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筆談二十四

COMPASS OF ACADEMIC LIBRARY MODERNIZATION (CALM) REPORT

(2021 Simplified Edition)

STEERING COMMITTEE FOR ACADEMIC LIBRARIES OF CHINA(SCAL)

PEKING UNIVERSITY LIBRARY

**Compass of Academic Library Modernization
(CALM) Report
(2021 Simplified Edition)**

Report Research Team

Team Leader: Chen Jianlong

Deputy Leaders: Wang Xincal, Dang Yuewu, Chen Daqing, Wang Bo

Members: Shao Yan, Zhang Huili, Zhang Lu, Li Feng

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Abstract Jointly formulated by the Steering Committee for Academic Libraries of China and Peking University Library, the *Compass of Academic Library Modernization (CALM) Report* primarily utilized the Delphi method to conduct three rounds of opinion solicitation with 34 experts and scholars in the fields of library communities, library science, information science, and other related disciplines. Integrating their wisdom, the *CALM report* summarized the development trends of academic library modernization in terms of core concepts, primary objectives, practical issues, theoretical issues, key elements, ecological relationships, and more to provide directional guidance for the realization of intensive, overall, high-quality, scientific, and sustainable development of academic libraries and establish a “compass” for academic libraries to embrace new ideas, facilitate new development, and build new development paradigms.

Keywords Academic library modernization; Intensive development; Overall development; High-quality development; Scientific development; Sustainable development; Development paradigms; Development trends; Core concepts; Primary objectives; Practical issues; Theoretical issues; Key elements; Ecological relationships

1 Introduction

As one of the Four Great Inventions of ancient China, the compass (*Sinan* in Ancient Chinese) was critical to determining positions in military, ceremonial, sacrificial, travel, and other applications. The invention has played an inestimable role in the advancement of technology and the development of civilization. In ancient times, the compass was often used as an allegory for a tool that could help one out of a maze or find directions. The term later also came to be used to mean “guidance” or “guideline”.

At present, academic libraries in China are in a critical period of modernization and intensive development, presenting opportunities and challenges in equal measure. Assessing the current situation, adapting to needs, and facilitating the comprehensive development of both domestic academic libraries and the industry as a whole have become key issues of exploration and consideration for those involved in the academic library community. Jointly formulated by the Steering Committee for Academic Libraries of China (SCAL) and Peking University Library (PKU Library) on the 40th anniversary of the establishment of the SCAL, the *Compass of Academic Library Modernization (CALM) Report* (hereinafter the “*CALM Report*”) aims to summarize historical experience, look towards future development trends, and outline trends for academic libraries across the country that are rooted in domestic issues, integrated with an international perspective, up-to-date, and forward looking. The report shall serve as a “compass” that helps academic libraries embrace new ideas, facilitate new development, and build new development paradigms for the new age.

1.1 Background

2021 marks the start of the 14th Five-Year Plan and a new journey in the comprehensive construction of a modern socialist country. By 2035, China will have basically realized socialist modernization, the modernization of its national governance system and capacity, reached a new level of national civilization, and significantly enhanced its cultural soft power^[1]. The issuance of national planning outlines such as the *National Innovation-Driven Development Strategy Outline*^[2], *China’s Education Modernization 2035 Plan*^[3], and the *Comprehensive Plan for Facilitating the World First Class University and First Class Academic Discipline Construction*^[4] has provided policy guarantees and directional guidance for the modernization of higher education and the modern development of academic libraries. The issuance of notices such as the “*Set Sail*” *Action Plan for 5G Applications*^[5], *Guiding Opinions on Facilitating the Construction of New Education Infrastructure and building a High-Quality Education Support System*^[6], and others has accelerated the pace of the digital transformation of higher education and the development of new education infrastructure, while also

providing a key driving force for the modernization of academic libraries. With the transformation in learning, teaching, and research approaches brought about by next-gen technologies, the information and service needs of both teachers and students will also undergo tremendous change. The optimization of resource allocation; innovation of service models; and meeting user needs in terms of modernization, convenience, knowledge, and intelligence has become the most critical impetus for the modern transformation and development of academic libraries.

The transformation and development of academic libraries has always been a key concern for the international library community. The International Federation of Library Associations and Institutions (IFLA) publishes the *IFLA Trend Report*^[7] and *IFLA Strategy*^[8] roadmap on a regular basis to provide an important reference for understanding changes to the global library environment and clarifying the direction of development. The New Media Consortium (NMC) and EDUCAUSE used to publish the *Horizon Report: Higher Education Edition*^[9] and *Horizon Report: Library Edition*^[10] (until 2017) on an annual basis to follow up on the changes to the technological environment faced by higher education and academic libraries on a global scale. The Association of College and Research Libraries (ACRL) releases the *Top Trends in Academic Libraries* on a biennial basis and the *ACRL Environmental Scan*^[11] on a biennial basis to provide references for the development of American academic and research libraries. The Association of European Research Libraries (LIBER) publishes a strategy report^[12] around once every five years to outline the strategic development direction for European research libraries. The Online Computer Library Center (OCLC) publishes a library development report^[13] on an intermittent basis to discuss the common issues affecting the development of global libraries. While learning from and drawing on the results of international research, the SCAL has also explored how the modernization of academic libraries in China should achieve transformation and development based on domestic conditions.

Since its establishment 40 years ago, the SCAL has led and guided the continuous theoretical exploration and practical innovation of national academic libraries, and undertaken a series of key changes to institutional structures and organizational improvement, co-construction and sharing of national literature and information resources, iteration and innovation of services, and professional librarian cultivation to effectively facilitate the modernization of academic libraries in China. The new era presents a historical period of consolidation, unremitting efforts, and great achievements for the academic library sector. It has become the endogenous driving force behind the modern development of academic libraries to establish a footing on this new stage of development, implement new development philosophy, and meet the new missions and challenges of the new journey with a modern attitude; integrate into the modernization

process of the country and higher education sector; facilitate “Double First Class” construction; and realize the fundamental task of morality education.

1.2 Purpose and Significance

1.2.1 Purpose

Jointly formulated by the SCAL and PKU Library, the *CALM Report* aims to consolidate the collective intelligence and valuable experience of senior experts in the fields of academic libraries along with library, information and archive management across the country through scientific research methods; establish a forward-looking macroscopic system for academic library modernization, analyze and evaluate the key trends for future development, and provide directional and referential guidance for academic libraries in regard to talent cultivation, relationship development with users, transformation of information resources, optimization of service innovation, research development theory, guarantees of governance capacities, and clarification of operational ecology; and serve as a “compass” for academic libraries in the new age.

1.2.2 Significance

The *CALM Report* is a programmatic trend report specifically formulated for the modernization of academic libraries that reflects the connotative and macroscopic development trends of academic library modernization in a comprehensive manner. The report is also the achievements in seeking the way of academic library modernization with Chinese characteristics and based on Chinese conditions, and provides academic libraries with positive and practical inspiration for the establishment of new objectives, injection of new momentum, and open-up of new prospects.

The publication of the *CALM Report* is expected to trigger in-depth discussions on the modernization of academic libraries across the country; set off the wave of accelerated modernization; and realize the development of a great modern socialist country by serving university construction goals and central tasks, fulfilling the fundamental tasks of morality education, and making the due contributions of academic libraries.

In addition to guiding the development planning, operation innovation, and management optimization of academic libraries, the *CALM Report* also provides academic libraries an important reference for undertaking undertaking operation, performance, and utility evaluations, facilitates theoretical development and practical applications, and drives forward the overall healthy and orderly development of Chinese library cause.

1.3 Methodology

1.3.1 Scope

The term “academic library modernization” refers to the historical process^[14] of

continuous innovation in which the academic libraries adapt to the development trends and modernization of human society. The modernization of academic libraries encompasses many aspects, which requires both the unified philosophy and the guidance of scientific theories; needs to balance the long-term development and current situations; should not only grasp the primary contradictions and core elements to realize sustainable development, but also coordinate and handle properly all aspects of the new development paradigms to realize overall development.

As such, this study will focus on the core concepts, primary objectives, practical issues, theoretical issues, key elements, and ecological relationships of academic library modernization development, by analyzing the value systems, developmental directions, key areas, practical guidance, developmental foundations, and positioning benchmarks. Interrelated and complementary, these aspects constitute the scope of research for academic library modernization.

1.3.2 Methods

In addition to the literature research method, this study was accomplished through the Delphi method, and also used some specific methods to analysis the opinions of experts, such as automated text analysis, manual indexing, and statistical analysis.

Literature Review: Before conducting expert surveys, the research team first conducted thorough research into policy documents, academic literature, and Internet resources to formulate three reports, namely *Summary of policies related to the modernization of academic libraries*, *Review on the research of development trends of global academic and research libraries*, and *Review on the application of Delphi method in the practical research of academic libraries*. Based on these research results, the research team designed the first expert survey form with eight open-ended questions.

Delphi Method: This study primarily adopted the Delphi method to conduct surveys of a panel of senior experts from academic and public libraries in China, and well-known scholars from library science, information science, and other related discipline across the country. Strict anonymization was implemented across the survey and questionnaire processing stages. The research team planned to conduct the expert survey in four rounds, lasting six weeks in total. In practicality, sufficient expert opinions were collected by the third round to reach the study's expected goals. As such, the survey process was completed in advance on the fifth week.

Automated Text Analysis: The first round of expert responses did not have a uniform standard and were relatively scattered. The research team used the TextRank, LDA, Word2Vec, and hierarchical clustering algorithms to extract keywords, key phrases, and key sentences from the answers to the open-ended questions, which were then used as a key reference for manual indexing.

Manual Indexing: Based on the results of the automated text analysis, the research

team manually indexed the original expert answers in the first round to create a summary table.

Statistical Analysis: The second and third rounds of expert opinion surveys were structured questionnaires. Once the questionnaires were collected, the research team used statistical methods to analyze the questionnaire data, then used SPSS to verify the reliability and validity of the results.

1.3.3 Process

The study lasted for three months and consisted of the following stages:

Sep. 2–Sep. 20, 2021, the research team was established to carry out literature review and discuss the direction, methodology, and scope of the study. After several rounds of discussion and revision, the expert opinion survey form for the first round was formulated.

Sep. 21–Sep. 29, 2021, the research team distributed and collected responses for the first-round expert survey. A total of 34 responses were received from the 49 distributed questionnaires, representing a response rate of 69.4%.

Sep. 30–Oct. 10, 2021, the research team carried out automated text analysis, manual indexing, and summarizing and refining the collected responses to formulate the expert opinion summary table for the first round. On this basis, the research team consolidated and refined the survey into 6 questions, then drafted an expert survey form for the second round that was made up of structured multiple-choice questions (aspects and options based on expert feedback) and open-ended supplementary calls for opinions.

Oct. 11–Oct. 18, 2021, the research team distributed and collected answers for the expert survey form for the second round. A total of 34 responses were received from the 34 distributed questionnaires, representing a response rate of 100%.

Oct. 19–Oct. 24, 2021, the research team conducted statistical analysis on the responses of the second round. After considering both expert selections and supplementary opinions, the aspects and options for each multi-choice questions were further refined for the expert survey form for the third round, made entirely of structured multiple-choice questions.

Oct. 25–Oct. 29, 2021, the research team distributed and collected answers for the expert opinion survey form for the third round. A total of 34 responses were received from the 34 distributed questionnaires, representing a response rate of 100%.

Oct. 30–Nov. 3, 2021, the research team conducted statistical data analysis on the questionnaire responses of the third round. No supplementary opinions were provided. After discussion, the research team decided to complete the expert survey stage in advance and begin formulating the final report.

Nov. 4–Nov. 30, 2021, the research team worked on formulating, discussing, revising, and finalizing the report.

2 Results Analysis

Comprehensive results of the three survey rounds show that expert opinions and suggestions in regard to the modernization of academic libraries can be reflected in six aspects: core concepts, primary objectives, practical issues, theoretical issues, key elements, and ecological relationships. In terms of concentration, this study divides expert opinions into three categories: highly concentrated ($> 85\%$), moderately concentrated ($50\%–85\%$), and less concentrated ($<50\%$).

2.1 About Core Concepts

The core concepts of academic library modernization are tied to intensive development and include three aspects: (1) the implementation of the new development philosophy of innovation, coordination, eco-friendliness, openness, and sharing in academic libraries; (2) the concrete embodiment of the “Double First Class” construction concept in academic libraries; and (3) the reflection of the concepts of professionalism and nature in academic libraries.

2.1.1 Implementation of New Development Philosophy in Academic Libraries

In regard to the implementation of the new development concept of innovation, coordination, eco-friendliness, openness, and sharing in academic libraries, there were two highly concentrated expert opinions: (1) an all-round innovation-driven development; and (2) collaborative services across all links. The innovation covers concepts, theories, institutions, governance, culture, resources, services, space, technology, and other aspects; while the collaborative services cover cooperation between academic libraries and various university departments, cooperation among industry institutions, regional cooperation, and also cover the coordinated development of multiple elements including library resources, services, and librarian personnel.

There were also four moderately concentrated expert opinions: (1) service quality reform; (2) sharing in accordance with the law; (3) comprehensive open services; and (4) energy conservation and emission reduction. Academic libraries could provide services such as data management, talent evaluation, and information analysis to continuously deepen existing services and better support the development of undertakings such as teaching and research in universities. Libraries should further the co-development and sharing of resources, talents, and technology within the scope of industries, industry alliances, and regions in accordance with relevant regulations, contracts, and agreements. Libraries can use their collection and human resources to provide open services to the public in line with their social responsibilities. Libraries should also implement the philosophy of green development and environmental protection by constructing smart buildings, adjusting the operating status of equipment and

facilities in real-time, and meeting the requirements for energy conservation and emission reduction.

Concepts such as opening up academic libraries, information security, and transformation of collection quality are also be mentioned. Particularly, the concept of opening up is often related to collaboration and sharing. Libraries should adopt a more open philosophy, extensively carry out cooperation and collaborative innovation with public institutions and international counterparts, and learn from the best practices of others.

2.1.2 Implementation of the “Double First Class” Construction Concept in Academic Libraries

In terms of the implementation of the “Double First Class” construction concept in academic libraries, there were three highly concentrated expert opinions: (1) serving university disciplinary construction; (2) serving university scientific research innovation; and (3) integration into university talent training systems. Libraries should become a key component of university disciplinary construction supporting systems, increase the resource ensuring rate for competitive and emerging disciplines, and provide greater support for the development of first-class disciplines. Libraries should coordinate with university scientific research innovation in providing integrated support through the development of collection and services. In accordance with talent training goals and student growth requirements, libraries should play a significant role in university talent training systems.

There were also two moderately concentrated expert opinions in this aspect: (1) serving major and curriculum development; and (2) the construction of a spiritual homeland for students and faculty. A few experts also mentioned that the concept of “Double First Class” construction was also reflected in other aspects such as mutually beneficial collaboration, pursuit of excellence, and participation of students and faculty in library development and management.

2.1.3 Reflecting the Concepts of Professionalism and Nature in Academic Libraries

In terms of reflecting the concepts of professionalism and nature in academic libraries, there were four highly concentrated expert opinions: (1) user-oriented and service-first concepts; (2) integration of library and university development; (3) refinement of librarian teams; and (4) integration of resources and services. Libraries should actively implement “user-oriented and service-first” concepts, focus on student and faculty’s needs, and take information services at the core. Academic libraries are a part of the overall university ecosystem. The implementation of new development philosophy should be integrated with overall development goals of universities and serve as a key support for further university development. Libraries should strengthen the

development of librarian team, attach importance to the cultivation of librarians, improve their professional knowledge and comprehensive skills, optimize their discipline and knowledge structures, and build a professional team of librarians. As the foundation of library development, the potential in resources must be unlocked and transformed into practical service capacities to facilitate the effective utilization of library collections.

There were also two moderately concentrated expert opinions: (1) unification of required documents guarantee with literacy education; and (2) fostering a strong cultural environment. A few experts expressed that strengthening value guidance and stay true to the original mission of libraries can also reflect the concepts of professionalism and nature in academic libraries.

2.2 About Primary Objectives

The primary objectives of academic library modernization after 5 years are related to overall development and encompass three aspects: (1) making greater contributions to the development of a great modern socialist country; (2) making greater contributions to high-quality development of their universities; and (3) realizing new achievements in the modernization of academic libraries.

2.2.1 Making Greater Contributions to the Development of a Great Modern Socialist Country

In terms of keeping up with the times and making greater contributions to the development of a great modern socialist country, there were two highly concentrated expert opinions: (1) general education and cultural inheritance to realize the objective of a strong country in terms of culture; and (2) multiple literacy education to realize the objective of a strong country in terms of education. Academic libraries can rely on their advantages in resources, services, space, and other areas to carry out general education, improve the overall literacy of students through a variety of methods, and actively guide students and faculty to understand and inherit unique campus culture, traditional Chinese culture, revolutionary culture, and advanced culture. With the rapid development of information society, libraries should focus on cultivating the literacy of students and faculty in spheres such as information, science, writing, data, and digital disciplines, and realize the objective of a strong country in terms of education through multiple literacy education.

There were also three moderately concentrated expert opinions: (1) development of innovation basis and new think tanks that realize the objective of a strong country in terms of science and technology; (2) construction of an academic exchange service system that realizes the objective of a strong country in terms of talent cultivation; and (3) provision of intellectual property information services that realize the objective of a strong country in terms of intellectual property.

2.2.2 Making Greater Contributions to High-Quality Development of Their Universities

In terms of making greater contributions to high-quality university development, there were three highly concentrated expert opinions: (1) construction of a high-quality and intelligent guarantee system for literature resources, data and information to realize the integration of all kinds of resources and in-depth value extraction of knowledge, and formulate of a complete and efficient resource layout to meet the needs of discipline construction of the university; (2) serving a key role in the development and inheritance of the university spirit and campus culture acting as a university cultural exchange center and spiritual homeland for the campus life of students and faculty; and (3) supporting the university's scientific research innovation and "Double First Class" construction while maintaining the university's core academic positioning.

There was also one moderately concentrated expert opinion, namely the construction of a cultural education and practice base that revolves around the fundamental task of morality education. Libraries should implement the fundamental task of morality education, cooperate with relevant cultural institutions on both an intramural and extramural basis, carry out cultural education extensively, and serve a key role for the morality education in higher education.

2.2.3 Realizing New Achievements in the Modernization of Academic Libraries

In terms of realizing new achievements in the modernization of academic libraries, there were four highly concentrated expert opinions: (1) reform of employment mechanisms, enhancement of overall literacy of librarians, and establishment of a hierarchical, professional, and innovative team of librarians; (2) establishment of a complete and efficient knowledge service system to provide strong support for teaching, scientific research, and disciplinary construction; (3) enhancement of service capacity with next-gen information technologies such as big data and AI, construction of a comprehensive information management platform, and realization of intelligent, smart and innovative development; and (4) resources acquisition based on data analysis, description and organization of various types of resources in depth, and establishment of an open and shared information resource system that integrates print and digital resources while ensuring value preservation and appreciation.

There were also two moderately concentrated expert opinions: (1) enhance voice and influence over both university and industry; and (2) establishment of a scientific management system supported by a unique organizational culture.

2.3 About Practical Issues

The practical issues need to be solved of academic library modernization over the next 5 years are related to high-quality development and encompass eight aspects: (1)

team building; (2) service innovation; (3) guarantee of funds; (4) collection development; (5) technology applications; (6) governance systems and capacity building; (7) space construction; and (8) status and influence.

2.3.1 Team Building

Team building is the primary issue in the high-quality development of academic libraries. In terms of the specific issues that require breakthroughs over the next 5 years of academic library team construction, there were three highly concentrated expert opinions: (1) professionalization and management capacity building of leadership teams; (2) cultivation of new types of librarians; and (3) enhancement of the professional competence of librarians. The modernization and high-quality development of academic libraries urgently requires a professional leadership team with the director at the core, along with the modern development concepts, strategic vision, and enhanced management capabilities of leadership team; urgently requires a librarian team adapted to the needs of disciplinary construction, technological development, and data services, including the cultivation of new types of librarians specializing in data and research; and urgently requires academic libraries take various ways such as training, exchanges, and practices to improve the comprehensive competence and professional capacity of librarians in basic theory, operational skills, and research literacy.

There were also two moderately concentrated expert opinions: (1) strengthened cultivation of an organizational culture, establishment of unified cultural values, and enhancing the sense of identity, belonging, and mission of librarians; and (2) optimization of the librarian position layout and system, establishment of a reasonable personnel hierarchy, and provide librarians with a broader space for development. A few experts also expressed that academic libraries should continue to conduct the ideological and political education of librarians.

2.3.2 Service Innovation

Service innovation is a key issue in the high-quality development of academic libraries. In terms of the key areas of academic library service innovation over the next 5 years, there were three highly concentrated expert opinions: (1) subject knowledge services integrating into teaching and scientific research; (2) provision of information consulting and think tank services supporting scientific and technological innovation; and (3) establishment of a smart service system oriented towards new user needs. In order to support the “Double First Class” construction, academic libraries should target the practical problems faced by the students and faculty of different disciplines, root into the whole cycle of teaching and scientific research, and provide all-round, multi-layer knowledge services. In view of the objective of a strong country in terms of science and technology, academic libraries should also integrate space, literature, data, technology,

and talents to provide information consulting and think tank services for scientific and technological innovation and decision-making needs at the national and university level. In order to meet the new user need with dynamic changes, academic libraries could use intelligent technology and integrate multi-source data to establish personalized smart service system combining online and offline.

There were also two moderately concentrated expert opinions: (1) provision of innovative information literacy and other multiple literacy education services based on next-gen information technology; and (2) active innovation in general education and cultural services to implement morality education. A few experts also expressed that academic libraries should pay further attention to service innovations in response to public crises such as global pandemics and natural disasters.

2.3.3 Guarantee of Funds

The high-quality development of academic libraries cannot be separated from the guarantee of funds. In terms of the specific issues of the guarantee of funds for academic libraries over the next 5 years, there were two highly concentrated expert opinions: (1) ensuring continuous and sufficient funding; (2) strengthening scientific budgeting with limited funds. Academic libraries require sustained and sufficient funding for collection development, space construction, talent training, informatization, reading services, daily operations and maintenance, and other areas. Relevant government departments should increase the spending on the procurement of the services. Meanwhile, academic libraries should regularly carry out the compilation of scientific budget according to expenditure and construction objectives.

There were also three moderately concentrated expert opinions: (1) soliciting donations from both intramural and extramural individuals and organizations; (2) applying for special funding; and (3) improvement of cost control strategies. Academic libraries should actively expand funding sources through various channels, reduce costs and improve the efficiency of funds utilization.

2.3.4 Collection Development

Collection development is a crucial foundation for the high-quality development of academic libraries. In terms of the specific issues that require breakthroughs over the next 5 years of academic library collection development, there were two highly concentrated expert opinions: (1) special collection development; and (2) integration of print and digital collections. Academic libraries should combine both their own and the university characteristics to carry out the systematic development of special collections, enrich the content and diversity of special collections, improve the description, exploration, and organization of special collections, accelerate the construction of special collection databases, and achieve unique collection advantages

and branding to enhance core competitiveness. From the perspective of user needs and services, academic libraries should also strengthen the integration, unified description, and management of print and digital collections to further their standardization and intelligent development.

There were also seven moderately concentrated expert opinions: (1) guarantee and evaluation of the literature resource allocation; (2) knowledge resource organization, pushing and discovery; (3) value-added data resource services; (4) development of open access resources; (5) customized, personalized, and integrated services of instructional resources; (6) long-term preservation of resources; and (7) co-construction and sharing of resources. A few experts also expressed their belief that academic libraries should pay attention to the digitalization of literature resources.

2.3.5 Technology Applications

The application of big data, AI, and other innovation technologies to realize the all-round upgrading and transformation of academic libraries is an inevitable requirement for adaptation to the fast-paced development of the technological environment. In terms of the specific issues that require breakthroughs over the next 5 years of academic library's technology applications, there were four highly concentrated expert opinions: (1) R&D of new user-oriented library management systems; (2) application of new technologies such as AI; (3) construction of data management platforms; and (4) integration of smart library and smart campus. Academic libraries should be oriented to user needs and preferences while strengthening the research and development of new management systems for teaching, scientific research, user, resources, and other modules to enhance the user experience; further the practical application of AI and other new technologies in various scenarios such as automatic cataloging and indexing, user consultation, intelligent push, and behavioral data mining; undertake data management responsibilities, carry out platform construction of scientific research data, open data, and other data, and gradually realize the aggregation, management, and service system layout of data resources; grasp the essence of smart library and organically integrate it with smart campus construction.

There were also four moderately concentrated expert opinions: (1) construction of smart equipment and infrastructure; (2) construction of mobile and micro-service platforms; (3) construction of digital scholarship (including digital humanities) infrastructure; and (4) application of information security technologies. Academic libraries should use smart technologies to empower the construction of equipment, facilities, and platforms while ensuring information security.

2.3.6 Governance Systems and Capacity Building

In terms of the specific issues of governance systems and capacity building, there

were three highly concentrated expert opinions: (1) construction of scientific evaluation systems; (2) formulation of operational norms and industry standards; and (3) optimization of management mechanisms and systems. To realize overall transformation and development over the next 5 years, academic libraries should construct a systematic and scientific evaluation system in terms of input and output, comprehensive influence, implementation of development plans, and other factors to evaluate and facilitate construction and reform; develop and optimize industry standards, technical standards, and operational norms of modernization construction at the national, SCAL, CALIS, and other levels to achieve standardized management; and utilize modern management methods to optimize operational processes and management mechanisms, enhance the construction model of central-branch library systems, reform employment mechanisms, and improve rules and regulations in areas such as resource management to achieve standardized, efficient, and human-centric management.

There were also two moderately concentrated expert opinions: (1) formation of a governance structure that involves both users and experts; and (2) strengthening of legal protections, including intellectual property rights. A few experts also expressed that library marketing should be actively strengthened from the perspective of the target market, user needs, and user satisfaction.

2.3.7 Space Construction

In terms of the specific issues that require breakthroughs over the next 5 years of academic library space construction, there were two highly concentrated expert opinions: (1) open and sharing of physical spaces; and (2) high-density storage spaces. With the acceleration of informatization and the increase of collections, academic libraries must inevitably transform the conventional book-oriented space service model, rethink the functional positioning of library buildings, and use intelligent technology to create an open, warm, comfortable, and fully functional shared space for different user types. Resource storage space must be further compressed and the construction of high-density storage space strengthened.

There were also five moderately concentrated expert opinions: (1) interactive learning spaces; (2) digital scholarship and collaboration spaces; (3) immersive cultural spaces; (4) virtual spaces; and (5) innovation, creative, and maker spaces. A few experts also expressed that academic libraries should also pay attention to issues related to green spatial environments and sustainable development.

2.3.8 Status and Influence

In terms of the specific issues of academic library status and influence, there were two highly concentrated expert opinions: (1) status in the minds of students and faculty; and (2) visibility at the university level. Academic libraries should make full use of their

own advantages, tap into student and faculty needs in terms of teaching and scientific research, learning and exchange, knowledge resources, and other areas, and strengthen the trust of student and faculty to continuously improve the status in the minds of student and faculty; and integrate with the university's overall development plan, participate in the university talent training, disciplinary construction, and scientific and research process, and improve decision-making and consultation capacity to significantly improve visibility at the university level.

There were also five moderately concentrated expert opinions: (1) influence through public services; (2) influence through academic library consortium; (3) regional inter-library substantive cooperation; (4) international status and influence; and (5) influence in regard to contract negotiation and acquisition of resources.

2.4 About Theoretical Issues

The theoretical issues that require urgent study over the next 5 years are related to the scientific development of academic libraries and encompass four aspects: (1) development history; (2) basic theory; (3) methodology; and (4) application of results.

2.4.1 Development History

In terms of the specific issues of academic library development history research, there was one highly concentrated expert opinion, namely the development history of libraries in higher education. As a key component of higher education, academic libraries should actively carry out historical research from the perspective of higher education development, summarize the historical advantages and experiences of academic libraries, and clarify their basic mission and responsibilities in higher education.

There were also five moderately concentrated expert opinions: (1) active study of academic library history in the context of university history; (2) the history of academic libraries in the context of the "Four Histories" (history of the CPC, of the PRC, of China's reform and opening-up and world socialism); (3) the cultural history of academic libraries; (4) oral library history; (5) the institution development history of academic libraries.

2.4.2 Basic Theory

In terms of the specific issues of basic theoretical research for academic libraries, there were three highly concentrated expert opinions: (1) function and positioning of academic libraries; (2) top-level design and strategic positioning of academic library modernization; and (3) content and concept of academic library modernization. Over the next 5 years, the scientific development of academic libraries must accurately grasp the

meaning of academic library modernization and recognize the functions and status in terms of resources, talent, culture, space, and services in the new era; should include a top-level design for modernization, earnestly grasp the formulation and implementation of the 14th Five-Year Plan and Long-Range Objectives through the Year 2035, and clarify strategic positioning in aspects such as the development of a great modern socialist country, university development, industry development, and self-development; and focus on intensive development, establish advanced development philosophy, and construct a value system for the modernization of academic libraries for the new era.

There were also two moderately concentrated expert opinions: (1) construction of a new development theory system that includes librarian management, incentive mechanisms, and more; and (2) transformation of academic libraries. A few experts also expressed that attention should also be paid to the nature of academic libraries.

2.4.3 Methodology

In terms of the specific issues of academic library methodology research, there were two highly concentrated expert opinions: (1) information analysis method; and (2) operational method innovation. Academic libraries should base their efforts on practical development issues, serve the actual needs of different target groups across different fields, utilize multi-disciplinary technical tools in an effective manner, and explore new methods of information analysis (including patent analysis); and focus on both online and offline library application scenarios, innovate on the methods of each link in the operational process, and improve the efficiency of management services.

There were also three moderately concentrated expert opinions: (1) exploration of new methodologies and tools in metrics science; (2) encouragement of multidisciplinary collaborative research in areas that include library, information and archive management, computer science and technology, marketing, journalism and communications, and cyberspace security; and (3) exploration of open science ecosystems issues including open data management methods. A few experts also expressed that academic libraries should pay attention to the construction of methodology system.

2.4.4 Application of Results

In terms of specific issues concerning the application of academic library research results, there were three highly concentrated expert opinions: (1) a evaluation system of library operational performance; (2) construction of library-related indicators in higher education evaluation; and (3) a user utility evaluation system of library. Over the next 5 years, academic libraries should establish a sound operational performance evaluation system (including comprehensive and individual performance) based on the existing theoretical evaluation basis that takes both the modernization requirements of academic

libraries in the new era and the library's own development characteristics into consideration, and carry out operational and librarian performance evaluations on a regular basis; take into account the positioning of academic libraries in higher education during the new era, constantly improve the design of relevant indicators in higher education evaluation, and effectively evaluate overall utility; and construct a library user utility evaluation system that considers multiple levels such as needs, experience, satisfaction, and influence.

There was also one moderately concentrated expert opinion, namely the construction of a library quality evaluation system that considers the quality of library operations in terms of resources, services, products, and platforms.

2.5 About Key Elements

The key elements of academic library modernization are related to the sustainable development of academic libraries and encompass five aspects: (1) librarians; (2) information resources; (3) users; (4) services; and (5) culture.

2.5.1 Librarians

Librarians play a key role in ensuring the sustainable development of academic libraries. A team of librarians with a firm philosophy, rational structure, operational proficiency, and high-level competence is the fundamental foundation of the intensive development of modern libraries^[15]. The modernization of librarians is the soul of library modernization. In terms of librarian personnel, there were three highly concentrated expert opinions: (1) high levels of professional identity and cultural self-confidence; (2) diversified operational capacity; and (3) leadership teams with modern concepts and capabilities. Librarians should be enthusiastic about their work, boast a high degree of professionalism and cultural self-confidence, and possess diversified operational capabilities compatible with the modernization and innovation requirements of their library. And directors should have profound professionalism, rich management experience, forward-looking governance concepts, and a strategic vision for overall planning to play a key role in the development direction and sophistication of academic libraries.

There were also seven moderately concentrated expert opinions: (1) rational team structures; (2) solid professional knowledge; (3) pioneering and innovative ideas; (4) strong teamwork; (5) high levels of dedication and professionalism; (6) an active mind for serving users; and (7) an international vision. A few experts also expressed that academic libraries should also formulate professional standards and competence frameworks, strengthen the systematic training of librarians, build a team of innovative librarians, and encourage the comprehensive and sustainable development of librarian teams.

2.5.2 Information Resources

Information resources are a key material basis for the sustainable development of academic libraries. In terms of information resources, there were five highly concentrated expert opinions: (1) special collection resources; (2) electronic (digital) resources; (3) data resources; (4) print literature resources; and (5) open access resources. Special collection resources are distinct and unique library collections that reflect the characteristics of the region, university, or library. Digital resources support the development of Internet services and serve as a key component in library collection systems. Data resources and open access resources are newly emerging library resource types and products of library service innovation. Print literature resources rank lower, but are still the core component of most library information resource systems. These resources complement each other, develop in an integrated manner, and are key mediums from which academic libraries realize the goals of morality education and “Double First Class” construction, preserve cultural heritage, and carry forward civilization. They also serve as a solid guarantee and a driving force for the innovation of academic library services.

There was also one moderately concentrated expert opinion, namely internet resources. And a few experts also expressed that knowledge resources are also key information resources of academic libraries. They both together with other resources constitute the guarantee system of required documents.

2.5.3 Users

The term “user” collectively refers to all library service targets. User needs are the foundation and endpoint for all library operations. Academic libraries must adhere to a user-oriented concept to achieve sustainable development. In terms of users, there were two highly concentrated expert opinions: (1) user need; (2) user satisfaction. Academic libraries must endeavor to earnestly grasp and understand user needs, expectations and problems that need to be solved, and strive to meet user performance requirements to fulfill their duties and all-round development in a satisfactory manner.

There were also three moderately concentrated expert opinions: (1) user experience; (2) user participation; and (3) user behavior and preferences. Academic libraries should continuously optimize the user experience in obtaining library resources and services, fully mobilize the enthusiasm of users in library construction and development, establish partnerships with users, know and understand users, and focus on user behavior and preferences to refine services. A few experts also expressed that it would be important to continuously expand the scope and diversity of users to extend the reach of library services in society.

2.5.4 Services

Libraries are academic institutions that serve the needs of teaching, scientific

research, and management. The primary symbol of library modernization is the significant improvement of service levels. In terms of services, there were three highly concentrated expert opinions: (1) subject knowledge service; (2) information literacy education; and (3) diversified space services. The development of new knowledge services based on requirements of different disciplines can support university teaching and scientific research in a more effective manner, and has become a universal service for academic libraries. Information literacy education oriented towards all-media and multi-element cultivation helps enhance the lifelong learning and academic research capabilities of students and faculties in the information age while highlighting the role played by libraries in the talent training system. The modernization of libraries requires a diverse space planning and functional layout that includes but is not limited to interactive learning spaces, digital scholarship spaces, innovation and creative spaces, cultural and leisure spaces, and so on.

There were also six moderately concentrated expert opinions: (1) intellectual property services; (2) data management services; (3) innovative think tank services; (4) cultural and general education services; (5) reading services; and (6) integrated media information services. Among these services, there are not only many relatively mature service projects that academic libraries have been developing for many years (such as cultural and general education services, reading services, and integrated media information services), but also a series of innovative services have been continuously explored by academic libraries in recent years following the development of new technologies and student/faculty needs (such as intellectual property services, data management services, and innovative think tank services).

2.5.5 Culture

Culture is the core cornerstone to embodies the team spirit, organization characteristics, and institutional modernization of a library. The transition from emphasizing institutional and objective-based management to cultural management is a key transformation in the modernization of library management. In terms of culture, there were four highly concentrated expert opinions: (1) positive team spirit; (2) pioneering and innovative organizational culture; (3) scientific and standardized institutional culture; and (4) efficient and collaborative management systems. There were also two moderately concentrated expert opinions: (1) library culture with regional, university, and professional characteristics; and (2) advanced and practical technological culture. A few experts also expressed that a rigorous and pragmatic work atmosphere also serves as a key component of culture.

The elements outlined above permeate and influence one another, and together form the unique cultural content of a library. They play a key role in enhancing core competitiveness, improving cohesion, and facilitating sustainable development of academic libraries.

2.6 About Ecological Relationships

The ecological relationships that must be properly managed in the modernization of academic libraries are related to the construction of new development paradigms and encompass four aspects: (1) the internal library ecology; (2) the library and the external ecology; (3) conditions and objectives; and (4) tradition and modernity.

2.6.1 Internal Library Ecology

In terms of the internal library ecology, there were three highly concentrated expert opinions: (1) librarian career development and library development; (2) inter-departmental cooperation and development; and (3) system construction and human-based management. The modernization of libraries cannot be separated from the support of a team of high-quality librarians, for whom career development is realized in tandem with the development of the library itself. As the modernization process is accompanied by the iteration and transformation of internal organizational structures, it is necessary to coordinate the development requirements of a variety of internal departments, strengthen horizontal cross-department communication and collaboration, and further coordinate core operations with outsourced services. The modernization of governance systems requires support from efficient management mechanisms and standardized systems, and must take into account the needs of librarians. While endeavoring for enhanced efficiency, libraries should not neglect their dedication to human-oriented management so as to effectively improve the sense of belonging and acquisition of librarian personnel.

There were also two moderately concentrated expert opinions: (1) communication and collaboration amongst librarians; and (2) the relationship between party building and library operations. In addition to focusing on the development and growth of individual librarians, libraries should also create a strong atmosphere of communication and collaboration to facilitate the overall development. Party building, and ideological and political work should promote the development of library work, while library work should implement the party's line, principles, and policies. A few experts also expressed their belief that the relationships between in-service and retired librarian personnel should also be a focus of library modernization.

2.6.2 The Library and the External Ecology

In terms of relationship between the library and external ecology, there were four highly concentrated expert opinions: (1) the relationship between libraries and university development objectives (including the morality education, “Double First Class” construction, governance system modernization, and more); (2) the relationship between libraries and their users (including intramural students and faculties, alumni, extramural readers, and more); (3) the relationship between libraries and relevant

university bodies (including decision makers, functional departments, other schools/ departments, and more); and (4) the relationship between libraries and industry institutions (including other academic libraries, public libraries, industry associations, and more) .

There were also four moderately concentrated expert opinions: (1) the relationship between libraries and commercial institutions (including publishers, information institutions, technical service providers, and more); (2) the relationship between libraries and national development strategies (including realizing the objective of a strong country in terms of education, technology, culture, intellectual property, and more); (3) the relationship between libraries and relevant higher-level departments (including supervisory departments and funding sources such as the Ministry of Education and local governments); and (4) the relationship between libraries and local economies, culture, and social development.

The modernization of academic libraries will be achieved along with national and university modernization. As such, the libraries must actively integrate into national and higher education development strategies, and properly handle their affiliations with relevant higher-level departments along with local economic and social development in a manner consistent with university development, discipline development, industry development, and user needs.

2.6.3 Conditions and Objectives

In terms of conditions and objectives, there were three highly concentrated expert opinions: (1) the relationship between high service standards and insufficient human, technical, and collection resources; (2) the relationship between limited funding and sustainable development; and (3) the relationship between open access sharing and intellectual property protection. There were also two moderately concentrated expert opinions: (1) the relationship between the scale of development and utility optimization; and (2) the relationship between opening up and energy conservation and environmental protection.

These items are the result of the gap between practical conditions and ideal objectives or development directions. How to coordinate and resolve these contradictions while making use of limited resources, funds, and capacity to meet high standards and sustainable development goals to the greatest possible extent is a key test for the modernization of library governance systems and capacities.

2.6.4 Tradition and Modernity

In terms of the relationship between tradition and modernity, there were two highly concentrated expert opinions: (1) the relationship between traditional and new services; and (2) the relationship between traditional and digital libraries. There were also three

moderately concentrated expert opinions: (1) the relationship between literature and data resources; (2) the relationship between refined library traditions and innovative development concepts; and (3) the relationship between the fine traditional Chinese culture and modern service methods.

Traditional resources, services, and cultural traditions serve as the basis and starting point for the modernization of academic libraries. Starting from the accumulation of profound cultural resources and historical experience, continuous inheritance and innovation can serve as the foundation of library modernization.

2.7 Analysis and Discussion

The results outlined above were summarized from three rounds of expert surveys using the Delphi method. The survey participants include senior experts in the library communities, and well-known scholars from library science, information science, and other related disciplines across the country. With their rich experience, unique insights, and in-depth thinking on the modernization of academic libraries, the collective wisdom of experts is a key guarantee for the validity of conclusions of the study. The study process strictly followed the Delphi method. Questionnaires were distributed and collected on a one-to-one basis, then collected, verified, and anonymized by a dedicated member of the research team. In the drafting and collation of questionnaire content, the research team ensured that expert opinions were taken as the standard to guarantee that their true thoughts and suggestions were obtained in a truthful, reliable, and accurate manner. The response rate of the three rounds of questionnaires were high (reaching 100% for the last two rounds). Experts responded in an earnest manner, the study process was rigorous, and the finalized results were scientific.

The research team used the selection rate of aspects and options for six questions as the primary indicator of reference to measure the concentration of expert opinions and the importance of each aspects and options. In terms of aspects, the average level of consensus among experts in the second round was 89.8%, with some as high as 100% (selected by all experts). Only 4 aspects had a consensus of below 85%, while the aspect with the lowest level of consensus still reached a majority of 73.5%. In terms of options, only a few aspects of individual options changed in ranking from the second round to third round of the survey. Options with a majority consensus accounted for 89.5% of all options, representing a high level of concentration and the consistency of expert opinions.

The research team further cross-validated the concentration and relevance of expert opinions through the horizontal analysis of questions, aspects, and options. In terms of questions and corresponding aspects, core concepts and primary objectives are highly related. This association can also be found between the “reflecting the concepts of

professionalism and content in academic libraries” and “making greater contributions to high-quality university development over the next 5 years and realizing new achievements in the modernization of academic libraries” answers. The aspects of practical issues and key elements are also interrelated. For example, librarian team establishment, collection development, services, and others are both key elements of academic library modernization and key practical issues that require urgent breakthroughs over the next 5 years. The rankings of expert opinions in these aspects show a high level of consistency. In terms of options, there are correlations and consistencies across multiple areas. For example, “librarian team establishment” is a key practical issue related to academic library modernization, “refinement of librarian teams” is a key concept that reflects the content and professionalism of academic libraries, and “establishment of a hierarchical, professional, and innovative team of librarians” is one of the primary development objectives that academic libraries must achieve over the next 5 years. The consistency can be also found in the fact that “librarians” ranked first in the key elements required to ensure the sustainable development of academic libraries, while the “team building” had the highest concentration of opinions among the practical issues facing the high-quality development of academic libraries in the next 5 years.

It should be further clarified that the options with less concentrations of expert opinions are not unimportant, and may soon become areas of significant consensus.

3 Conclusion

Based on the aforesaid study results, the research team primarily summarized the 27 aspects and 75 options with a high concentration of expert opinions; systematically analyzed the six main questions of academic library modernization and their internal links; integrated intensive, overall, high-quality, scientific, sustainable development with the construction of new development paradigms; grasped the general trend of academic library modernization; and summarized existing study limitations and the targets of future efforts.

3.1 Development Trends

The development trends of academic library modernization are primarily reflected as follows.

(1) Academic library modernization is a key proposition in the overall strategy for the great rejuvenation of the Chinese nation and the profound changes unseen in a century by the world. It shall realize the construction and optimization of a new development paradigms through intensive, overall, high-quality, scientific, and sustainable development while realizing the unique value of academic libraries in the new era.

The modernization of academic libraries follows the same direction as the modernization of civilization, is closely connected to national modernization, and goes hand in hand with the modernization of universities. In the process of modernization, academic libraries must accurately recognize changes, respond in a scientific manner, actively seek transformation, stay true to their founding philosophy, take up the mission responsibly; treat their intensive development as a characteristic endeavor, take overall development as the target, and engage in high-quality development in a manner that suits the times, use scientific development as a guideline for innovation, apply sustainable development as a strategic path; base themselves on the foundations of a new development stage, implement new development philosophy, construct a new development paradigms, establish a value system under the guidance of the system of core socialist values, and make unique contributions to the “Double First Class” construction and the development of an innovative country.

(2) The intensive development of academic libraries requires a clearer establishment and consolidation of core concept. Advanced core concepts should include the implementation of new national development philosophy, high education development concept, and “Double First Class” construction concept while reflecting the professional and historical characteristics of academic libraries. In the coming development period, the core concept will be formulated through the association of basic notions such as innovation, collaboration, services, users, resources, librarians, universities, and their operational positioning.

Guided by the new development philosophy of “innovation, coordination, eco-friendliness, openness, and sharing”, academic libraries shall adhere to providing a full range of innovation-driven and coordinated services across all links. Under the guidance of the higher education development strategy, academic libraries shall fully serve the disciplinary construction, contribute to the scientific research and innovation, and integrate into the university talent training system. In the coming development period, academic libraries shall adhere to a user-oriented and service-first philosophy, unify their development with the university development, refine the quality of librarian personnel, integrate resources and services, and continue to drive intensive development forward to develop a spiritual and cultural homeland for students and faculty.

(3) The overall development of academic libraries needs to set the long-term and periodical goals scientifically. Upper-level development objectives should be closely integrated with the objectives of national modernization, high-quality university development, and the mission of the library itself. Over the next 5 years, academic libraries shall achieve greater results in areas such as librarian team construction, user information literacy education, integration of print and digital literature resources, data resource value-added services, next-gen information technology applications,

disciplinary knowledge service system construction, library modernization theory construction, performance evaluation system optimization, and intramural/extramural collaboration.

In realizing the objective of a strong country in terms of culture, education, and talent, academic libraries shall vigorously strengthen general education services, culture inheritance and innovation services, and information literacy education services. In serving higher education and high-quality university development, libraries shall comprehensively upgrade their literature guarantee, cultural education, and information service systems while fully integrating core university tasks such as teaching, scientific research, and public services. In fulfilling their own missions, academic libraries shall comprehensively apply next-gen information technology and related collaboration mechanisms, unify standards and specifications, and greatly improve work efficiency in the precise acquisition, description, organization, and use of their various information sources. The design, development, innovation, and application of information services shall track the needs of real users along with any changes and feedback throughout the service process, solicit user participation, and strive to improve service equity. Through these three paths, academic libraries will enhance their contribution to and improve their status in society.

(4) The high-quality development of academic libraries requires constant breakthroughs of chronic problems and issues of the time. Over the next 5 years, leadership and execution in team building, synergy and contribution in service innovation, adequacy and continuity in funds, specialization and digitization in collection development, openness and security in technological applications, institution and mechanism in governance system construction, sharing and interactivity in space design, and other issues will be improved greatly. The common understanding of modern propositions such as libraries serving a key role in university talent cultivation systems and representing a key indicator of national cultural prosperity will have significantly improved.

The high-quality development of academic libraries encompasses the highlighting and enhancement of quality, efficiency, and overall capacity in the growth of services and optimization of organizational structures. Academic libraries shall establish and consolidate advanced development philosophy, strengthen and increase the accessibility and efficiency of services, mobilize the enthusiasm of a variety of stakeholders, make up for shortcomings, shore up weaknesses, and improve the comprehensive benefits of overall development. To this end, on the basis of strengthening the top-level design and overall planning and formulation of unified objectives, standards and requirements, libraries should sort out the various issues (including team building, service innovation, guarantee of funds, collection development, technology application, governance system

and capacity, space construction, status, influence and other issues) that arise and should be solved during development in a thorough, timely, and dynamic manner; unify objective orientation with problem orientation, innovation guidance with comprehensive evaluation, librarian competence with user needs, and information services with cultural development. Libraries should also actively take the initiative in publicity and communication while striving for the understanding, attention, and support of university leaders and relevant higher-level departments.

(5) The scientific development of academic libraries requires the guidance of more powerful modernization theory. The next 5 years will see the development of multidisciplinary collaborative research in library modernization, with in-depth research carried out in terms of the history, basic theory, methodology, and the application of results.

The scientific development of academic libraries needs to inherit and build on original foundations through historical research, establish the philosophy and strategic layouts of modernization through basic theoretical research, and innovate modernization methodologies in multidisciplinary collaborative research including library, information and archive management, management science and engineering, computer science and technology, marketing, and journalism and communication. In addition, the practical application of research results shall provide theoretical guidance for actual work and specific operations while integrating the inherent demands of overall, intensive, and high-quality development to establish objective indicators and evaluation systems to measure the modernization of academic libraries and ensure their sustainable development.

(6) The sustainable development of academic libraries must further adhere to the fundamental and strategic position of several key elements, including librarians, resources, users, services, and culture. Under the guidance of advanced concepts and scientific theories, positions shall be further consolidated and breakthroughs made in the pursuit of corresponding objectives.

A team of librarian personnel with a firm philosophy, rational structure, high operational proficiency, and high-level competence talent serves as the fundamental foundation; multi-source integration, adequate and accessible, distinctive features, and open and shared information resources and their ingrained cultural knowledge serves as the driving force; user-oriented design, ensuring user satisfaction, dutifully providing services, and insisting on service innovation serves as the unremitting pursuit; and the construction of a library culture in areas such as positive team spirit, pioneering and innovative organizational culture, efficient and coordinated management systems, and scientific and standardized systems serves as the basis. These key elements coordinate with and mutually reinforce each other. Together, they constitute a supporting system for

the sustainable development of academic libraries.

(7) The construction of new academic library development paradigms must further coordinate and straighten out the multi-faceted relationship based on primary responsibilities and major works, including internal rapport and external relationships, the relationship between internal library conditions and objective requirements, and the relationship between tradition and modernity. By properly taking advantage of the modernization process, libraries can create a better future.

The modernization of academic libraries cannot be separated from good external and internal environment, nor the proper handling of the relationships between supply and demand, as well as development and reform. To construct a new development paradigms for academic libraries, it is necessary to coordinate the development of librarian personnel, departments, and the library itself to develop a harmonious internal library ecology; integrate with national, university, industry, and social development while realizing the open, cooperative, highly interconnected, and coordinated development of the external library ecology; innovate on development concepts to solve the practical contradictions between the limited supply of library resources, funds and high quality, sustainable development; and treat development as the basis and deepen reforms to realize the concerted development and integration of traditional and modern resources, services, and construction.

3.2 Limitations and Future Efforts

The research team adopted and strictly followed the specifications of the Delphi method to study the development trends of national academic library modernization, along with a variety of methods to process and analyze results. The research process was objective and rigorous, summarization was comprehensive and meticulous, results were scientific and effective, and conclusions provide value in terms of guidance at the macro level. As a result of spatiotemporal constraints, there were also some limitations to the study. For example, the range of experts consulted was limited, there may be individual omissions in the interpretation of expert opinions, some aspects and options were not fully developed(or expanded upon from the perspective of application scenarios), and the text analysis methods based on machine learning requires further optimization.

Looking forward, (1) in terms of research methods, the research team shall continue to expand the quantity and scope of experts consulted, introduce technology foresight methods such as scenario analysis and technology roadmaps, improve the efficiency of automatic text analysis and manual indexing, further iterate on the design and analysis of its questionnaires in view of actual research, and provide dynamic trend forecasts for academic libraries; (2) in terms of research content, specific and special operation studies and scenario-based applications shall be added on the basis of macro

research, with best practices and advanced models identified in the various aspects of construction extracted and promoted; and (3) in terms of the application of results, the research team shall use the academic library modernization frameworks to further supplement and optimize the new development theory system. The team shall develop evaluation indicators for the modernization of academic libraries based on report results, perfect the construction of a fact database of Chinese academic libraries, strengthen in-depth cooperation with province, municipality, autonomous region steering committee for academic libraries across the country, regularly analyze and evaluate the modernization progress of academic libraries at all levels and of various types, grasp the common and individual problems faced by the modernization of different types of libraries in a timely manner, form a positive cycle of theoretical guidance and practical promotion, and facilitate the modernization of academic libraries in a steady manner.

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Appendix

1. List of Experts

Name	Library/Institution	Title	Research Interests
Chen Bin	Xiamen University Library	Research Librarian	Library service and management, academy of classical learning research, etc.
Chen Chuanfu	Graduate School, Wuhan University; School of Information Management, Wuhan University	Dean/Professor	Library development, information resource management, intellectual property, etc.
Chen Jin	School of Mechanical Engineering, Shanghai Jiao Tong University	Professor	Vibration shock noise, etc.
Chu Jiewang	Anhui University Library; School of Management, Anhui University	Director/Professor	Knowledge management, information management, education management, science and technology management, etc.
Chu Jingli	National Science Library, Chinese Academy of Sciences; Library, Information and Archives Management Department, University of Chinese Academy of Sciences	Professor	Library and information development strategy, user service, subject service, scientific and technical journal editing and publishing, etc.
Cui Bo	Zhengzhou University Library	Director/Research Librarian	Library modernization, "Zhou Yi" and ancient culture, ancient literature, etc.
Du Baoguo	Shandong Normal University Library	Director/Research Librarian	Library modernization management and innovation, library internal management reform, volunteer service and education, academic library construction, etc.
Gao Fan	School of Public Administration, Southwest Jiaotong University	Professor	Government digital governance research, information literacy education, library management, etc.
Huang Chen	Zhejiang University Library	Deputy Director/Research Librarian	Big data application, think tank research, visual computing, etc.
Huang Ruhua	School of Information Management, Wuhan University	Professor	Information organization and retrieval, information literacy education, open access, data openness and sharing, etc.

Name	Library/Institution	Title	Research Interests
Huang Shuiqing	Humanities and Social Sciences, Nanjing Agricultural University; College of Information Management, Nanjing Agricultural University	Head of Division/ Professor	Information organization and information retrieval, digital library, etc.
Jia Shenli	Xi'an Jiaotong University Library; School of Electrical Engineering, Xi'an Jiaotong University	Director/Professor	Power equipment, discharge plasma, etc.
Ke Ping	Department of Information Resource Management, Business School, Nankai University	Center Director/ Professor	Library management, knowledge man- agement, bibliography, public culture, etc.
Li Yuelin	Department of Information Resource Management, Business School, Nankai University	Dean/Professor	Information behavior, interactive infor- mation retrieval, health informatics, digital library and information system e- valuation, etc.
Li Yuhai	School of Information Management, Central China Normal University	Dean/Professor	Smart library, management information system, etc.
Lin Ming	SunYat-sen University Library	Executive Deputy Director/Research Librarian	Library management, protection of ancient books, etc.
Liu Bin	Dalian University of Technology Li- brary	Research Librarian	Library management, literature and in- formation resource construction, reader service, etc.
Ning Jin	Library of University of Science and Technology of China	Executive Deputy Director/Grade 5 Staff Member	Literature resource construction, subject service, regional alliance, etc.
Sha Yongzhong	Lanzhou University	Vice President/ Professor	Public crisis management, network measurement and information analysis, government performance management, etc.
Shao Bo	Nanjing University Library; School of Information Management, Nanjing University	Deputy Director/ Professor	Competitive intelligence, information security, digital library technology, etc.
Shao Min	Tsinghua University Library	Deputy Director/ Associate Research Librarian	Documentary resources construction, subject service, etc.
Shen Jinhua	Tongji University Library	Secretary of CPC Committee /Re- search Librarian	Library management, information ser- vice, patent analysis and service, etc.

Name	Library/Institution	Title	Research Interests
Song Jifang	Renmin University of China Libraries; Evaluation Research Center, Renmin University of China	Executive Deputy Director/Research Librarian	Knowledge management and service, subject analysis and evaluation, information resource construction, IT application, etc.
Tang Chengxiu	Tianjin University of Finance& Economics Library	Director/Research Librarian	Library management, information literacy education, etc.
Tong Yunhai	Peking University Library; School of Electronics Engineering and Computer Science, Peking University	Deputy Director/Professor	Data mining and knowledge discovery, intelligent media analysis, digital library, etc.
Wang Yu	Shenyang Normal University Library	Secretary of CPC General Branch/Research Librarian	Library management, reading promotion, etc.
Wu Jianzhong	University of Macau Library, Shanghai Library	Director/Research Librarian	Library management, library service, etc.
Xia Lixin	Central China Normal University	Vice President/Professor	Information organization and retrieval, knowledge management, digital library, etc.
Yang Xinya	Chongqing University Library	Director/Research Librarian	Digital library, smartlibrary, etc.
Yu Ping	Jilin University Library; College of the Humanities, Jilin University	Director/Professor	Ancient Chinese history, linguistics, Chinese international education, etc.
Zhang Jilong	Fudan University Library; Institute of Humanities and Social Science Data, Big Data Research School, Fudan University; Shanghai Joint Innovation Laboratory of Big Data in Scientific Research	Deputy Director; Executive Vice Director; Director/Research Librarian	Digital library, scientific data management, etc.
Zheng Jianming	School of Information Management, Nanjing University	Professor	Library science, bibliography, social informatization, public digital culture, etc.
Zheng Zhangfei	Hunan University Library; Steering Committee for Academic Libraries of Hunan Province; Editorial Department of Library Work in Colleges and Universities	Deputy Director and Secretary General; Editor-in-Chief/Research Librarian	Library management, digital library, information literacy education, etc.
Zou Yunlong	Northeast Normal University Library; The Institute of Ideological and Political Education, Northeast Normal University	Director/Professor	Autonomous learning, information literacy education, innovation and entrepreneurship education, learning theory, etc.

2. Profiles of Research Team Members

- **Team Leader:**

Chen Jianlong

Deputy Director of School Affairs Committee, Library Director, Professor of Information Management Department, Peking University; Director of Steering Committee for Academic Libraries of China, Ministry of Education; Deputy Director, Branch Director of Academic libraries, Library Society of China; Member of the First Council, National Library of China; Executive Director of the Chinese Li Dazhao Research Association; Executive Director, Ancient Books Preservation and Conservation Association.

Main research areas: information service studies, information resource management, library management, informatization and human information behavior, etc.

Selected publications:

Books: *Information Market Management and Information Users, Introduction to Information Service Studies, etc.*

Papers: *A Study of Information Service Models, The Subdivision and Integration Strategy of Information Service Innovation in University Libraries, Discussion on the Transformation of Academic Libraries Modernization, etc.*

- **Deputy Team Leaders:**

Wang Xincui

Professor of Information Management School, Library Director, Wuhan University; Deputy Director of Steering Committee for Academic Libraries of China, Ministry of Education; Executive Council Member, Deputy Director of the Reading Promotion Committee, Library Society of China; Deputy Director and Secretary-General of Steering Committee for Academic Libraries of Hubei Province; Vice President of the Library Society and Vice President of Ancient Books Protection Association, Hubei Province.

Main research areas: cataloguing, reading promotion, document and information resource management, etc.

Selected publications:

Books: *Chinese Cataloguing: Theory, Tradition and Development, Reading Promotion in Academic Libraries, Government Information Resource Management, etc.*

Papers: *From Classical Bibliography to Contemporary Bibliography, On Selective Dissemination of Documents, etc.*

Dang Yuewu

Professor of Public Administration School, Part-time Professor of Marxism School, Library Director, Sichuan University; Deputy Director of Steering Committee for

Academic Libraries of China, Ministry of Education; Director of Steering Committee for Academic Libraries of Sichuan Province; Vice President of the Library Society and Director of Document Imaging Technology Association, Sichuan Province.

Main research areas: information service management, information resource development and university culture construction, etc.

Selected publications:

Books: *Introduction to Information Management, Archival Resource Development Based on Information Organization Technology, Zhang Lan and Sichuan University, etc.*

Papers: *Developing Organization Management Mechanisms of Modern Library and Information Institutions Supporting Knowledge Services, Case Study of Subject-based Word List Reference System, AACR2 Development Research, etc.*

Chen Daqing

Director and Research Librarian of Shenzhen University Library; Executive Council Member of Library Society, Member of Steering Committee for Academic Libraries, Guangdong Province.

Main research areas: library informatization, digital construction, library management, etc.

Projects: *Library integrated system SULCMIS (1988-2015), electronic resource management system OpenERMS, digital acquisition alliance of university libraries DRAA portal, new generation library platform based on micro-service architecture, etc.*

Papers: *Development of ERMS and Its Future, Research on the Sustainable Development Model of Library Open Source Community, Implementing the Standardized Usage Statistics Harvesting Initiative (SUSHI) Protocol, Study on Data Management Service Framework in Foreign Academic Universities, etc.*

Wang Bo

Research Librarian of Peking University Library, Deputy Editor-in-chief of University Library Journal, Deputy Secretary-General of Steering Committee for Academic Libraries of China, Ministry of Education.

Main research areas: reading therapy, reading promotion, ancient Chinese reading pictures, etc.

Selected publications:

Books: *Reading Therapy, A Study of Reading Promotion Activities in Chinese and Foreign Libraries, Lovely Librarianship, etc.*

Papers: *Some Issues about Library Reading Promotion, Study on Reading Pictures of Ancient China, An Exploration on the Two Most Beautiful Pictures on Reading in Ancient China, etc.*

• **Members:**

Shao Yan

Associate Research Librarian, Administration Center, Peking University Library.

Main research areas: digital library construction and management, digital library service promotion, library evaluation, etc.

Selected publications:

Books: *Theory and Practice of Digital Library Promotion, Research on the Development of Digital Library in China*(co-author), etc.

Papers: *Performance Indicators for Digital Library Services, International Experiences of Standardization in Grass-roots Libraries and the Enlightenment*, etc.

Zhang Huili

Associate Research Librarian, Center of Collaborative Services, Peking University Library, Ph.D. in Library Science.

Major research areas: information literacy education, information research service, etc.

Selected publications:

Books: *History of Chinese Libraries, Library Reading Promotion Research* (co-author), etc.

Papers: *Process and Method of Universities Discipline Competitiveness, the Training and Education for Children's Librarians in Pratt Institute Library School in the United States from the End of the 19th Century to the Beginning of the 20th century*, etc.

Zhang Lu

Librarian, Center of Document Resource Services, Peking University Library, Ph. D. in Information Science.

Major research areas: literature catalog and knowledge organization, knowledge management and service innovation, etc.

Selected publications:

Papers: *The Current Status, Hotpots, and Frontiers of Research on Knowledge Service Mode; Empirical Research on Knowledge Service Modes of Think Tank Based on Client Requirements s; Analysis on Microblog Content Features of Think Tanks in China*, etc.

Li Feng

Associate Research Librarian, Director of Development and Reform Office, Peking University Library.

Major research areas: library development and planning, information research service, etc.

Selected publications:

Papers: *Investigation and Consideration of Decision-making Support Service of University Libraries in China, Exploration and Practice of Patent Information Service in University Libraries, How to Carry out Discipline Competitiveness of Library Subject Service*¹, etc.

3. Survey Results (3rd Round)

Question 1: The core concepts of academic libraries modernization related to intensive development

Aspect 1: Implementation of New Development Philosophy (*innovation, coordination, ecofriendliness, openness, and sharing*) in Academic Libraries

Options	Agreed experts	Percentage
All-round innovation-driven development	31	91.18%
Collaborative services across all links	31	91.18%
Service quality reform	27	79.41%
Sharing in accordance with the law	24	70.59%
Comprehensive open services	22	64.71%
Energy conservation and emission reduction	19	55.88%
Opening up academic libraries	16	47.06%
Information security	14	41.18%
Transformation of collection quality	13	38.24%

Aspect 2: Implementation of the “Double First Class” Construction Concept in Academic Libraries

Options	Agreed experts	Percentage
Serving university disciplinary construction	34	100.00%
Serving university scientific research innovation	33	97.06%
Integration with university talent training systems	32	94.12%
Serving major and curriculum development	27	79.41%
Construction of a spiritual homeland for students and faculty	20	58.82%
Mutually beneficial collaboration	14	41.18%
Participation of students and faculty in library development and management	13	38.24%
Pursuit of excellence	12	35.29%

Aspect 3: Reflecting the Concepts of Professionalism and Nature in Academic Libraries

Options	Agreed experts	Percentage
User-oriented and service-first concepts	31	91.18%
Integration of library and university development	31	91.18%
Refinement of librarian teams	30	88.24%
Integration of resources and services	29	85.29%
Unification of required documents guarantee with literacy education	21	61.76%
Fostering a strong cultural environment	19	55.88%
Strengthening value guidance	15	44.12%
Staying true to their original mission of libraries	12	35.29%

Question 2: The primary objectives of academic libraries modernization related to overall development after 5 years

Aspect 1: Making Greater Contributions to the Development of a Great Modern Socialist Country

Options	Agreed experts	Percentage
General education and cultural inheritance to realize the objective of a strong country in terms of culture	33	97.06%
Multiple literacy education to realize the objective of a strong country in terms of education	31	91.18%
Development of innovation basis and new think tanks that realize the objective of a strong country in terms of science and technology	28	82.35%
Construction of an academic exchange service system that realizes the objective of a strong country in terms of talent cultivation	26	76.47%
Provision of intellectual property information services that realize the objective of a strong country in terms of intellectual property	25	73.53%

Aspect 2: Making Greater Contributions to High-Quality Development of Their Universities

Options	Agreed experts	Percentage
Constructing a high-quality and intelligent guarantee system for literature resources, data and information	34	100.00%
Serving a key role in the development and inheritance of the university spirit and campus culture, and act as a university cultural exchange center	33	97.06%
Supporting the university's scientific research innovation and "Double First Class" construction while maintaining the university's core academic positioning	30	88.24%
Construction of a cultural education and practice base that revolves around the fundamental task of morality education	28	82.35%

Aspect 3: Realizing New Achievements in the Modernization of Academic Libraries

Options	Agreed experts	Percentage
Establishment of a hierarchal, professional, and innovative team of librarians	34	100.00%
Establishment of a complete and efficient knowledge service system	33	97.06%
Realization of intelligent, smart and innovative development	30	88.24%
Establishment of an open and shared information resource system that integrates print and digital resources while ensuring value preservation and appreciation	29	85.29%
Enhance voice and influence over both university and industry	21	61.76%
Establishment of a scientific management system supported by a unique organizational culture	21	61.76%

Question 3: The practical issues need to be solved of academic libraries modernization over the next 5 years and related to high-quality development

Aspect 1: Team Building

Options	Agreed experts	Percentage
Professionalization and management capacity building of leadership teams	33	97.06%

Options	Agreed experts	Percentage
Cultivation of new types of librarians (including data and research librarians)	33	97.06%
Enhancement of the professional competence of librarians	29	85.29%
Strengthened cultivation of an organizational culture	26	76.47%
Optimization of the librarian position layout and system	23	67.65%
Ideological and political education of librarians	12	35.29%

Aspect 2: Service Innovation

Options	Agreed experts	Percentage
Subject knowledge services integrating into teaching and scientific research	32	94.12%
Provision of information consulting and think tank services supporting scientific and technological innovation	32	94.12%
Establishment of a smart service system oriented towards new user demands	30	88.24%
Provision of innovative information literacy and other multiple literacy education and services based on next-gen information technology	28	82.35%
Active innovation in general education and cultural services to implement morality education	22	64.71%
Service innovations in response to public crises such as global pandemics and natural disasters	14	41.18%

Aspect 3: Guarantee of Funds

Options	Agreed experts	Percentage
Ensuring continuous and sufficient funding	32	94.12%
Strengthening scientific budgeting with limited funds	30	88.24%
Soliciting donations from both intramural and extramural individuals and organizations	28	82.35%
Applying for special funding	27	79.41%
Improvement of cost control strategies	23	67.65%

Aspect 4: Collection Development

Options	Agreed experts	Percentage
Special collection development	34	100.00%
Integration of print and digital collections	32	94.12%
Guarantee and evaluation of the literature resource allocation	26	76.47%
Knowledge resource organization, pushing and discovery	25	73.53%
Value-added data resource service	24	70.59%
Development of open access resources	23	67.65%
Customized, personalized, and integrated services of instructional resources	22	64.71%
Long-term preservation of resources	22	64.71%
Co-construction and sharing of resources	22	64.71%
Digitalization of literature resources	12	35.29%

Aspect 5: Technology Applications

Options	Agreed experts	Percentage
R&D of new user-oriented library management systems	32	94.12%
Application of new technologies such as AI	30	88.24%
Construction of data management platforms	29	85.29%
Integration of smart library and smart campus	29	85.29%
Construction of smart equipment and infrastructure	25	73.53%
Construction of mobile and micro-service platforms	25	73.53%
Construction of digital scholarship (including digital humanities) infrastructure	23	67.65%
Application of information security technologies	18	52.94%

Aspect 6: Governance Systems and Capacity Building

Options	Agreed experts	Percentage
Construction of scientific evaluation systems	33	97.06%
Formulation of operational norms and industry standards	32	94.12%
Optimization of management mechanisms and systems	31	91.18%
Formation of a governance structure that involves both users and experts	21	61.76%
Strengthening of legal protections, including intellectual property rights	17	50.00%
Strengthening of library marketing	16	47.06%

Aspect 7: Space Construction

Options	Agreed experts	Percentage
Open and sharing of physical spaces	30	88.24%
High-density storage spaces	29	85.29%
Interactive learning spaces	27	79.41%
Digital scholarship and collaboration spaces	26	76.47%
Immersive cultural spaces	24	70.59%
Virtual spaces	22	64.71%
Innovation, creative, and maker spaces	19	55.88%
Green spatial environments and sustainable development	16	47.06%

Aspect 8: Status and Influence

Options	Agreed experts	Percentage
Status in the minds of students and faculty	33	97.06%
Visibility at the university level	31	91.18%
Influence through public services	28	82.35%
Influence through academic library consortium	26	76.47%
Regional inter-library substantive cooperation	20	58.82%
International status and influence	19	55.88%
Influence in regard to contract negotiation and acquisition of resources	18	52.94%

Question 4: The theoretical issues that require urgent study over the next 5 years and related to the scientific development of academic libraries

Aspect 1: Development History

Options	Agreed experts	Percentage
Development history of libraries in higher education	34	100.00%
Academic library history in the context of university history	27	79.41%
History of academic libraries in the context of the “Four Histories”	22	64.71%
Cultural history of academic libraries	21	61.76%
Oral library history	20	58.82%
Institution development history of academic libraries	18	52.94%

Aspect 2: Basic Theory

Options	Agreed experts	Percentage
Function and positioning of academic libraries	32	94.12%
Top-level design and strategic positioning of academic library modernization	31	91.18%
Content and concept of academic library modernization	30	88.24%
Construction of a new development theory system (including librarian management, incentive mechanisms, etc.)	25	73.53%
Transformation of academic libraries	18	52.94%
Nature of academic libraries	11	32.35%

Aspect 3: Methodology

Options	Agreed experts	Percentage
Information analysis method	32	94.12%
Operational method innovation	29	85.29%
New methodologies and tools in metrics science	27	79.41%
Multidisciplinary collaborative research	26	76.47%
Open science ecosystems issues (including open data management methods)	23	67.65%
Construction of methodology system	14	41.18%

Aspect 4: Application of Results

Options	Agreed experts	Percentage
Evaluation system of library operational performance	33	97.06%
Construction of library-related indicators in higher education evaluation	32	94.12%
User utility evaluation system of library	30	88.24%
Construction of a library quality evaluation system	28	82.35%

Question 5: The key elements of academic libraries modernization related to the sustainable development

Aspect 1: Librarians

Options	Agreed experts	Percentage
High levels of professional identity and cultural self-confidence	33	97.06%

Options	Agreed experts	Percentage
Diversified operational capacity	31	91.18%
Leadership teams with modern concepts and capabilities	31	91.18%
Rational team structures	28	82.35%
Solid professional knowledge	25	73.53%
Pioneering and innovative ideas	25	73.53%
Strong teamwork	24	70.59%
High levels of dedication and professionalism	24	70.59%
Active mind for serving users	23	67.65%
International vision	22	64.71%

Aspect 2: Information Resources

Options	Agreed experts	Percentage
Special collection resources	34	100.00%
Electronic (digital) resources	33	97.06%
Data resources	31	91.18%
Print literature resources	30	88.24%
Open access resources	29	85.29%
Internet resources	18	52.94%
Knowledge resources	14	41.18%

Aspect 3: Users

Options	Agreed experts	Percentage
User need	32	94.12%
User satisfaction	31	91.18%
User experience	28	82.35%
User participation	26	76.47%
User behavior and preferences	25	73.53%
User scope and diversity	10	29.41%

Aspect 4: Services

Options	Agreed experts	Percentage
Specialized knowledge service	32	94.12%
Information literacy education	31	91.18%
Diversified space services	29	85.29%
Intellectual property services	28	82.35%
Data management services	25	73.53%
Innovative think tank services	24	70.59%
Cultural and general education services	24	70.59%
Reading services	20	58.82%
Integrated media information services	19	55.88%

Aspect 5: Culture

Options	Agreed experts	Percentage
Positive team spirit	32	94.12%
Pioneering and innovative organizational culture	32	94.12%
Scientific and standardized institutional culture	32	94.12%
Efficient and collaborative management systems	30	88.24%
Library culture with regional, university, and professional characteristics	25	73.53%
Advanced and practical technological culture	21	61.76%
Rigorous and pragmatic work atmosphere	16	47.06%

Question 6: The ecological relationships that must be properly managed in the modernization of academic libraries in the construction of new development paradigms

Aspect 1: Internal Library Ecology

Options	Agreed experts	Percentage
Librarian career development and library development	32	94.12%
Inter-departmental cooperation and development	32	94.12%
System construction and human-based management	30	88.24%
Communication and collaboration amongst librarians	28	82.35%
Relationship between party building and library operations	26	76.47%
Relationships between in-service and retired librarian personnel	9	26.47%

Aspect 2: The Library and the External Ecology

Options	Agreed experts	Percentage
Relationship between libraries and university development objectives (including the morality education, “Double First Class” construction, governance system modernization, and more)	33	97.06%
Relationship between libraries and their users (including intramural students and faculties, alumni, extramural readers, and more)	33	97.06%
Relationship between libraries and relevant university bodies (including decision makers, functional departments, other schools/departments, and more)	31	91.18%
Relationship between libraries and industry institutions (including other academic libraries, public libraries, industry associations, and more)	29	85.29%
Relationship between libraries and commercial institutions (including publishers, information institutions, technical service providers, and more)	23	67.65%
Relationship between libraries and national development strategies (including realizing the objective of a strong country in terms of education, technology, culture, intellectual property, and more)	20	58.82%
Relationship between libraries and relevant higher-level departments (including supervisory departments and funding sources such as the Ministry of Education and local governments)	20	58.82%
Relationship between libraries and local economies, culture, and social development	19	55.88%

Aspect 3: Conditions and Objectives

Options	Agreed experts	Percentage
Relationship between high service standards and insufficient human, technical, and collection resources	34	100.00%
Relationship between limited funding and sustainable development	33	97.06%
Relationship between open access sharing and intellectual property protection	31	91.18%

Options	Agreed experts	Percentage
Relationship between the scale of development and utility optimization	26	76.47%
Relationship between opening up and energy conservation and environmental protection	18	52.94%

Aspect 4: Tradition and Modernity

Options	Agreed experts	Percentage
Relationship between traditional and new services	32	94.12%
Relationship between traditional and digital libraries	29	85.29%
Relationship between literature and data resources	27	79.41%
Relationship between refined library traditions and innovative development concepts	22	64.71%
Relationship between the fine traditional Chinese culture and modern service methods	21	61.76%

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