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## Analysis of Mainstream Library Resource Discovery Platforms

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### Abstract

This article conducts a multi-level and multi-angle analysis of the page structure and page layout of mainstream resource discovery platforms (Elsevier, Springer, CNKI) and commercial resource discovery systems (Primo, Summon, EDS) in the library domain, and investigates and analyzes the distinctive resources and functionalities of multiple platforms (such as Willy, the British Library, the National Library of the Netherlands, the Library of Congress, NSDL, OCLC, PubMed, etc.). Finally, by leveraging the excellent features of the aforementioned platforms, it improves our center's self-built integrated resource discovery service system, with a focus on enhancing user experience.

### Full Text

### Preamble

#### Analysis on Mainstream Discovery Service of Library

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### Abstract

This paper presents a comprehensive, multi-level analysis of mainstream resource discovery platforms in the library domain, examining both major publisher platforms (Elsevier, Springer, CNKI) and commercial discovery systems (Primo, Summon, EDS). The study investigates the distinctive resources and functionalities of additional platforms, including Wiley, the British Library, the National Library of the Netherlands, the Library of Congress, NSDL, OCLC, and PubMed. Drawing upon the exemplary features identified through this analysis, we enhanced our in-house resource integration discovery service system, with particular emphasis on improving user experience.

**Keywords:** resource discovery platform; integrated discovery service; library services; Summon

Resource discovery platforms constitute the core service systems of libraries and should remain consistently user-centered and demand-driven. Platforms designed and implemented according to this philosophy undoubtedly represent the mainstream in the library community. OCLC's latest member report, "At a Tipping Point: Education, Learning and Libraries," indicates that over half of respondents consider guiding users in accessing available resources and tools as the library's most important function [1]. This underscores the critical importance of resource discovery and user guidance in libraries.

## 1.1 Overview of Resource Discovery Platforms

This paper examines mainstream library resource discovery platforms through a comprehensive, multi-angle analysis. The investigation focuses on three major database and retrieval platforms (Elsevier [2], Springer [3], CNKI [4]) and three resource discovery demonstration platforms (Primo from Ex Libris [5], Summon from Serials Solutions [6], and EDS from EBSCOhost Discovery System [7]; typical users include Tsinghua University for Primo, Peking University for Summon, and Nanjing University for EDS). The analysis unfolds across four main dimensions: homepage, browsing, search (including results presentation), and other features, investigating system functionality, page content, layout, font colors, and other aspects from multiple perspectives.

## 1.2 Homepage

From a functional perspective, all platforms position search options and platform introductions at the center of the homepage. Additionally, each platform offers customization features, including top recommendations, login/favorites, multilingual switching, and interactive communication. Many platforms feature top recommendation sections in the middle-lower portion of the homepage, primarily showcasing selected e-books (EDS), Latest Articles (Elsevier), New books and journals (Springer), and similar content. While Primo and Summon provide Chinese-English language switching, Springer offers English-German switching, and EDS robustly supports 29 language options.

In terms of page layout, all systems adopt a three-part structure: the upper section primarily contains the logo, conventional links, and personalized options; the middle section serves as the page's focal point, housing search options and prompts; the lower section mainly presents recommendation information, service introductions, and copyright details. Color schemes typically follow a pattern of primary color + secondary color + accent color. For instance, CNKI employs blue (primary) + white/red (secondary) + orange (accent). Other systems utilize combinations such as gray+blue+orange, black+blue+dark blue, black+blue+green, and black+blue+gray. These color combinations align with human aesthetic sensibilities, offering simplicity and elegance.

Beyond conventional search options and introductions, platforms incorporate distinctive features such as resource recommendations and interactive communication. Ideally, recommended resources should include popular articles in specific fields, with users able to customize their domains of interest. Interaction functions primarily encompass help, feedback, and communication mechanisms, establishing effective channels for user engagement.

### 1.3 Browsing

Regarding resource browsing functionality, platforms primarily support browsing of books and journals (Elsevier and Springer), journals (CNKI), e-journals (Primo), e-journals and e-books (Summon), and e-books (EDS). Among these platforms, 66.7% support alphabetical browsing, 83.3% support subject classification browsing, 66.7% support secondary discipline browsing, and 50% support database browsing. Integrating search functionality within browsing pages undoubtedly enhances resource discovery efficiency—a feature present in CNKI, Primo, Summon, and EDS. Search fields typically include title, ISSN/ISBN, and similar parameters. Browsing result pages generally display resource titles, links, ISSN/ISBN, resource types, database information, and subject classification details. Notably, CNKI's browsing interface includes journal composite impact factors, comprehensive impact factors, and citation counts, while Springer offers faceted display of browsing results by resource type, subject, publication date, and language.

From a layout perspective, 66.7% of platforms employ a two-column layout with classification lists on the left and browsing results on the right, while 33.3% use a vertical two-column layout with classifications on top and results below. All platforms utilize list-based displays showing resource titles, links, types, ISSN/ISBN, and related information. Font colors typically combine black, blue, and red (or green), where black represents standard text, blue indicates hyperlinks, and red/green serves as special markers.

For browsing functionality, the detailed classification methods employed by Springer and CNKI merit particular attention and reference for platform development. Additionally, incorporating database information and resource covers in browsing result pages can significantly enhance user experience.

### 1.4 Search

All platforms position search entry points on the homepage. Most platforms (Elsevier, CNKI, Primo, EDS) support field-specific searching, with optional fields typically including title, keywords, and author. Elsevier, CNKI, and Primo enable searching by resource type, which generally includes journals, books, articles, and images. CNKI and EDS support search term suggestions and search history viewing.

Search results are analyzed across five dimensions: sorting, results per page

selection, refinement, faceted display, secondary search, resource information, and resource services.

**Sorting:** All platforms offer relevance and date sorting. Additionally, Primo provides popularity-based sorting, while CNKI offers citation frequency and download count sorting options.

**Results per page:** Platforms typically allow selection of 10-50 items per page, with common options being 10, 20, and 50. Half of the platforms support user-defined selection. Default display quantities for the six platforms are shown in Figure 1 [Figure 1: see original paper].

**Refinement:** Most platforms enable further refinement within search results. For example, Springer can display only results with preview content, Primo can include additional results beyond library holdings, and Summon allows refinement by document type. These refinement options support multiple selections, proving both necessary and effective for users.

**Faceted display:** While each platform's faceted display varies, all include facets for resource type, language, and publication date, with subject, author, discipline, and source being commonly used. Beyond these standard facets, CNKI provides grouping by research level and funding source.

**Secondary search:** Half of the platforms (Elsevier, CNKI, Summon) offer secondary search functionality—searching within existing results.

**Resource information:** Platforms typically display availability indicators, covers, titles, creators, publication years, and online links. Depending on resource type, additional information may include ISBN (for books), tables of contents, database information (for journals and papers), and detailed publication information such as volume, issue, page numbers, and publication dates (for articles).

**Resource services:** Platforms primarily provide online access links, holding institutions, and detailed information. Some also offer features such as Related articles and Related reference work articles (Elsevier), sharing (CNKI), comments/tags and SFX (Primo), saving items (Summon), and adding to folders (EDS).

## 1.5 Personalization Features

The personalization features of the six platforms are analyzed in Table 1 .

## 2. Investigation and Analysis of Distinctive Features in Mainstream Resource Discovery Platforms

This section examines twelve resource discovery platforms, including the six previously mentioned plus additional public platforms such as Wiley, the British Library, the National Library of the Netherlands, the Library of Congress, NSDL,

OCLC, and PubMed. The investigation focuses on distinctive platform features to identify best practices and reference points.

The analysis and insights are summarized in Table 2 .

### **3. Design and Implementation of the Resource Integration Discovery Service System**

Based on the above investigation and analysis, users' ideal state for a resource integration discovery service system involves: single-entry searching (searching all resources by default with optional type selection), clear identification of resource availability, direct access links for available resources, and alternative acquisition methods for unavailable resources. This section introduces the distinctive features of our in-house resource integration discovery service system (hereinafter referred to as the Discovery Service System) across three dimensions.

#### **3.1 Homepage**

The homepage' s central area constitutes the Discovery Service System' s main functional zone, divided into three sections. The header features a welcome message that identifies the user' s institution based on IP address, providing a personalized greeting that enhances user experience. The upper section offers quick links for categorized resource searching and browsing, the middle section contains search options and input fields, and the lower section presents featured resource recommendations. Unlike Elsevier, our system' s recommendations operate at the database and journal level rather than the article level. The recommendation function identifies the user' s institution via IP and automatically suggests the top 20 or 30 most-accessed resources from that institution in the previous year. Additionally, the system provides recommendations for hot keywords, new book announcements, and newly added resources across the entire academy.

#### **3.2 Browsing**

The Discovery Service System' s browsing functionality comprises four categories: physical holdings browsing, e-book browsing, e-journal browsing, and database browsing. Using physical holdings browsing as an example, the system automatically recommends institutional holdings based on IP-sensitive context, while allowing manual switching to view other institutions' holdings or academy-wide collections. Navigation and faceted display methods reference the aforementioned research findings and user habits, including: alphabetical title browsing, resource type, publication year, language, publisher, subject classification, and creator. Book covers are incorporated to enhance visual appeal and enrich user experience. Each search result allows direct checking of on-shelf status, enabling users to view location and circulation information without navigating to the automation system.

Dedicated browsing portals for e-journals and e-books provide enriched faceted navigation. For e-journals, the system reveals electronic access URLs, hosting databases, and detailed publication year/volume/issue information. Database browsing facets include access rights, database type, and subject classification. The system automatically recommends institution-subscribed databases based on IP context while allowing manual switching to view academy-wide or other institutions' subscriptions. Database search results include user guides, training materials, and journal coverage lists, enabling direct access to relevant documents and presentations, thereby strengthening the visibility of various database-specific services.

### 3.3 Search

The Discovery Service System' s search philosophy emphasizes integrated academic search across all resources, with optional categorized searching. The search entry point occupies the central homepage position, offering a Google-like simple search box that provides discovery pathways to various library academic resources. The search interface accommodates majority user habits by supporting field-specific searching, with title searching as the default and eight commonly used fields available via dropdown list. When users input English letters, Chinese characters, or pinyin, the system automatically suggests similar terms for selection. The search box provides tips for precise searching, with search function introductions and searchable data scope descriptions positioned above, and help and advanced search options to the right. Advanced search allows strategy adjustment through: 1) additional search fields; 2) limitation by resource type and publication year; and 3) modification of results per page and default sorting. Statistics indicate that searching by specific type saves 33% of time compared to all-type searching, reducing user waiting time.

Search results employ multi-dimensional faceted display to reveal data details. Facet dimensions include: carrier type (electronic/print), resource type, subject classification, publication year, keywords, journal, and author institution. Frequently used multi-dimensional facets can switch to visual presentation modes, such as keyword cloud displays, journals, publication years, and resource types. Users can click facets to narrow search scope, with a navigation bar recording each step to show the search trajectory and allow return to any previous navigation point. Such refinement options prove both necessary and essential for users.

Search results can be sorted by publication date, relevance, or journal impact, arranging important data according to user needs while highlighting matched search terms. Results per page can be adjusted to 20 or 25 items. After initial searching, users can limit search fields, input new terms, and select "secondary search" to conduct deeper searches within results.

For individual results, the system provides abstract previews and three-level linking services: to databases, to journals, and to full text. Additionally, it offers

on-shelf status checking for books and journals, and document delivery links for unsubscribed resources. Individual results can be shared across common social networks. Users can select multiple results and export citations in CAJ-CD, Endnote, Note Express, Note First, and RefWorks formats for direct import into these tools. The detailed information page for each document displays all bibliographic information and recommends similar articles for further reading.

Beyond conventional resource discovery, the system reveals commercial database search statistics and semantic concepts, providing users with comprehensive knowledge cognition. The system indicates third-party database hit counts through cross-database searching, with links directing users to original third-party search result pages. Semantic concepts involve querying authoritative encyclopedias such as Wikipedia and Britannica for professional definitions of user search terms, providing term classifications and related images from these sources.

The Discovery Service System has been operational for approximately six months, receiving positive feedback during promotional activities and daily interactions. Users have affirmed and praised the clean interface layout and appropriate system functionality. Several innovative features and ideas identified during the investigation have not yet been implemented but offer valuable insights for future system improvements. For example, Elsevier allows users to define domains for homepage resource recommendations; Wiley can email users their search information, system recommendations, and publication tracking to create personal information repositories; and platforms such as Wiley, the British Library, and NSDL categorize users to provide tailored guidance and services, emphasizing library-user interaction.

In conclusion, this paper employs multi-angle comparative analysis to investigate mainstream library resource discovery platforms, summarizes best practices and distinctive features from perspectives including homepage design, browsing, searching, and personalization, and applies these insights to implement our center's Resource Integration Discovery Service System. The implementation has demonstrated positive effects in terms of outcomes and user feedback.

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