Building the LibAI All-in-One Intelligent Service Matrix: A Library Initiative

Case Providing Department: Library

Supported by LM

1. Background

In the era of rapidly advancing artificial intelligence, libraries—as key hubs for academic services and knowledge dissemination—are actively embracing the opportunities presented by intelligent transformation. While traditional library services, built on the professional expertise of librarians and structured workflows, have established a well-functioning service framework for resource management, user support, and academic assistance, the growing diversity of academic resources and evolving user needs present new opportunities for enhancement:

- ✓ Users navigate multiple platforms and resource types, suggesting potential to further improve the efficiency and accuracy of information retrieval.
- ✓ Librarians handle a high volume of routine inquiries, creating an opportunity to optimize response processes and refocus their expertise on deeper, personalized research support.

- ✓ Users increasingly seek intelligent assistance in areas such as in-depth reading and personal knowledge management within their academic workflows.
- ✓ As user behavior shifts toward digital and instant solutions, there is a need to complement high-quality human services with flexible, proactive, and intelligent service channels.

Leveraging the university's strategic advances in AI and data infrastructure, the library has launched the LibAI All-in-One Intelligent Service Matrix to meet evolving user needs. This initiative upgrades existing services through AI integration, establishing a human-machine collaborative ecosystem that delivers seamless, efficient, and personalized academic support.

2. Solutions

2.1 Overview Introduction

This initiative establishes an integrated LibAI intelligent service matrix, where a suite of interconnected intelligent agents collaboratively redefines essential service workflows. Moving beyond a simple assembly of standalone tools, we have architected a unified AI platform that facilitates seamless data integration and operational harmony.

At the strategic level, we are guided by the principle of "Technology-Enabled Services, Smarter Experiences," and have built five AI assistants that function as a coordinated system:

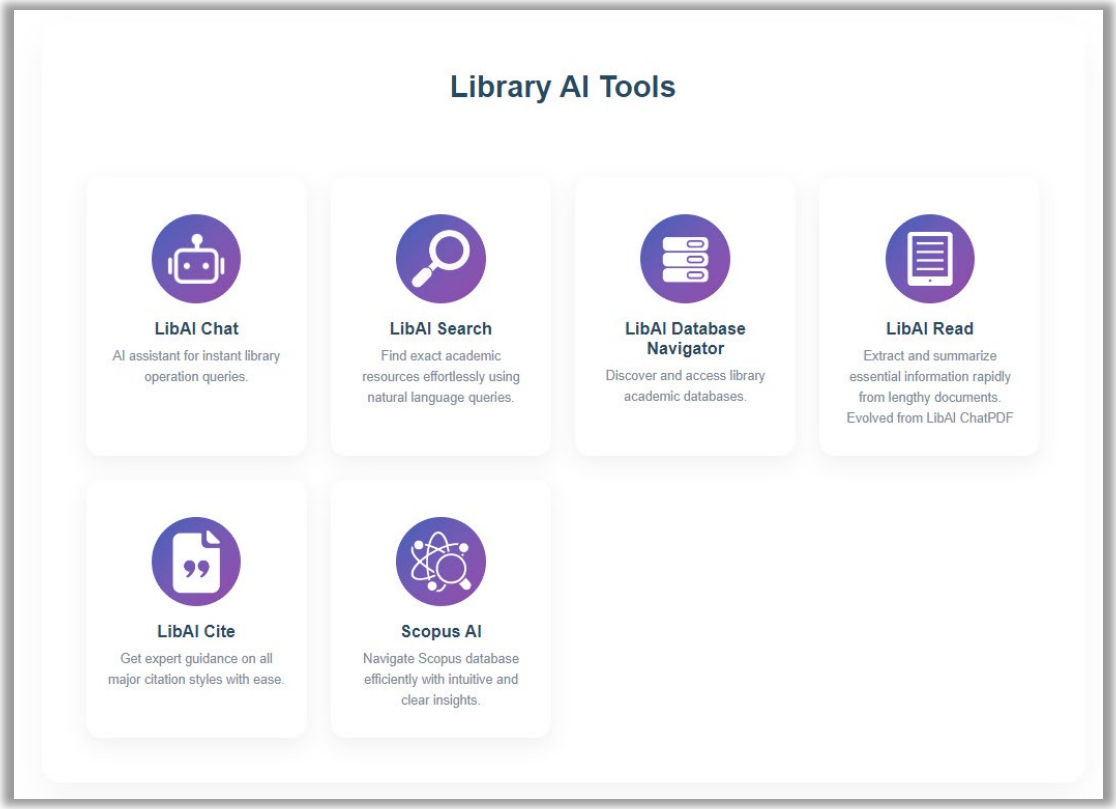

Figure 9-1 LibAI All-in-One Intelligent Service Matrix

1) **LibAI Chatbot** serves as our Main Service Point, answering all kinds of questions 24/7 and smoothly passing complex requests to librarians or other specialized tools.

2) **LibAI Search and Database Navigator** work together as Smart Search Partners. The former enables comprehensive cross-resource discovery, while the latter specializes in precise database recommendations, collectively addressing the primary challenge of "information disorientation."

3) **LibAI Read** serves as the In-depth Knowledge Processor. It engages after users locate target documents, transforming static PDFs into interactive, query-enabled knowledge objects, thereby bridging the gap from "finding" to "understanding."

4) **LibAI Cite** acts as an academic output standardizer. It provides assurance at the research dissemination stage, guaranteeing the rigor and standardization of academic work.

At the implementation level, we have seamlessly integrated the five agents into key touchpoints such as the library website and discovery system, using a lightweight front-end (e.g., web plugins) and a platform-based back-end approach. For example, when a user expresses a research need in the Chatbot, they may be guided to the Discover system; after locating documents through natural language search, they can invoke Read for in-depth reading with one click; and when writing, they can activate Cite for formatting assistance. This collaborative workflow systematically liberates both librarians and users from tedious, repetitive tasks, enabling them to advance toward higher-value exploration and innovation.

2.2 Functional Modules Showcase

2.2.1 LibAI Chatbot

LibAI Chatbot is an intelligent assistant built on a large language model and enhanced with our local library knowledge base. It identifies user questions about both general services and research support, providing instant, correct answers 24/7.

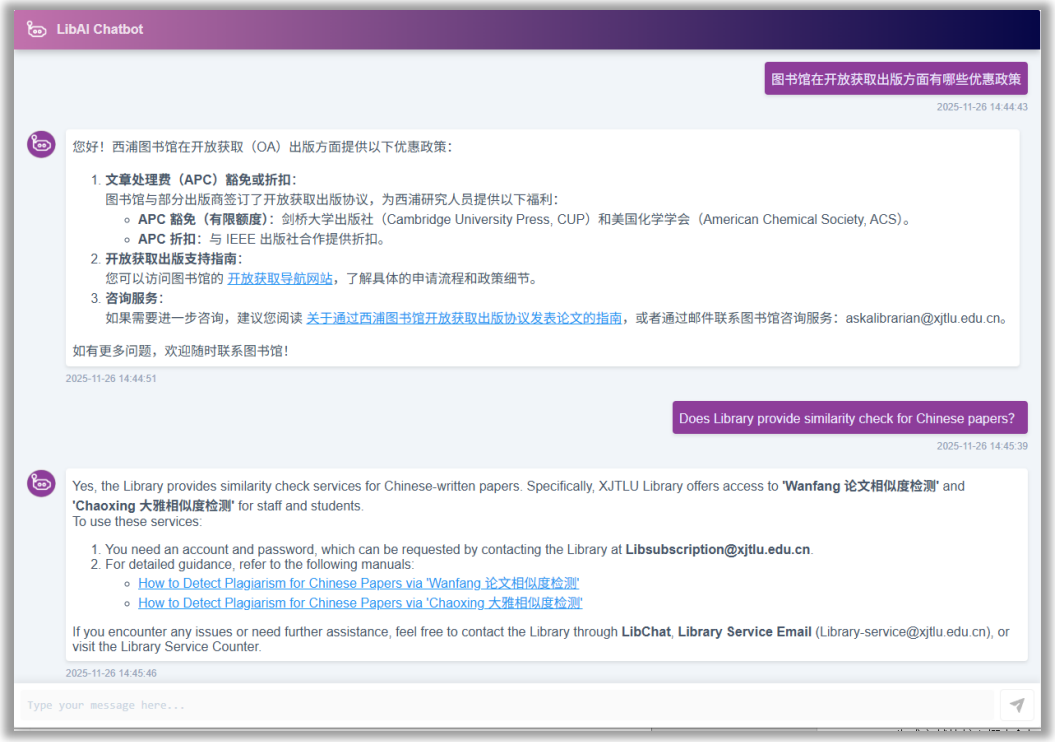

Figure 9-2 An Example of LibAI Chatbot Session

Integrated into our website as a web plugin and working seamlessly with our staff-moderated LibChat system, it creates a new "AI-first, librarian-supported" service model. This approach has comprehensively improved our reference services, making them faster and more in-depth.

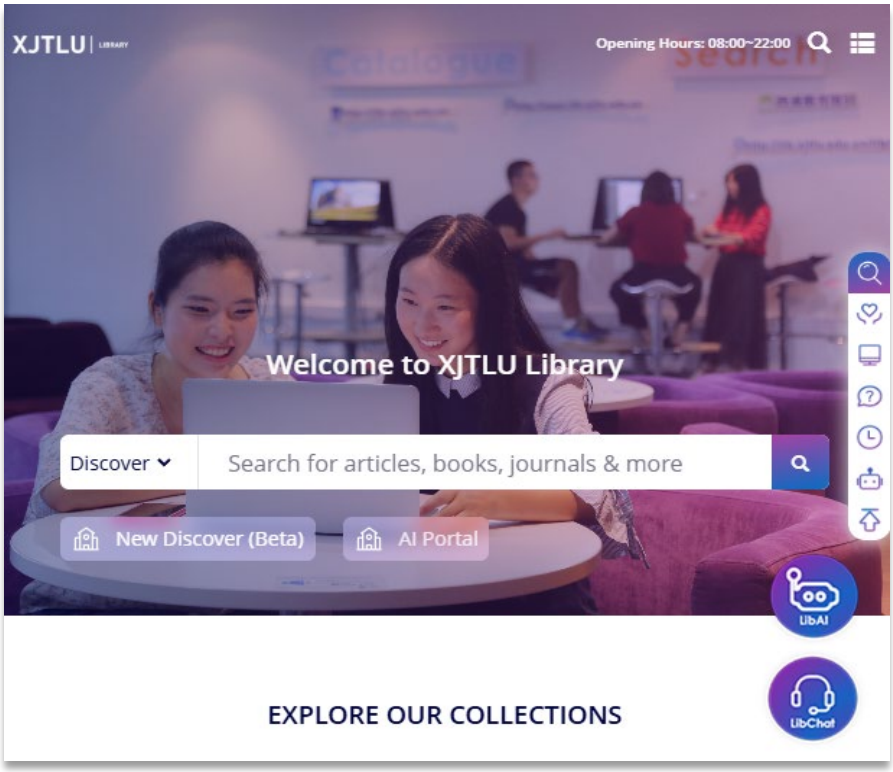

Figure 9-3 AI-Librarian Collaborative Service

2.2.2 LibAI Database Navigator

LibAI Database Navigator is an AI-powered library database assistant developed on the XIPU AI Agent platform. It utilizes our institution's subscribed database resources—including document types, subject classifications, detailed descriptions, and user guides—as a local knowledge base for training and enhancement.

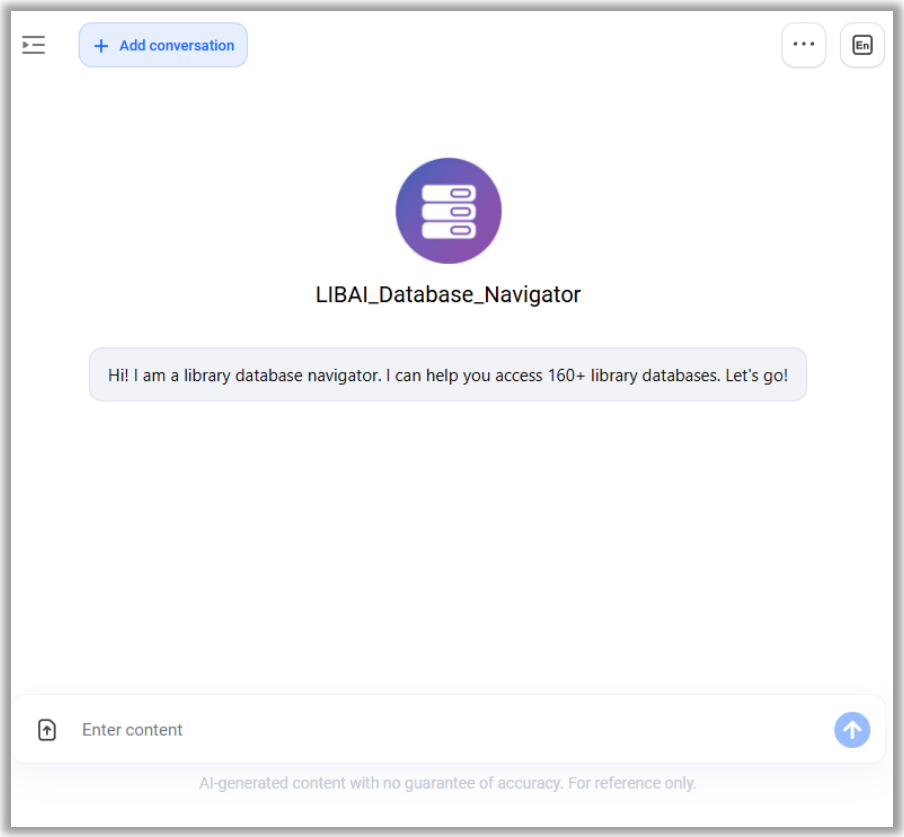

Figure 9-4 LibAI Database Navigator

When users submit search requests in natural language, the assistant accurately interprets their query intent and automatically filters and recommends the most relevant databases from available resources. This significantly reduces the time users spend locating materials while substantially improving search accuracy and relevance.

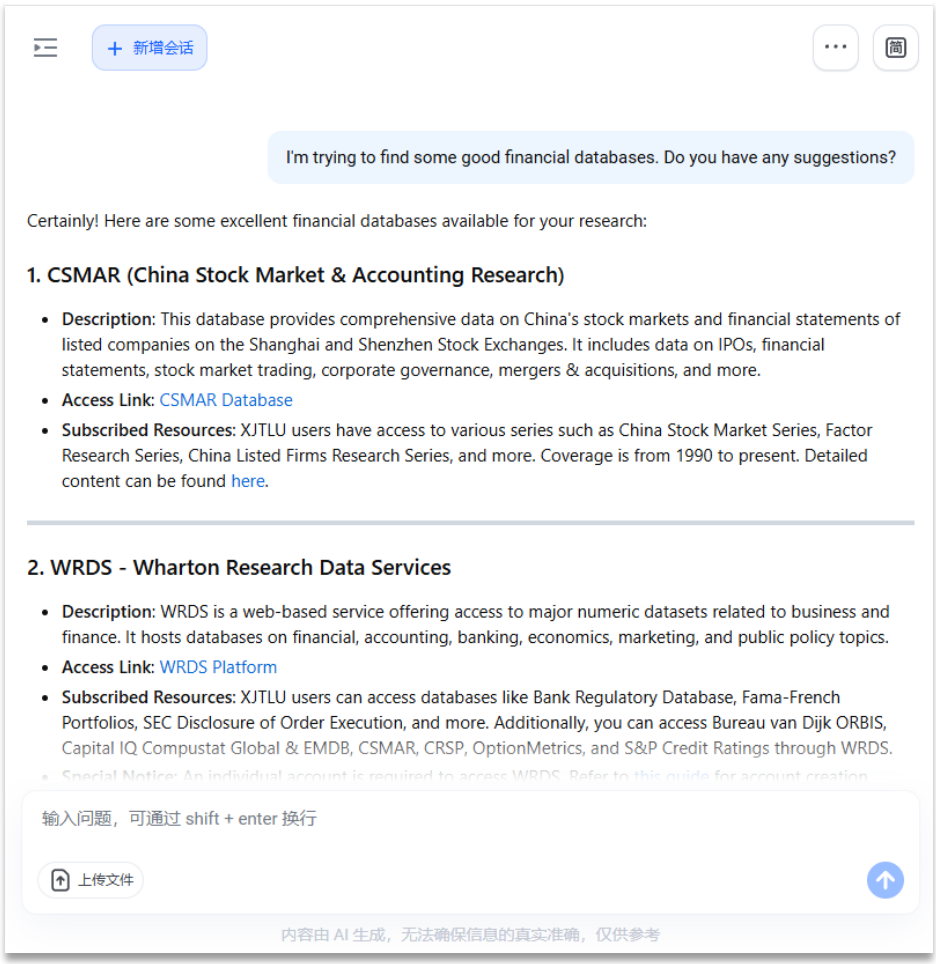

Figure 9-5 An Example of LibAI Database Navigator Session

2.2.3 LibAI Search

LibAI Search is an intelligent academic resource retrieval assistant developed based on the XIPU AI Agent platform. It employs a two-tier collaborative architecture of "Router Agent + Specialized Sub-Agents": the Router Agent intelligently parses user intent, while the specialized Sub-Agents accordingly dispatch relevant resources. This enables unified access and intelligent scheduling of all types of resources including books, journals, academic papers, databases, and examination papers, establishing a one-stop intelligent resource discovery platform. This fundamentally transforms the cumbersome traditional retrieval model

that required repeated switching between different systems, significantly enhancing both resource retrieval efficiency and user experience.

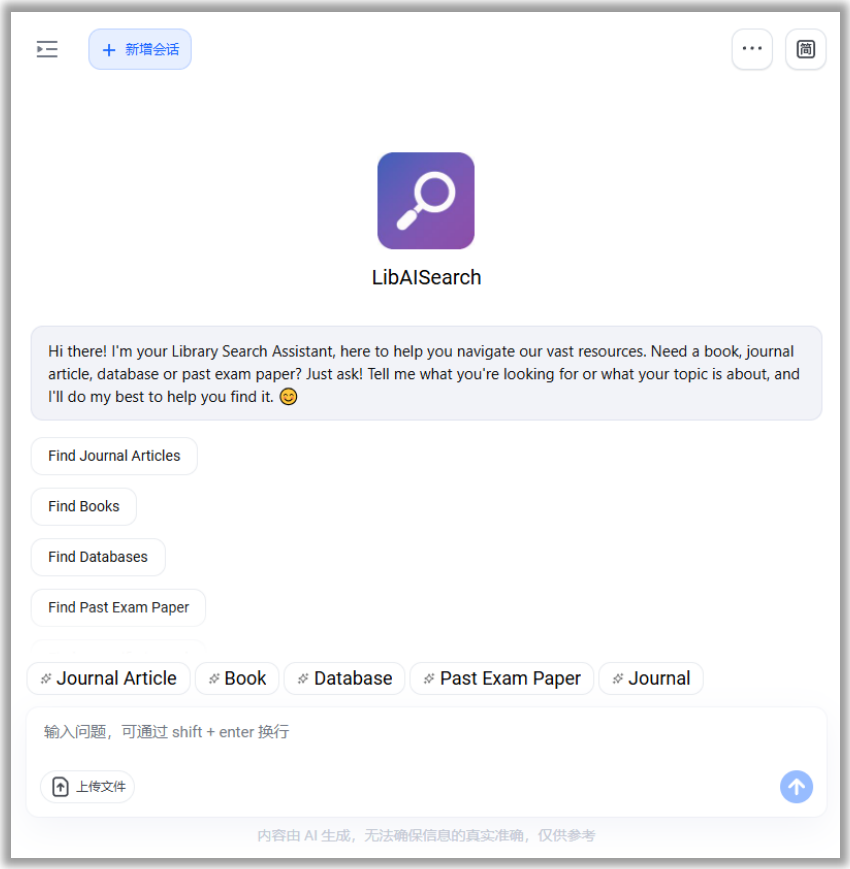

Figure 9-6 LibAI Search

LibAI Search understands natural language requests and automatically directs them to the appropriate Sub-Agent. For instance, when a user asks for "books about urban planning," the system instantly routes the query to the Find Books Agent, executes API interface queries, and quickly returns highly relevant book information including availability, circulation status, and direct links. This streamlined approach enables users to find academic resources faster and more accurate than ever before.

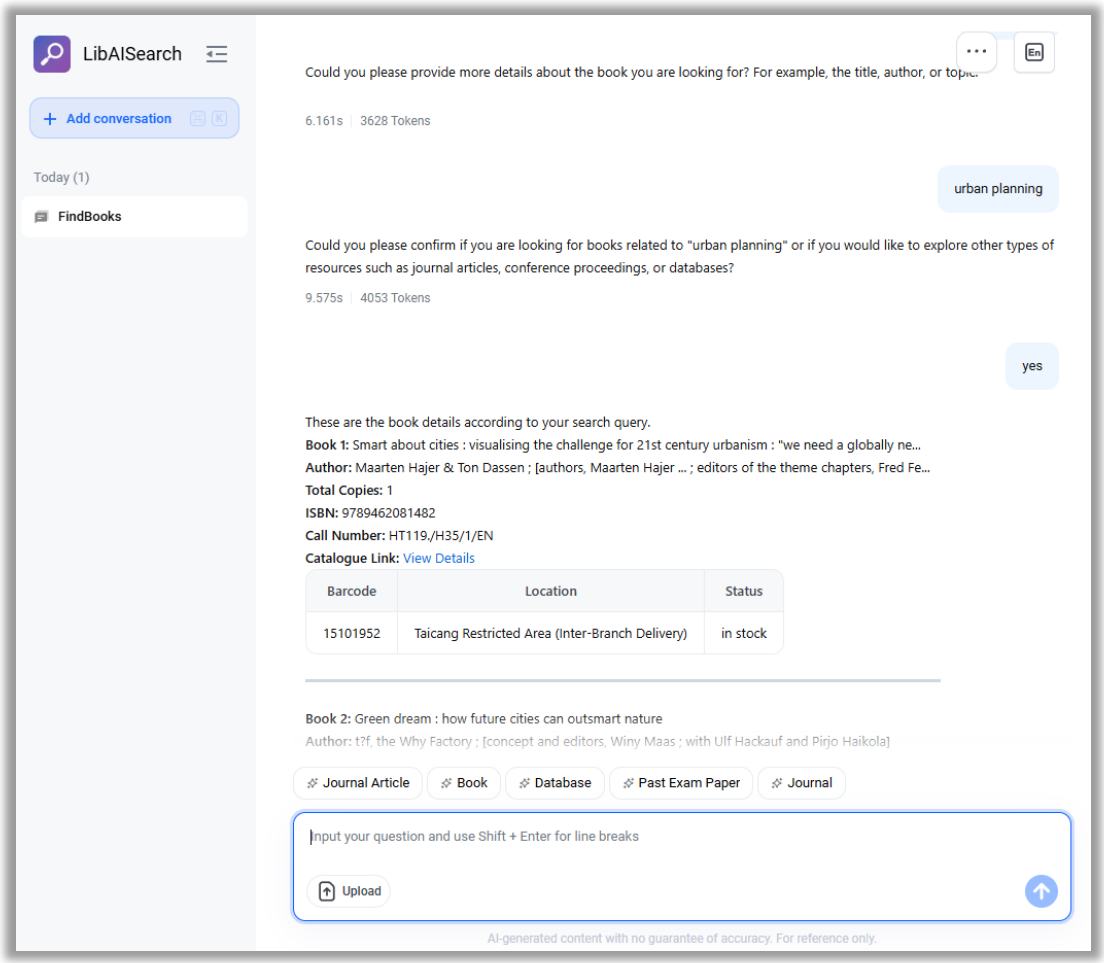

Figure 9-7 Example of Find Books Agent Session

2.2.4 LibAI Read

LibAI Read is a locally deployed AI document reading assistant, deeply integrated within the library's resource discovery system. Specifically designed for academic reading scenarios, it provides immediate, intelligent reading support for PDF documents retrieved through the platform. The assistant rapidly analyzes PDF structure, precisely locates key information, and automatically generates content summaries. With a single click, users can obtain core concept overviews and relevant knowledge graphs, enabling them to quickly grasp the academic context

and logical framework of documents.

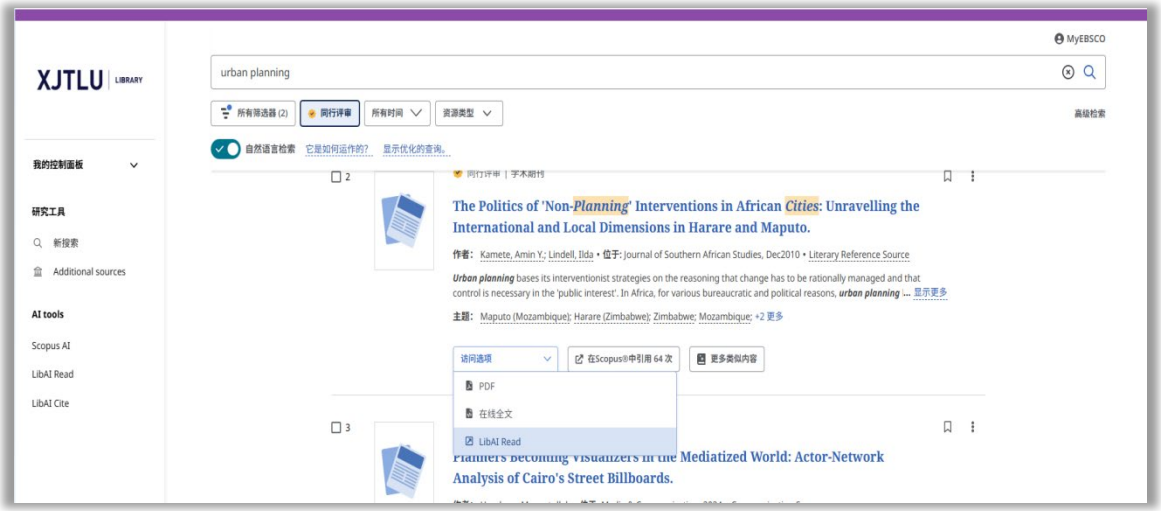

Figure 9-8 Embedded LibAI Read Plug

LibAI Read enables natural language interaction with document content. Readers can ask questions about any section or the entire text, requesting analysis, explanation, or clarification, and receive direct answers. The system supports seamless switching between Chinese and English, eliminating language barriers when reading foreign language materials or asking questions. This significantly lowers the barrier to document comprehension, allowing users to quickly absorb essential knowledge while substantially enhancing both the efficiency and depth of academic research.

Figure 9-9 Example of LibAI Read Session

2.2.5 LibAI Cite

LibAI Cite is a citation style consultation and generation assistant, specifically designed to address the challenges students and academics face in managing complex citation rules and avoiding common formatting errors. It offers complete, one-stop support for all your citation needs. Whether you're new to academic writing or a seasoned researcher, it helps you create perfectly formatted citations and bibliographies, ensuring your work meets scholarly standards. Its key features are: guidance on citation fundamentals; support with generating and formatting references in major styles like APA, MLA, and Chicago; assistance using reference management tools such as EndNote and Zotero; and automated checking and optimization of bibliographies, significantly reducing the formatting burden in the research process.

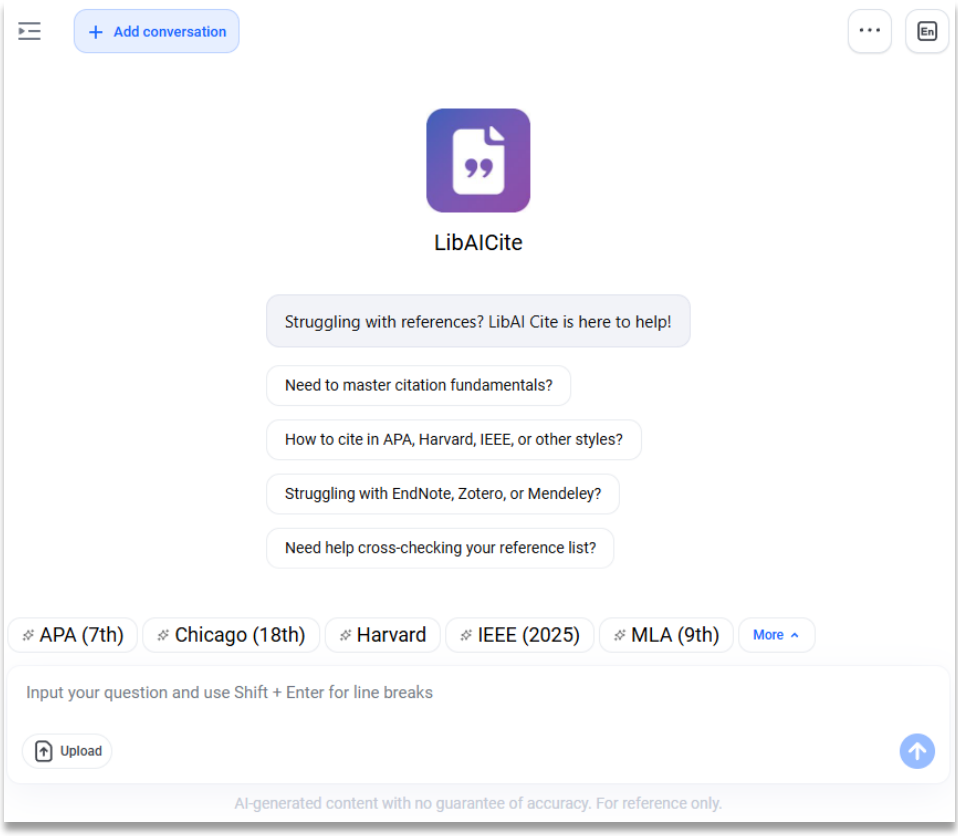

Figure 9-10 LibAI Cite

Take a student writing a social media marketing paper as an example: He needs to cite a REDnote post as a case study but cannot find relevant rules in the APA manual. In this case, LibAI Cite can intelligently recognize the content as a "social media post," flexibly apply corresponding general rules from APA format, and ultimately generate a fully compliant citation example while explaining the composition of each element in detail.

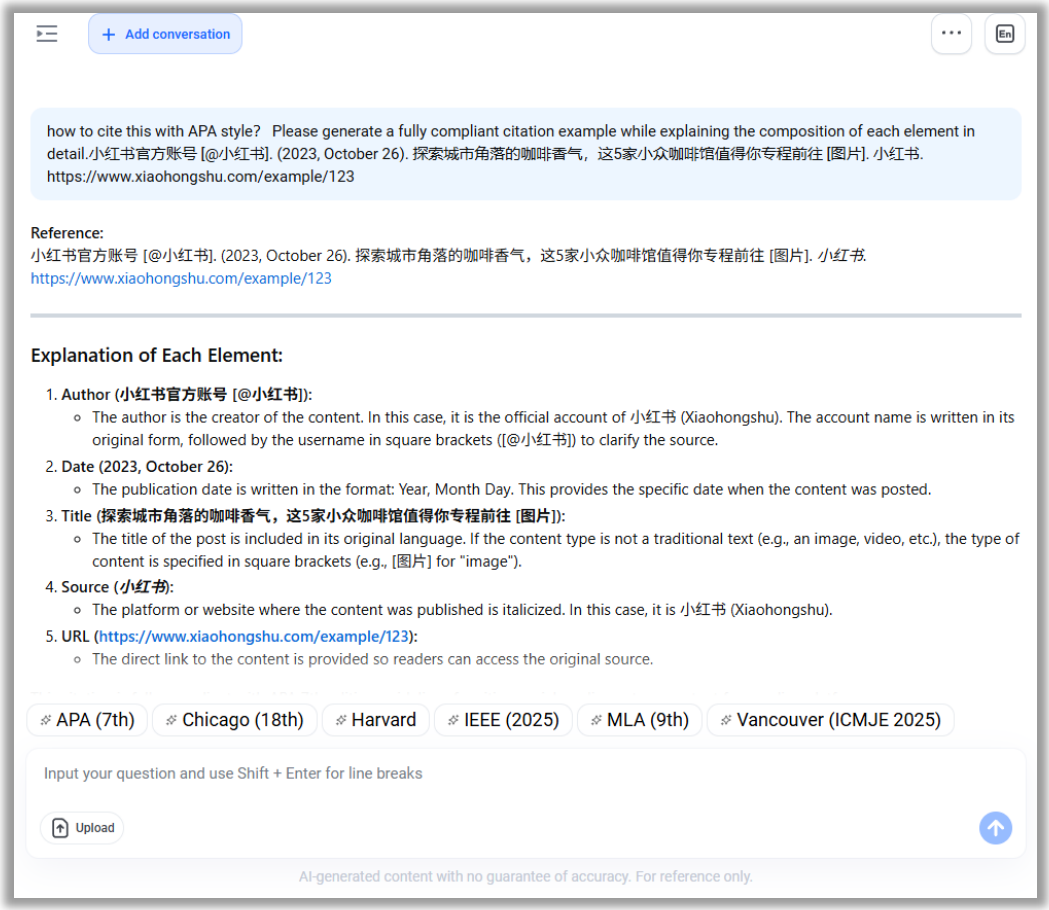

Figure 9-11 Example of LibAI Cite Session

3. Outcomes and Benefits

3.1 Service Efficiency Improved with Significant Cost Optimization

This initiative has brought about a substantive breakthrough in service efficiency. The response time for basic inquiries has been reduced from hours or minutes to seconds, enabling real-time support. Preliminary statistics show that librarians' workload for handling routine and factual inquiries has decreased by over 50%, effectively freeing up human resources. Furthermore, with the support of LibAI Search and LibAI Database Navigator, the efficiency of resource retrieval and localization

has been significantly enhanced. Both users and librarians now benefit from considerably reduced time and operational costs in information acquisition, leading to a fundamental improvement in overall operational effectiveness.

3.2 Service Breadth and Depth Expanded with Harmonized Standardization and Personalization

The LibAI intelligent service matrix effectively overcomes the traditional limitations of time, space and staff capability. Through LibAI Chatbot, assistance is available 24/7, meeting immediate needs whenever they arise. Meanwhile, AI integration ensures both precision and consistency in responding to enquiries and guiding users to resources, eliminating service variations caused by human factors and establishing a standardized framework for service quality. Crucially, the system also delivers personalized support within this standardized structure – for example, LibAI Read’ s tailored literature interpretation enables the library to offer individualized experiences while operating at scale.

3.3 Librarian Roles Transformed with Core Value Reimagined

By delegating repetitive and procedural tasks to AI, librarians have been liberated from routine administrative work, enabling them to focus more on deeper services requiring professional judgment, humanistic care, and innovative thinking. This shift has transformed the role of librarians from traditional information intermediaries into designers of disciplinary services, educators in information literacy, and collaborative partners in addressing complex research challenges. This evolution has not only

significantly enhanced librarians' professional fulfillment but also strengthened the expertise and value of the library's services as a whole.

4. Next Steps

4.1 Deepen System Integration

Expand LibAI's integration into specialized areas including subject services and information literacy instruction, while exploring its potential for supporting research and scholarly impact analysis.

4.2 Establish Continuous Improvement Cycle

Implement a systematic feedback-evaluation-optimization process to regularly assess performance and user satisfaction, enabling targeted refinements to knowledge bases and interaction flows.

4.3 Enhancing Librarian-AI Collaboration Capabilities

Develop training programs to strengthen librarians' AI application skills and optimize human-AI workflow coordination for efficient query resolution.