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Research on a Framework for Library Space Guidelines (Postprint)

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Abstract

[Purpose/Significance] Library space guidelines are reference documents first developed by the International Federation of Library Associations and Institutions (IFLA), the United States, and Australia to guide new library construction and space renovation projects. This study aims to explore a core element framework for developing library space guidelines suited to China's context. [Method/Process] Through literature and web-based research, we compiled an overview of domestic and international library space guidelines and conducted comparative analysis of the content and evolution of 20 representative guideline frameworks using case study and content analysis methods. [Results/Conclusion] The proposed core framework for China's library space guidelines should encompass physical space and element planning/design, virtual space design, exemplary library space design cases, and resource appendices. Development should draw on existing models, concepts, and methods from IFLA and developed countries, with library professional associations leading relevant stakeholders—including research teams, libraries, space contractors, and government agencies—in joint drafting and release. Guidelines should be periodically updated and supplemented to meet evolving external demands, ensuring human-centeredness, applicability, and continuity.

Full Text

Preamble

Research on the Framework of Library Space Guidelines

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Abstract: [Purpose/Significance] Library space guidelines are reference documents pioneered by IFLA, the United States, and Australia to guide the con-

struction of new libraries and space renovation projects. This article aims to explore and formulate a core element framework for library space guidelines that aligns with China's actual conditions. [Method/Process] Through literature and web-based research, we compiled an overview of library space guidelines at home and abroad, and conducted comparative analysis of the content and developmental changes in 20 representative space guideline frameworks using case study and content analysis methods. [Result/Conclusion] The research proposes that China's library space guidelines should include physical space and element planning design, virtual space design, excellent cases of library space design, and resource appendices. The formulation of China's library space guidelines should draw on the formulation models, concepts, and methods of existing space guidelines from IFLA and developed countries, with library industry associations leading the organization of research teams, libraries, space contractors, and government stakeholders to jointly draft and release the guidelines. These guidelines should be updated and supplemented within a certain timeframe to meet the evolving demands of the external environment and achieve human-centeredness, applicability, and continuity.

Keywords: library space guidelines; guideline framework; architectural planning; space design

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Library building space construction is a complex process involving multiple stakeholders. Librarians are not merely users of architectural space and participants in planning and design, but more importantly, key leaders who should possess professional expertise, discourse power, and decision-making authority. However, architectural space planning and design is not a task that librarians frequently engage in or understand well. Library space guidelines (hereinafter referred to as "space guidelines") can serve as normative documents to guide library staff in carrying out space services [1]. The target audience for space guidelines typically includes library practitioners, students and faculty in library and information science departments, policymakers and those involved in policy formulation, and non-governmental organizations [2]. Therefore, during the construction process, space guidelines can provide libraries with conceptual methods, data indicators, and excellent examples for architectural space planning and design, offering reliable, practical, and effective guidance for multi-party collaborative architectural design work.

Currently, IFLA and the American Library Association (ALA) have published numerous general or regional library space planning and design guidelines. Some IFLA departments are also conducting research on library space guidelines across various regions worldwide, intending to develop the latest international and industry-specific space guidelines to respond to and ensure the return and high-quality development of library physical spaces. However, it is necessary to consider the applicability in China of many foreign library space guideline standards formed under different discourse systems and cultural contexts, as well

as the significant differences in specific types of libraries, service group needs and behaviors, and the integrated development of urban culture and natural environment. Therefore, compiling China's library space guidelines based on existing foreign guidelines has become an important task to support relevant practical development.

At present, research on China's library guidelines mainly focuses on the interpretation and analysis of library children's service guidelines [3], youth service guidelines [4], elderly service guidelines [5], dyslexia population service guidelines [6], library copyright guidelines [7], resource construction guidelines [8], and big data security management guidelines [9]. Our research team previously focused on content analysis of IFLA and U.S. library space guidelines published before 2020 [10-11], lacking analysis of some updated and reference-worthy guidelines released in the past two years by the U.S. and other countries, as well as discussion of practical problems facing China's guideline compilation. One of the key issues urgently needing resolution in China's library space guideline compilation is the formulation of the guideline framework. Therefore, based on organizing and comparing the content and external characteristics of mature foreign space guidelines, this study proposes the core framework for China's library space guidelines, aiming to provide effective reference for China's library space guideline compilation work.

2 Overview of Library Space Guidelines at Home and Abroad

2.1 Foreign Library Space Guidelines

This study used search terms such as "Library building," "space planning," and "Design Guidelines" to conduct web searches for foreign library building space planning and design guidelines. Guidelines were screened based on whether their content focused on library building space or space elements, librarians, and users. Combined with the "Standards, Guidelines, and Policies" directories (such as ALA Guidelines and Standards) on websites of library associations like IFLA and ALA, comparisons and supplements were made, yielding 20 guideline documents as shown in Table 1 .

As shown in Table 1, the foreign library space guideline system is relatively complete, covering different types of libraries and different types of library spaces. Library new construction and renovation projects are arduous and complex tasks involving multiple parties, and tasks that most librarians do not frequently undertake. ALA's published recommendations on library new construction or renovation projects rarely set standards for the number of reading space seats and bookshelves, instead providing reference tools, resources, and suggestions. Only some space guidelines also serve as "general standards," such as Australia's "People Places: A Guide for Public Library Buildings in New South Wales," which released its first version in 2000 and was revised in 2005 and 2012 as space utilization concepts and practices continuously updated and

developed. In July 2019, it was approved as an Australian national standard, and the current version was formed in August 2020 based on the third edition.

2.2 Domestic Standards and Guidelines Related to Library Space

In May 2012, the International Organization for Standardization (ISO) released “Information and Documentation — Quality Conditions and Basic Statistics for Library Buildings — Space, Function and Design (ISO/TR 11219:2012),” which provides very detailed regulations on the architectural design of libraries (especially public and research libraries). Under the wave of new construction and renovation of various types of libraries in China, adopting internationally accepted standard guidelines for more scientific and orderly planning and design of library architectural space is of great significance for promoting the high-quality development of China’s library space construction cause.

China has not yet released specialized library space construction guidelines. Currently, relevant standards and guidelines are mostly formulated from an architectural engineering perspective, and those developed from a space design dimension are relatively broad and not detailed enough, as shown in Table 2 .

As shown in Table 2, China’s library building space guideline system began to emerge and gradually improve in 2020-2021, characterized by: (1) Space guidelines focusing on reading space guidelines, such as urban reading space guidelines and primary/secondary school reading space guidelines. These improve the standardization, humanistic design, and intelligent construction of reading spaces by providing content on architectural space environment, document resources and facility equipment construction, space design concepts, and space reading service system construction. (2) Formal industry standards and norms being drafted and released from the library industry perspective, specifying relevant space and technical facility indicators for newly built, rebuilt, or renovated libraries to help calculate required space and divide different technical building equipment data. This data is used not only for collection storage but also for providing adequate user space and venues needed for internal library operations. For example, “Information and Documentation — Quality Conditions and Basic Data for Library Buildings — Space, Function and Design” covers not only user space, collection space, and operational space requirements but also technical details on security systems, floor loads, transportation systems, acoustic conditions, lighting systems, wiring, and issues related to barrier-free architecture and sustainability [12].

3 Content Framework and Development of Foreign Library Space Guidelines

3.1 Content Framework of Library Space Guidelines

As user reading behavior patterns have changed, the application of large-scale intelligent intensive stacks for physical collection resources in space reconstruction

[20] and the systematic attributes, logical levels, and characteristic functional zoning planning for user needs and behaviors [21] have become mainstream. Physical space construction is the core content of space guidelines. Many guidelines do not even include virtual space in their content system, only elaborating on several issues, objectives, principles, methods, cases, and data indicators for library interior space design. Guidelines such as “Library Space: A Planning Resource for Librarians,” formulated by library associations and committees, create a set of formal best practice examples and tools for using public library building planning and design for librarians, administrators, space planners, and architects designing library spaces, applicable to libraries nationwide. They require users to gradually determine what to consider when designing new libraries for their communities, and include illustrations of different room types, adjacency, shelving, and seating that can be used in construction projects. “Library Space Planning: A PLA Guide” provides suggestions for libraries to design spaces based on user, time period, and usage priority.

The library space guidelines listed in Table 1 each have different characteristics. Some focus on theoretical research, policy overview and interpretation, and practical examples; others emphasize the applicability and scientific nature of guidelines, or use extensive illustrations, data, and scales for discussion. Among them, the use of highly recognizable and direct illustrations in space guidelines (see Figure 1 [Figure 1: see original paper]) for librarian reference is highly significant for reference.

3.1.1 Library Physical Space Zoning/Step-by-Step Planning and Design Table 3 analyzes seven relatively complete library space guidelines from four aspects: library physical area design, space element design, virtual space design, and space practice cases and appendices. The analysis reveals that space guideline texts focus more on the planning and design of library building physical areas, followed by planning methods, principles, and objectives for space elements. Only the “National Teen Space Guidelines” discuss virtual space design.

3.1.2 Library Space Element Planning Design and Virtual Space Design Space element design is the core content of foreign library space guideline texts. Different guidelines have slightly different descriptions and classifications of elements. Local library space guidelines, such as the “Fairfax County Library Design Manual,” list relatively complete elements for library design, including external standards, internal criteria, site organization, building orientation, site components (landscaping, lighting, off-street parking, trash and recycling bins), ground circulation/traffic (storage areas, locations, freight, public access and control), furniture (bicycle racks, flagpoles, seating, etc.), and signage (building identification, parking signs, information signs, etc.). Virtual space design is the part of virtual community construction and operation that complements physical space in library new construction projects, serving as a complement to physical space. Especially with the rapid development of various virtual real-

ity technologies, the integration between the two has been further promoted. However, except for the “National Teen Space Guidelines,” most library space guidelines have not included virtual space in their discussion.

3.1.3 Library Space Design Best Practice Cases and Appendices The analysis of excellent practice cases in library space guidelines provides intuitive reference for other libraries’ design through vivid design descriptions (including problem identification, creative planning, design concepts, and solution highlights), location maps, current environmental status maps, landscape environment effect drawings, node design effect drawings, and other graphics and text descriptions expressing design intentions. These cases can also verify and expand on the aforementioned guideline content. Therefore, most guidelines listed in Table 3 include different proportions, quantities, and years of excellent library space design cases in their texts for analysis and recommendations. For example, “Library Space: A Planning Resource for Librarians” provides case statistics on actual library space allocation (see Figure 2 [Figure 2: see original paper] and Figure 3 [Figure 3: see original paper]) that can offer suggestions for other libraries when allocating such spaces.

Based on comprehensive data from 11 library space cases, the guideline provides average and recommended data for space allocation: teens (5%), children (15%-30%), adults (15%-30%), and divides space by purpose into collection space (25%), seating space (20%), program activity space (15%), staff space (10%), and other areas (30%). This is important content not covered or specifically elaborated in other space guidelines, providing excellent data support for libraries on how to allocate reading, leisure, and work areas, or how to delineate space proportions based on user groups. A major innovation and breakthrough of Shanghai Library East Hall is its greatly expanded proportion of learning, communication, and creation spaces, with a total area of approximately 115,000 square meters, a stack area of about 2,500 square meters (only about 2% of the total), achieving nearly 80% of space open to readers [22].

Meanwhile, adding independent appendix information to texts is a trend in updating foreign library space guidelines. Among the seven guidelines listed in Table 3, six provide appendix information. Although their content varies, all serve as supplements and expanded reading for the guidelines. The 2014 revised “Library Space Planning Guide” also includes two worksheets outside the formal guideline text to assess library space needs and help initiate facility planning processes. The “Library Space: A Planning Resource for Librarians” published by the Massachusetts Board of Library Commissioners in November 2020 provides relatively complete appendix supplementary information. In the final appendix section “09 Resources-For Further Reading,” it offers book information and basic content overviews, five regional library space guidelines and planning text information (Regional Guidelines and Master Plans), numerous related research articles and websites, and additional guideline commentary information or question feedback URLs. As library building expert Lauren Stara

believes, “This space planning guide not only helps designers flexibly and efficiently design library buildings to meet the unique needs of communities, but also saves time and money when communities begin exploring options for new or rebuilt libraries” [25].

3.2 Development and Changes of Library Space Guidelines

The characteristics of development and changes in foreign library space guidelines include the gradual formation of guideline texts focusing on public/academic libraries, users (special groups), and librarians, in addition to universal library space guidelines.

- (1) Guidelines focusing on public/academic libraries. These guidelines focus on discussing space requirements around the positioning of a specific library and differences in service users. Sixty percent of the library space guidelines listed in Table 1 are oriented toward a specific library type, with the most targeting public libraries (7) and academic libraries second (5). Some foreign academic library space guidelines are included in facility standards and design guidelines formulated and promulgated by their universities, incorporating the library as a component of university learning spaces into the overall campus space planning guidelines or listing library building space planning requirements separately, as shown in Table 4 .
- (2) Guidelines focusing on users/librarians. Due to the special physical or psychological characteristics of special groups, they have more personalized requirements for library space equipment, facilities, and service design. Therefore, guidelines such as the American Library Association’s “National Teen Space Guidelines” are formulated to better design spaces oriented toward user needs. The ALA has incorporated content ensuring special groups’ reading into numerous library space planning and design guidelines, explicitly providing design suggestions on lighting, temperature, ventilation, furniture, equipment, and facilities needed to ensure and promote reading for special groups [23]. Simultaneously, the direct and key service target of space guidelines should be librarians who communicate and coordinate with library building and interior design parties. “Library Space: A Planning Resource for Librarians” clearly focuses on providing reference for librarians.

The formulation subjects and processes of foreign library space guidelines are generally determined by the nature and service objects of the guidelines. Library associations are the most important formulation subjects, followed by libraries themselves, with some guidelines formulated by space design guideline committees. These guideline developers and responsible parties continuously revise or issue new guideline documents as appropriate. The United States has a relatively complete library space guideline system with numerous revisions and the richest variety. Its development follows the principle of “originating from practice, forming theory, guiding practice, and timely revision.” The six key

guidelines listed in Figure 4 [Figure 4: see original paper] reflect the content development and changes of U.S. library space guidelines over the past 20 years. From the initial “Library Space Planning Guide” (2002 version) that treated basic library space design steps and zoning planning as the entire guideline content, subsequent guidelines began focusing on special populations, reflecting best practice cases, and subdividing service groups and space elements, with increasingly complete and rich content and increasingly improved and diverse stakeholders (see Figure 4). The development and changes from “old” to “new” library space guidelines have basically formed the U.S. library space guideline content system and formulation model, providing reference for other countries and regions.

4 Core Framework for Formulating China’s Library Space Guidelines

After decades of evolution and development, foreign library space guidelines have gradually formed a relatively clear path for formulation and improvement. Formulating China’s library space planning and design guidelines based on existing models should fully draw on their formulation concepts and methods. According to China’s existing policies and legal regulations, with library societies/associations leading relevant stakeholders (libraries, research teams, space design parties and contractors, higher-level management departments and government) as joint guideline formulation subjects, and updating and supplementing the guidelines within a certain timeframe (see Figure 5 [Figure 5: see original paper]). This also has certain feasibility in China. For example, the “Guidelines for the Prevention and Control of Insects and Mold in Library Ancient Books (WH/T88-2020)” implemented in April 2020 was drafted by the China Society for the Preservation of Ancient Books, Sun Yat-sen Library of Guangdong Province (Guangdong Ancient Books Protection Center), and Zhuhai Ligao Si Development Co., Ltd. On this basis, further proposing the core framework elements for China’s library space guidelines is an important step in compiling them.

Combining foreign guidelines, the core framework for formulating China’s “Library Space Guidelines” can include but is not limited to: physical space step-by-step planning and design, physical space element planning and design, virtual space design, excellent cases of library space design, and resource appendices (see Figure 6 [Figure 6: see original paper]). Of course, the framework of library space guidelines should not be limited to these aspects alone; it also needs to incorporate deep-level concepts and fundamental methods and ideas throughout the content. For example, how to understand the reasons and directions for library space transformation, space as a reader service platform and the need for deep-level reader services, and space design oriented toward and reflecting reader reading atmosphere and other forward-looking content.

4.1 Library Physical Space and Element Design

Many environmental elements of library physical space are important factors that directly affect readers' reading willingness and effectiveness, including lighting, temperature, sound, equipment and facilities, location, wireless networks, reading equipment, reading activities, collections, and librarian services. It is necessary to include these element designs in the guidelines and discuss them in detail. At the same time, library "architectural space" and "functional positioning" should be unified. Providing reading venues and services for the public is the fundamental social and cultural service function and basic duty of libraries. Library architectural space should be planned and designed around user reading, with the fundamental goal of meeting users' reading needs as much as possible and stimulating users' reading interest and willingness. Taking library space lighting as an example, natural light should be adopted, introduced, and controlled as much as possible, with full consideration of reasonable levels of indoor lighting performance attributes. Any type of library should adopt necessary measures and effective strategies for lighting design in the space design process, including strengthening climate-adaptive window-to-wall area ratio design and optimized daylighting window design in reading spaces and other building interiors, using high-performance glass, skylights, daylight orientation devices, daylight-responsive electronic lighting controls and shading devices, and daylight-optimized furniture design, space planning, and space surface treatment and other interior designs.

4.2 Library Virtual Space Design

Library virtual space is a library service space that comprehensively utilizes computer network technology, digital information technology, and other technical means to integrate digital resource acquisition and utilization, knowledge sharing, online reading, and exchange learning services. In practice, there are already examples such as the virtual space of the University of Manitoba Library in Canada and the "Xuehu" virtual space system of the Communication University of China Library [24]. As a carrier of smart library construction, virtual space and library physical space promote each other and become an innovative development direction for library space construction. China's library space guidelines should include this part as a supplement to architectural space design content, focusing on discussing library virtual space construction methods, paths, and referential practical approaches, and managing and operating the distribution of network space collection resources, social media and virtual communities, online courses and related resource databases, project databases, and case databases through professional space service positions.

4.3 Excellent Cases of Library Space Design

In the past decade, China's public library industry has developed rapidly, with many aspects of architectural space design and services already at the forefront of the world, and its international influence continues to grow. In 2021, Ningbo

Library was nominated for the IFLA Public Library of the Year Award, Pingshan Library won the IFLA Green Library Award, Haikou Cloud Cave Library won the Architizer A+ Award, and Wenzhou Library's Comic Wenzhou project won the IFLA International Marketing Award. These excellent cases can provide experience for other libraries' space construction in China and should become an important part of China's library space guidelines.

The selection basis and quantity of practice cases in space guidelines can be current influential large, medium, and small library new construction cases in China, cases with outstanding features in certain aspects, or cases selected through relevant selection activities such as architectural space awards and expert recommendations. Currently, relatively representative library architectural space awards are shown in Table 5 .

4.4 Resource Appendices

As the final part of space guidelines, appendix information mainly includes legal policies and related guideline standards, bibliographies, and online links to practical projects, serving as important supplements to the main text. Appendix information typically includes disability acts formulated by different institutions and organizations that affect library space design, public building service facility standards, and links to space designs that have won industry association-issued library design awards. Some foreign space guidelines use appendices as supplementary explanations to main text content, such as the "Library Space Guidelines" that include specific worksheets as appendices. Libraries and other new types of public cultural spaces are undergoing profound changes from place to scene, from facility to service, and from intelligence to wisdom. This also requires systematic and highly applicable space guidelines and sufficient appendix reference resources to meet the space construction needs of libraries at various regions, levels, and types. The "Library Space: A Planning Resource for Librarians" published by the Massachusetts Board of Library Commissioners (MBLC) in November 2020 provides relatively complete appendix supplementary information. In the final appendix section "09 Resources-For Further Reading," it offers book information and basic content overviews, five regional library space guidelines and planning text information, numerous related research articles and websites, and additional guideline commentary information or question feedback URLs.

5 Research Discussion

Space guidelines provide specific and actionable guidance and suggestions for library space construction and are an important link in promoting the high-quality development of the library space construction cause. Based on the guideline framework proposed in this article, several key issues need to be considered: (1) Coordinating the contradiction between enhancing the applicability scope of guidelines and improving their specificity. The research foundation of this article is analysis of foreign guidelines. How to promote the local adaptability in

China of existing foreign space guideline content and its universality as international guidelines, as well as referencing existing international, national, and industry standards to formulate library space guidelines applicable to libraries at different levels, provinces, and regions, requires further in-depth research and improvement. (2) Enhancing the summarization of China's successful practical experience, innovating and breaking through the limitations and deficiencies of existing guidelines in content, focusing on forward-looking and actionable space design content, aligning with the development trends of smart era library physical space design, function, layout, and technology, and seeking solutions for rapid library space transformation and full benefit realization [26]. (3) Focusing on user demand behavior and space technology empowerment to promote smart library space construction, space scene settings for reading promotion, and different types of library space scenario designs oriented toward literacy education. On the basis of enhancing library architectural space, promoting user reading, and attracting users to enter and use the space, space guidelines need to pay more attention to new issues such as the technicality, inclusiveness, and accessibility of library architectural space driven by smart services. (4) Physical library space construction is the application of guidelines on library building space entities, and guidelines are the concretization and summarization of construction experience. China's public libraries and various types of branch libraries and themed libraries are becoming key components of new types of public cultural spaces. At the same time, due to continuous higher education reform changing the functions of university libraries, the individualization of university libraries makes guidelines for both international and domestic university libraries very challenging. Researching and releasing China's library space guidelines as soon as possible is a necessary and urgent practical issue.

In summary, this study proposes the core element framework, key issues to be resolved, and formulation paths for China's space guidelines by analyzing the content and external characteristics of foreign library space guidelines, hoping to accelerate the compilation process of China's first library space guidelines. This will provide support for telling China's library space practice stories and construction experience well, and also provide theoretical guidance for further improvement of library space policies, thereby promoting the high-quality development of libraries, and the standardization and standardization of space optimization, management, and evaluation work.

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Keywords: library space guidelines; guideline framework; architectural planning; space design

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

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