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Research on the Path of Subject-based Services in Local Undergraduate University Libraries—A Case Study of the Library of Nanyang Normal University

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Abstract: Subject-based service constitutes a core approach for university libraries to engage in talent cultivation and scientific research, as well as a vital pivot for libraries to shift from document guarantee to knowledge-oriented services. Most existing studies concentrate on "Double First-Class" universities, paying limited attention to practical paths for local undergraduate universities hampered by insufficient manpower, strained resources and scattered disciplinary demands. Taking the inter-generational evolution of subject librarians as the thread, this paper clarifies the connotation transition of subject-based services from subject liaison and embedded research support to knowledge services. Identifying four constraints concerning manpower, resources, demands and institutions, this paper takes the Library of Nanyang Normal University as a case against its positioning of "strengthening teacher education and consolidating applied disciplines" and master's program-building requirements. It explores service pathways across six dimensions including organization, demand identification, service content, competency building, technology application and institutional mechanisms, and discusses three practical tensions. It concludes that local undergraduate university libraries should prioritize stable, user-perceivable service deliverables over sophisticated modes to establish an irreplaceable role in institutional disciplinary construction.

1. Introduction

The Outline of the Plan for Building a Powerful Country in Education (2024-2035) proposes building China into an education-powered country by 2035. It stresses promoting higher-education reform by classification, optimizing the layout of disciplines and specialties, and enhancing universities' capacity to serve national strategies and regional development[1]. For local undergraduate universities, such requirements translate into fostering several advantageous disciplinary directions amid limited disciplinary scale and resources, so as to improve the overall quality of talent cultivation. Consequently, disciplinary construction has shifted from external competition for research projects to internal connotation-driven improvement. Precision and depth

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of literature and information support constitute an irreplaceable yet easily overlooked component of connotation-oriented development.

Subject-based service refers to the embedded and specialized library service targeting specific academic disciplines. Its value lies in transforming general document support into targeted solutions for disciplinary needs. Chu Jingli et al. put forward the concept of "second-generation subject librarians", pointing out that subject librarians should shift from resource-centered to user-centered operations, and expand services from within libraries to front-line embedding[2]. Chu Jingli further discussed role positioning for new-generation subject librarians, emphasizing their transformation from "liaison officers" to "knowledge service providers"[3]. Zhang Xiaolin conceived "Research Library 2020: an embedded collaborative knowledge laboratory", advancing subject-based services toward collaborative knowledge production embedded in the whole research lifecycle[4]. He later advocated reshaping library business structures through supply-side structural reform of knowledge services[5]. Since then, academic circles have extensively discussed modes, evaluation and organizational forms of subject-based services, and several referential paradigms have emerged in practical work.

Nevertheless, existing research has two obvious limitations. First, most research subjects are "Double First-Class" universities and Chinese Academy of Sciences institutions. Their sufficient full-time subject librarians, generous database budgets and large-scale disciplines generate experience hardly transferable to local undergraduate universities. Second, case studies tend to present successful practices while ignoring constraint conditions. When libraries only have one or two full-time staff, mostly general-purpose databases, and fragmented, unstable disciplinary demands, there lacks operable answers as to whether subject-based services should "scale down" or "scale up". This paper fills this gap: focusing on local undergraduate universities and taking Nanyang Normal University Library as the case, it explores feasible paths under realistic constraints rather than depicting ideal scenarios.

2. Connotation Evolution and Constraints for Local Undergraduate Universities

2.1 From Liaison to Knowledge Services: Three Stages of Subject-based Services

The connotation of subject-based services evolves alongside technological contexts and research paradigms, and can be roughly divided into three stages. The first stage centers on "subject liaison". Subject librarians are responsible for resource promotion, user training and demand transmission, following the logic of "informing users of library collections". The second stage focuses on "embedding". Services extend to research projects, courses and research teams, guided by the logic of "bringing services to users". The third stage features "knowledge-oriented services", highlighting analysis, reorganization and value-adding processing of knowledge content under the logic of "producing new knowledge products for users". These three stages are not mutually exclusive but superimposed. Most local undergraduate universities stay between the first and second stages, while their disciplinary construction already generates demands for third-stage knowledge services. Such "stage dislocation" forms the starting point for path design.

2.2 Four Major Constraints Faced by Local Undergraduate Universities

Local undergraduate university libraries face the following four main problems in developing subject-oriented services compared to high-level universities. Firstly, manpower shortage: there are a limited number of librarians, full-time subject librarian positions are scarce, and most of the tasks are carried out by staff who are also busy with reference or circulation work and have fragmented time due to routine tasks. Secondly, resource constraints: although the procurement of databases

focuses on general-purpose and all-encompassing resources, there is a lack of specialised foreign-language resources and professional tools for niche disciplines to deepen the scope of services. Demand constraints: research output is low; the demands of different disciplines are uneven and fragmented and seasonal, thus precluding large-scale regular services. Fourthly, institutional constraints: subject-based services are rarely included in the official job descriptions and evaluation indicators. Practitioners do not have guaranteed working hours or corresponding incentives; thus, it is "implementation without administration or evaluation".

Therefore, based on the above four constraints, local undergraduate university libraries cannot implement the high-level goals of "full-discipline, whole-process and fully-equipped" services. Therefore, a high-intensity way of "hierarchical supply, priority breakthroughs and product-oriented deliverables" should be pursued. Constraints are not only negative constraints but also parameters of path planning. Due to the shortage of personnel, efforts need to be focused on connections with the highest concentrations of demand and concrete user perceptions.

3. Case Background: Realistic Starting Point of Nanyang Normal University Library

3.1 Disciplinary Pattern Shaping Demand Structures

Nanyang Normal University is a provincial public undergraduate university in Henan Province. It obtained the authorization to grant master’s degrees in 2017, was selected as a university under the Construction Project for Characteristic Key Disciplines of Henan Province in 2020, and was designated as a key cultivation institution for doctoral degree authorization in Henan Province in 2025[6]. The university adheres to its development guideline of “strengthening teacher education and consolidating applied disciplines”. Chemistry, materials science and engineering have entered the top 1% of ESI global rankings. It owns 3 national-level first-class undergraduate majors, 15 provincial-level first-class undergraduate majors, 9 majors that have passed second-level accreditation for teacher-training programs, and 23 master’s degree programs[7].

This pattern forms a three-tier structure of demands for subject-based services.Demands from the first tier are due to favourable disciplines; researchers in ESI-ranked disciplines need frontier tracking, bibliometric analysis and journal submission evaluation to determine "where their research stands among international peers". Second-tier demands originate from teacher-training majors; programme accreditation and curriculum construction require guaranteed teaching reference books, curriculum-standard-related documents and information literacy courses for normal university students, focusing on "whether teaching and accreditation materials are complete and accurate". Third-tier demands stem from the development of degree-granting programmes: the expansion of master's programmes and cultivation of doctoral programmes require disciplinary competitiveness analysis, sorting of supervisors' research outputs and data support for application materials, and focusing on "clarifying the foundation of disciplinary development" [8]. The demands of various levels are different in type and required skills; thus, hierarchical service provision is feasible.

3.2 Existing Foundations and Service Gaps

The main tasks of the university library are to build up resources for documents, teach information literacy, provide reference help and offer reader services. A department-liaison mechanism has been set up to provide the foundation for subject-based services; namely, relatively stable database resources, teaching capacity for literature retrieval courses, and existing communication channels with academic departments. However, liaisons are mainly engaged in the dissemination of notices, resource recommendations and lecture organisation. Lack of stable

product forms and delivery standards in services; work outputs are difficult to accumulate and hard for academic departments to assess accurately.

The Three main deficiencies are known. Firstly, "liaison personnel exist without full service chains": liaisons mainly connect people rather than specific tasks. Responses are ad-hoc to the emergence of demands and connections weaken after the demands cease. Secondly, "resources exist without targeted solutions": although there are databases, there is a lack of compiled resource portfolios, alternative solutions and practical guides for specific research areas, and thus faculty must search for resources independently. Thirdly, "no documentary evidence for the work"; many services have been provided but are poorly documented. Only the number of lectures can be provided in annual reports instead of showing the effects on disciplinary construction. The above three deficiencies are the direct objectives of path optimisation.

4. Path Design: Intensive Reform in Six Dimensions

4.1 Organizational Path: Replacing Loose Liaison with the “1+N+Project Team” Model

The organisation is the main constraint on subject-based services. A hybrid "1+N+project team" structure is proposed: one full-time lead for subject-based services is responsible for the whole planning, standard formulation and external coordination; N part-time subject liaisons are assigned to clusters of disciplines for regular communication. Cross-departmental project teams are formed to carry out important tasks by mobilizing staff from acquisition & cataloging, reference consultation, information technology and information literacy education. The above teams are disbanded after the work. Differential resource allocation shall be implemented: full-time or semi-full-time support is allocated for ESI-ranked disciplines, characteristic key discipline clusters and doctoral program cultivation disciplines; general disciplines will be covered by part-time liaisons plus standardised service products to avoid an average resource distribution. At the same time, the three items of service lists, response time limits and deliverables will be specified to change the informal, human-relationship-oriented liaison into an institutional-based service agreement.

4.2 Demand Path: Three-tier Demand Lists and Annual Departmental Alignment

The purpose of demand management is to turn the general expectation of "increased library support" into specific tasks. A three-level catalog of teaching support, research support and decision-making support needs to be created. Formal annual coordination meetings of academic departments produce yearly service plans. Teaching-support tier is dedicated to ensuring the availability of course reference books, embedded information literacy courses and literature guidance for graduation theses, as well as support materials for program accreditation. Research support tier: Intelligence for topic selection, retrieval and review methods; journal submission analysis and research output dissemination. Decision-making support tier contains disciplinary competitiveness analysis, ESI dynamic monitoring and data support for degree-programme applications. Three-tier lists set the scope for services; academic departments are notified of available library services, and librarians specify out-of-scope work to avoid over-promising and resulting service failures.

4.3 Content Path: Achieving Replicability through Product-oriented Services

Due to labour constraints, services need to be product-oriented to achieve a quality-cost trade-off. Five categories of core products can be developed: firstly, discipline-oriented resource navigation,

sorting databases, open-access resources, print collections and alternative solutions for each discipline in the form of concise one-page guides. Secondly, guarantee of course reference books: connect with the academic affairs system to allocate bibliographies and electronic resources for specific courses and directly support teaching. Thirdly, all-encompassing research support: divided-service packages for intelligence on topic selection, literature review methods, journal submission analysis and institutional repository archiving of research results. Fourth, annual disciplinary competitiveness analysis reports concerning research outputs, collaboration networks and impact indicators for degree-program development and application. Fifth, a curriculum group for information literacy covering new-student library orientation, graduation-thesis research and postgraduate research training. The core logic of product-oriented services lies in “standard templates plus customized modification”: templates guarantee efficiency and consistency, while targeted adjustments satisfy disciplinary needs. The proportion of template usage and customization can be adjusted according to the priority level of each discipline.

4.4 Competency Path: Building Composite Competencies of “Library-information Science + Disciplinary Knowledge + Data Analytics”

Subject librarians need to enhance the scope of their skills from simple literature retrieval to four areas: the base is library-information science knowledge, disciplinary knowledge aids in user communication, data analysis enables high-value-added services, and collaboration skills ensure effective on-site implementation. Local undergraduate universities can barely recruit librarians of specialised disciplinary backgrounds. A feasible workaround is to build internal disciplinary knowledge maps; for each priority discipline, gather internal learning materials on disciplinary profiles, main research trends, key journals, representative scholars and frequently-used databases to enable librarians without matching academic backgrounds to gain basic conversational skills in a few months. Mechanisms of capacity building include regular fixed-on-site office hours in academic departments, participation in research group meetings, accumulation of practical experience via real-world projects and external training. Integration of competency enhancement in the day-to-day work process will replace standalone training modules.

4.5 Technology Path: Data Integration and high-Precision Information Push

Technology has altered the logic of service from "users seeking resources" to "resources reaching users". Data integration is included in the basic work to merge circulation logs, retrieval records, database access statistics, curriculum information and research-output data for the construction of discipline profiles, identification of resource-utilization characteristics and deficiencies in each department. Three kinds of apps can be made according to the discipline profile. Firstly, precision push: distributing the newly obtained resources, thematic exhibitions and training notices according to disciplinary orientations. Secondly, analysis help: using bibliometric tools to produce output reports at the institutional and individual researcher levels and reduce manual statistical work. Thirdly, intelligent auxiliary work: employing large language models for preliminary literature screening, abstract extraction and review-framework drafting to free librarians from repetitive tasks and enable them to concentrate on problem definition and result assessment. Outputs of intelligent tools need to be manually verified, especially for disciplinary evaluation and application materials, as the accuracy of data is prioritized over efficiency.

4.6 Institutional Path: Department-embedded Collaboration and Incentivised Assessment

Institutional construction enables subject-based services to "gain access and achieve sustainability"; "gaining access" refers to subject librarians attending teaching or research committee meetings of academic departments, participating in curriculum scheme revision, program accreditation preparation and degree programme application work, and thus changing from passive observers to active participants; "achieving sustainability" requires integrating subject-based services into formal job descriptions and annual performance evaluations. Convert workload to service hours, project deliverables and user feedback. Service outputs of the subject, such as analysis reports, resource navigation documents and curriculum construction achievements, will be regarded in the professional title evaluation. Furthermore, within the university, a collaborative network should be established by setting up task and data interfaces with the Academic Research Office, Academic Affairs Office and Postgraduate Affairs Office, and cooperating with public libraries and peer university libraries to compensate for the lack of resources at the institution through resource sharing and experience exchange.

5 Discussion: Three Sets of Tensions and Risk Prevention

5.1 Embedding versus Independence

Subject-based services focus on embedding; however, embedding does not imply subordination. Librarians who only meet the demands of various departments in an unplanned manner have reduced their services to simple tasks and lack professional discretion. An excessive rigidity in following pre-set library service frameworks results in a disconnect with the demands of life. Balanced principle: "independent methodologies and jointly-defined themes"; academic departments set research questions, and librarians are in charge of solution methodologies. Professional methodological independence is the basis for long-term trust from academic departments.

5.2 Service Depth versus Manpower Constraints

The conflict of high-quality service with insufficient personnel cannot be resolved by individual desire and can only be addressed through organisational design. The three feasible options are: hierarchical supply (in-depth services for priority disciplines and standardised services for general disciplines); workflow decomposition (division of services into deliverable modules carried out by multiple posts); utilising tools and assistance (assigning mechanical tasks such as data statistics and format editing to software or student assistants, reserving librarians' working hours for analytical judgement and scheme design). High-quality all-encompassing deep-dive services that do not recognize manpower limitations generally result in unsatisfactory results for both parties.

5.3 Service Effectiveness versus Evaluation

The results of subject-service cannot be properly evaluated by circulation volume or the number of lectures. It is recommended to use a three-dimensional evidence system of process indicators, such as the number of service projects, response time and department coverage ratio; outcome indicators, such as supported application materials, adopted analysis reports and embedded courses; and perception indicators for department satisfaction and faculty revisit rates. The three kinds of evidence show both the work-load and actual effects. In addition, all the documentation of typical

cases should be kept; as the value of subject-based services is frequently shown by a small number of key milestones rather than average performance.

5.4 Risk Prevention

The three kinds of risks should be avoided in practice. Firstly, data compliance risks: discipline profiling is based on faculty research output and resource-use behaviour. Collection of data and its use will be limited to a reasonable scope with explicit permission, and anonymisation will be employed in external reports. Secondly, an excessive reliance on technology; therefore, the review and evaluation results of intelligent systems may be biased. Direct application without manual verification of the application documents may lead to significant risks. Thirdly, campaign-style implementation risks: subject-based services driven by short-term campaigns with formal launch ceremonies and report meetings may generate only surface-level momentum without long-term mechanisms. Pilot application and stable delivery of results will be carried out before widespread use.

6. Conclusion

Subject-based services in local undergraduate university libraries are essentially choices made under realistic constraints. Taking the inter-generational evolution of subject librarians as a starting point, this paper identifies four major constraints: manpower, resources, demands and institutions. Accordingly, it proposes an intensive path of “hierarchical supply, priority breakthroughs and product-oriented deliverables”. Combined with Nanyang Normal University’s guideline of “strengthening teacher education and consolidating applied disciplines” and its demands for master’s-degree-program construction, operable arrangements are put forward covering organization, demand identification, service content, competency building, technology application and institutional mechanisms.

It should be stressed that the value of subject-based services lies not in advanced service forms but in stable deliverables genuinely perceived by academic departments. For local undergraduate universities, rather than pursuing full-coverage whole-process services for every discipline, libraries shall first deliver high-quality services for two or three priority disciplines, form replicable templates and credible practical cases, and then expand service scope step-by-step. When libraries can continuously provide irreplaceable information analysis for disciplinary construction, subject-based services achieve genuine implementation, and libraries secure their due position within the university’s disciplinary landscape.

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