Library Architectural Spaces for Reading Promotion: Best Practices from North American Library Design (Postprint)

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Abstract

[Purpose/Significance] Libraries are important institutions for promoting reading. Investigating and researching typical cases of architectural space planning and design for reading promotion in North American libraries provides reference and inspiration for the development and practice of new library building spaces in China. [Method/Process] Through deductive and inductive methods, the concept of "library architectural space promoting reading" is proposed, which serves as the research perspective and content. Using representative multiple case analysis, this study empirically analyzes the content and characteristics of architectural space planning and design for reading promotion in 11 North American libraries that won the "ALA/IIDA Library Interior Design Award" and "AIA/ALA Library Building Award" in 2020. [Results/Conclusion] The space design of North American libraries for reading promotion fully focuses on users' reading needs and behavioral differences, outstanding historical elements, and natural environments, achieving the support and motivational role of architectural space on users' reading behaviors. Implications for library architectural space design in China: reconstruct the cognitive value of library reading promotion spaces; leverage the supportive role of space in information literacy education; integrate the development of reading spaces with geographical and humanistic environments; build library space talent teams and data resource databases.

Full Text

Research on Library Architectural Space Promoting Reading: A Case Study of Best Practices in North American Library Design

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Abstract

[**Purpose/Significance**] Libraries are vital institutions for promoting reading. This study investigates and analyzes exemplary cases of architectural space planning and design in North American libraries that effectively promote reading, providing references for the development of new library buildings in China. [**Method/Process**] Through deductive and inductive reasoning, the study proposes the concept of "architectural space promoting reading" as its research perspective and content. Using representative multi-case analysis, it empirically examines the spatial planning and design features of 11 North American libraries that won the 2020 "ALA/IIDA Library Interior Design Awards" and "AIA/ALA Library Building Awards." [**Results/Conclusion**] The spatial design of North American libraries to promote reading fully attends to users' diverse reading needs and behaviors, incorporates historical elements, and integrates natural environments to support and motivate reading behaviors. Implications for China's library architectural design include: reconstructing the value perception of library reading promotion spaces; leveraging spatial design to support information literacy education; integrating reading spaces with geographical and humanistic environments; and building professional teams and data resource libraries for library spaces.

Keywords: reading promotion; architectural planning; space design; North America; library

Introduction

Libraries promoting reading represent a core concept in national strategies for universal reading development, planning of new public cultural spaces, and informal learning spaces, and have long been a hot topic in international library science research. The International Federation of Library Associations and Institutions (IFLA) identified open, friendly, and orderly spatial facilities as prerequisites for promoting reading in its 2011 *Guidelines for Library Professionals on Promoting Literacy and Reading* [1]. The 2019 *IFLA Toolkit for Developing National Literacy and Reading Strategies* further clarified that library spaces should motivate users to read [2]. At the policy level, China is actively formulating planning documents such as the *National Reading Development Plan (2021-2025)* during the 14th Five-Year Plan period. On March 8, 2021, the Min-

istry of Culture and Tourism and other ministries jointly issued the *Opinions on Promoting High-Quality Development of Public Cultural Services*, explicitly calling for creative transformation of public library functional layouts [3] and expansion of urban and rural public cultural spaces.

Library architectural space has a significant impact on readers' reading willingness and behavior, particularly through spatial factors that directly affect user perception, including lighting, color, distance, temperature, sound, interior decoration, and visual signage. The Illuminating Engineering Society of North America (IES) detailed in a technical memorandum that retinal light radiation signals not only influence how humans perceive the world but also directly or indirectly regulate physiology and behavior, including increasing cerebral alertness, enhancing psychomotor abilities, raising heart rate and body temperature, activating pupillary constriction, and even stimulating circadian gene expression [4]. Color-in-context theory (CIC) posits that spatial color perception can influence behavior, meaning individuals' emotional and cognitive behaviors can be evoked and activated by the colors of their environment. Thus, library space environments represent an important dimension that, through a "push-pull" interaction with readers' intrinsic reading motivations, jointly stimulates and promotes reading willingness, effectiveness, and duration, giving rise to the research topic of "architectural space promoting reading."

Architectural space falls within the applied research domain of libraries, with its research themes evolving primarily based on information technology development and user-centered concepts. Since R. Oldenburg first proposed the third place concept in 1989 and scholars like Wu Jianzhong introduced the information commons concept in 2005 [5], the development and utilization of spatial resources have gradually become a key research focus in the library field, forming discussions on various spatial forms such as knowledge space [6-7], learning space [8-9], makerspace [10-11], reading promotion space [12-13], smart space [14-15], and digital humanities space [16]. Professor Wang Zizhou notes that library space research is becoming an important field, with newly built libraries and public reading spaces constructed with social participation across China urgently needing theoretical guidance on spatial design and layout [17]. Current research on library reading spaces in China focuses on case studies, covering cases such as Shenzhen Nan Study Room [18], Beijing One-Way Street Library [19], Nanjing Minor Reading Space [20], Shenyang Normal University Library [21], and Beijing Normal University Library [22], as well as basic issues [23], service targets [24], standard guidelines [25], and empirical research [26] on space promoting reading. International research primarily focuses on spatial factors affecting reading, including facilities and equipment, noise control, lighting and temperature, color and decoration, and equipment and services [27-31]. Existing studies have not systematically examined and summarized typical cases of North American library design. Against this backdrop, this article takes "architectural space promoting reading" as its research content, analyzing award-winning library architectural and spatial design practices in the United States and Canada to provide references for promoting high-quality development of library reading

spaces in China.

2. Selection of Research Cases

To understand and analyze representative cases of library space promoting reading in North America, this study selected 11 North American libraries that won the 2020 "ALA/IIDA Library Interior Design Awards" and "AIA/ALA Library Building Awards" as sample cases. The award-winning cases' spatial design experiences and successful practices can be quickly referenced by peers through award publicity.

2.1 ALA/IIDA Library Interior Design Awards The ALA/IIDA Library Interior Design Awards are jointly organized by the International Interior Design Association (IIDA) and the American Library Association (ALA). A jury composed of librarians and interior design professionals selects winners based on criteria including aesthetic design, creativity, functionality, design solutions to project challenges, and integration of design elements, aiming to recognize excellence in library interior design and publicize innovative design concepts embodied in library spatial design examples [32]. Winning cases receive special coverage from ALA, publication in magazines, and logo promotion [33].

2.2 AIA/ALA Library Building Awards The AIA/ALA Library Building Awards are jointly established by the American Institute of Architects (AIA) and the American Library Association. As an authoritative library architecture award in North America and globally, it recognizes exemplary library architectural design concepts and methods, honoring the best achievements in library architecture and design [34]. Academic libraries, school libraries, public libraries, national libraries, federal/presidential libraries, institutional libraries, and corporate libraries providing public services are eligible, with buildings located in the United States or abroad.

In 2020, 12 libraries won these two internationally recognized spatial awards, with 11 from North America (91%). These included eight public libraries: (Re)imagining The Community Library, The Springdale Library, The Center for Fiction, Scoville Memorial Library, Billie Jean King Main Library, Capilano Library, Independence Library and Apartments, and Northtown Branch Library and Apartments; and three academic and school libraries: Ethical Culture Fieldston School Tate Library, Temple University Charles Library, and Milby High School Library Renovation (Houston ISD).

3. ALA/IIDA Library Interior Design Award Cases

L. Christopher proposed that North American library users' daily information behavior increasingly manifests through instant information access via Google searches rather than relying on local library resources. The focus of library design should shift from storing and protecting valuable resources (books) to

guaranteeing and promoting public spaces for learning, sharing, and reading experiences [35]. Consequently, North American libraries engage internationally renowned design firms to achieve the goal of architectural space promoting reading from both interior and architectural planning dimensions.

3.1 Library Interior Space Planning Aligned with Reading Behavior Characteristics Modern libraries have become gathering places for users' leisure, reading, and learning, requiring spaces that not only provide suitable venues for reading services but also subtly stimulate and promote reading behavior. The award-winning libraries' interior space planning fully reflects alignment with readers' reading behavior characteristics, as shown in Table 1 .

Table 1 2020 ALA/IIDA Library Interior Design Award-Winning Libraries' Spatial Design

Library Name	Interior Space Planning and Layout
(Re)imagining The Community Library [36] (Small public library $ $30,000 sq ft, Ketchum, Idaho, USA)	Exhibition area at entrance: Regular exhibitions at the entrance, plus five special collection displays on Hemingway biographies and criticism, railroad history, Native American and pre-Columbian history, stimulating readers to use public computers, Wi-Fi, and iPads for reading
Springdale Library & Komagata Maru Park [37] (Small public library $ $30,000 sq ft, Brampton, Ontario, Canada)	Controlled natural lighting—"Springdale Eye": Perforated panels reduce noise while softening light, creating awe and wonder, plus unusual sense of shelter and integration. Visual metaphor design: Ceramic frit daylight-responsive stripe patterns change color between white and dark gray with sun angles, expanding and contracting. Thermally protected stainless steel columns add visual elements abstractly suggesting two metaphors: turning pages in books and tree branches in forests
Ethical Culture Fieldston School Tate Library [38] (Small academic library $ $30,000 sq ft, New York, USA)	Optimized reading area division: Transformed quiet study spaces into vibrant communication venues, creating spaces for all reading, learning, and communication activities, including business teleconference corners, music and art corners, and tower guest rooms/glass meeting rooms. Added entrance to new children's garden, integrating stacks to form youth reading areas

Library Name	Interior Space Planning and Layout
Temple University Charles Library [39] (Large academic library >30,000 sq ft, Philadelphia, PA, USA)	Wayfinding and lighting design: Users in the domed atrium can see every corner, providing guidance while making them visual centers of activities. Circular "light eye" in cedar-clad dome allows external light to support reading, wayfinding, and navigation. Added spatial forms: Service desk and café on first floor; student tutoring center, digital scholarship and tech experience Loretta C. Duckworth studio, 40+ reservable meeting and study rooms, speech practice rooms, student success center, teaching rooms, VR studio, and Scholars Studio makerspace on second and third floors. Laptop and charging centers on every floor support mobile needs
Scoville Memorial Library [40] (Small public library $ $30,000 sq ft, Salisbury, CT, USA)	Innovative collection display: Physical books and magazines are carefully selected and arranged to attract readers. Maximizes display space showing book covers rather than spine-only compressed stacking to encourage picking up books for reading

3.1.1 Adapting Reading Space Zoning to Dynamic Reading Formats
(1) Adding "Browsing Reading Spaces." Library exhibition spaces enable readers to conveniently and intuitively obtain needed knowledge and information, representing typical "browsing reading spaces." Research by K. Leousis et al. [41], Z. Renić et al. [42], and Sugihara [43] suggests library exhibitions help build closer connections with the public, enhance scientific literacy, and attract more readers. Award-winning libraries' exhibition spaces are mostly located near entrances, regularly hosting exhibitions reflecting local cultural characteristics. For example, (Re)imagining The Community Library's entrance exhibition area regularly holds five special collection displays on Hemingway biographies and criticism, railroad history, Native American and pre-Columbian history, Idaho history bestsellers, and Lister astrology and paranormal collections, subtly promoting browsing reading.

(2) Creating "Experiential Reading Spaces." Data shows that "Millennials" are the highest proportion of public library users in the U.S., with over 53% of surveyed 18-35-year-olds visiting public libraries [44]. Younger generations tend to collaborate and share information across different projects. Therefore, libraries have created many new spaces for public information processing: makerspaces, cafés, meeting and study rooms, speech practice rooms, student success centers, and teaching rooms. Additionally, spaces like Temple University's Loretta C. Duckworth studio for digital scholarship and immersive tech experiences, and the Scholars Studio VR and makerspace, represent important "experiential reading spaces."

(3) Constructing "Immersive Reading Spaces." North American libraries enhance acoustic zoning and treatment to strengthen sound environment control. Canadian libraries divide spaces into five categories based on noise control: noisy zones, low-noise communication zones, quiet self-study zones, silent study zones, and academic research rooms [45]. Some areas explicitly prohibit family activities like birthday parties, holiday celebrations, and family gatherings [46]. The "Springdale Eye" in Table 1 provides softer reading light while reducing noise levels. Scoville Memorial Library designs business teleconference corners, music and art corners, and glass meeting rooms to isolate noise interference.

3.1.2 Controlled Natural Lighting for Optimal Reading Environments Readers' cognitive evaluation, emotional experience, and attitudes toward library spaces are determined by spatial scene perception and value judgment, with lighting being one of the most important factors affecting reading space perception. "In reading rooms, the most important issue is lighting" [47]. Spatial lighting is not merely an energy-saving issue but a crucial environmental component—excessive or insufficient light is detrimental to reading. Therefore, North American libraries prioritize visual lighting design as the most important dimension in interior spaces for reading promotion. All 11 sample libraries emphasize introducing natural light through atriums to create reading-motivating environments, striving to maximize daylight while reducing glare and solar radiation, providing open views and soft lighting for reading. Large floor-to-ceiling windows and skylights enhance natural light entry, with glass curtain walls and additional windows maximizing reading positions. The "Springdale Eye" and "circular light eye" are typical examples of such lighting environment design.

3.1.3 Open Public Reading Spaces Connecting to External Communities Shamichael Hallman called for libraries, as public assets, to have unique opportunities to bridge socioeconomic divides and rebuild trust, which requires welcoming everyone into the space [48]. Therefore, North American libraries promoting reading attach great importance to equitable openness and equal access for all populations. Temple University's Charles Library in Philadelphia is defined as a modern public square and urban reading gathering place for all Philadelphians. The building uses a grand wooden arched entrance with towering arches extending into the building, forming a striking three-story domed atrium that signals welcome to local residents. These experiences and successful practices provide valuable insights for China's new library construction, optimization, and renovation.

3.2 Library Architectural Space Planning Reflecting Humanistic and Natural Environmental Characteristics Library reading spaces primarily serve local residents or specific user groups, who constitute the core service population and target audience for planning and design. Award-winning libraries have made extensive efforts to align with target readers' spatial usage habits by integrating local natural and humanistic environmental characteristics, as

shown in Table 2 .

Table 2 Spatial Design Features Reflecting Humanistic and Natural Environment Characteristics in Sample Libraries

Category	Library Name	Design Features
Meeting User Needs	Temple University Charles Library (USA)	Clearly oriented toward students and public. As a public university in Philadelphia, Charles Library serves not only college students but also functions as a modern public square and urban reading gathering place. Uses grand wooden arched entrance referencing surrounding campus materials, creating a striking three-story domed atrium [49]
	Springdale Library & Komagata Maru Park (Canada)	Meets local resident characteristics. The Springdale area has over 100,000 residents, approximately half being immigrants primarily from South Asia [50]. Design features include a cylindrical service desk centrally located to provide advice for students, new immigrants, or job seekers
Historical Building Inheritance	Ethical Culture Fieldston School Tate Library (USA)	Preserves original design elements. Tate Library transformed a 1970s iconic campus building into a learning commons, maintaining the integrity of the original stone and concrete structure, adding bird-friendly glass, new windows, and entrance facing the campus quadrangle [51]

Category	Library Name	Design Features
	Scoville Memorial Library (USA)	Excellent historic renovation. Features suspended chandeliers above dropped ceilings, original fireplaces wrapped in blackened steel marking connections to children's library, garden, and parking. Reception desk, stairs, railings, porches, and furniture use appropriate decorative materials with sculptural elements
Natural Landscape and Vegetation	Springdale Library & Komagata Maru Park (Canada)	Creates landscape fitting location. Site composed of commercial plaza to east, road to south, and natural ravines to north and west. Library located near street for easy access while preserving natural topography [52]. Fluid ceiling shapes, sloping floors, and green roofs create spatial undulation [53]
	Temple University Charles Library (USA)	Selects landscape plants and garden vegetation. Roof garden uses ornamental grasses and herbs as base landscape, supplemented with selected flowering plants, enabling reading room users to see blooming flowers year-round. The new roof garden features 15 different plant species, providing natural scenery

As Table 1 shows, reflecting external environmental characteristics of the community in library architectural space requires first understanding local geography, history, culture, and service population characteristics and needs. Second, it involves introducing natural and artificial landscape designs, selecting local tree species and vegetation suited to the climate. Finally, it requires protecting original historical elements. For example, Milby High School Library, winner in

the historic renovation category, inherited its deep history through preservation and reuse of original materials, addition of highly visible glass walls, and integration of smart technology blending past and future [54], earning local historical preservation recognition.

4. "AIA/ALA Library Building Award" Cases

Library reading promotion space planning and design are primarily based on user perception and evaluation. The four libraries winning the "AIA/ALA Library Building Award" demonstrate notable work in reading area planning and reading perception environment design, as shown in Table 3 .

Table 3 Reading Area Planning and Reading Perception Environment Design in Award-Winning Libraries

Library	Reading Area Planning and Reading Perception Environment Design
Billie Jean King Main Library (Downtown Long Beach, CA, USA)	Features group and individual study areas, tech-driven makerspace, teen space, graphic studio, film studio, family learning center, children's reading room, veterans resource center, special collections room, multi-purpose community room (fee-based), and adaptive technology center. Central hall brings abundant natural light throughout, with aluminum and glass curtain walls featuring cornice structures that reduce glare and solar radiation while ensuring ample natural light for soft reading illumination. Exposed fir and ash boards separate areas, while white bookshelves, soft yellow lighting, and various colored desks/chairs create warm visual stimulation [55-56]
Capilano Library (Edmonton, Canada)	Interior divided into three parallel zones: staff space, collections, and community space. Community space features expanded, naturally lit study rooms, rest areas facing nearby canyon views, and well-equipped makerspace. Roof planes optimized for daylight, acoustics, and structure; numerous skylights provide ample light and cast beautiful shadow patterns indoors [57]

Library	Reading Area Planning and Reading Perception Environment Design
Independence Library and Apartments (Illinois, USA)	Divided into all-ages reading and learning areas, plus large multi-purpose rooms for lectures and community gatherings. Children's area features murals of the city's famous writers by street artists [58-59]. Large floor-to-ceiling windows on both sides and skylights allow abundant sunlight, supplemented by cool white lighting for bright interiors. Ground floor divided by carpet colors and U-shaped bookshelves; second floor main reading area features staggered white bookshelves, book walls, learning labs, community rooms, and shared halls. Community rooms regularly host resident artists. Colorful murals in halls create visual stimulation; perforated roof forms outdoor deck accessible to wheelchairs. Apartments face east to maximize corridor daylight and create roof garden enjoyed by nearby park and quiet residential area [60-61]
Northtown Branch Library and Apartments (Illinois, USA)	Weaves library and apartments into unified system enabling residents to conveniently use library space for reading. Bookshelf heights carefully designed to place books within readers' sight lines. Vibrant magenta, orange, and yellow colors in external spaces and corridors evoke vitality, while book collection areas use white shelves and light walls/floors to highlight brightly colored print materials, drawing reader interest to pick up books and read, achieving the goal of architectural space promoting reading

4.1 Expanding Boundaries of Library Space Reading Services The Billie Jean King Main Library in California, located at the intersection of two major municipal and cultural corridors with proximity to Los Angeles Metro, enhances accessibility and convenience of its reading space [62]. The library's exterior features cantilevered glass curtain walls fully open to Lincoln Park and city streets, creating flexible, multi-purpose interior spaces. Designed by SOM, the library receives over 1,000 visitors daily, with signage guiding users to various spaces (teen area, art collection area, silent reading zone), providing ample choice and autonomous control. Capilano Library not only creates various reading-motivating spatial scenes inside but also greatly expands physical service boundaries through its "Literacy Van" program, creating "pop-up library spaces" in urban facilities, parks, recreation centers, schools, childcare facilities, hospitals, and organizations to help users obtain library cards, return books, play with robots, and participate in reading activities.

4.2 Creating Apartment Reading Spaces Combining "Living" and "Reading" Independence Library and Apartments and Northtown Branch Library and Apartments demonstrate a new spatial model: library branch +

apartment housing, integrating street-level libraries with upper-level affordable housing and senior apartments. This model weaves the two functions into a unified system, making it more convenient for apartment residents to use library space for reading. The interior decoration and design feature carefully calculated bookshelf heights placing books within readers' sight lines. Vibrant colors in external spaces evoke vitality, while collection areas use white shelves and light surfaces to highlight brightly colored reading materials, attracting readers to pick up books and read.

5. Implications for Library Architectural Space Design in China

5.1 Reconstructing Value Perception of Library Reading Promotion Spaces From book repositories to public spaces for the masses, evolving architectural spaces are increasingly recognized as equally important development elements alongside resources and services. Reconstructing the value perception system for library reading promotion spaces and defining their "logical boundaries" and "existential forms" represents an important objective in examining North American library design practices. This study argues that aesthetic presentation, comfort enhancement, and partial service entertainment should not affect libraries' fundamental value as public cultural facilities—as lifelong schools for universal literacy education and open spaces for universal reading promotion. As scholars have noted: "If libraries only focus on providing 'cultural life' for leisure and recreation, they cannot be ideal learning exchange spaces, knowledge living spaces, or information commons" [63].

New library construction and renovation represent critical opportunities for redefining spatial value and service innovation. North American libraries' "browsing," "experiential," and "immersive" reading space designs can support broader user groups and ubiquitous reading behaviors. In fact, many new library spaces and services in China's developed eastern regions have begun innovatively applying artificial intelligence to empower smart reading services, expanding the service depth and capabilities of architectural space in promoting reading. For example, developing AR facial recognition glasses for librarians to identify readers' information, borrowing history, and activity reservations, helping librarians quickly and accurately understand readers and their preferences [64], thereby facilitating one-on-one precise services. These technologies not only better serve librarians' capacity development but also apply spatial technology development to the great cause of "promoting reading."

5.2 Leveraging Space to Support Information Literacy Education Universal reading promotion and information literacy education are two major fields and development directions for library science research to fulfill its mission [65]. As important domains of library work, reading and literacy have a mutually reinforcing relationship: basic literacy ensures fundamental reading ability, while advanced literacy guides reading in all-media environments regarding content, methods, and approaches [1]. As Professor Fan Bingsi stated,

"The essential purpose and fundamental significance of reading promotion is to enhance literacy" [66]. North American library reading promotion space design clearly defines and expands libraries' important role in integrating universal reading and literacy education by providing open, safe, equal, flexible, and attractive public spaces.

Libraries have spatial advantages for undertaking public information literacy education and have long been regarded as the most important information literacy education institutions [67]. Leveraging space to support information literacy education is also an important way to fulfill their social education functions. Since libraries transitioned from bibliographic instruction to information literacy education, three paradigms have evolved: generic skills, situated capabilities, and embedded practice [68], all emphasizing the importance of space to varying degrees. North American libraries have formed distinctive outreach and technology-enhanced literacy education spaces, such as Charles Library's Loretta C. Duckworth studio for digital scholarship and immersive tech experiences, free reservable meeting and study rooms, speech practice rooms, VR studios, and Scholars Studio makerspace, greatly supporting student information literacy education and achieving UNESCO's goals for media and information literacy development in its *Media and Information Literacy: Policy and Strategy Guidelines* [69].

5.3 Integrated Development of Reading Spaces with Geographic and Humanistic Environments Library architectural spaces embody national spirit and regional history and culture. How to achieve organic integration with surrounding geography and humanistic environments to meet served residents' or specific user groups' reading preferences and psychological characteristics is a key focus for library space design to promote reading. Drawing from North American practices in meeting user needs and cognition, historic building inheritance and protection, and natural landscape and vegetation utilization, we can gain insights: First, emphasize diverse spatial display of collections and reading books, such as adding motivational reading slogans on white walls and bookshelves, placing recommended reading guides, booklists, or specific collection copies beside sofas and desks. Second, treat the entire building as a living organism, strengthening coordination, integration, and uniqueness with surrounding parks, mountains, rivers, lakes, roads, and buildings. For example, Capilano Library positions itself as a link between residential areas and nature, as urbanization in 1960s Canada cut off the ravine from the North Saskatchewan River, leaving remnants of the riparian ecosystem [47].

Thus, based on North American practices, this study proposes that library reading promotion space scenes, as organic components of urban public reading space, must not only align with readers' reading forms and characteristics but also integrate with local geographical and humanistic environments. Therefore, library architectural space design for reading promotion should satisfy five elements: Establish connections with the community, with spaces and collections

reflecting community cultural spirit; Have stable and complete spatial structures with infrastructure, equipment, and software; Attract and serve diverse populations regardless of race, belief, class, gender, or education; Form distinctive user reading promotion activity brands; Sublimate and preserve spatial cultural values nurtured in the scenes.

5.4 Building Library Space Governance Teams and Data Resource Libraries North American library design for reading promotion fully utilizes the continuous support of professional librarians and online spatial data resources for library reading promotion space construction. The scope, vision, and angles of library architectural space promoting reading research and practice are rich and diverse.

5.4.1 Cultivating Space Management and Service Talent Teams In China, circulation departments managing collection and reading spaces are responsible for designing and replanning library spatial layouts, while office and logistics departments purchase and replace furniture like desks, sofas, and chairs [70]. In contrast, North American libraries engage professional lighting, landscape, and energy design teams to complete architectural space design and adjustment with participation from librarians and readers, with clear practical concepts for promoting and motivating user reading. Therefore, while China's library space construction practice has made considerable progress, it should also strengthen the construction of space management and service talent teams to enhance their architectural design and spatial governance capabilities.

5.4.2 Building Library Spatial Data Resource Libraries China has completed numerous library space renovations in recent years, making it necessary to summarize, organize, and systematize valuable industry experiences and technical methods formed during construction. This study's two major North American library architecture and design awards, plus online spatial resource libraries like "Designing Libraries" [71] and "Model Programme for Public Libraries" [72] from Northern Europe and the UK, provide excellent examples. Therefore, we urgently need to build a thematic knowledge base for library space renovation [73] under the support of cultural authorities and relying on library professional organizations to scientifically manage and share experiential data, texts, and image materials from space renovation.

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