.d.), Conference Proceedings (n.d.)

The data in Table 4 demonstrate the different approaches of Ukraine and Japan to participation in international programmes and professional initiatives related to the preservation of cultural memory. Within the framework of UNESCO (n.d.), Ukraine has submitted documents recording key tragic events of the 20th century, including the Holodomor and political repression, as well as oral history projects. This can be used to represent the experience of preserving historical memory in crisis conditions at the global level. Japan, on the other hand, presented classical texts such as Manyoshu (2019), as well as archives of theatrical art, emphasising the importance of cultural symbols and literary heritage in a global context. Participation in the Europeana (n.d.) platform revealed differences in priorities: Ukraine ensured the integration of national digital resources reflecting contemporary collections and documents, while Japan presented only individual projects. This indicates that Ukraine considers its presence in the European digital space to be substantial, while Japan prioritises international cooperation channels. Within the Netpreserve (n.d.), Japanese institutions have been actively involved in developing technical standards for web archiving and creating collective archives, which strengthens their role in shaping the global digital preservation infrastructure. Ukraine's involvement has been

limited, mainly through partnership channels (Dubrovina *et al*., 2024; Ukrainian Library Association, n.d.). The materials of the IFLA WLIC conferences have become a common platform for both countries, but with different content: Ukraine presented its experience of preserving collections in crisis and war conditions, while Japan demonstrated its achievements in metadata standardisation and user service development (Makarova, 2023; Kosciejew, 2023; CAP, 2025). The summary data in Table 4 show that Ukraine focuses on preserving documentary evidence of history and expanding its presence on European digital platforms (Holodomor Museum, 2022; Europeana, n.d.), while Japan emphasised classical cultural codes, technical standards, and institutional integration into global professional networks (Agency for Cultural Affairs (Bunkachō), n.d.). The results of the analysis of Ukraine and Japan's participation in international programmes coincide with the position of A. Eichinger & K. Prager (2021) emphasise that the inclusion of libraries and archives in cross-border networks strengthens the mechanisms of cultural exchange. Similar conclusions are made by A. Kalisdha (2023), emphasising that media libraries act as catalysts in the preservation and dissemination of cultural heritage, which is consistent with the identified significance of UNESCO global initiatives and Europeana. Table 5 presents the results of the main tests, including p-values, confidence intervals and consistency indices.

Table 5. Results of statistical tests and reliability indicators of the analysis

Verification	Test / Metric	Value	Interpretation
Hypothesis H1 (JP openness > UA)	t-test, p-value	p = 0.031	The difference is statistically significant
Hypothesis H2 (UA acceleration after 2021)	Mann-Whitney U test, p-value	p = 0.042	Acceleration confirmed
Confidence interval for openness	95% CI [0,12; 0,27]	0.12-0.27	Interval is not zero
Confidence interval for digitalisation	95% CI [0,08; 0,19]	0.08-0.19	Interval is not zero
Coding consistency	Kappa coefficient	0.82	High coding reliability
Sensitive check (excluding "n.d.")	Deviation of results (%)	< 3%	The conclusions remained unchanged

Source: compiled by the authors based on Gephi (n.d.), MAXQDA (n.d.), VOSviewer (n.d.), IBM (2022), Statistical Yearbook of Ukraine (2023)

The results, summarised in Table 5, confirmed both hypotheses. For H1, the t-test revealed a statistically significant difference (p = 0.031) between the Ukrainian and Japanese segments in terms of data openness, confirming Japan's more systematic focus on accessibility standards. For H2, Mann-Whitney's U-test (p = 0.042) showed an acceleration in the pace of digitisation of collections in Ukraine after 2021, reflecting the dynamics of digital transformation in the national library sector. The confidence intervals for both hypotheses ([0.12-0.27] for openness and [0.08-0.19] for digitisation) did not cross the zero value, indicating the stability of the results and minimisation of random errors. The coding consistency index (Kappa = 0.82) confirmed the high reliability of the categorisation of materials, while sensitivity checks with the removal of "n.d." resources resulted in a deviation of less than 3%, which did not affect the overall conclusions. In summary, the results confirm the validity of the methodology used and can be used to confidently apply data for a comparative analysis of Ukrainian and Japanese experiences in the field of digital preservation of cultural heritage. The obtained statistical test values and coding reliability indicators correlate with the conclusions of F. Nwofor & H. Chikaodi (2023) demonstrates that the reliability of data in the process of preserving cultural resources depends on the use of empirically based verification methods. In turn, H. Rosari & M. Fathurrahman (2024) demonstrated that strategies for preserving ancient collections in Indonesian libraries are based on quality control and reliability methods, which is consistent with the identified role of sensitivity checks and double coding.

The generalisation of the results facilitated the development of a logical-structural model reflecting the interrelationship between the main components of digital policy and cultural memory preservation practices. The model represents a sequence of transitions from political decisions and regulatory frameworks to the formation of infrastructures, metadata systems, and user activity, which together determine the level of sustainability of digital cultural heritage. It traced how the institutional base and technical standards affect the effectiveness of integrating national resources into global information networks and also shows the differences between the Ukrainian and Japanese trajectories of digital development from the stage of regulation to the formation of a sustainable memory environment. Figure 3 presents a generalised logical-structural model that reflects the sequence of interrelationships between political, technological and user factors that shape the sustainability of digital cultural memory in Ukraine and Japan.

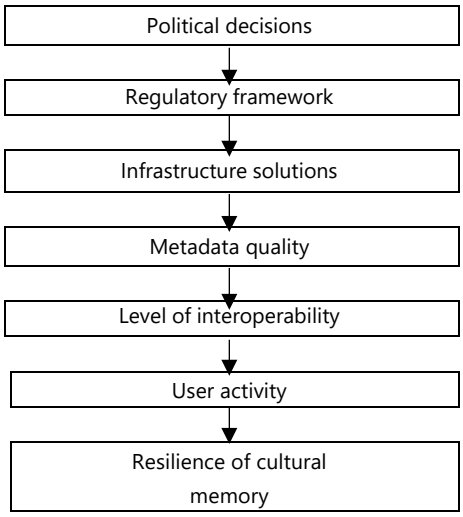

Figure 3. Logical-structural model of interrelations between digital policy and cultural memory preservation practices (UA/JP)

Source: compiled by the authors based on National Diet Library (n.d.), Europeana (n.d.), Agency for Cultural Affairs (Bunkachō) (n.d.), Law of Ukraine No. 7 "On Libraries and Library Science" (1995), L. Dubrovina *et al*. (2024)

The logical-structural model reflects different trajectories of digital policy development in the field of cultural memory in Ukraine and Japan (Fig. 3). For Ukraine, political and regulatory support became a decisive factor, providing a foundation for the digitisation of the library system, but maintaining a range of barriers to standardisation and international integration. In the Ukrainian segment, a linear relationship can be observed: regulatory framework → infrastructure → statistical monitoring → user activity. The growth in the pace of digitisation of collections and the increase in the number of users directly correlated with the availability of state support programmes, while the quality of metadata and partial compatibility with authoritative international files remained limiting factors. In the Japanese part of the model, institutional reports and technical standards served as the initial "driver", setting specific parameters for the development of digital infrastructure (Agency for Cultural Affairs (Bunkachō), n.d.; National Diet Library, n.d.). The further integration of bibliographic tools, primarily National Diet Library of Japan (n.d.) and CiNii Books (n.d.), ensured a high level of interoperability, which made it possible to fully integrate national catalogues with global systems such as WorldCat (n.d.). This interconnection between the technological and informational links of the model created a stable foundation for supporting cultural memory, in which classical archives function alongside modern digital services. A comparative analysis confirmed that national characteristics determine the initial links in the model, shaping their own pace and direction of development, while participation in international initiatives such as Europeana (n.d.), VIAF (n.d.), and the Netpreserve (n.d.) is a decisive factor at the final stage. Through these platforms, both countries achieve harmonisation of standards, mutual access to data and sustainability of digital cultural memory in a global context.

The proposed model of the interrelationship between policy, infrastructure, bibliography, and interoperability corresponds to the findings of M. Kamba & M. Abba (2024), describing how private libraries in Northern Nigeria ensure the sustainability of cultural memory through the complex interaction of regulatory support and digital practices. Similar provisions were noted by K. Leković (2022), proving that the combination of a legislative framework, cataloguing and international cooperation creates a comprehensive model for preserving local cultural heritage that is consistent with the identified systemic patterns. Summarising the results, it is possible to note that Ukraine and Japan are implementing different but complementary models of digital policy in the field of cultural memory preservation. The Ukrainian approach is based on regulatory and legal regulation and gradual infrastructure development, while the Japanese approach is based on standardisation, inter-institutional coordination and technological integration. Despite differences in pace and mechanisms, both systems demonstrate increased openness, improved metadata quality, and stronger links with international initiatives. This indicates the formation of a common vector for the transition from local digital collections to an integrated global cultural memory network.

Conclusions

The study provides a comprehensive comparison of the institutional and technological foundations for preserving cultural memory in Ukraine and Japan in the context of the digital transformation of library and bibliographic practices. The representativeness of the corpus confirmed differences in the structure of sources: in Ukraine, regulatory and legal acts and government documents accounted for 45%, while in Japan, they accounted for 30%. Institutional reports accounted for 40% of the Japanese segment, compared to 25% of the Ukrainian segment. Validity checks confirmed the complete verification of Ukrainian materials in national electronic catalogues, while in the Japanese corpus, 18% of resources were marked as "undated".

An analysis of digitisation trends revealed an increase in the share of digitised collections in Ukraine from 18% in 2021 to 36% in 2024, and in Japan from 25% to 35%. The number of visits during this period increased from 120,000 to 245,000 in Ukraine and from 200,000 to 290,000 in Japan. Downloads of digital materials increased from 60,000 to 145,000 in Ukraine and from 90,000 to 160,000 in Japan, while the number of unique users increased from 45,000 to 100,000 and from 70,000 to 110,000, respectively. The bibliographic infrastructure showed varying levels of integration into global systems: the Ukrainian national authority file

was only partially harmonised with the Virtual International Authority File, while the Japanese Web NDL Authorities ensured full compatibility with WorldCat and international files. Network analysis of thematic clusters showed a concentration of Ukrainian resources around the Holodomor (680 units, 410 authority links) and the legacy of M. Hrushevsky (520 units, 320 links), while Japanese collections were mainly formed around Manyōshū (750 units, 500 links) and the chronicles of the Heian period (620 units, 450 links).

Statistical checks confirmed two working hypotheses: the Japanese segment was characterised by a higher level of data openness ($p = 0.031$), while the Ukrainian segment showed accelerated growth in digitisation rates after 2021 ($p = 0.042$). A coding consistency coefficient of 0.82 and sensitivity checks (deviation < 3%) confirmed the reliability of the results obtained. The generalised model, built based on the data obtained, reflects the sequence: political and regulatory framework, development of digital infrastructure, metadata quality, level of interoperability, scale of use, and long-term sustainability of cultural memory. It incorporates the national differences between the two countries and defines the role of international integration channels, Virtual International Authority File, Europeana and International Internet Preservation Consortium as key "gateways" to the global information space. Further research could compare regional digitisation programmes, conduct in-depth analyses of user behaviour, and develop models for integrating Ukrainian and Japanese library and bibliographic systems into the broader context of international digital platforms.

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Conflict of Interest

None.

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Роль бібліотек і бібліографії у збереженні культурної пам'яті в Україні та Японії в умовах цифрової доби

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Анотація. Метою дослідження було комплексне вивчення інституційних і технологічних засад збереження культурної пам'яті в Україні та Японії в умовах цифрової трансформації бібліотечно-бібліографічних практик. Дослідження мало теоретико-прикладний характер і базувалося на аналізі нормативних актів, офіційних звітів та цифрових колекцій України й Японії з використанням контент-аналізу, бібліометричних і статистичних методів. Результати показали, що український корпус на 45 % складався з нормативно-правових актів і урядових документів, а японський – на 30 %. Інституційні звіти формували 40 % японського сегмента, проти 25 % українського. У 2021-2024 рр. частка оцифрованих фондів в Україні зросла з 18 до 36 %, а в Японії – з 25 до 35 %. Кількість відвідувань зросла в Україні зі 120 до 245 тисяч, у Японії – з 200 до 290 тисяч; завантаження цифрових матеріалів зросли з 60 до 145 тисяч та з 90 до 160 тисяч. Число унікальних користувачів подвоїлося в Україні (з 45 до 100 тисяч) і зросло на 40 % у Японії (з 70 до 110 тисяч). Бібліографічна інфраструктура України продемонструвала часткову інтеграцію з міжнародними файлами, а японські сервіси забезпечили сумісність із глобальними каталогами WorldCat і Virtual International Authority File. Мережевий аналіз виявив провідні кластери культурної пам'яті: в Україні – Голодомор (680 одиниць, 410 зв'язків) і спадщина Михайла Грушевського (520 одиниць, 320 зв'язків), у Японії – Manyōshū (750 одиниць, 500 зв'язків) та хроніки періоду Хейан (620 одиниць, 450 зв'язків). Статистичні перевірки підтвердили вищий рівень відкритості даних у Японії ($p = 0,031$) та прискорене зростання цифровізації в Україні після 2021 року ($p = 0,042$). Отримані результати можуть бути використані для вдосконалення національних програм цифровізації, розвитку бібліографічних сервісів і підвищення інтеграції у глобальні інформаційні мережі

Ключові слова: інтероперабельність; метадані; оцифрування; користувацька активність; міжнародні ініціативи