

Review of International Research Trends in Bibliographic Control over the Past Decade (Post-print)

Authors: Xiong Xiangyu, Zheng Jianming, Sun Honglei

Date: 2023-04-01T00:00:00+00:00

Abstract

[Purpose/Significance] Research on bibliographic control in the modern information technology environment has entered a new stage. Understanding international trends in bibliographic control research and drawing experience from them can facilitate bibliographic data exchange and realize worldwide sharing of literature resources.

[Method/Process] Utilizing multiple retrieval approaches including platforms such as Web of Science, this study employs content analysis to investigate and analyze international bibliographic control research achievements from the past decade.

[Results/Conclusion] Based on clarifying the theoretical connotations of bibliographic control, international bibliographic control research is categorized into four major themes: research on regional bibliographic control development, bibliographic control studies for various types of literature, bibliographic control standardization research, and comprehensive bibliographic control research. The study explores new growth points for bibliographic control research in the digital environment, positing that bibliographic control represents an expansion of bibliographic theory in the big data era, a means for structuring digital information resources, and the foundation for precision and personalized services in libraries. Finally, based on the current state of bibliographic control in China, development recommendations are proposed to promote the effective operation of bibliographic control and achieve orderly utilization of information resources.

Full Text

Preamble

Bibliographic control theory represents an important branch of bibliography that applies cybernetic principles to simulate, regulate, and control documentary information systems. As a navigation tool and distillation of knowledge, research on bibliographic control can facilitate the exchange of bibliographic data and thereby achieve worldwide sharing of documentary resources. In recent years, international research on bibliographic control has rapidly expanded due to the unprecedented explosion of electronic resources.

Our investigation of literature from web-based databases and institutional web-sites reveals that Chinese research on bibliographic control began around the 1980s, with studies gradually deepening and keeping pace with technological developments. Current research findings are already quite extensive, covering basic theoretical studies, universal bibliographic control, national bibliographic control, bibliographic control practice, subject-specific and genre-specific bibliographic control, and bibliographic control in network environments. Although research themes are diverse, recent work in this area has been somewhat weak, with the most systematic review of foreign bibliographic control research appearing in a 2009 doctoral dissertation (search date: September 15, 2008), which categorized foreign research into eleven areas including basic theoretical issues, the Library of Congress' s bibliographic control, IFLA bibliographic control, electronic resource bibliographic control, various types of resources, national/regional development status, subject-specific bibliographic control, and bibliographic control education [1]. Over the past decade, with the widespread application of modern information technology and the rapid development of emerging technologies such as the Internet of Things, cloud computing, and mobile internet, bibliographic control research under new technological environments has entered a new stage.

This study utilized multiple databases including Scopus, ScienceDirect, Web of Science Core Collection, EBSCOhost, as well as platforms such as Google Scholar, Baidu Academic, and Chaoxing Discovery. Using “bibliographic control” as the search term, we employed various search fields including title, subject, abstract, and keywords, with the search conducted on February 24, 2020. To maximize precision and recall, title searches used the strategy “bibliographic AND control” (allowing characters between the two terms), while subject, abstract, and keyword searches used “bibliographic control” as a fixed phrase. presents statistics from selected search results.

The vast majority of retrieved documents were in English, with a small number in Spanish, Portuguese, French, German, Russian, and Japanese. Referencing the aforementioned 2009 dissertation, this paper focuses on analyzing foreign research findings from 2008 onward. After eliminating duplicates and irrelevant papers, 117 foreign-language documents were selected for detailed reading. Representative works were then chosen to analyze and review recent interna-

tional trends in bibliographic control research, examining new developments, characteristics, and directions in both basic theory and practical work under new technological environments.

2. Theoretical Connotation of Bibliographic Control

The *ALA Glossary of Library and Information Science* defines bibliographic control as encompassing a series of activities including improving bibliographic records for publications, standardizing bibliographic description, providing physical access through library consortia and networks, and offering bibliographic retrieval through union catalogs, subject catalogs, and bibliographic service centers [2]. The *Dictionary for Library and Information Science* interprets the term more broadly, including all activities related to creating, organizing, managing, and maintaining bibliographic record files, such as bibliographic description standardization and subject access, creating and maintaining catalogs, union catalogs, and retrieval tools, and providing physical access to collections. Bibliographic control is not an end in itself but a means to facilitate information access [3]. It has also been metaphorically described as a sophisticated network composed of bibliographies and bibliographic databases [4], or summarized as a mechanism for identifying and locating information resources [5].

With the development of information technology, bibliographic control has entered a new chapter, no longer limited to print books but encompassing information resources in various formats. The theoretical connotation of bibliographic control has continuously enriched and deepened alongside societal development, creating a solid foundation for exploring both theory and practice and achieving the ultimate goals of bibliographic control. In today's networked information environment, bibliographic control extends beyond library catalogs to include a wide range of information resources in various forms. It is not uncommon for different processes to describe and manage diverse resources and provide user access separately. For example: (1) coverage information, citation links, and circulation/sales data are all valuable in bibliographic control; (2) user-contributed data such as reviews or ratings can help other users identify potentially interesting resources; and (3) any collection of electronic data, from library catalogs to full-text works, can be mined using automated tools. To organize and utilize data from various sources, bibliographic control should be viewed as a distributed rather than centralized activity. Expanding the definition of bibliographic control to include all library materials, diverse user groups, and multiple information-seeking venues can better serve users [7].

3. Analysis of Research Themes

Based on a content analysis of international bibliographic control research over the past decade, this paper organizes foreign studies into four thematic areas: regional bibliographic control development, bibliographic control of various document types, bibliographic control standardization, and comprehensive biblio-

graphic control research.

3.1 Regional Bibliographic Control Development

Recent regional bibliographic control research has primarily focused on developing countries, covering historical reviews, experience summaries, problem analyses, and strategic recommendations, though some studies examine developed countries' status and limitations. I. Ramjaun summarized challenges facing national bibliographic control in Mauritius, including lack of printer cooperation, limited new book reporting and promotion, budget constraints hindering overseas acquisitions, absence of audiovisual and electronic resources in the national bibliography, time lags between bibliographic compilation and printing due to funding shortages, and inadequate bibliographic control training. Proposed countermeasures include closely tracking new publications, establishing partnerships with stakeholders, strengthening overseas print acquisitions, updating laws and regulations, launching electronic national bibliographies for timely access, enhancing staff training, and strictly enforcing legal deposit systems. The national bibliography center should be equipped with the latest tools and technologies, highly specialized personnel, and adequate financial resources to meet current and future challenges. Printers, publishers, booksellers, authors, and other stakeholders should also provide support to ensure national bibliographies are as comprehensive, timely, and accessible as possible [8].

E. F. Ejedafiru and B. A. Akporhonor identified problems in Nigeria' s bibliographic control: (1) diversity of indigenous languages, lack of reading habits, low literacy rates, and shortage of quality writers hinder mass-market publishing development; (2) insufficient libraries, lack of reading awareness, frequent curriculum changes, editor shortages, currency devaluation, unstable power supply, and political transitions impede publishing industry innovation; (3) underdeveloped book publishing makes national bibliography compilation difficult; (4) governments prioritize defense and social welfare over library sector funding; (5) political transitions prevent the National Library of Nigeria from fulfilling its bibliographic control mandate; (6) ideology influences national bibliography compilation; and (7) Nigeria' s historical evolution, geography, ethnic diversity, and linguistic complexity create special classification and cataloging challenges [9]. K. O. Towolawi, using Bells University of Technology as a case study, shared experiences in acquiring and managing grey literature produced within universities, noting difficulties in access, organization, management, and use due to lax bibliographic control, unprofessional formatting, and low print runs [10]. J. O. Akidi and C. A. Okezie surveyed ICT application in cataloging at Nigeria' s National Library, finding that while staff had strong computer networking skills, application of ICT knowledge to cataloging practice remained low, with major obstacles being funding, infrastructure, power supply, network facilities, bandwidth, vendor support, maintenance culture, and staff training. They argued that ICT application could enhance bibliographic control and offered recommendations addressing these barriers [11].

P. N. Rath traced the evolution of systematic bibliography in India from 1849-1993, noting that progress in various knowledge domains promoted bibliography compilation and that bibliographies emerged alongside societal intellectual advancement. Indian printed book publishing only became common in the first half of the 19th century, so no systematic bibliographic control was attempted before then. The 1958 *Indian National Bibliography* marked the normalization of bibliography compilation in India. Four factors positively influenced Indian bibliographic work: (1) the Serampore Mission Press published numerous vernacular works after its establishment; (2) Governors Bentinck and Hastings hoped to understand Indian mentality through local publishers; (3) missionaries sought to translate and publish religious articles to make Christian gospels more accessible; and (4) the 1867 Press and Registration of Books Act represented the first government control over publications, a landmark year for Indian bibliographic control. The author noted that even in the computer age, bibliographies remain important tools for literature retrieval, particularly in social sciences and humanities [13].

Due to funding shortages and limited staffing, Italy's national bibliography (*Bibliografia Nazionale Italiana*, BNI) currently covers only slightly over 15% of publications [14], failing to meet International Conference on National Bibliographic Services (ICNBS) standards for completeness and coverage. F. Nepori and F. Sabba argued that BNI should assume responsibility for Italian publication statistics nationally and internationally, noting that long-term delays in timeliness, coverage, and sharing reflect insufficient attention to national cultural heritage. Flexible adherence to bibliographic standards could improve timeliness, but more importantly, they called for funding support from Italy's Ministry for Cultural Assets and Activities and Tourism (MiBACT) [15].

Regional bibliographic control development studies primarily focus on developing countries, where scholars analyze current conditions through retrospective research, aiming to promote national bibliographic control development by examining phenomena, summarizing causes, and offering recommendations. Economic and technological underdevelopment, weak library infrastructure, and other factors constrain bibliographic control development in these nations. Even in economically and culturally advanced countries, limitations exist. The degree of information resource development and utilization can measure national economic development levels. Meanwhile, information technology and internet development create both opportunities and challenges for bibliographic services. National bibliographic control is the prerequisite for universal bibliographic control, and establishing bibliographic records is fundamental to indicating publication existence and accessibility [5]. Libraries are essentially public welfare institutions that cannot generate economic benefits themselves, making government funding essential for national bibliography center construction and bibliographic control mechanism operation. All countries should leverage technological development to fully exploit bibliographic control tools and supporting services, cultivate specialized personnel, establish sound library infrastructure, and strengthen professional cooperation to achieve effective national and univer-

sal bibliographic control.

3.2 Bibliographic Control of Various Document Types

As bibliographic control research matures and new document types emerge, foreign scholars have begun focusing on specific genres. M. W. Ndungu investigated bibliographic control of Kenyan theses and dissertations, analyzing challenges through descriptive surveys, interviews, and questionnaires at four universities and two programs. Findings revealed: (1) delays in acquiring dissertation copies prevented up-to-date bibliographic records; (2) no mechanisms ensured dissertation acquisition, resulting in incomplete records; (3) poor inter-departmental coordination during deposit; (4) electronic theses were relatively new, with unclear deposit requirements and manual abstract entry increasing processing time and costs; and (5) lack of professional librarian supervision led to inconsistent, non-uniform records, slowing cataloging and reducing quality. These issues limit accessibility and utilization while risking duplication and plagiarism. The author recommended leveraging ICT opportunities for electronic theses, implementing necessary infrastructure and policies, establishing clear university policies and mechanisms, promoting metadata standardization for record uniformity, and elevating institutional bibliographic work to the national level through a National Commission for Science, Technology and Innovation (NACOSTI) or national documentation center [16].

R. P. Holley noted that e-books and print-on-demand have dramatically reduced self-publishing costs and barriers, with companies like Amazon providing royalties and support. Self-published works now account for over half of annual U.S. book production but often escape publishing and bibliographic control networks, posing new challenges for universal bibliographic control [17].

R. K. Barry examined special challenges in controlling Mongolian-language materials outside Mongolian-speaking regions. Different alphabets create spelling variations for names and titles, complicating retrieval. Western libraries typically use Latin-script transliteration tables like the ALA-LC system, but Mongolian letters sometimes map to multiple Latin letters, creating cataloging difficulties [18].

D. Daniel assessed challenges facing non-English ethnic minority newspapers in resource development, bibliographic control, and preservation from traditional print to new digital media. Under the National Digital Newspaper Program (NDNP), some ethnic newspapers have been digitized, with the U.S. Newspaper Directory listing digital and print versions since 1690. The Chronicling America website allows browsing all NDNP-digitized newspapers with language and ethnicity search options. However, NDNP progress on non-English newspapers has been slow, with only 6% digitized. State-level digital collections often lack language or ethnicity browsing capabilities. While many foreign-language ethnic newspapers have come online through efforts by minority organizations, public libraries, academic libraries, historical societies, and other stakeholders, digi-

tization priorities are determined by funding agencies, commercial companies, and mainstream archivists rather than publishers or readers. The author noted persistent difficulties in accessing digitized non-English newspapers and called for attention to collecting needs for both print and digital minority press [19].

3.3 Bibliographic Control Standardization

Standardization provides the foundation for scientific management of bibliographic control, essential for adapting to digital and networked environments, optimizing processes, and ensuring continuity and vitality. M. J. Han argued that new resource discovery system performance depends heavily on catalog record quality and each library's bibliographic control methods. Challenges include: (1) difficulty enforcing even minimal cataloging standards, causing inconsistency and incompleteness; (2) gaps between record content and discovery service requirements; (3) need for granular metadata at article or chapter level to improve deep-level resource discoverability; (4) integrating user-generated metadata into records; and (5) questioning whether MARC is ideal for describing article-level information and user-generated content [20].

I. C. McIlwaine noted that subject control is harder to standardize than other bibliographic elements. Every classification system aims for universal applicability but can only meet most needs. The Dewey Decimal Classification, though most widely used, cannot adapt to all situations, particularly networked information retrieval. Reviewing the history of the Universal Decimal Classification and its relationships with Dewey and Bliss classifications, the author argued that collaboration and compatibility among classification systems are imperative, with existing systems seeking cooperative opportunities to leverage respective strengths for mutual improvement [21].

P. Riva and C. Oliver reviewed relationships among Resource Description and Access (RDA), Functional Requirements for Bibliographic Records (FRBR), and Functional Requirements for Authority Data (FRAD), covering user tasks, entities, attributes, and relationships. RDA, based on FRBR and FRAD conceptual models, adjusts these frameworks according to actual conditions and trends, proving more suitable for digital environments than AACR2 and driving continuous innovation in cataloging [22].

G. L. Hoffman functionally envisioned bibliographic control expanding into new areas, such as using RDA to display more resource relationships or extending authority control work to all library resources in catalogs, databases, and digital collections [23]. UNIMARC and metadata expert M. Willer affirmed that the concept of universal bibliographic control remains valid [24], while G. Dunsire et al. discussed its future in the semantic web environment. Resource Description Framework (RDF), the foundation of semantic web technology and a modeling standard supporting metadata applications, can establish semantic mappings to create linked networks, storing legacy and new metadata to enrich the bibliographic ecosystem. Libraries are undergoing tremendous transformation, and

deep research into the semantic web' s distributed architecture and reasoning capabilities can help establish global bibliographic information control and exchange systems [25].

J. H. Leong proposed that resource description and discovery typically employ two approaches: bibliographic control and metadata. Massive digital network resources present unprecedented challenges. In digital environments, new knowledge production, declining controlled vocabularies, rising natural language use, traditional catalog system digitization, and electronic publishing impose higher demands on knowledge organization. Metadata schemes reduce time and human resources through automation while leveraging computers more effectively; bibliographic control-based catalog systems demonstrate standardization and consistency with typically higher quality. Research shows convergence and complementarity between metadata and bibliographic control, which can adapt to rapid knowledge development in both traditional and digital resources through mutual reinforcement [26].

As information technology advances and resource types multiply, information organization methods are automating, cooperative mechanisms constantly emerging, and cross-regional bibliographic sharing becoming more frequent. Computer technology has transformed bibliographic production, making automatic classification and indexing routine. Standardization, scientific management, and normalization guarantee quality improvement [27].

3.4 Comprehensive Bibliographic Control Research

In 2008, the Library of Congress released *On the Record: Report of the Library of Congress Working Group on the Future of Bibliographic Control*, offering five recommendations: (1) improve bibliographic production efficiency through enhanced cooperation and record sharing; (2) shift focus to high-value activities, strengthening discovery of hidden rare and special collections; (3) recognize the web as both a technical and standards delivery platform; (4) incorporate evaluative and user-provided information into resource descriptions; and (5) strengthen the library and information science profession [7].

Subsequently, the Bibliographic Control Cost/Value Assessment Working Group was established to address recommendation 5.1.1.1 regarding standards for bibliographic control costs, benefits, and values. E. Stalberg and C. Cronin outlined the group' s work developing assessment metrics, including seven operational definitions of value: retrieval success rate, usage, content comprehensibility, open web operability, interoperability in the bibliographic supply chain, support for FRBR user tasks, productivity and timeliness, and support for library administrative goals [28].

L. V. Shemberko and A. V. Shershova studied bibliographic control in the Russian Academy of Sciences' Institute of Scientific Information for Social Sciences (INION) database, arguing that modern software and tools have potential for analyzing and controlling bibliographic records, references, and citations. They

recommended: (1) developing new tools for scientific research information and analytical support; (2) building infrastructure for coordinating scientific information and research activities; (3) introducing new ICT in humanities and social sciences; and (4) integrating and coordinating scientific information activities focused on socioeconomic and humanities interdisciplinary research [29].

S. A. Kiczek summarized Library of Congress reference librarian T. Mann's views on catalogs, cataloging, bibliographic control, and related issues. Mann argued that traditional research library methods and tools—particularly online public catalogs, professional cataloging, Library of Congress Subject Headings, and pre-coordinated subject strings—retain enduring value. Responding to doubts about catalog necessity, Mann contended that while internet keyword searching is valuable, it should not replace traditional catalogs, which have distinct functions and advantages. He highly praised professional catalogers' intellectual labor, arguing that cataloging should be performed by professionals rather than through assembly-line shortcuts, and that print books remain ideal media for deep intellectual expression, crucial for scholarship, education, and civilization [30].

C. M. Ruschoff retrospectively summarized two conferences on digital resource bibliographic control and their impact on the Program for Cooperative Cataloging (PCC) direction to address digital publication explosion challenges. The author affirmed PCC's contributions in reducing redundant bibliographic control work, providing training, and developing record standards, while emphasizing cross-industry collaboration for digital network resource bibliographic control [31].

Bibliographic control is not a static concept but evolves with societal progress, as technological advances provide broader means of controlling documents [32]. The network has transformed traditional information resource environments, spawning research on bibliographic control in network information resource contexts. Comprehensive analysis of bibliographic systems' technology, processes, benefits, and development can optimize digital environment bibliographic work and improve the entire bibliographic control chain. Using control methods to reduce duplication and waste, improve knowledge management and dissemination, and promote information retrieval and utilization will ultimately achieve bibliographic work's goal: information resource sharing and utilization.

4. New Growth Points in Digital Environment Bibliographic Control Research

Bibliographic work has entered a new digital stage, facing opportunities and challenges from emerging technologies [27]. Information science and technology have catalyzed updates to bibliographic knowledge structures, opening new disciplinary growth points [33]. Recent foreign bibliographic control research predominantly focuses on network information resource environments influenced by information technology development. Bibliographic control research holds sig-

nificant theoretical and practical importance: as theory, it guides bibliographic work while deepening bibliographic science development; as practice, it serves as an effective means for information ordering, promoting information resource sharing and utilization.

4.1 Extension of Bibliographic Theory in the Big Data Era

In traditional environments, bibliographic work processed documents as whole entities, forming the classical bibliographic principle of “distinguishing academic fields and tracing origins.” With rapid modern IT development and widespread application in information processing, digital and networked information resources have become increasingly prevalent. The openness, interactivity, diversity, dynamism, and fragmentation of massive, complex network information impose higher demands on bibliographic control, making digital resource classification and retrieval a new research topic. The digital environment has expanded bibliographic work’s scope from whole documents to knowledge units and from physical to digital resources. The digital environment features intelligent technology, networked services, and personalized user behavior, with information developing toward digital carriers, automated retrieval, networked transmission, and humanized services. Consequently, bibliographic science application fields have expanded, research scope has deepened, new sub-disciplines have emerged, and library science theory has been further elevated.

Bibliographic work forms the practical foundation of bibliography as an “applied science,” with bibliographic control permeating the entire bibliographic process. It represents a crucial research area in bibliography and the convergence point of theory and practice. Bibliography is a map that orderly accommodates all human intellectual achievements; modern bibliography studies bibliographic control methods, theory, and history [34]. Reasonably addressing digital resource revelation, control, development, and utilization in the network era constitutes bibliography’s new mission while continuing its classical traditions [35] and a necessary measure for integrating bibliography with new information environments. Bibliographic control research will promote bibliographic theory development to some extent. Information technology has opened broader development space for bibliography, with technological environmental changes enriching network information resource types and making effective revelation and reporting of network bibliographic resources imperative [33]. As a discipline that scientifically reveals and effectively reports documentary information to resolve the contradiction between massive literature and specific user needs, controlling information resources to address this conflict represents an inevitable trend for bibliography in network environments.

4.2 Means of Structuring Digital Information Resources

In the information society, digital resources grow exponentially, making information distribution increasingly disorderly and intensifying the contradiction between information provision and use. Increasing information resource vol-

umes make finding high-quality information among fragmented resources more difficult, while the unlimited nature and uneven quality of network information resources complicate user retrieval and utilization. As a discipline that scientifically reveals and reports documentary information, organizing and revealing disorderly network information resources has become a new task for Chinese bibliography [36].

The conflict between chaotic, unorganized network information resources and the need for orderly information utilization can be addressed through bibliographic control methods and means to achieve information ordering. Bibliographic control provides a method for improving information ordering, with results appearing as intellectual outputs that help resolve conflicts between information resource diversity and user need specificity. The objects of bibliographic control are essentially information. Whether in traditional print or digital information environments, bibliographic control represents an important information organization method, with processes including collection, description, retrieval, and dissemination all being components of bibliographic control. Bibliographic control systematically organizes information resources, reconstructs information structures, reduces information entropy, increases orderliness, and enables organization, revelation, and utilization of disorderly information.

4.3 Foundation for Precision and Personalized Library Services

The practical value of bibliographic control is resolving the contradiction between rapidly growing literature and specific needs to achieve resource sharing [37]. Before network information resources emerged, bibliographic control primarily targeted print documents. With network resources, bibliographic control has expanded to discovering, screening, organizing, and arranging needed information resources from vast information oceans, reducing user search time, improving utilization efficiency, promoting healthy network resource development, and helping achieve maximum information resource sharing.

Bibliographic control aims to effectively control documentary resources for convenient user retrieval and utilization, with resource sharing requiring bibliographic control results as its foundation. From the perspective of complete records of all documents, bibliographic control promotes human knowledge management and dissemination; from the perspective of standard literature information systems, it promotes information retrieval and utilization; and from the perspective of all activities in bibliographic data development and maintenance, it promotes information institutions' management of information resources. The most direct outcomes are improved resource utilization efficiency and maximum satisfaction of user needs through micro-control of specific documents and macro-control of entire literature flows.

In the digital era, user information needs and behaviors incorporate diversified and personalized characteristics, providing opportunities for library innovation and development through richer, friendlier, and smarter services. Big data,

cloud computing, and artificial intelligence support precision library services. Abundant digital resources are fundamental for transcending temporal and spatial constraints, achieving extensive interconnection, meeting personalized needs, and enabling convenient, accurate, and efficient smart services. Establishing bibliographic databases suited to digital environments helps resolve contradictions between explosive information resource growth and user needs, addresses organization and utilization of digital resources in information society, and fulfills bibliography's function in reading and scholarship in the network era.

5. Analysis of China's Bibliographic Control Status and Development Recommendations

5.1 Status Analysis

Economic and technological progress has promoted scientific and cultural development, confronting humanity with contradictions between geometrically growing literature and limited reading time, as well as between expanding information resources and human capacity. In humanity's continuous exploration of knowledge organization and classification, bibliographic control has proven an effective means for reporting documentary information and encompassing human knowledge, becoming essential for information development.

A report from the National Library of China Union Cataloging Center indicates that linked data application in Chinese cataloging is entering its final promotion stage, with cataloging transitioning from flat bibliographic records to linked, knowledge-based data collections, making bibliographic information dataization a foreseeable future direction. Current cataloging faces declining attention, professional staff shortages, and quality degradation, requiring conceptual transformation. Between July 2018 and June 2019, data issues reported to the center included encoding blocks, descriptive blocks, subject analysis blocks, and duplicate data. In late 2017, the National Library of China became the Asian regional national institution representative on the RDA Board, facing challenges in transitioning from observer to contributor [39]. RDA implementation suffers from conceptual misunderstandings, lack of toolkits, and differences in Chinese cataloging application [40].

China's national bibliography has completeness issues across both document types and historical periods. Publications with deposit system protection are basically included, but deposits of braille materials, academic papers, and reports are inadequate, affecting coverage. Digital publications, especially online publications, lack deposit system protection and cannot yet be included in the national bibliography. Although China's national bibliography is web-published, retrieval sharing has not been achieved; relationships between national bibliographies and external data are weak, preventing direct data sharing and linking [41].

With rapid IT and network development, digital information resources have

surged, making information retrieval complex and overloaded [42]. While the network has become a vast, comprehensive information repository, its characteristics—massive content, diverse formats, disorder, dynamic changes, and uneven quality—hinder effective utilization. The new digital and networked environment opens a new chapter for bibliography, combining traditional methods with advanced IT [43], making bibliographic data resource co-construction and sharing possible through technological progress [33].

5.2 Development Recommendations

5.2.1 Establish a Reasonable Legal Deposit Implementation Mechanism As national bibliography is the foundation for universal bibliographic control, its coverage should be expanded temporally and spatially with enriched collection types. Legal deposit systems are prerequisites for comprehensive literature information control and national bibliography compilation. China's *Public Library Law* (effective 2018) Article 26 requires publishers to deposit publications with the National Library and provincial public libraries, providing legal basis for improving the deposit system. However, implementation remains inadequate, requiring gradual improvement of compensation, penalty, and supervision mechanisms to establish reasonable implementation procedures. Particular attention should be paid to deposit system guarantees for all resource types, especially new digital publications. Additionally, establishing coordinating management agencies, effective cooperation mechanisms, and systematic bibliographic work planning will ensure sound bibliographic control operation.

5.2.2 Promote Co-construction and Sharing of Information Resources in Internet Environments The ultimate goal of bibliographic control is promoting human knowledge management and dissemination for more efficient information retrieval and utilization. The digital and networked environment has turned a new page for bibliography, combining traditional methods with advanced information technology [43], making bibliographic data resource co-construction and sharing technologically feasible [33]. Co-construction and sharing can reduce cataloging costs while avoiding redundant data development. During this process, responsibility awareness should be strengthened, data maintenance emphasized, and data quality improved. Efforts should promote establishment of relationships between data for multi-level bibliographic data application, achieving resource revelation and linking through data interconnection and resource integration, enhancing knowledge guidance and service capabilities. Development plans should be formulated to strengthen cross-industry cooperation with internet and software companies, encouraging network construction and software development to deepen bibliographic database construction, development, and maintenance in network environments, achieving systematic literature recording, bibliographic data exchange, and effective literature information utilization. This will provide users with more effective search pathways, adapt to large-scale resource sharing needs, promote internet environment information resource co-construction and sharing, and achieve orderly information resource

utilization.

5.2.3 Advance Bibliographic Control Standardization Widespread internet penetration and new literature types have changed cataloging work, while increasing cultural exchange demands deeper international bibliographic information exchange. Bibliographic control should be user-oriented, establishing new cataloging concepts that meet literature cataloging dataization development trends and reflect contemporaneity and intelligence. Cataloging rules applicable to both traditional and network environments, usable worldwide and easily operable, are needed to improve cataloging efficiency amid exponential information resource growth and enable description and retrieval of both traditional and digital resources. Such rules also provide effective bibliographic control for all literature types, facilitate global bibliographic record sharing, and strengthen literature information resource exchange. The profession should further promote bibliographic control standardization, forming complete cataloging rules and revision mechanisms that balance bibliographic data integrity, timeliness, and authority with flexible standard compliance, solving issues of data integrity, accuracy, and shareability. Technological advancement should be pursued to enhance international bibliographic information interchangeability, reduce duplication and waste, and enable rapid, accurate literature reporting and retrieval, promoting bibliographic control development in theory, technology, and practice. Data quality management and supervision should be strengthened, with attention to problem collection and feedback to ensure dynamic data updating and improvement. Simultaneously, cataloging training should be expanded to establish stable cataloging teams with systematic knowledge, relevant computer skills, and deep understanding of standards, ensuring bibliographic data standardization.

References

- [1] Wu Lihong. Research on Bibliographic Control of Network Information Resources [D]. Wuhan: Wuhan University, 2009.
- [2] Levine-Clark M, Carter T M. ALA Glossary of Library and Information Science [M]. 4th ed. Chicago: American Library Association, 2013: 28.
- [3] Reitz J M. ODLIS: Online Dictionary for Library and Information Science [EB/OL]. [2020-02-24]. https://www.abc-clio.com/ODLIS/odlis_b.aspx.
- [4] Lor P J. Bibliographic Standards in Context: Current Challenges in Bibliographic Control [M]// Coetzee H S. Seminar on Bibliographic Standards for Promotion of Co-operation. Pretoria: University of Pretoria, 1996: 1-23.
- [5] Snyman R M M. Bibliographic Control—Is the Current Training Still Relevant? [J]. International Cataloguing and Bibliographic Control, 2001, 30(1): 13-15.

- [6] Howarth L C. Metadata and Bibliographic Control: Soulmates or Two Solitudes? [J]. *Cataloging & Classification Quarterly*, 2005, 40(3/4): 37-56.
- [7] Library of Congress. On the Record: Report of the Library of Congress Working Group on the Future of Bibliographic Control [R/OL]. [2020-02-24]. <http://www.loc.gov/bibliographic-future/news/lcwg-ontherecord-jan08-final.pdf>.
- [8] Ramjaun I. National Bibliographic Control in Mauritius: Issues and Challenges [J]. *Information Development*, 2009, 25(4): 296-303.
- [9] Ejedafiru E F, Akporhonor B A. Enabling and Disabling Bibliographic Control in Nigeria [J]. *International Journal of Library and Information Science*, 2013, 5(4): 85-89.
- [10] Towolawi K O. Management and Acquisition of Grey Literature in Academic Libraries: A Case Study of Bells University of Technology, Nigeria [J]. *Chinese Librarianship*, 2018(2): 44-54.
- [11] Akidi J O, Okezie C A. Application of ICT to Cataloguing and Classification for Effective Bibliographic Control in the National Library of Nigeria: Issues and Challenges [J/OL]. *Library Philosophy and Practice*, 2018, article ID 2173, 21 pages [2020-02-24]. <https://digitalcommons.unl.edu/libphilprac/2173/>.
- [12] Shores L. Basic Reference Sources [M]. Chicago: American Library Association, 1954: 11-12.
- [13] Rath P N. Evolution of Systematic Bibliographies in India, 1849-1993 [J]. *Library & Information History*, 2018, 34(3): 160-171.
- [14] Bellingeri L, Giunti M C. BNI: Aperta e Cooperazione: Come e Perché [J]. *Italian Journal of Library, Archives and Information Science*, 2017, 8(1): 67-76.
- [15] Nepori F, Sabba F. Bibliography, National Bibliography, and National Union Catalog in Italy [J]. *Cataloging & Classification Quarterly*, 2019, 57(2): 73-87.
- [16] Ndungu M W. Bibliographic Control of Theses and Dissertations in Kenya [J]. *Library Review*, 2017, 66(6/7): 523-534.
- [17] Holley R P. Self-Publishing: A New Challenge for Universal Bibliographic Control [EB/OL]. [2020-02-24]. <http://library.ifla.org/818/>.
- [18] Barry R K. Bibliographic Control of Mongolian Language Material at the Library of Congress [J]. *Mongolian Studies*, 2013, 35: 7-25.
- [19] Daniel D. Elusive Stories: Collecting and Preserving the Foreign-Language Ethnic Press in the United States [J]. *Serials Review*, 2019, 45(1/2): 7-25.
- [20] Han M J. New Discovery Services and Library Bibliographic Control [J]. *Library Trends*, 2012, 61(1): 162-172.

- [21] McIlwaine I C. Universal Bibliographic Control and the Quest for a Universally Acceptable Subject Arrangement [J]. *Cataloging & Classification Quarterly*, 2010, 48(1): 36-47.
- [22] Riva P, Oliver C. Evaluation of RDA as an Implementation of FRBR and FRAD [J]. *Cataloging & Classification Quarterly*, 2012, 50(5/7): 564-586.
- [23] Hoffman G L. Could the Functional Future of Bibliographic Control Change Cataloging Work? An Exploration Using Abbott [J]. *Journal of Library Metadata*, 2012, 12(2/3): 111-126.
- [24] Willer M, Plassard M F. An Interview with Mirna Willer [J]. *Cataloging & Classification Quarterly*, 2019, 57(7/8): 453-461.
- [25] Dunsire G, Hillmann D, Phipps J. Reconsidering Universal Bibliographic Control in Light of the Semantic Web [J]. *Journal of Library Metadata*, 2012, 12(2/3): 164-176.
- [26] Leong J H. The Convergence of Metadata and Bibliographic Control? Trends and Patterns in Addressing Current Issues and Challenges of Subject Access [J]. *Knowledge Organization*, 2010, 37(1): 29-42.
- [27] Ke Ping, Liu Xuqing, Peng Liang. Seventy Years of Bibliographic Enterprise in New China [J]. *Library Journal*, 2019, 38(10): 16-23.
- [28] Stalberg E, Cronin C. Assessing the Cost and Value of Bibliographic Control [J]. *Library Resources & Technical Services*, 2011, 55(3): 124-137.
- [29] Shemberko L V, Shershova A V. Normative and Technological Problems of Bibliographic Control over Information Resources on Social Sciences and Humanities [J]. *Scientific and Technical Information Processing*, 2018, 45(1): 55-62.
- [30] Kiczek S A. Thomas Mann' s Contributions to Current Library Debates on Cataloging and Bibliographic Control [J]. *Cataloging & Classification Quarterly*, 2010, 48(5): 450-471.
- [31] Ruschoff C M. Confronting the Digital Environment: Assessing the Challenges to Bibliographic Control of Electronic Resources [J/OL]. *Cataloging & Classification Quarterly*, 2020 [2020-02-24]. <https://www.tandfonline.com/doi/full/10.1080/01639374.2020.1712510>. DOI: 10.1080/01639374.2020.1712510.
- [32] Liu Wei, Lin Haiqing, Xia Cuijuan. Library Science Methods for Digital Humanities Research: Bibliographic Control and Documentary Evidence [J]. *Journal of Academic Libraries*, 2018, 36(5): 116-123.
- [33] Ke Ping, Liu Xuqing. Seventy Years of Chinese Bibliography: Retrospect and Analysis [J]. *Journal of Library Science in China*, 2019, 45(5): 101-111.
- [34] Huang Jungui. Speculation on Bibliographic Control Theory: From the World to China [J]. *Journal of Library Science in China*, 1995(5): 56-63.

- [35] Xia Nanqiang, Xu Weilan. The Return and Reconstruction of Chinese Bibliography [J]. Library and Information Service, 2017, 61(14): 34-39.
- [36] Peng Feizhang, Fu Xianhua. Retrospect and Reflection on Chinese Bibliographic Research in the 20th Century [J]. Library Tribune, 2004(6): 5-10, 57.
- [37] Wang Yan. Research on the Meaning and Practicality of Bibliographic Control [J]. Journal of Library Science in China, 1992(4): 68-71, 92.
- [38] Smiraglia R P. The Elements of Knowledge Organization [M]. Cham: Springer International Publishing, 2014: 33.
- [39] National Library of China Union Cataloging Center. Data Download [EB/OL]. [2020-02-24]. <http://olcc.nlc.cn/page/document.html>.
- [40] Zhong Bin. Analysis of Difficulties and Ease in RDA Local Cataloging [J]. Library and Information Service, 2017, 61(S1): 11-12, 25.
- [41] Mao Yajun. Review and Reflection on China's National Bibliography [J]. Library Science Research, 2017(14): 45-49.
- [42] Borovik M A, Shemberko L V. The Challenges of Information Retrieval in Social Sciences and Humanities and Ways to Overcome Information Barriers [J]. Scientific and Technical Information Processing, 2016, 43(2): 99-105.
- [43] Ke Ping, Liu Xuqing. Achievements, Problems, and Reflections on Chinese Bibliographic Research in the 40 Years of Reform and Opening-up [J]. Information and Documentation Services, 2019, 40(5): 17-22.

Author Contributions: Xiong Xiangyu: Collected and analyzed materials, wrote and revised the paper. Zheng Jianming: Proposed research topic and framework. Sun Honglei: Refined and improved the paper.

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

Source: ChinaXiv –Machine translation. Verify with original.