Research on the Transformation Path of Academic Libraries from the Perspective of Strategic Planning: Postprint

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Abstract

[目的/意义] To provide theoretical reference and practical guidance for the formulation of the "14th Five-Year" strategic plan and the design of transformation and development pathways for academic libraries in China. [方法/过程] This study selects as samples strategic plans and strategically significant policy documents, vision statements, trend reports, annual reports, annual conference themes, and other texts from renowned libraries and related organizations both domestically and internationally over the past decade. Through statistical analysis of the word frequency and content of "transformation," it examines their transformation characteristics and development trends, and synthesizes their transformation practice pathways and implementation strategies. [结果/结论] Libraries both domestically and internationally generally maintain a positive attitude toward "transformation," with their transformation pathways, specific practices, and implementation strategies primarily manifested in five dimensions: positioning, resources, services, space, and organizational management.

Full Text

Preamble

Abstract: [Purpose/Significance] This study provides theoretical and practical references for Chinese academic libraries to formulate their 14th Five-Year strategic plans and design transformation and development pathways. [Method/Process] We selected strategic plans and strategically significant policy documents, vision statements, trend reports, annual reports, and conference themes from renowned domestic and international libraries and their organizations over the past decade as samples. By statistically analyzing the word frequency of "transformation" and related terms, we examined transformation characteristics and development trends, and summarized practical pathways

and implementation strategies. [Result/Conclusion] Libraries worldwide generally hold a positive attitude toward "transformation," with transformation pathways, practices, and strategies primarily reflected in five aspects: positioning, resources, services, space, and organizational management.

Keywords: strategic planning; academic library; transformation

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Surveying the global library development landscape, although different types of libraries face distinct challenges, they all operate within the continuous influence of information technology evolution. Shifts in social demands, changes in user behavior and needs, transformations in scientific research paradigms, and the development of open science concepts and practices have created similar challenges for all libraries. This has compelled libraries to constantly redefine their value and functional characteristics, actively seek transformation, and develop corresponding strategic plans and actions. As a critical document with holistic, forward-looking, and guiding significance, strategic planning reflects the positioning and mission, vision and purpose, development direction, and action plans of the planning entity. Library international organizations, domestic and foreign library associations, and academic libraries all attach great importance to strategic planning, conducting forward-looking design and guidance for library development practices from a "top-level design" perspective.

This paper first analyzes the overall characteristics of strategic planning, statistically examining the word frequency of "transformation" and related terms such as "change," "rethinking," and "redefining" to identify library transformation trends. It then further analyzes these transformation trends from five dimensions—positioning, resources, services, space, and organizational management—to reveal the strategic directions, practical pathways, and implementation strategies of library transformation, providing references for the development of academic libraries in China.

2 Strategic Plans of Representative Library Organizations

2.1 Research Methods

Considering the representativeness and influence of library organizations and their strategic plans, this study selected three categories of library organizations' strategic plans and strategically significant documents from the past decade: policy documents, vision statements, trend reports, annual reports, and conference themes. These were assigned identification numbers. Content analysis was conducted using NVivo 11 software for word frequency queries, text searches, and reference point analysis of "transformation" and related terms.

The samples were obtained through websites and information platforms of well-known domestic and international libraries and organizations, as well as major professional journals and reports. The study focused on collecting texts from

academic libraries while also including new strategies and initiatives from public libraries and relevant research institutions. The three categories of samples include: (1) International library organizations: 24 samples from UNESCO and IFLA, numbered O1-O24; (2) Library associations and consortia: 33 samples from organizations including NMC, ALA, CARL, ALIA, LIBER, and the Chinese Library Society, numbered A1-A33; (3) Individual libraries and digital libraries: 27 samples from institutions including WDL, DPLA, TIB, NLM, the Library of Congress, the British Library, the National Library of China, and Peking University Library, numbered L1-L27.

2.2 Research Findings

Analysis reveals that "transformation" and related terms appear frequently in the samples, representing one of the key terms reflecting academic library development trends over the past decade. As shown in , libraries worldwide generally maintain a positive attitude toward transformation. Library transformation results from both external pressures and internal drivers. External pressures include socio-economic changes, technological development, and shifting user demands. Internal drivers include achieving sustainable development and gaining greater initiative and voice within society. However, transformation also involves uncertainties regarding efficiency, cost, effectiveness, and culture, along with risks in investment, operations, technology, policy, and values that require mitigation through environmental scanning, governance optimization, business innovation, and institutional development.

3 Multi-dimensional Analysis of Academic Library Transformation Pathways

Existing research on library transformation has yielded numerous results, with some scholars outlining transformation contours by extracting "key elements" [48-51]. Building on these studies and incorporating content from the selected strategic planning texts, this paper further categorizes academic library transformation pathways into five dimensions: positioning, resources, services, space, and organizational management. These dimensions are analyzed in [Figure 1: see original paper] to demonstrate transformation pathways, practices, and implementation strategies from a strategic planning perspective.

3.1 Positioning Transformation

Positioning addresses the fundamental philosophical question of "who we are" in academic library development. Whether rethinking, redefining, innovating, transforming, or changing, positioning must be clarified first.

3.1.1 From Service Provider to Research Process Supporter and Collaborator In traditional times, academic libraries held an advantageous position due to their extensive collections, primarily serving as service providers

following a model where researchers made requests and libraries responded. With the continuous development of open access and open science, libraries' "resource monopoly" advantage has been diluted. Researchers have reduced their reliance on library document delivery while increasing their demand for more precise research process support. Consequently, libraries now aim to provide comprehensive support throughout the entire scientific research lifecycle—from knowledge production and dissemination to preservation and services—while also participating in research processes as researchers themselves.

In terms of role positioning, the League of European Research Universities' report "Open Science and its Role in Universities: A Roadmap for Cultural Change" [52] states that libraries must actively participate in future academic publishing trends by developing roadmaps and establishing new publishing mechanisms. Further, ARL's "Strategic Thinking and Design Initiative" [53] proposes that "by 2033, research libraries will transform from being university knowledge service providers to partners in a rich and diverse research ecosystem… research libraries will more closely engage in supporting the entire lifecycle of knowledge discovery, use, and preservation."

Regarding role implementation, ARL collaborates with STEM field associations to develop research data evaluation and preservation guidelines, and with humanities associations to create digital management guidelines and scholar assessment frameworks [54]. CARL [55] lists leading, developing, and deploying research data management plans as one of its three key research directions, explicitly stating it will cultivate a research data management culture through the Portage NETWORK community.

3.1.2 From Professional Academic Supporter to Cultural and Educational Service Provider Academic libraries' core mission is supporting scientific research and technological innovation, making them professional supporters of academic research. To better demonstrate value and gain broader understanding and support, libraries increasingly extend services to communities, regions, and socio-economic and cultural education sectors. More academic libraries support public cultural education through exhibitions, online resource development, and community cultural activities.

In preserving cultural heritage, IFLA includes supporting cooperation between libraries and other cultural heritage institutions as a core strategic objective in all planning phases, promoting diverse forms of cultural heritage protection. ARL encourages member institutions to collect 19th and 20th-century cultural materials while emphasizing digital processing, preservation, and dissemination. Europeana [56], under its strategic plan, aggregates over 200 million records and 10 million digital objects from more than 1,500 European libraries, archives, museums, and art galleries, publishing them as linked data and planning to strengthen description, preservation, and dissemination of these resources [57]. Similarly, DPLA's 2019-2022 strategic plan states it will continue expanding its cultural heritage resource aggregation network, providing one-stop public access

to resources from libraries, archives, museums, and cultural institutions across the United States [58].

In strengthening social service functions, Macau University of Science and Technology Library opens its collections to Macau citizens and institutions, providing research resources for government, educational, and enterprise entities while offering lifelong learning spaces to enhance public competitiveness [59]. UC Berkeley Library strengthens its role as a public academic institution, making providing richer learning, research, and development opportunities for its region a strategic goal [60].

3.2 Resource Transformation

In an environment of serious service and resource homogenization, where resource description is limited to surface attributes and libraries have usage rights without preservation rights, building differentiated services based on distinctive resources becomes a transformation pathway. This involves expanding resource boundaries, conducting fine-grained processing and organization, and securing resource usage rights.

3.2.1 Distinctive Resource Content Development Distinctive resources possess scarcity, non-renewability, cultural or academic uniqueness, and systematic accumulation. They are core resources that libraries must preserve as cultural heritage and documentation institutions, and brand resources representing library professionalism and influence. Libraries continuously promote distinctive resource development with characteristics including: (1) rescuing and providing alternative services for scarce and non-renewable resources; (2) systematically collecting distinctive academic resources and expanding open service scope; (3) making digital processing and linked services for distinctive resources a core development strategy.

In cultural heritage preservation, IFLA, ARL, Europeana, and DPLA all emphasize cooperation, digital processing, and open access. The British Library plans to manage and preserve UK national publications while cooperating to develop digital content collections for non-print legal deposits. Hong Kong Chinese University Library develops digital collections to preserve precious special collections, promote resource sharing, and support teaching and research. Harvard, Cambridge, and other university libraries propose building distinctive collections, ensuring continuous development of international special collections, and strengthening indexing, discovery, and access. Most domestic university libraries maintain parallel digital and physical institutional repositories, comprehensively collecting works by faculty, students, and alumni [61].

3.2.2 Resource Boundary Expansion Under open science, publishing objects have expanded from final research results to all research elements. Libraries plan to expand resource scope and types, including: (1) scientific data; (2) software tools; (3) research process resources.

The U.S. National Library of Medicine enhances diversity and richness of medical collections, acquiring non-traditional resources like scientific data, computational models, and analysis tools while incorporating unpublished manuscripts, images, videos, audio, and web data. Sixty percent of ARL member libraries purchase digital scholarship software covering programming languages, data analysis, visualization, GIS, digital humanities, media processing, data management, text mining, and digital exhibitions. In 2017, the Max Planck Digital Library assumed 25% of the Max Planck Society's commercial software ordering, management, and service functions, including system, research, and engineering software, making unified software support a collection development priority.

3.2.3 Fine-grained Resource Processing and Organization To support knowledge-level discovery, understanding, communication, integration, and sharing, libraries plan knowledge-based processing at finer granularity to achieve structuring, semantic representation, and computability. Measures include: (1) structured description of full-text content; (2) transitioning from basic bibliographic data to authority files and from vocabularies to semantic knowledge graphs; (3) strengthening application of open linked entity relationship data.

The U.S. National Library of Medicine proposes exploring new article organization models—"executable articles" that decompose papers into interactive visualizations, decision models, executable models, and simulation processes, allowing users to conduct calculations and obtain new results. It also proposes interactive publications enabling flexible utilization of embedded media content [62]. The German National Library optimizes cataloging through automation, enhancing standardization and universality through authority files and promoting third-party use through linked data mechanisms. The British Library, Library of Congress, and others continue publishing bibliographic, authority, and knowledge organization data as linked data, establishing connections with external datasets like Wikipedia, DBpedia, and GeoNames.

3.2.4 Resource Deep Utilization Rights Acquisition and Management Under current network database service models, having only usage rights without preservation rights or only reading rights without mining rights cannot meet libraries' needs for reliable resource support and deep services, nor users' needs for large-scale computation and mining. Consequently, libraries increasingly prioritize acquiring long-term preservation rights, text and data mining rights, and other interests as important development strategies.

CARL makes permanent access and long-term preservation key components of its 2019-2022 strategic plan [63]. The League of European Research Universities has reformed its copyright framework, advocating for text and data mining rights under the principle that "the right to read is the right to mine" [64]. LIBER emphasizes copyright and legal affairs research, monitoring European legislation, and providing guidance to researchers.

3.3 Service Transformation

Service transformation represents the richest and most diverse transformation pathway. Coexistence and mutual reinforcement of traditional and emerging services expand library service scope, enabling libraries to extend from information intermediaries to both ends of the communication chain and support the entire lifecycle of teaching and research activities. Downstream expansion includes digital scholarship services, research data services, data analysis, and research evaluation services. Upstream extension includes publishing and publishing support services.

3.3.1 Digital Scholarship Services The rise of digital scholarship services results from deep integration of digital technology into research support. Library initiatives include: (1) developing and using digital research tools; (2) designing and building digital humanities projects; (3) supporting digitization, management, and display of academic materials; (4) conducting visualization and text mining of collections from digital research perspectives.

The Max Planck Digital Library has developed a series of tools and services supporting the entire research data lifecycle and collaborative research through research data management services and Digital Labs [65]. Eighty-four percent of ARL member libraries have digital humanities project plans, and 89% have enhanced hardware and software for digitization. Shanghai Library, Peking University Library, and Wuhan University Library have made digital humanities key development areas. Ninety-seven percent of ARL member libraries have digital scholarship centers, with nearly all conducting or planning digitization of special collections and providing public access.

3.3.2 Research Data Services OCLC's "Overview of Research Data Services" categorizes academic library research data services into three types: (1) educational services, including raising RDM awareness, encouraging skill development, and discovering RDM tools; (2) professional services, making decisions to support specific RDM issues; (3) custodial services, supporting the entire research data lifecycle through technical infrastructure. These correspond to: (1) research data literacy services; (2) research data planning services; (3) research data management services.

Data literacy extends concepts of media and information literacy, focusing on data handling capabilities. Libraries expand information literacy education to include data literacy, such as the University of Queensland's "Managing Your Research Data" workshops and the University of Oregon's data management courses. For research data planning, 46 of the top 50 U.S. university libraries provide scientific data planning services. Cornell University Library offers free access to funding agencies' data management policies, guidance on meeting requirements, and DMPTool assistance. For research data management, Brown University Library provides planning, analysis, sharing, and metadata creation

services. UC Berkeley's Research Data Management Program systematically integrates data management resources and storage platforms.

3.3.3 Data Analysis and Support Services Providing customized data analysis and support for specific needs and scenarios has become a new service form. Emory University Library employs statistical analysis experts to help researchers identify, acquire, clean, and format relevant data for analysis applications. The Max Planck Digital Library's data scientist team drives the RIo (Research Information Observatory) project, aggregating data from Web of Science, Scopus, patents, and other sources to create a research information data lake providing basic analytical services and personalized datasets.

3.3.4 Publishing and Publishing Support Services According to the Library Publishing Coalition's "Library Publishing Directory" (2017) [66], 118 institutional libraries across 11 countries conduct library publishing, offering 49 types of publishing-related services. Library publishing represents a new development direction, extending library business and creating new growth points through digital publishing, publishing consultation, copyright consultation, and open data copyright research.

ARL's "Academic Library Trends" reports (2010, 2012, 2018) state libraries should assist faculty and students with copyright issues in open publishing and online communication. LIBER includes "libraries as innovative academic communication platforms" in its strategic plan, promoting open access research and exploring libraries as open access publishers. On August 28, 2019, Educopia Institute and CDL announced Arcadia Foundation's $2.2 million grant to the "Next Generation Library Publishing" project to advance open-source publishing infrastructure [67].

3.4 Space Transformation

Space transformation is the most visible transformation pathway. Through space reconfiguration, libraries achieve functional reorganization. With mobile libraries and AI applications, library spaces transform from traditional collection and lending spaces to multi-dimensional spaces integrating learning, social interaction, experience, exhibition, and innovation.

3.4.1 Space Differentiation for Specialized Services Singapore's public university libraries, after surveying user needs, design spaces according to four needs: collaborative/social space, quiet study space, resource service support space, and campus culture aggregation space. Shanghai Jiao Tong University's "Nanyang Study" integrates traditional Chinese cultural elements with modern classroom equipment to create a new cultural education space. Many domestic university libraries feature parallel digital and physical institutional repositories with distinctive spatial designs showcasing faculty works and university history.

3.4.2 Service Integration for Digital Scholarship Spaces With digital scholarship development, libraries build digital scholarship centers, labs, and visualization studios. These spaces integrate different functions, resources, and services with flexible design as a key feature. The University of Illinois at Urbana-Champaign's "Scholarly Commons" provides technology-enhanced space for copyright, data, digital humanities, digitization, and academic communication consulting. The Claremont Colleges Library's Digital Humanities and Digital Knowledge Center serves as an incubator for innovative digital research, teaching, and learning.

3.4.3 Automated Facilities Supporting Space Transformation Advanced technologies and equipment are rapidly penetrating library construction and services. The Suzhou Second Library (2019) applies human-computer interaction and intelligent voice technologies, featuring automated storage and retrieval systems, RFID, indoor navigation robots, facial recognition, and infrared detection for human-like interactive services.

3.5 Organizational Management Transformation

Library positioning and functional transformation require corresponding organizational structure and mechanism adjustments. Overall, organizational management transformation shifts from process-oriented to service function-oriented models, reflected in department and position settings, librarian roles and capabilities, service mechanisms, and long-term mechanisms.

3.5.1 Organizational Structure: Reorganization Driven by New Services Sydney University Library's reorganization redefines business functions, restructuring traditional units into four major sectors: Access Services, Space Services, Academic Services, and Integrated Services. "Space Services" manages 11 branch libraries; "Access Services" includes traditional resources and publishing/data services; "Academic Services" comprises information literacy and subject services; "Integrated Services" handles internal management. TIB's similar four-part structure includes: (1) Development and Metadata; (2) Application Services and Reference; (3) Research and Development; (4) Administrative functions.

3.5.2 Librarian Roles and Capabilities: Strengthening Professional Skills Library transformation requires librarian transformation first. Strategic plans emphasize reshaping librarian roles and developing capabilities through: (1) strengthening existing position skills; (2) designing new positions. SLA's "Competencies for Information Professionals" (2016) divides capabilities into core and enabling competencies, with core competencies including six categories with 42 items covering information services, systems and technology, resources, retrieval and analysis, organization, and ethics. UC Berkeley Library emphasizes role transformation and diverse training opportunities.

Sydney University Library significantly reduced traditional resource acquisition staff while creating new positions for institutional repositories, digital services, academic publishing, research data management, and copyright—guiding librarians toward higher-level services.

3.5.3 Service and Work Mechanisms: Multi-party Collaboration and Dynamic Configuration Given that restructuring cannot immediately meet transformation needs, some libraries form composite teams to address changing user needs and full-lifecycle research support. These teams combine digital scholarship specialists, librarians from multiple backgrounds, subject experts, and specialists (e.g., intellectual property experts), collaborating with IT and instructional design staff. For example, the Chinese University of Hong Kong forms teams comprising research services, academic communication, digital scholarship, digitization, and digital technology librarians to conduct digital research projects.

Conclusion

Analysis of strategic plans and policy documents from representative libraries over the past decade shows that positioning considerations are paramount. To ensure future value in the information exchange system, libraries must: (1) in resources, emphasize distinctive collections, expand boundaries, conduct fine-grained processing for value-added services, and secure deep utilization rights; (2) in services, extend from partial to full-lifecycle research support, expanding downstream to digital scholarship, research data, analysis, and evaluation services, and upstream to publishing support; (3) in space, transform traditional collections into multi-dimensional learning, social, experiential, exhibition, and innovation spaces; (4) in organizational management, restructure around new services, guide librarian role transformation, and establish collaborative, dynamic mechanisms. Libraries must actively face continuous environmental change and thoughtfully pursue transformation.

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ZHAO Yan: Proposed the research topic and writing framework, co-authored and revised the paper.
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Research on the Transformation Path of Academic Library from the Perspective of Strategic Planning

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Abstract: [Purpose/significance] This paper aims to provide theoretical and practical reference for academic libraries in China to study and formulate the 14th Five-Year Plan, and to design the transformation and development paths. [Method/process] By selecting strategic planning and strategic documents, vision objectives, trend reports, annual reports in recent ten years from well-known domestic and foreign libraries and their organizations as samples, this paper analyzed the characteristics and development trend of "transformation" through statistics of the word frequency of "transformation" and related terms, and summarized the practice path and implementation strategy of transformation. [Result/conclusion] Libraries at home and abroad generally hold a positive attitude towards "transformation." The transformation path, specific practice and implementation strategy are mainly reflected in five aspects: positioning, collection development, services, space, organization and management.

Keywords: strategic planning; academic library; transformation

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