# Exploration and Practice of Precision Push Services for Print and Electronic Resources in University Libraries: A Case Study of Xidian University Library

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## Abstract

Abstract: [Purpose/Significance] This article addresses the pertinent issues in current literature resource push services in Chinese university libraries, proposing a precision push service solution for print and electronic literature resources. It aims to guide university libraries to better implement print and electronic literature resource push services, improve service quality, and achieve precision push and personalized services. [Method/Process] Taking Xidian University Library as an example, through the integration of the library's automated integrated management platform, the university's academic affairs management system, and the Feiyue cloud service platform, the system collects, analyzes, and comprehensively synthesizes the library's print and electronic literature resources, relevant student academic data, and user behavior records to construct precise resource profiles for users, subsequently providing precision push services, while users can provide feedback on recommended content to further facilitate system optimization. [Result/Conclusion] Through optimizations in system interoperability, resource integration, personalized learning support, and technical integration and resource display, the Xidian University Library platform has achieved significant implementation results in precision push services for print and electronic literature resources, and is expected to better meet users' information needs in the future, providing a data foundation and theoretical reference for precision resource push in university libraries.

## Full Text

## Preamble

**Exploring Precision Push Services for Print and Electronic Document Resources in University Libraries: A Case Study of Xidian University**

**Library**
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## Abstract

[**Purpose/Significance**] This article addresses existing challenges in document resource push services in Chinese university libraries and proposes a precision push service solution for print and electronic document resources. The aim is to guide university libraries in better implementing push services, improving service quality, and achieving precision delivery and personalized services. [**Method/Process**] Taking Xidian University Library as an example, the study integrates the library's automated management platform, the university's academic administration system, and the Feiyue Cloud Service Platform to collect, analyze, and synthesize 馆藏 print and electronic document resources, student academic data, and user behavior records. This process constructs precise resource profiles for users, enabling precision push services while allowing user feedback to facilitate system optimization. [**Results/Conclusions**] Through optimization in system interoperability, resource integration, personalized learning support, and technical integration with resource presentation, Xidian University Library's platform has achieved significant implementation results in precision push services for print and electronic document resources. The platform is expected to better meet users' information needs in the future and provide a data foundation and theoretical reference for precision resource push services in university libraries.

**Keywords:** Print and Electronic Document Resources; Personalized Service; Precision Push; Resource Profile
**Classification Number:** G258

For a long time, most university library service models have focused on traditional document lending and information retrieval services, with librarians providing only general consultation services such as introducing library regulations and borrowing rules. Personalized services using information technology have mainly been limited to relatively closed systems like "My Library" within integrated management systems, resulting in superficial service levels that fall far short of meeting faculty and students' demands for personalized document resource services and precision push. With the development of Internet technology and the rapid growth of information, faculty and students have increasingly higher requirements for document resources provided by university libraries. Libraries should no longer be single-function document resource centers but should evolve into intelligent platforms that achieve precision push of print and electronic document resources [1].

## 1 Related Research

In the big data era, faculty and students rarely lack document resources; rather, they struggle to quickly and accurately locate needed resources within effective

timeframes. Traditional university library recommendation systems often rely on shallow content analysis of document resources without deep processing and integration. Beyond surface-level content information, other types of information are insufficient, making it difficult to achieve precision push tailored to different users' information needs. Each user is a unique individual with distinct interests, hobbies, and academic backgrounds, resulting in truly personalized information needs that are explosive in both quantity and nature. Precision push services for print and electronic document resources in university libraries under the new era context must not only efficiently and proactively provide high-quality document resources but also deeply understand users' information needs and value preferences. Based on this understanding, the precision push platform for print and electronic document resources completes the service model transformation from traditional "people searching for resources" to "resources finding people," alleviating the passive dilemma in resource push, effectively saving users' time in searching for needed resources, intelligently sensing users' information needs, and proactively providing required document resources to become intelligent assistants for faculty and students in teaching and research [2].

## 2.1 Precision Push Platform for Print and Electronic Document Resources

The precision push platform for print and electronic document resources employs advanced technologies such as big data and cloud computing to provide distinctive personalized services for readers, including personalized search and recommendation engines, reading socialization and knowledge sharing applications, individual resource space storage, and individual space data and information services. Users can flexibly create various types of "individual spaces" (schools, departments, groups, individual readers) with data and services running throughout, creating a true lifelong private cloud library for individual users and thereby achieving personalized services and precision push for print and electronic document resources.

## 2.2 Design Philosophy of the Precision Push Platform

Since 2019, Xidian University Library has conducted long-term user needs surveys and in-depth analysis of user feedback information, holding multiple seminars to summarize and 归纳 current needs of users and administrators. After thorough consideration and discussion, corresponding solution functions were designed, as shown in Table 1 .

**Table 1: Requirements-to-Function Design for Precision Push Platform**

| Primary User Needs | Corresponding Functional Design |
|---|---|
| No unified retention of historical borrowing records, search topics, etc. | Aggregate personal reservation, search, click, borrowing, and collection records to retain learning memory and preserve user value preferences |
| Desire to improve professional level and enrich extracurricular reading but lack specialized channels or personal recommendations; uncertainty about suitable books | Combine algorithmic and manual recommendations to meet different levels of needs for course learning and interest-based reading |
| Hope for personalized services that align with personal value preferences and create a sense of belonging | Construct precise resource profiles based on user behavior records and value preferences, integrated with academic course selection systems to achieve personalized services and precision push for print and electronic document resources |
| Desire for continuously updated authoritative data recommendations related to one's major, such as teacher recommendations | Based on curriculum syllabus recommendations, both teachers and librarians can independently add recommendations in forms not limited to books but also including websites, patents, courseware, and other multi-source data |
| Some books may have low borrowing rates, making them difficult to locate and filter | Set data tags for new books, recently added books, teaching references, e-books, special topics, etc., and consider 冷门 resources in algorithms to facilitate filtering by tags |

The precision push platform for print and electronic document resources features user resource profiles [3] that can accurately perceive user value preferences, providing convenience for intelligent system recommendations while making it easier for readers to find desired print and electronic document resources.

## 2.3 Design Framework of the Precision Push Platform

The precision push platform integrates the library's automated management platform, the university's academic administration system, and the Feiyue Cloud Service Platform to collect, analyze, and synthesize 馆藏 print and electronic document resources, student academic data (such as major and courses), and user behavior records. This integration constructs precise resource profiles

[4] for users, enabling precision push services while allowing user feedback to facilitate algorithm optimization, as shown in Figure 1 [Figure 1: see original paper].

**Figure 1: Service Architecture Design of Precision Push Platform**

## 2.4 Functions of the Precision Push Platform

The precision push platform focuses on functions such as Book Sharing Space, My Subscriptions, My Courses, My Digital Resources, My Professional Classics, Thesis Proposal, My Collections, My Reading List, and Library Memory, striving to create a new personalized service and precision recommendation system. The specific functional modules are shown in Figure 2 [Figure 2: see original paper].

**Figure 2: Functional Framework of Precision Push Platform**

**Module Descriptions:**

**Book Sharing Space:** This module currently includes seven components: "Smart Recommendations," "Popular Recommendations," "New Book Recommendations," "What Seniors Read," "Preference Settings," "Relevance Sorting," and "Refresh." "Popular Recommendations" and "New Book Recommendations" suggest resources users might like based on survey questionnaires submitted at login and set reading preferences. The algorithms employed are not limited to library borrowing information and click rates but also include reader profiles gradually collected through functions such as My Searches, My Tags, and My Courses. "Smart Recommendations" uses a series of static data (such as major and preference settings) and dynamic behaviors (such as borrowing, clicking, collecting, and searching) to learn user characteristics daily, forming a comprehensive reader resource profile before making "smart recommendations" to readers, which may include popular resources or unexpected discoveries. "What Seniors Read" refers to books favored by previous seniors, recommending books read by seniors from the same major in the past five cohorts for user reference. "Preference Settings" provides brief book categories that can be modified when reading preferences change, thereby affecting recommendations in "Popular Recommendations," "New Book Recommendations," and "Smart Recommendations." "Relevance Sorting" allows filtering recommended books by ascending/descending borrowing volume or publication date. "Refresh" is for users who dislike current recommendations to view other suggested books.

**My Courses:** This module primarily consists of "My Academic Courses" and "My Elective Courses." "My Academic Courses" connects with the academic administration system to display users' course information across all academic years. Clicking into a specific course allows users to view recommended print and electronic document resources based on their course information, including library-related resources and teacher-designated reference books. Library-related resources include five components: smart recommendations, course web-

sites, related courseware, patent information, and other materials. Smart recommendations suggest 馆藏 book information in the library potentially related to the course based on users' course information. Course websites aggregate relevant open resources from the National Smart Education Platform. Related courseware currently provides content from the Metel multimedia resource library and Software Courseware Resource Library corresponding to specific courses, plus a section for 本馆 courseware where instructors can upload course materials they wish to share with students. Other materials include journals, articles, and other format-related course materials. "My Elective Courses" offers all university courses for readers who need them beyond semester course selection.

Notably, the "My Courses" module also integrates with commonly used systems by our university's faculty and students, generating a "course page" for university courses within the system. A "Library Related Resources" menu link is added to the course learning homepage on the "Study at Xidian · Resource Sharing & Online Teaching Platform," directing to the "course page" on the precision push platform to display print and electronic document resources related to that course. This approach breaks the "closedness" of the library's self-built systems to some extent.

**My Subscriptions:** This module aggregates relevant print and electronic document resources for users through subscription conditions and preferences. By setting subscription conditions or preferences (such as priority order of multiple authors or publishers), subscription results can be arranged to prioritize desired content. Compared to ordinary searches, My Subscriptions enables customized searches that can save common book search terms and proactively push the latest books under those terms. It can also intelligently sort search results based on personalized book search preferences, prioritizing reader-preferred resources to help readers quickly find target resources, provide personalized search result recommendations for different readers, improve retrieval efficiency, and meet deep search needs.

**My Digital Resources:** This module primarily includes three components: 本馆 E-books, 本馆 Databases, and One-Stop Search. Clicking on 本馆 E-books supports searching by inputting search terms and filtering e-books by Chinese Library Classification and e-book sources. In the internal network environment, clicking e-book resource links enables online reading. Clicking on 本馆 Databases supports searching by database name or filtering by conditions, allowing users to pin commonly used databases for daily convenience. Clicking on One-Stop Search redirects to the Chaoxing Discovery System for resource retrieval. Additionally, this module can promptly push update information for subscribed databases, integrate various database resources ordered by the library and other open-access databases, sort database search results according to reader subscription preferences, periodically calculate and sense reader needs, and push recent update information for databases readers follow.

**Library Memory:** As an important teaching and research support institution,

the library continuously strives to improve for its readers. Library Memory recounts the library's various services and efforts throughout the year, sharing the 点点滴滴 of its progress. This module automatically recognizes user identity (current student or graduate) without requiring any user action. The graduate version of Library Memory is dedicated to recording users' 点点滴滴 related to the library during their school years, providing an online "takeaway" library memory. The current student version shows users their delicate growth in each time period at the library, including annual library data bills and personal annual data commemorative albums. It aggregates various user borrowing data and personal library usage data to automatically generate personal commemorative albums.

**My Professional Classics:** This module focuses on users' professional knowledge learning, gathering library professional classic literature recommended from various angles to help users quickly consolidate their professional foundation. It primarily includes three modules: Smart Recommendations, Teacher Recommendations, and Librarian Recommendations. Smart Recommendations finds relevant professional print and electronic document resources in the library based on information from teaching standards. Teacher Recommendations aggregates classic document resources published by faculty from various departments, accessible with a click. Librarian Recommendations collects wisdom from librarian teachers, allowing users to understand must-reads for various majors from the librarians' perspective.

**My Research/Thesis Proposal:** This module supports integration with research systems and graduate training systems, pushing relevant library print and electronic document resources for research projects based on thesis proposals, titles, abstracts, and graduation design information. My Research/Thesis Proposal displays content differently according to reader identity. Faculty readers see "My Research," while student readers see "Thesis Proposal." The module extracts keyword information from users' research projects or thesis proposals to match relevant 馆藏 print and electronic document resources, facilitating rapid access to library materials during the extensive data collection phase.

**My Collections:** This module provides users with a favorites folder to save personal preferences or commonly used resources. Users can select books that meet their needs or interests from recommended books to create and save collections. They can also add search results from My Subscriptions and electronic resources from My Digital Resources to collections for easy access anytime. Collections can nest new collections with hierarchical levels, gradually forming users' personal studies, aggregating preferred print and electronic document resources, and creating systematic reading and learning systems. Users can also filter My Collections by e-books, print books, digital resources, bookshelf levels, or bookshelves.

**My Reading List:** For books not currently in the library collection (marked as non-collection), users can click to add them to their reading list to record reading needs. All books in the reading list are recorded in My Reading List

and communicated to the library through backend records; books users want to read may appear in the library next time.

The precision push platform for print and electronic document resources also features data tags. Recommended books display tags such as “E-book,” “New Publication,” “Teacher-Designated Reference,” and “Popular Book.” Users can click data tags to filter books for easier selection. Books with e-book tags indicate electronic resources available for reading in the internal network environment. Additionally, all 馆藏 books can link to the virtual library to check location and availability; e-book resources are also displayed accordingly.

## 3 Research Results

Through Phase I and Phase II construction, the precision push platform for print and electronic document resources has been successfully built and achieved favorable implementation results.

1. **System Interoperability and Resource Integration**
   The platform successfully achieved interoperability with library systems, university user authentication systems, academic administration systems, and online course learning systems. This provides great convenience for students and has won unanimous praise, as they can access various learning resources on a single platform without switching between different systems. This integration also enables organic combination of the library’s print and electronic document resources, user value preferences and behavior records, and user academic information, allowing timely data updates as user information needs and value preferences change. The updated data is then precisely pushed to students’ course desktops, meaning students can more directly obtain course-related resources, saving time in resource searching and improving learning efficiency.

2. **High Traffic Volume and User Activity**
   The platform receives over 3,000 monthly visits, demonstrating active use and high recognition from students and other users. High traffic volume also indicates that platform resources and services are widely utilized.

3. **Personalized Learning Support**
   The platform not only provides abundant print and electronic document resources but also proactively pushes relevant library resources according to each student’s course needs. This personalized learning support helps meet students’ diverse learning needs and promotes their autonomous and deep learning. Through multiple modules such as “My Courses,” “Themed Bookshelves,” and “Teaching Reference Navigation,” students can select and explore according to their interests and needs, forming personalized learning paths.

4. **Technical Integration and Resource Presentation**
   The platform integrates with multiple library systems (such as 3D vir-

tual libraries, integrated management systems, RFID, VR, etc.), ensuring resource comprehensiveness and providing diverse resource presentation methods. For example, through 3D virtual and VR technologies, students can understand and learn about resources more intuitively, enhancing the learning experience. The integration of print and electronic document resources also makes platform resources richer and more diverse, meeting different students' reading habits and needs.

## 4 Conclusion

Although the platform has achieved significant implementation results, continuous optimization and upgrading are necessary considering ongoing technological development and changing student needs. For example, artificial intelligence and big data technologies could be further explored to enhance the precision and personalization of resource recommendations. Additionally, current pushes mainly consist of coarse-grained information such as titles or abstracts of books, videos, courseware, patents, and articles; fine-grained knowledge unit pushes should be implemented later. Furthermore, strengthening user feedback collection and processing mechanisms to promptly understand and resolve issues users encounter is crucial for ensuring the platform's sustained and healthy development.

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