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## WoS-Based Review of Interlibrary Loan and Document Delivery Research: Postprint

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### Abstract

[Purpose/Significance] To comprehensively grasp the development trajectory of interlibrary loan and document delivery and explore their future development trends. [Method/Process] Using the Web of Science Core Collection as the data source, bibliometric methods were employed to conduct statistical analysis on the publication dates, countries and regions, institutions and authors, and publishing journals of foreign research literature on interlibrary loan and document delivery; HisCite and CiteSpace were utilized to screen for key relevant literature, and based on reading and summarizing these works, an analysis of the development trajectory and themes of interlibrary loan research was performed. [Results/Conclusion] Interlibrary loan can be divided into four stages: the traditional interlibrary loan period (before the 1980s), the rapid development period of interlibrary loan research (1980-1990), the rapid growth period of document delivery (1990-2000), and the dynamic development period (2000-2016); the roles of interlibrary loan staff should become more diversified in the future.

### Full Text

#### Preamble

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A Systematic Review of Interlibrary Loan and Document Delivery Studies Based on the WoS Database

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**Abstract:** [Purpose/Significance] This study aims to comprehensively grasp the development trajectory of interlibrary loan and document delivery services and explore their future trends. [Method/Process] Using the Web of Science Core Collection as the data source, we conducted a bibliometric analysis of foreign research literature on interlibrary loan and document delivery, examining publication timelines, countries/regions, institutions/authors, and journals. We utilized HisCite and CiteSpace to identify key literature and, through close reading and synthesis, analyzed the developmental 脉络 and thematic evolution of interlibrary loan research. [Result/Conclusion] The development of interlibrary loan can be divided into four stages: the traditional interlibrary loan period (pre-1980s), the rapid research development period (1980–1990), the rapid rise of document delivery (1990–2000), and the dynamic development period (2000–2016). Future interlibrary loan librarians should assume more diversified roles.

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In China, the practice of utilizing external resources to meet user needs is referred to as interlibrary loan and document delivery. Abroad, related terms include document supply, interlibrary loan (interlending, interlibrary lending), and document delivery. In the following discussion, we respect the original terminology but use “interlibrary loan” as a general representative concept when providing overviews. When distinguishing between the two services, we follow the conventional criterion of whether the item is returned: document delivery refers to the non-returnable service of providing users with copies of needed documents through effective means, while interlibrary loan refers to returnable services conducted through cooperation between libraries.

Interlibrary loan constitutes an important component of library reference work, with a history spanning over a century since its inception in the 19th century. In 2016, the specialized journal *Interlending & Document Supply* (SSCI-indexed) was renamed *Information Discovery and Delivery*. This name change symbolizes the end of the golden age of interlibrary loan research. Although related research and practice continue, they have become normalized and declined in importance within library operations [1]. Following this transition, a systematic review is necessary to map the macro-level development trajectory and provide reference for domestic interlibrary loan practice and research.

Examining existing domestic review literature on foreign interlibrary loan re-

search [2–5], we identify several limitations: First, these review articles were published primarily between 2007–2011, analyzing literature mainly from around 2000 onward, resulting in a relatively short time span (approximately 10 years). Second, the retrieval strategies were limited, often focusing on publications in *Interlending & Document Supply* or using limited search terms, yielding small sample sizes of around 300 articles that cannot comprehensively trace the evolutionary path of interlibrary loan research.

In contrast, our study covers 87 years of data (1931–2017) from the Web of Science Core Collection database, encompassing 2,047 records. This enables us to macroscopically outline the evolution of the interlibrary loan field, overcome limitations of thematic analysis, and provide readers with a holistic understanding of the research landscape.

## 2 Data Sources and Research Methods

### 2.1 Data Sources

The Web of Science Core Collection database aggregates significant international scientific research achievements. In September 2017, we selected SCI-EXPANDED (1900–), SSCI (1900–), A&HCI (1975–), CPCI-S (1990–), CPCI-SSH (1990–), BKCI-S (2005–), BKCI-SSH (2005–), and ESCI (2015–). Using the search query TS=(“document supply” OR “document delivery” OR “interlend\*” OR “interlibrary lending” OR “interlibrary loan”) AND LANGUAGE:(English), we retrieved 2,047 results (see Figure 1 [Figure 1: see original paper]). The dataset included 27 books or book chapters and 425 conference papers, with 1,434 research or review articles.

### 2.2 Research Methods

Building upon WoS database analytical functions, we employed HisCite and CiteSpace for analysis. First, we used HisCite’s LCS and LCR metrics to filter important literature. LCS (Local Citation Score) indicates how often a document is cited within the local dataset, helping identify key literature in the field; we selected 16 documents with  $LCS > 8$ . LCR (Local Cited References) indicates the number of references a document cites from the local dataset, helping identify review literature and new trends; we selected 17 documents with  $LCR > 10$ .

Additionally, we used CiteSpace for co-occurrence analysis of terms and keywords, as well as co-citation analysis of authors and documents. Combining these results with visual analysis, we identified 38 key documents, including 3 monographs, 2 book chapters, and 33 journal articles. Based on close reading of these 33 articles and thematic expansion through related review literature, we supplemented the bibliometric analysis with content analysis to examine developmental 脉络 and themes.

### 3 Foreign Bibliometric Analysis

#### 3.1 Publication Timeline Distribution

Although interlibrary loan practice began in the 19th century, the earliest publications in the WoS database date back to 1931. From 1931 to 1982 (52 years), publications were intermittent, with annual output remaining below 10 articles. During this period, interlibrary loan practice was primarily in the conceptual advocacy and preliminary implementation stage, not yet widely promoted, and some literature had not been digitized, resulting in low counts in WoS statistics.

In 1983, publications from *Interlending & Document Supply* began to be indexed, increasing annual output to 23 articles, with continuous growth thereafter. During the 1990s, annual publications exceeded 50, peaking at 101 articles in both 1997 and 2000. After entering the 21st century, publications gradually declined, as shown in Figure 2 [Figure 2: see original paper].

#### 3.2 Country and Regional Distribution

Interlibrary loan research is concentrated primarily in the United States, United Kingdom, Canada, Australia, France, China, and Germany. The US and UK lead significantly: the US published 745 articles (36.4% of total output), while the UK published 367 articles (17.9%). China ranks sixth with 35 articles (1.7%), as shown in Figure 3 [Figure 3: see original paper].

The US has a long interlibrary loan history, issuing the *United States Library Interlibrary Loan Implementation Code* as early as 1917. The Association of Research Libraries (ARL) and the Library of Congress played active roles in promoting interlibrary loan implementation. Although no centralized national interlibrary loan system emerged, various levels of systems were established, with ARL member libraries currently using systems including OCLC, Rapid, and Docline [6]. Among these, OCLC's WorldShare ILL is the world's largest interlibrary loan system.

In contrast, the UK established the centralized British Library Document Supply Centre (BLDSC) for interlibrary loan services, supplemented by specialized and regional library systems. Chinese publishing institutions include Peking University, Wuhan University, and Nanjing Agricultural University, focusing on CALIS and BALIS document delivery system evaluation, intellectual property rights, collection development, and Shanghai Library interlibrary loan services.

#### 3.3 Institution and Author Distribution

From an institutional perspective, the British Library leads with 114 publications (5.6%). Other top institutions are primarily university-affiliated, including the University of California, State University of New York, University of Illinois, University of North Carolina, and University of London—consistent with domestic research concentration in universities. Except for the University of London,

these are all US institutions. The Association of Research Libraries in the US shows particularly prominent performance.

Although the UK produces fewer total publications than the US, a clear collaborative network exists among the British Library, British Museum, and *Interlending & Document Supply* journal. Several authors from these institutions rank among the top ten most prolific, including M. McGrath, G.P. Cornish, S. Gould, and M.B. Line. Their roles encompass British Library directors or staff, editors of *Interlending & Document Supply*, and IFLA Interlending Section members. For example, since becoming editor-in-chief in 2002, M. McGrath has annually reviewed extensive materials including journals, blogs, and websites, producing 64 publications including 36 review articles. Additionally, J. Schopfel from France has published continuously since 2003, with research areas covering open access and grey literature.

### 3.4 Journal Distribution

Compared with other fields, few journals specialize in interlibrary loan. The primary venues are two: *Interlending & Document Supply* is the only SSCI-indexed journal dedicated to interlibrary loan, with 761 indexed articles (37.2%), far exceeding other publications (e.g., *Bulletin of the Medical Library Association* ranks second with 63 articles, 3.1%). Another commercial publication, *Journal of Interlibrary Loan, Document Delivery & Electronic Reserve*, published by Taylor & Francis, focuses on US interlibrary loan activities but is not SSCI-indexed and thus excluded from our statistics.

## 4 Development Stages

Based on practice development trends, publication volumes, and research themes, the evolution of foreign interlibrary loan can be divided into four stages: the traditional interlibrary loan period (pre-1980s), the rapid research development period (1980–1990), the rapid rise of document delivery (1990–2000), and the dynamic development period (2000–2016). Using CiteSpace's term burst detection, the emergent terms for each stage are shown in Figure 4 [Figure 4: see original paper].

### 4.1 Traditional Interlibrary Loan Period (Pre-1980s)

Traditional interlibrary loan began in the late 19th century, with slow practice development during the first half of the 20th century, sometimes even treated as a welfare benefit [7]. Before the 1980s, with electronic publications not yet widespread, interlibrary loan (interlibrary loan) of print books and journals was relatively common. Research during this stage concentrated in the US, UK, and Germany.

In the UK, interlibrary loan became standardized and legalized through two landmark events: the 1972 British Library Act established its legal status, and

the British Library Lending Division (BLLD) was established in 1973. In the US, proposals for a national interlibrary loan center did not materialize; instead, OCLC launched its interlibrary loan subsystem in 1979 based on its union catalog, which rapidly expanded. Overall, pre-1980s interlibrary loan focused on scarce resources, with member libraries submitting standardized request forms and supplying libraries delivering copies via mail—time-consuming and costly.

Regarding copyright legislation, the UK revised its Copyright Act in 1911 and 1956; Germany implemented the Copyright and Related Rights Law in 1966; and the US enacted the Copyright Act of 1976, which clarified library exceptions, preservation copying exceptions, and restrictions on systematic reproduction. These laws provided protection and guidance for interlibrary loan activities.

#### 4.2 Rapid Research Development Period (1980–1990)

The 1980–1990 period marked rapid development in interlibrary loan research and the emergence of document delivery. CiteSpace co-word analysis reveals that emergent themes focused on document supply and interlibrary loan, with electronic publications becoming a key concern by the late 1980s. The establishment of national union catalogs and interlibrary loan systems in various countries promoted interlibrary loan development in the US, UK, Germany, France, and Brazil.

Three key documents from this period focus on the US. T.J. Waldhart’s 1984–1985 study of ARL libraries since 1970 found increased interlibrary loan volumes, attributing this to declining budgets (journal acquisition funds fell approximately 27% annually from 1976–1982), implementation of online interlibrary loan systems facilitating bibliographic discovery, and state and federal policy support [7]. Another study examined OCLC’s interlibrary loan subsystem, finding that turnaround time from request submission to receipt averaged about two weeks [8].

Copyright law continued evolving. The UK enacted the Copyright, Designs and Patents Act 1988, revised multiple times thereafter. Compared with the 1956 Act, it provided specific regulations on “fair dealing” and copying for research and study purposes, offering some freedoms to individuals and libraries while requiring careful monitoring of interlibrary loan. The US considered its existing law adequate; Spain introduced “fair use” for the first time; and Australia, Singapore, and South Korea enacted new legislation permitting library copying and protecting foreign publications [9].

#### 4.3 Rapid Rise of Document Delivery (1990–2000)

The 1990s witnessed the rapid development of electronic publications due to information technology advances. Commercial document delivery systems flourished, making non-returnable journal article delivery a frontier research topic. *Library Trends* and *The Reference Librarian* published special issues on document delivery services. *Journal of Interlibrary Loan & Information Supply*

renamed itself *Journal of Interlibrary Loan, Document Delivery & Information Supply*. Emergent terms included information technology, journal literature, document delivery, electronic document delivery, developing countries, and commercial document suppliers. Thirteen key documents from this period can be categorized into document delivery, commercial document delivery cost-benefit analysis, information technology, standards and law, and developing countries.

**4.3.1 Document Delivery, Electronic Document Delivery, and Commercial Document Delivery** In the early 1990s, rising journal acquisition costs and staff reductions in many academic libraries led to inadequate collection development. Combined with slow traditional interlibrary loan, commercial document delivery emerged as an attractive alternative due to its copyright-free, timely, and targeted services [10], gradually becoming an important supplement to traditional interlibrary loan. Users also gained multiple access channels, including pay-per-view, independent information providers, full-text databases, and bibliographic utilization services.

This proliferation of access channels raised cost-effectiveness concerns. To maximize user satisfaction, libraries sometimes needed to utilize multiple document delivery providers, making supplier selection for each request a practical challenge. Cost and timeliness analysis of commercial document delivery became a research focus. For example, in 1990, Vassar College, facing journal budget cuts, compared the fulfillment rate, delivery time, and quality of academic library interlibrary loan systems versus commercial suppliers (TIF, IOD, UMI, TGA), finding traditional interlibrary loan most cost-effective [11]. Another study by W. Pedersen et al. examined six commercial suppliers (UMI, ISI, EI, CA, IS, IoD), finding that while commercial systems could not replace interlibrary loan entirely, they offered flexibility [12]. User perspectives were also examined: a survey of 79 faculty and graduate students at three Ohio universities found that cost was the primary consideration, with respondents preferring interlibrary loan over commercial systems [13].

Although traditional interlibrary loan remained dominant, commercial document delivery gradually supplemented it due to copyright freedom, better timeliness, and libraries' willingness to cover costs. Moreover, commercial markets shaped user expectations for interlibrary loan services, such as self-service, convenience, and speed.

**4.3.2 Impact of Information Technology Development** Information technology strongly supported interlibrary loan acquisition and transmission. In the early 1990s, CD-ROM databases greatly facilitated bibliographic information access, promoting request submission. According to a study cited by S. Gould from M.A. Siddiqui [14], 16% of bibliographic records at King Fahd University came from CD-ROM in 1992, rising to 35% by 1994. Internet technology enabled direct submission of document delivery requests through online catalogs, further promoting interlibrary loan development.

Internet technology also provided technical support for document delivery transmission systems, including the Ohio State University's network fax project, ARIEL developed by the Research Libraries Group, and digital file transfer projects from North Carolina State University. Fax was applied early in document delivery, improving speed but with poor quality and high costs. ARIEL, specifically developed for transmitting full-text documents over the internet, facilitated rapid receipt, sending, and forwarding, gradually becoming the global library standard for full-text document transmission.

**4.3.3 Interlibrary Loan Standards** To promote communication and sharing among different computer and network systems, Canada issued ISO 10160/10161 (Information and Documentation—Open Systems Interconnection—Interlibrary Loan Service Definition/Specification) in 1991, which structured, standardized, and systematized interlibrary loan activities, processes, and language. Mandatory protocols in the field also included Abstract Syntax Notation One (ASN.1), with the United Nations' Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) serving as a supplement [10]. In the US, the Information Retrieval Application Service Definition and Protocol Specification (Z39.50) was introduced in 1988 to facilitate data exchange among the Library of Congress, OCLC, and the Research Libraries Group, with second and third editions released in 1992 and 1995. The third edition became ISO 23950 in 1998. S. Gould described the IRIS distributed "logical union catalog" using Z39.50 [14], while another project, "Electronic Document Interchange between Libraries" (EDIL), tested electronic document transmission among France, the Netherlands, the UK, and Germany using different interlibrary loan systems.

**4.3.4 Copyright Law** The World Wide Web facilitated document access but also created barriers, as traditional copyright could not adapt to the electronic environment. In 1996, to address copyright issues arising from changing information environments and technologies, WIPO adopted the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty. Based on these, the US enacted the Digital Millennium Copyright Act in 1998, strengthening protection for copyright holders while limiting network service providers. Compared with 1980s copyright law, this legislation explicitly addressed online file transmission, copying, and infringement. Regarding reproduction rights, Section 404 revised Section 108 of the original Copyright Act, increasing the allowance for nonprofit libraries and museums from one non-digital copy to up to three copies including digital reproductions.

In research, G.P. Cornish noted that electronic interlibrary loan appears simple but is technically complex and involves many copyright issues [15]. J.T. Brassil et al. studied copyright protection for text document distribution, describing several document marking mechanisms and decoding mechanisms after distortion [16].

**4.3.5 Document Delivery in Developing Countries** To promote scientific literature access in developing countries, the UN launched a pilot project from 1989–1993 that subsidized delivery costs to support document delivery for 12 developing countries in the Asia-Pacific Technology Information and Experience Exchange Network (ASTINFO). Technological advances (e.g., CD-ROM) bridged information gaps for developing countries. However, barriers remained, including high international interlibrary loan fees, insufficient bibliographic records, copyright restrictions, technical obstacles, and political/economic issues. An Iowa State University Library survey found that document delivery to several developing countries achieved a 73% fulfillment rate with 16.3-day average turnaround, with fax costs approximately 12 times more expensive than airmail [17].

#### 4.4 Dynamic Development Period (2000–2016)

Entering the 21st century, document delivery entered a period of general decline with localized development, which we characterize as the dynamic development period. M. McGrath believes document delivery began declining relatively after 2001 [18]. The term “relative” is used because different countries and regions experienced varying development speeds and trends. Influencing factors multiplied, including new scholarly communication environments, search engines, e-journals, database consortium purchasing, discovery systems, copyright, institutional repositories, and open access. Some countries saw declines (e.g., UK, Germany, Canada), while others experienced rapid growth.

Key themes during this period included e-journals, e-books, interlibrary loan and collection development, copyright issues, and open access research.

**4.4.1 E-Journal Research** At the turn of the century, many academic libraries experienced explosive e-journal growth. For example, the University of Glasgow increased from 367 e-journals in 1997 to 5,526 in 2002 [23]. This growth raised two questions: how to evaluate e-journals, and how they affect document delivery requests. Regarding evaluation, T.E. Nisonger et al. argued that traditional journal evaluation methods (collection analysis, bibliography, availability, document delivery, citation, and usage studies) could be adapted for e-journals with modifications, emphasizing continuity in electronic environments [24].

Did widespread e-journal procurement affect document delivery requests? Initially, e-journals reduced document delivery numbers at large national systems like UK’s BLDSC and Canada’s CISTI, leading to predictions that full-text electronic access would completely replace document delivery. However, research revealed that e-journals did not necessarily reduce document delivery volumes. M.E. Jackson’s study of 59 ARL member libraries found that despite growing e-journal collections, interlibrary loan requests actually increased [25]. He attributed this to: (1) Google, online citation databases, and word-of-mouth promoting article discovery; (2) improved document delivery speed increasing service utilization; and (3) some libraries not implementing open linking or dis-

covery systems, making purchased resources difficult to find and access, causing users to request local holdings through document delivery.

**4.4.2 E-Book Research** Interlibrary loan helps identify user needs and has been used to supplement collection development. Patron-driven acquisition (PDA) emerged in the late 1990s, initially for print books and later becoming a major e-book acquisition model. In the first decade of the 21st century, local datasets contained limited e-book research, focusing mainly on e-journals. E-books were less studied due to high prices, copyright restrictions, and various factors limiting interlibrary loan volumes [26]. During this period, S.M. Ward explored new collaborative models between interlibrary loan, collection development, and acquisitions, finding comparable turnaround times, average costs (\$37 per book), and high customer satisfaction [27].

In recent years, as e-book sales platforms and technologies matured, libraries began integrating e-books with OPAC through discovery systems. Users could access e-books either through interlibrary loan or via PDA agreements where purchases were triggered after user behavior (browsing, downloading) reached negotiated thresholds. E-book research gradually became a hot topic. In 2015, D. McGee described a one-year demand-driven acquisition pilot at an engineering library involving seven independent interlibrary loan departments, where interlibrary loan books could be purchased directly, saving procurement funds but ultimately discontinued due to configuration issues [28].

To maximize profits, vendors imposed restrictions on e-book sharing through digital rights management (DRM) and licensing agreements. Many e-book providers prohibit interlibrary loan; some restrict transmission methods; others allow only printing, scanning, and faxing of specific chapters. W.H. Walters' 2014 review [29] explored these restrictions and their impact on users, identifying limited availability, software, file types, DRM, and single-reader business models as primary barriers to e-book delivery.

**4.4.3 Copyright Research** E-journals and e-books facilitated interlibrary loan but threatened publishers' interests without restrictions. Protection measures included technological solutions (e.g., US document delivery software Ariel and the EU's Electronic Copyright Management System, ECMS) and legislation. The International Association of Scientific, Technical and Medical Publishers (STM) played a crucial role in urging legislative revision. Under STM's influence, Germany passed the Second Act on the Regulation of Copyright in the Information Society in September 2007, implemented in 2008. New Article 53a stipulated that electronic transmission of article portions was permitted only under agreed conditions with compensation, affecting the Subito library consortium's cross-border document delivery and forcing a return to traditional mail and fax.

In 2011, STM issued the *STM Document Delivery Statement*, proposing five principles: compliance with Berne Convention's three-step test, agreement priority,

publisher-provided single-article ordering, due diligence, and direct printing. STM's restrictions on non-returnable document delivery led some libraries to abandon or reduce these services [30]. Conversely, the UK revised its copyright law in 2014. G.P. Cornish found that the new act permitted direct electronic transmission of journal articles without print-scan-fax processes, expanded resource types, and simplified workflows, facilitating expanded library services [31]. R. Tiessen studied Canadian copyright law and licensing agreements' impact on document delivery and electronic resources, describing confusion caused by US copyright law agreements for Canadian libraries and predicting that new regulations and Supreme Court rulings might resolve some issues [32].

**4.4.4 Open Access and Interlibrary Loan** Besides interlibrary loan, open access (OA) emerged as another response to soaring journal prices. OA originated in the late 20th century and rapidly developed after 2000. The Directory of Open Access Journals (DOAJ) now indexes 10,353 journals [33], and the Registry of Open Access Repositories (ROAR) includes 4,545 institutional repositories [34]. OA initially spread in natural sciences, then social sciences, and recently humanities (e.g., re.press [2006], Open Humanities Press [2008], Open Library of Humanities [2015]).

Despite growth, OA development has been tortuous, involving complex stakeholder interests. Publishers initially resisted but gradually joined. Springer began its "Open Choice" program in 2004; Elsevier adopted hybrid publishing in 2006 and acquired the Social Science Research Network (SSRN) in 2015 [35]; Wiley-Blackwell and Taylor & Francis also entered OA publishing. While STM is known for copyright protection and opposing OA, M. McGrath found that STM shifted to supporting gold OA due to its profitability [36].

Under these intersecting interests, OA publishing has moved forward 曲折ly. M. McGrath's review found that 70% of cited literature was OA in mid-2015, dropping to 50% by 2016, with predictions of further decline [18].

Some researchers have declared OA "the nail in interlibrary loan's coffin," predicting its demise as internet resources become freely available. However, C. Boukacem-Zeghmouri and J. Schopfel's 2006 survey of five major institutions (British Library, CISTI, INIST-CNRS, KISTI, TIB Hannover) found all deeply involved in OA, with significant impacts on acquisition and grey literature policies [37]. T. Baich tracked the interlibrary loan-OA relationship during 2010–2011 and 2012–2013, finding stable overall request volumes but increasing OA requests. The study rejected OA's negative impact, concluding that OA facilitated resource sharing and cost savings for Indiana University [38–39].

## 5 The Future of Interlibrary Loan

### 5.1 Challenges and Transformations in Library Interlibrary Loan Work

Due to incomplete digitization, paywalled content, and access difficulties, interlibrary loan's "long tail" will continue surviving and may even grow longer [36]. Future challenges will likely come from three sources: commercial database publishers and service providers, open access, and social media-based mutual assistance. Libraries must respond accordingly.

- (1) **Database Publishers and Service Providers.** To maximize profits, publishers have implemented discovery systems and commercial document delivery systems, shaping user expectations through convenient interfaces. In sales, besides "big deals," they offer pay-per-view (PPV) options. Sun Weilian warns that widespread PPV development could squeeze traditional interlibrary loan and ultimately jeopardize library document assurance [30]. Facing these challenges, libraries should explore partnerships with digital publishers, implement patron-driven acquisition, adjust collection strategies, and focus on user needs in document delivery.
- (2) **Open Access.** OA promotes journal access and affects interlibrary loan volumes while providing convenience. As OA develops, interlibrary loan institutions are integrating it into workflows and shifting procurement funds toward open publishing [40]. In March 2016, the Max Planck Society released "Open Access 2020," proposing a smooth, rapid, scholarship-oriented transition from subscription to open access for most academic journals. OA will profoundly transform scholarly publishing and communication systems, with increasingly far-reaching impacts on interlibrary loan that require process redesign [41].
- (3) **Social Media-Based Mutual Assistance.** Social media facilitates increasing academic exchange and mutual assistance among peers and communities. Though representing a small proportion, it fosters strong community awareness and loyalty. C.C. Gardner et al. investigated motivations for using social media (Twitter, Reddit, Facebook), document sharing sites (AvaxHome, LibGen, Sci-Hub, commercial cloud storage), comparing them with library-centered interlibrary loan [42]. Users preferred document sharing due to: interlibrary loan providing only print versions; faster, cheaper shared document delivery; and better access and user experience. Consequently, some users treat interlibrary loan as a last resort. To meet this challenge, interlibrary loan must enhance service efficiency and user experience while respecting copyright.

### 5.2 Role Transformation for Interlibrary Loan Librarians

While interlibrary loan will persist, librarians' roles must evolve to better adapt to changing academic environments. Beyond traditional document delivery,

future interlibrary loan librarians should become knowledge discoverers, information literacy educators, scholarly publishing literacy facilitators, and communicators—adapting through diverse, flexible role transformations to survive and thrive.

- (1) **From Document Delivery to Knowledge Delivery.** Document delivery is the traditional core role. As social media and OA intersect, knowledge creation and dissemination feature low cost, diversity, interactivity, and convenience. Although OA develops rapidly, not all OA literature is easily accessible—some green OA articles in non-subscribed journals remain un-deposited or difficult to access, with BLDSC frequently receiving OA requests. Thus, traditional document delivery remains important. Building on this, interlibrary loan staff should deeply explore user needs, participate in scholarly communication, and provide knowledge services to enhance core competitiveness.
- (2) **Scholarly Publishing Literacy Facilitator.** Researchers face increasing publishing pressures. As OA progresses, the publishing environment grows more complex, and some researchers may not fully understand OA and related issues. Predatory publishers may exploit author-pays policies, charging excessive article processing fees (APCs). Interlibrary loan staff, with their resource acquisition expertise and OA knowledge, can actively support researchers' scholarly publishing if they strengthen their understanding of publishing issues. L.L. Zhao considers scholarly publishing literacy an extension of information literacy provided through research support [43]. Thus, shifting from delivering individual articles to facilitating user research publication represents a key direction.
- (3) **Communicator Role.** This includes deeply exploring user needs and interpreting fair use policies, as well as serving as a policy communicator among governments, publishers, and libraries regarding increasingly strict copyright environments, especially for e-book interlibrary loan. By studying e-full-text database licensing agreements, librarians can interpret policies for users, ensure compliance with fair use principles, and advocate with publishers to protect user rights. Interlibrary loan departments should become part of the library-publisher dialogue, balancing author, publisher, and user interests to provide optimal service.

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Peng Liwei: Conceptualization, writing;

Xu Wenjing: Revision and review;

Wu Jing: Participation in framework and content discussion.

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**A Systematic Review of Studies on Interlibrary Loan and Document Delivery Based on WoS Database**

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**Abstract:** [Purpose/significance] This paper aims to explore the development and future of Interlibrary Loan. [Method/process] Based on the literature in Web of Science Core Collection, this paper analyzes the distribution time, countries, institutions, authors, publications, research topics and cited references using bibliometric method. On this basis, HisCite and CiteSpace were used to filter important relevant papers as reading and inducing subject, to analyze the subjects and the development of interlibrary loan and document delivery. [Result/conclusion] The development of interlibrary loan can be divided into four periods: the traditional period of interlibrary loan (before the 1980s), the rapid development of interlibrary loan research (1980–1990), the rapid rise of document delivery (1990–2000), the dynamic development (2000–2016). The role of future interlibrary loan librarians should be more diversified.

**Keywords:** interlibrary loan, document delivery, biblio-metrics, content analysis

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

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