Research on Preservation Strategies for Library Publishing Services in European and American Universities: Postprint

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Abstract

[Objective/Significance] To comprehensively grasp the characteristics and development trends of preservation strategies for publishing services in European and American university libraries, thereby providing references for domestic university library publishing services.

[Method/Process] Based on data from the Library Publishing Directory (2014–2018) published by the Library Publishing Coalition in the United States, combined with web surveys and literature investigation, and employing comparative analysis and dialectical analysis methods, this study analyzes and examines the preservation strategies of publishing services in European and American university libraries in recent years.

[Results/Conclusions] The results indicate that: Preservation strategies for publishing services in European and American university libraries are highly diverse, with nearly half of libraries simultaneously employing multiple preservation strategies; Years of development have led to the formation of mainstream preservation strategies; Internal preservation and consortium preservation have become important preservation approaches; Cloud storage and third-party preservation exhibit distinct characteristics. When selecting preservation strategies, domestic university libraries should fully consider factors such as the types of published literature, the publishing platforms adopted, participation in preservation consortia, and other relevant elements.

Full Text

Preamble

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Abstract

[**Purpose/Significance**] This study aims to comprehensively understand the characteristics and development trends of preservation strategies for university library publishing services in Europe and the United States, providing reference for domestic university libraries. [**Method/Process**] Based on data from the *Library Publishing Directory* (2014–2018) released by the Library Publishing Coalition, combined with web surveys and literature research, this study employs comparative analysis and dialectical analysis to examine the preservation strategies of European and American university library publishing services in recent years. [**Result/Conclusion**] The results show that: (1) There is a wide variety of preservation strategies, with nearly half of libraries adopting multiple strategies simultaneously; (2) Mainstream preservation strategies have emerged through years of development; (3) In-house preservation and consortium-based preservation have become important approaches; (4) Cloud storage and third-party preservation exhibit distinct characteristics. When selecting preservation strategies, domestic university libraries should fully consider factors such as the types of published documents, publishing platforms adopted, and preservation consortia participated in.

Keywords: library publishing service, preservation strategy

1. Introduction

In January 2013, the Library Publishing Coalition (LPC) project officially launched as a collaborative initiative involving multiple university libraries dedicated to advancing cooperation in the field of university library publishing services. With the development of library publishing services, LPC has clearly recognized the necessity of knowledge sharing, collaboration, and mutual development. To support the healthy and effective growth of library publishing services, LPC published five editions of the *Library Publishing Directory* (hereinafter referred to as the *Directory*, with editions 1–5 corresponding to 2014–2018) between 2013 and 2018. The *Directory* provides annual reports on publishing activities in European and American university libraries, including publication quantities and types, service content, staffing, funding sources, long-term preservation strategies, and future plans.

The rich data in the *Directory* enables us to more thoroughly understand the

themes, challenges, and trends in university library publishing services, gain deeper insights into the landscape, progress, and future directions of European and American university library publishing services, and comprehend their mutually beneficial partnerships and data preservation strategies. Numerous domestic scholars have conducted research based on the *Directory*. For instance, Wei Rui and Chu Jingli surveyed the first edition and further investigated 61 libraries with institutional repository services, analyzing their organizational development, resource allocation, and characteristics of publishing resources and services. You Yi used the first edition to conduct statistical analysis and summarize foreign library publishing service profiles, specific service content, related technologies, and future development plans. Chen Airong conducted statistical analysis, synthesis, and comparative research using the first two editions to comprehensively reflect the progress and development trends of foreign university library publishing services. Sui Jingqiu selected five UK university libraries from the second edition for analysis, identifying four major characteristics of UK university library publishing activities. Sun Jie and Li Shuyuan examined the first three editions to elaborate on practical progress in foreign university library publishing services, providing in-depth analysis of organizational forms, funding sources, and service content. Liu Ziheng and Miao Meijuan studied North American university libraries in the third edition, concluding that their publishing services are diversified, emphasize digital publishing, strengthen advantageous disciplines, and simplify workflows.

However, existing research has analyzed and studied various aspects of foreign university library publishing services as a whole, without delving into specific areas. Therefore, this paper focuses specifically on preservation strategies for European and American university library publishing services, conducting in-depth and detailed analysis of relevant data from editions 1–5 of the *Directory* combined with web surveys and literature research to explore their significance and characteristics, providing reference for Chinese university libraries.

2. Research Objects

The research data primarily comes from editions 1–5 of the *Directory* published by the Library Publishing Coalition in recent years, supplemented by web surveys of selected library websites. The libraries included in the *Directory* are predominantly from the United States and Canada. The 2014 edition included 115 libraries (108 from the US and Canada, 7 from other countries), 2015 included 126 libraries (113 from the US and Canada, 13 from other countries), 2016 included 115 libraries (105 from the US and Canada, 10 from other countries), 2017 included 118 libraries (106 from the US and Canada, 12 from other countries), and 2018 included 156 libraries (133 from the US and Canada, 23 from other countries). Across all five editions, a total of 205 university libraries were involved (non-duplicative count), including 21 libraries from outside North America. This study examines the preservation strategies of these 205 libraries over the five-year period, combined with relevant literature survey results.

3. Statistical Results

3.1 Annual Preservation Strategies

shows the preservation strategies adopted by university libraries included in the 2014–2018 editions of the *Directory*. For statistical purposes, "under consideration" was treated as a preservation strategy category. Additionally, approaches such as "institutional repository," "local database," "locally developed software," and "library digital library services" were categorized as "in-house preservation" strategies. The table reveals that the libraries included in the 2014–2018 editions collectively employed 58 distinct preservation strategies, with over 30 strategies used in any single year.

In the 2014 *Directory*, five libraries provided no information about preservation strategies, and five explicitly stated they offered no preservation services. The remaining 105 libraries reported 36 preservation strategies. Among 47 libraries considering preservation services, 24 had already implemented at least one strategy, while 23 were still considering without implementation.

In the 2015 *Directory*, four libraries explicitly stated they offered no preservation services. The remaining 122 libraries reported 34 preservation strategies. Among 55 libraries considering preservation, 33 had implemented at least one strategy, while 22 had not yet done so.

In the 2016 *Directory*, one library provided no information, one explicitly offered no service, and the remaining 113 libraries reported 36 preservation strategies. Among 44 libraries under consideration, 30 had implemented at least one strategy, while 14 had not.

In the 2017 *Directory*, four libraries provided no information, one offered no service, and the remaining 113 libraries reported 34 preservation strategies. Among 41 libraries under consideration, 27 had implemented at least one strategy, while 14 had not.

In the 2018 *Directory*, three libraries provided no information, three offered no service, and the remaining 150 libraries reported 39 preservation strategies. Among 54 libraries under consideration, 35 had implemented at least one strategy, while 19 had not.

3.2 Multiple Preservation Strategies per Library

Individual libraries may adopt multiple preservation strategies due to publishing various document types or different access policies. For example, the University of Alberta Library published 23 faculty-driven journals, 8 student-driven journals, and 1 collaborative journal in 2016, employing nine preservation strategies. Therefore, analyzing the adoption of multiple strategies by single libraries is significant for comprehensive understanding.

presents statistics on libraries adopting multiple preservation strategies each year. Libraries under consideration without actual implementation were counted

as having no preservation strategy. In the 2014 *Directory*, 23 libraries were considering but had not yet implemented preservation services, so they were counted as having no strategy in Table 2. Thus, libraries with zero strategies in Table 2 include three types: those explicitly not providing services, those not providing relevant information, and those still considering.

4. Results Analysis

Based on the survey results, the following characteristics of preservation strategies for European and American university library publishing services emerge (noting that the *Directory* records data from the previous year):

4.1 Diverse and Evolving Preservation Strategies

Excluding "under consideration," "no information provided," and "no digital preservation service" categories, libraries collectively employed 58 preservation strategies over five years, with more than 30 strategies used in any given year. Although surveyed libraries varied annually, the total number and annual variety demonstrate that European and American university libraries employ a wide range of digital preservation strategies that continue to evolve. For instance, the University of Arizona Library was considering but not yet providing preservation services in 2013; in 2014 and 2015, it adopted three strategies (Amazon S3, LOCKSS, and in-house preservation) while still considering options; by 2016, it added Rosetta for a total of four strategies; and by 2017, it implemented six strategies including Archive-It and Archivematica. Conversely, the University of Illinois at Chicago Library used both HathiTrust and LOCKSS in 2013 but only LOCKSS from 2014 to 2017.

The decreasing number of libraries with zero preservation strategies (Table 2) and the high percentage of libraries "under consideration" (Table 1) indicate that European and American university libraries attach great importance to data preservation in publishing services. Over the past five years, they have continuously addressed digital preservation issues, though progress has been cautious and deliberate. For example, in the 2017 survey, although 19 libraries had no preservation strategy, 14 were actively considering implementation. Even libraries with existing strategies continue evaluating their options—Syracuse University had six strategies but remained under consideration, and Pennsylvania State University had seven strategies yet still deliberated.

Furthermore, some strategies declined in usage over time while others gained traction. DSpace was used by 10 libraries in 2013, only 1 in 2014, and none after 2015. Conversely, Hydra (now Samvera) saw no adoption in 2013 but increased annually, reaching five libraries in both 2016 and 2017. This demonstrates ongoing adjustment of preservation strategies based on practical experience.

4.2 In-House Preservation as a Key Strategy

In-house preservation emerged as the primary digital preservation strategy for European and American university library publishing services over the past five years, with over 40% of libraries adopting it annually, reaching 49.52% in 2013. This likely stems from two factors:

First, many publishing services are closely related to institutional repositories. In the 2017 *Directory*, 60 libraries' publishing services were connected to institutional repositories, with some operating directly on repository platforms. For example, the University of San Francisco's Gleeson Library/Geschke Center uses its institutional repository as its publishing system, explicitly stating in its publishing mission that the library publishing program aims to provide an open access platform for the university's scholarly output through the institutional repository. This model offers an economical and rational preservation approach.

Second, many libraries publish diverse document types. In the 2017 *Directory*, 83 libraries (over 70%) published five or more types of documents, with some publishing more than ten types. For instance, Claremont College Library at the Claremont University Consortium published 13 document types in 2016. Since many document types such as technical reports, undergraduate theses, lecture materials, grey literature, and datasets may have restricted campus-only access, in-house preservation becomes a suitable option. The University of Manchester Library, for example, uses its institutional repository for in-house preservation of doctoral dissertations, technical reports, and conference papers.

4.3 Emergence of Mainstream Preservation Strategies

Despite the variety of preservation strategies, over two-thirds were used by fewer than five libraries, with 26 strategies employed by only one library in each of the five surveys. [Figure 1: see original paper] shows the adoption rates across years for strategies used by five or more libraries.

Combining Table 1 and Figure 1 reveals that while many strategies exist and libraries select cautiously, certain approaches have demonstrated clear advantages. The top ten strategies shown in Figure 1 (excluding in-house preservation) represent the mainstream preservation strategies of European and American university libraries over the past five years. Beyond universal in-house preservation, strategies such as LOCKSS, HathiTrust, Portico, Archive-It, Amazon S3, CLOCKSS, DPN, DuraCloud, and MetaArchive have shown distinct advantages, particularly Amazon S3's dramatic adoption increase in 2018.

These advantages relate closely to technical characteristics. For example, LOCKSS (Lots of Copies Keep Stuff Safe), funded by the National Science Foundation and Mellon Foundation and implemented by Stanford University Library, operates on the principle that multiple copies ensure safety. Through continuous peer audit and repair among distributed cache sites, it ensures archived materials' integrity and validity. Its open-source technology, low

cost, and reliable security have made it widely popular. HathiTrust, built on metadata produced by participating libraries and guided by traditional library values of preservation, quality, reader rights, and access, aims for collaborative resource building and sharing, earning broad library support. As a digital book repository jointly established by multiple US universities with many existing members, member libraries naturally adopt HathiTrust for preservation. Temple University Library, as a HathiTrust member, uses it alongside other strategies for its publishing services.

Notably, six of the top ten mainstream strategies—LOCKSS, HathiTrust, CLOCKSS, Archive-It, DPN, and MetaArchive—employ consortium-based approaches. This method avoids single-point failures and digital silos, facilitates aggregation of diverse digital resources, enables organic linking of different content types, enhances large-scale preservation value, breaks institutional barriers, and achieves integration of preservation and services. For example, LOCKSS establishes collaborative platforms among libraries, provides electronic journal preservation and access services, offers technical support to members, and maintains multiple local copies for real-time updating, supplementation, and repair, ensuring resource permanence and integrity.

4.4 Coexistence of Multiple Strategies

[Figure 2: see original paper] shows the percentage of libraries adopting different numbers of preservation strategies. Table 2 and Figure 2 indicate that while over one-third of libraries use a single strategy, many employ multiple strategies (two or more), with some using up to nine simultaneously. Libraries using two strategies exceeded 15% in 2015–2018 surveys, demonstrating that multiple strategy adoption is common.

For example, Indiana University Library publishes 19 faculty-driven journals, 5 student-driven journals, 92 monographs, 332 technical/research reports, and 565 student papers, employing eight preservation methods. The University of Alberta Library, publishing only 36 faculty-driven and 8 student-driven journals, uses nine methods. The proportion of libraries using 2–3 strategies has shown an increasing trend, likely due to the diversity of published document types. Different document types may have varying access audiences, degrees of openness, and service models, requiring different preservation strategies. Purdue University Library, for instance, uses CLOCKSS and Portico for important journals and MetaArchive for other document types. Utah State University's Merrill-Cazier Library archives its digital publications on multiple geographically distributed BEPress servers, maintains copies on internal servers, and stores some titles in HathiTrust or DPN.

4.5 Integration with Publishing Platforms

Some European and American university libraries directly use their publishing platforms for preservation, aligning platforms with preservation strategies. In-

stitutional repositories serving as publishing platforms exemplify this approach. The survey identified similar cases: in 2018, 24 libraries used CONTENTdm as a publishing platform, with two using it directly as their preservation strategy; among eight libraries using Samvera (formerly Hydra) as a publishing platform, four also used it directly for preservation.

4.6 Distributed Preservation

Distributed preservation reflects the principle of not putting all eggs in one basket. European and American university library publishing services exhibit significant characteristics of distributed, multi-location, multi-backup digital preservation. LOCKSS, CLOCKSS, Archive-It, and MetaArchive all employ distributed preservation. LOCKSS is inherently a multi-backup preservation project. CLOCKSS builds upon LOCKSS technology to establish a sustainable, globally distributed archiving system under a publishing-preservation coexisting model, ensuring long-term access to scholarly resources. MetaArchive's distributed digital preservation features multiple copies in multiple locations, mitigating digital file loss risks by distributing copies across geographically dispersed sites and ensuring complete file preservation rather than merely backing up metadata.

4.7 Cloud Storage

Among mainstream preservation strategies, DuraSpace and Amazon S3 represent typical cloud storage, while others like LOCKSS and CLOCKSS also utilize cloud storage technologies. In cloud storage environments, consortium members need not maintain local data storage or servers, requiring only appropriate terminal devices to store, query, and retrieve information resources via the internet. Cloud storage conveniently enables multi-location data storage to prevent loss. DuraCloud, for example, stores and updates resources across three different clouds, managed through a web-based console, saving time and enabling more economical management. It is the only hosted cloud service helping organizations archive content across multiple cloud providers, ensuring important documents, images, and videos remain accessible. Prestigious institutions including MIT, Columbia University, Northwestern University, and Rice University use hosted cloud services to preserve digital resources.

4.8 Third-Party Preservation

As shown in Figure 1, Portico as a third-party preservation strategy has gained increasing attention. Portico is a non-profit organization dedicated to permanent access and long-term preservation of electronic journal resources. As a third-party strategy, Portico preserves both published electronic journal files and authors' submitted manuscripts, enabling regeneration of the former from the latter when issues arise. Additionally, Portico has established mirroring agreements with renowned preservation systems to enhance trustworthiness. For

libraries, journals preserved by Portico remain virtual, yet third-party preservation offers significant advantages by avoiding redundant resource preservation and saving substantial human, material, and financial resources, aligning with social division of labor trends and demonstrating substantial development potential.

5. Recommendations

Given the development trends of university library information services, publishing services have emerged as an innovative content attracting high attention and rapid development. Digital preservation for library publishing services represents a crucial challenge. The practical experience of European and American university libraries offers valuable lessons. We should select feasible and effective preservation strategies based on national and institutional contexts.

5.1 Select Preservation Strategies Prudently

Since library publishing products are typically digital resources with high management complexity and risk, preservation requirements for storage institutions are increasingly demanding. The cautious attitude of European and American university libraries warrants attention. The analysis shows that even with existing strategies, many libraries continuously research preservation issues. In the 2016 survey, 30 libraries (26% of the total) had preservation strategies but were still considering their options. Dartmouth College Library, despite having five strategies, continued deliberating. Libraries also fine-tune strategies based on publishing service development. Therefore, Chinese university libraries should comprehensively consider document types, preservation requirements, access audiences, openness levels, publishing platforms, cooperative institutions or consortia, and resource constraints to select practical and effective strategies.

5.2 Emphasize In-House Preservation and Focus on Mainstream Strategies

The survey results show in-house preservation is an important strategy for European and American university libraries, which have gradually formed mainstream preservation strategies through years of practice. These mainstream systems are more mature and stable in development technology, compatibility, operation, maintenance, and updates, earning favor among many libraries. For example, Boston University, California Polytechnic State University, and Carnegie Mellon University all use the mainstream LOCKSS strategy. Chinese university libraries should prioritize in-house preservation while focusing on mainstream strategies to leverage advanced, mature technologies and align with international standards. This can accelerate development, narrow gaps with developed countries, and promote global open access and academic exchange. Since digital preservation is technically and operationally complex, exceeding any single library's capacity, cooperative approaches should be considered to

share technology, costs, markets, and content. Additionally, libraries can directly use publishing platforms for preservation based on their conditions and capabilities.

5.3 Monitor New Technology Developments

Developments in information and network technologies provide more options for digital preservation in library publishing services. Distributed preservation and cloud storage employed in European and American mainstream strategies represent applications of new technologies. Third-party preservation particularly highlights network technology advantages. Chinese libraries should monitor and understand new technology developments relevant to long-term digital preservation. When equipped with appropriate technical capacity, libraries should apply relevant technologies to their preservation solutions to ensure strategies keep pace with evolving publishing service requirements.

References

[1] Library Publishing Coalition. *Library Publishing Directory* (2014) [EB/OL]. [2017-08-16]. https://www.librarypublishing.org/sites/librarypublishing.org/files/documents/LPC_{LPDirect

[2] Library Publishing Coalition. *Library Publishing Directory* (2015) [EB/OL]. [2017-08-16]. https://www.librarypublishing.org/sites/librarypublishing.org/files/documents/lpc_{{{dir}}_{

[3] Library Publishing Coalition. *Library Publishing Directory* (2016) [EB/OL]. [2017-08-16]. https://www.librarypublishing.org/sites/librarypublishing.org/files/documents/Library_{{{Pub

[4] Library Publishing Coalition. *Library Publishing Directory* (2017) [EB/OL]. [2017-08-16]. https://www.librarypublishing.org/sites/librarypublishing.org/files/2017%20Directory.pdf.

[5] Library Publishing Coalition. *Library Publishing Directory* 2018 [EB/OL]. [2018-12-24]. https://librarypublishing.org/wp-content/uploads/2017/03/LPC_{LPDirectory2018}.pdf.

[6] Wei R, Chu JL. Research on institutional repository-based publishing services in American university libraries [J]. *Journal of Academic Libraries*, 2015, 33(3): 5-11, 21.

[7] You Y. Research on current status of foreign university library publishing services: Analysis based on the *Library Publishing Directory* [J]. *Journal of Library Science*, 2014, 36(11): 135-137, 141.

[8] You Y. Analysis of library publishing services based on academic communication [J]. *Journal of Academic Libraries*, 2015, 33(1): 61-65.

[9] Chen AR. Overview of foreign university library publishing services: Statistical analysis based on the *Library Publishing Directory* [J]. *Shandong Library Journal*, 2016(6): 62-67.

[10] Sui JQ. Research on UK university library publishing practices based on the *Library Publishing Directory* [J]. *Library Tribune*, 2015, 35(10): 125-131.

[11] Sun J, Li SY. Progress in overseas university library academic publishing services [J]. *Library and Information Service*, 2016, 60(2): 64-70.

[12] Liu ZH, Miao MJ. Research on North American university library publishing services [J]. *Library Development*, 2016(3): 43-48, 54.

[13] Digital Publishing Services [EB/OL]. [2018-09-28]. https://www.usfca.edu/library/digitalpublishing.

[14] What Is LOCKSS? [EB/OL]. [2018-03-16]. http://www.lockss.org.

[15] Xia ZF, Li QS. CLOCKSS: Controlled LOCKSS [J]. *Modern Information*, 2007, 27(11): 80-81.

[16] Wu JZ. HathiTrust [EB/OL]. [2018-09-28]. http://blog.sina.com.cn/s/blog_{53586b810100ys1h}.html.

[17] Dai JL. Copyright risk avoidance in university digital library construction: With discussion on Authors Guild v. HathiTrust case [J]. *Library*, 2015(11): 91-95.

[18] Dong XL, Long W. Analysis of library digital resource long-term preservation models under cooperation in the big data era [J]. *Modern Information*, 2017, 37(7): 110-115.

[19] Wang RL. LOCKSS: Achieving permanent preservation of network electronic resources [J]. *Library Journal*, 2007, 26(2): 58-60.

[20] How DDP Works [EB/OL]. [2018-03-18]. http://www.metaarchive.org.

[21] DuraCloud [EB/OL]. [2018-03-22]. https://duraspace.org/.

[22] Zhao Y. Comparative study on electronic journal long-term preservation solutions [D]. Zhengzhou: Zhengzhou University, 2017.

[23] Ding YJ, Zheng JC. Portico: A preliminary study of third-party digital resource long-term preservation model [J]. *Library and Information Service*, 2009, 53(3): 74-77.

[24] Sun C, Wu ZX. Analysis and evaluation of foreign digital resource long-term preservation maturity models [J]. *Library and Information Service*, 2017, 61(1): 32-39.

[25] Pan JY, Liu KJ. Research progress on foreign digital resource long-term preservation and sustainable utilization [J]. *Library*, 2011(5): 72-76.

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Shi Dewan: Responsible for paper structure design, writing, and revision
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Research on Preservation Strategy of Publishing Service in European and American Academic Libraries

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Abstract: [Purpose/significance] This article aims to fully grasp the characteristics and development trends of preservation strategies for university library publishing services in Europe and the United States, and provides suggestions to Chinese university libraries on publishing services. [Method/process] Based on the data of *Library Publishing Directory* (2014-2018) released by the American Library Publishing Coalition, combined with network survey and literature research, the methods of comparative analysis and dialectical analysis are used to study the preservation strategies of publishing services of European and American university libraries in recent years. [Result/conclusion] The results show that: (1) there are a great variety of preservation strategies for publishing services of European and American university libraries, and nearly half of the libraries choose multiple preservation strategies; (2) mainstream preservation strategies have been formed; (3) the preservation strategies of in-house and alliance become important methods; (4) the characteristics of cloud-storage and third-party preservation are obvious. University libraries in China should take full account of the types of documents published, the publishing platforms adopted and the preservation alliances they participate in, when choosing preservation strategies.

Keywords: library publishing service preservation strategy

Note: Figure translations are in progress. See original paper for figures.