Connecting Spaces, Services, and Users: AI Agent–Driven Smart Library Circulation Services

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Library

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1. Background

• High volume of repetitive manual consultations

Library visitor flow continues to grow steadily. Consultations at service desks regarding space reservations, regulations, and borrowing are frequent. Book search inquiries and questions about popular reference books in the Course area and magazines area are concentrated.

• Service time and space limitations

Readers can only access manual services during opening hours; consultation needs outside these hours cannot be promptly addressed.

• Trend toward library intelligence

Under the "15th Five-Year Plan," digitalization and intelligent services in libraries are an inevitable trend. Libraries are innovating smart

services starting from information query services, which helps obtain timely feedback and adapt to future development patterns.

2. Solutions

- **Intelligent Q&A system based on knowledge base**

Library daily FAQ questions are classified by type; spaces are subdivided into group discussion rooms, study seats, functional areas, etc.; collections are subdivided into borrowing rules, cross-campus interlibrary loan procedures, returns and renewals; services are subdivided into space distribution, library rules, etc. All Q&A are organized by category into markdown documents and uploaded to the system as PDFs.

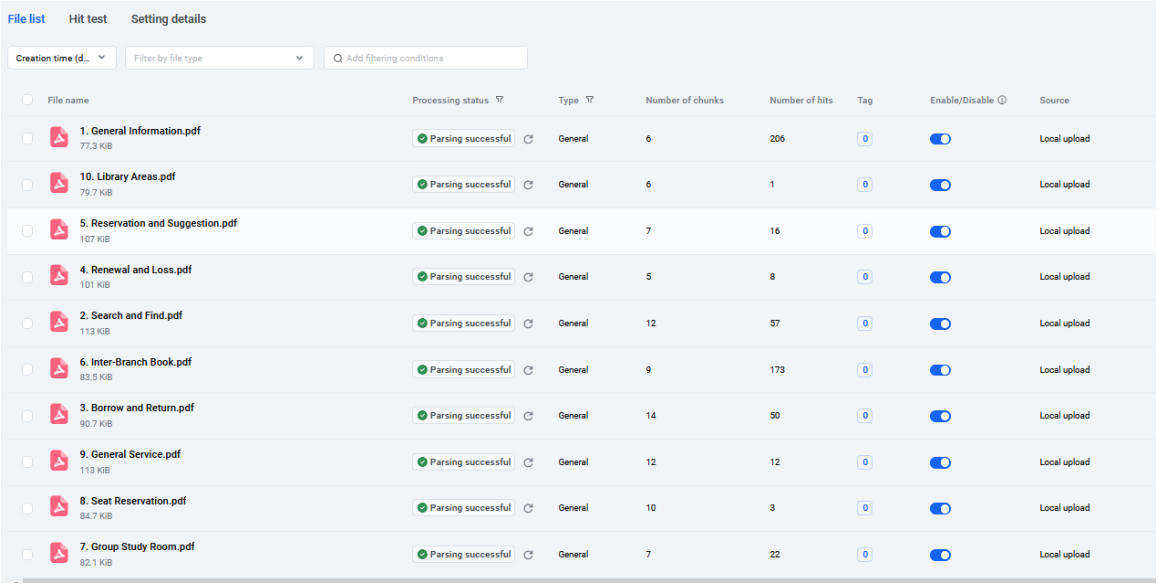

Figure 12-1 Knowledge Base of Library_Circulation_Service

With the knowledge base at the core, the AI agent can quickly retrieve relevant information to accurately respond to user inquiries, avoiding AI hallucinations. Meanwhile, librarians supplement the knowledge base in the backend with new questions, unclear answers, or service desk–encountered issues, providing reverse training for the agent. This ultimately achieves "accurate response + dynamic optimization," forming a closed loop of "Q&A – training – iteration," continuously enhancing service capabilities.

Screenshot examples of dialogues:

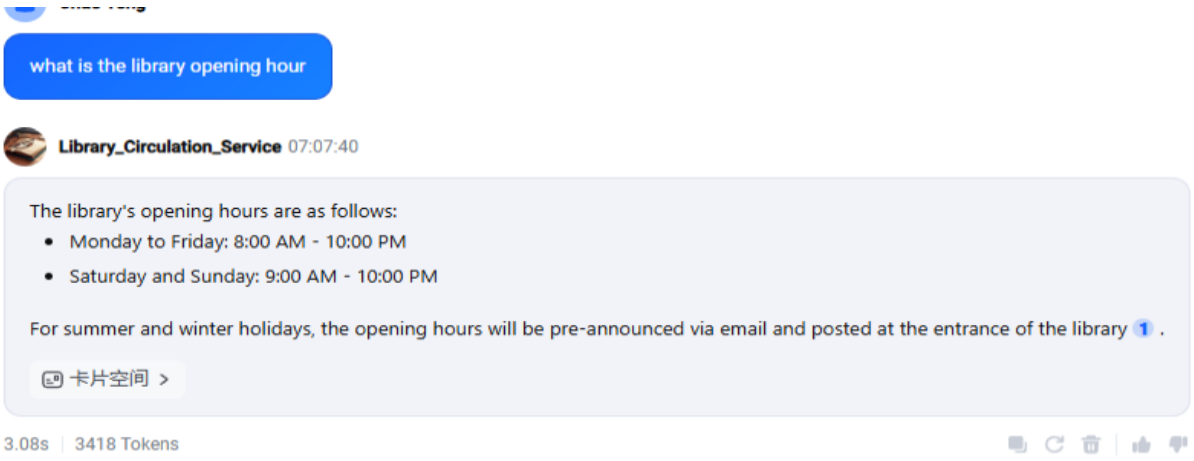

Figure 12-2 Example of Library_Circulation_Service

- **Workflow integration with existing systems**

Through workflow integration, the AI agent connects to the library's printed catalog via the Huiwen system API. Inputs and outputs are defined in the workflow to achieve real-time queries: when a user inputs

a book title or ISBN, the corresponding collection details are returned. This simplifies book search steps and improves user experience.

Workflow diagram as follows:

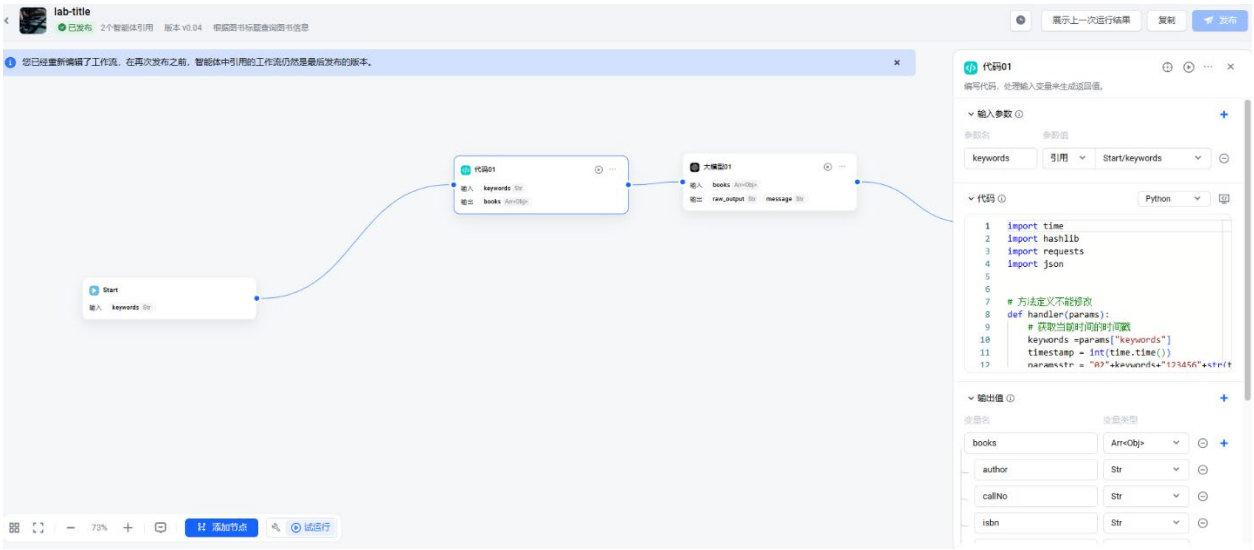

Figure 12-3 lab-title Workflow

- **Collaboration among multiple AI agents**

A multi-agent collaboration mode addresses different user consultation needs. For example, in the 3rd-floor teaching reference area, users can scan a QR code and input the module code to query course reference books. In the 4th-floor magazine area, users can scan a QR code to access the Magazine Query Assistant for the latest subscription information on print magazines.

Screenshot showing relevant course reference books after inputting a module code:

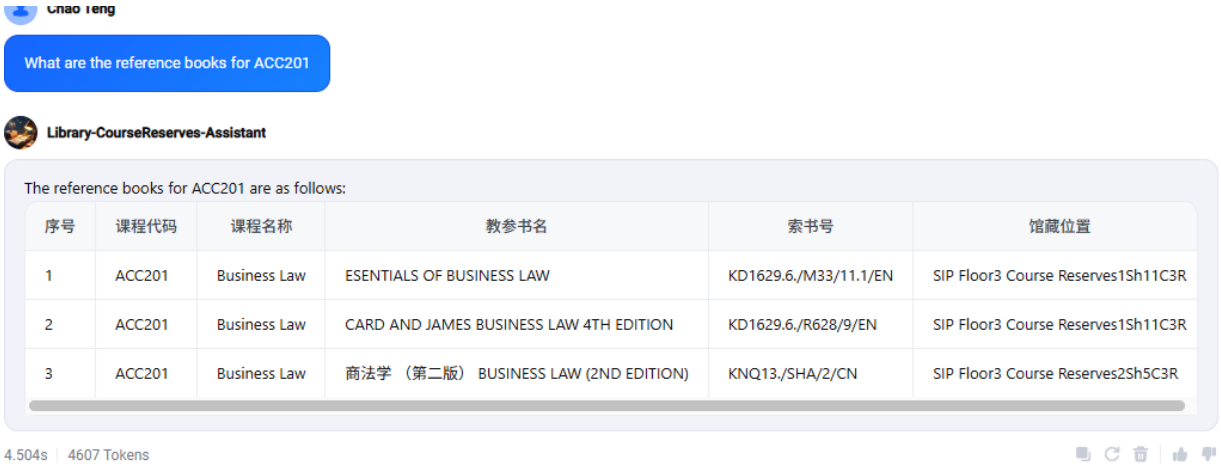

Figure 12-4 Retrieving collection information based on module code

3. Outcomes and Benefits

- **Improved user experience**

Breaks the time barrier of traditional manual consultation, providing "zero-wait" responses and 24-hour Q&A. Dialogue logic is optimized for different scenarios, making interactions more natural and user-friendly.

- **Connecting spaces, users, and collections through AI**

QR codes are placed in library physical spaces for immediate on-site access. AI agents link library spaces, services, and users, creating a full-scenario smart service ecosystem.

4. Replicability and Promotion Value

This case is based on actual library application scenarios. AI agents are collaboratively created by librarians and utilize the university' s agent platform for functionality, requiring no additional cost or complex programming knowledge. It can be promoted across different departments and relevant application scenarios.

5. Next Steps

- **Continuous knowledge base iteration**

Fully record user offline consultations and AI agent interactions. Newly validated Q&A will be fed back into the knowledge base, guiding continuous iteration based on real user needs, improving response accuracy and aligning smart services with user requirements.

- **Parallel online promotion and offline guidance**

Promote the platform online primarily via the official WeChat account, and offline with prominent posters and usage guides at service desks. Encourage librarians to actively recommend the AI agent for quick queries during user consultations.

- **Data analysis and decision support**

Analyze consultation data accumulated by AI agents to provide data-driven support for future optimization of library spaces and services.