ChinaRxiv

AI translation · View original & related papers at
chinarxiv.org/items/chinaxiv-202506.00163

Prospects·Quality·Pathways: ChatGPT-Enabled Smart Library Construction Research Postprint

Authors: Zhou Huan

Date: 2025-06-16T15:42:52+00:00

Abstract

ChatGPT has triggered transformations in library construction and evaluation standards, as well as library service modalities, gradually advancing innovative breakthroughs in the overall public cultural security strategy. ChatGPT facilitates the upgrading of library services such as intelligent recommendation, retrieval, classification, translation, and editing, enriching users' three-dimensional and immersive perceptual experiences. However, it also introduces risks and challenges for libraries in areas such as user privacy, information data, and ideology. Therefore, it is necessary to enhance libraries' smart services and security assurances by optimizing development pathways. First, promote technological innovation and optimize infrastructure. Establish a sound library smart service system, and dismantle technological hegemonism controlled by capital. Second, construct data supervision platforms to enhance intelligent services. Promote the development of a multi-party collaborative linkage mechanism for libraries, safeguarding the main stronghold of our country's socialist ideology. Third, cultivate talent teams and develop emerging forces. Coordinate multiple parties to synergistically stimulate subject learning efficacy, fostering a scientific and technological talent team with firm ideals and convictions who dare to break through and innovate.

Full Text

Preamble

Journal: University Library Work
Special Issue: Artificial Intelligence Empowering Library Construction
Publication: 2023, Issue 5
Title: Prospects, Quality, and Paths: A Study on ChatGPT Empowering Smart Library Construction
Author: School of Marxism, Nankai University, Tianjin

Abstract

ChatGPT has triggered transformative changes in library construction and evaluation standards, as well as service methodologies, gradually advancing innovations in the overall public cultural security strategy. It contributes to upgrading intelligent recommendation, retrieval, classification, translation, and editing services, while enriching users' three-dimensional and immersive perceptual experiences. However, it also introduces risks and challenges regarding user privacy, information data security, and ideological concerns. Therefore, optimizing development pathways is essential to enhance both intelligent services and security guarantees in libraries. This involves three key strategies: First, promoting technological innovation and optimizing infrastructure to dismantle technological hegemony controlled by capital; second, constructing data supervision platforms to enhance intelligent services and defend China's socialist ideological positions; and third, cultivating talent teams to foster a new generation of professionals with firm ideals and innovative capabilities.

Keywords: Library; ChatGPT; Digital intelligence service; Public culture; Civilized community

1. Analysis and Optimization

1.1 Human-Computer Interaction Systems

Human-computer interaction (HCI), also termed human-machine interaction, refers to the interactive relationship between smart library systems and users. Smart libraries utilize ChatGPT as an embedded tool, creating a natural two-way interaction between libraries and users. Through conversational dialogue, users can communicate with the system using natural language, store knowledge in personal accounts, and receive intelligent responses. This interactive model significantly enhances user efficiency while simultaneously addressing the risk of intellectual dependency.

The smart library human-computer interaction process operates as follows: Users search for information and knowledge through natural language queries. ChatGPT analyzes these requirements using powerful computing capabilities and massive corpora, generating responses that facilitate knowledge storage and retrieval. Due to differences in individual knowledge reserves and environmental contexts, users require diverse library literature, giving rise to both private domains and public cultural spaces. This interactive dialogue becomes a conduit for new knowledge internalization, with ChatGPT serving as a medium that penetrates users' daily lives, enabling dynamic transmission of library knowledge and enhancing information flow.

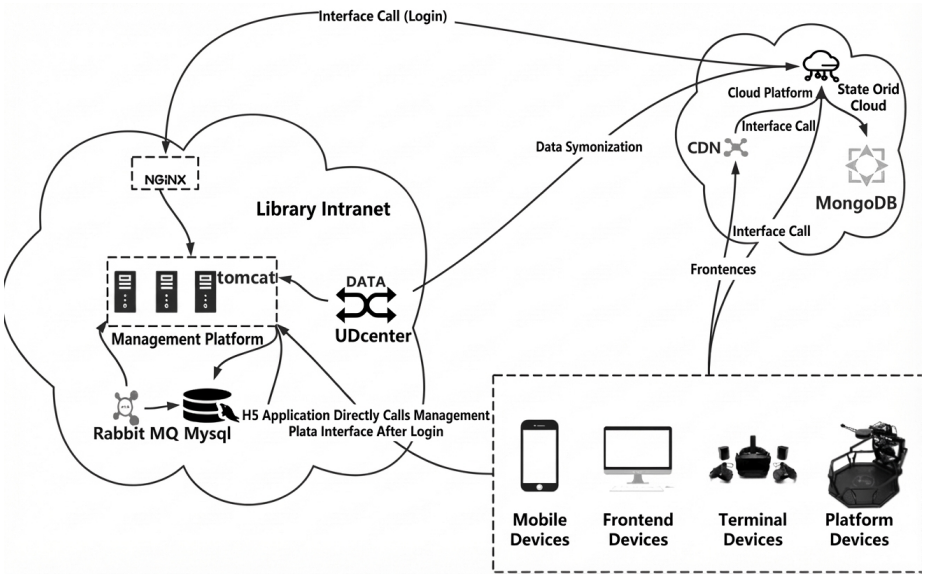

Figure 1: Figure 1

Smart Library Human-Computer Interaction Flow

1.2 User Experience Enhancement

Smart libraries can employ ChatGPT to improve user experience through several mechanisms. The system captures user data including emotional expressions, voice tones, and facial expressions to create rich sensory experiences. By analyzing intelligent interaction dialogue data, libraries can scientifically generate user portraits and design interface elements such as layout patterns and color schemes. The generative dialogue model precisely analyzes user needs for resources and reading experiences, enabling personalized resource provision and immersive learning experiences.

The technology facilitates both online and offline library services. For online services, virtual digital customer service provides 24/7 consultation. For offline services, smart libraries deploy unmanned robots and automatic book sterilization equipment. Users can interact with the system through mobile devices, tablets, or library self-service machines, enabling intelligent identification for quick search and borrowing. This cross-domain language modality utilizes computers to facilitate librarians' work, supporting large-scale data processing and analysis.

Smart Library Unmanned Service Process

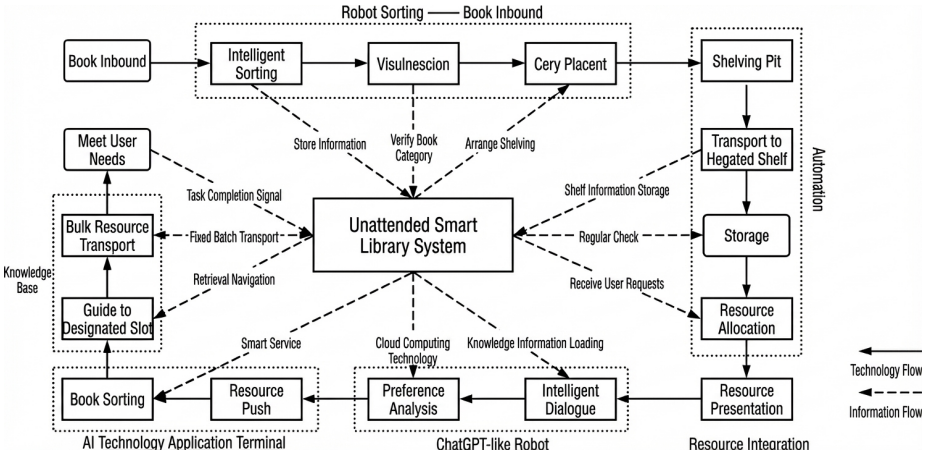

Figure 2: Figure 2

1.3 Unmanned Management Systems

Smart library unmanned management encompasses two primary aspects: First, utilizing intelligent robots for automated book classification and placement, equipped with RFID technology and visual sensors to capture book information and ensure proper positioning; second, employing smart technology for book integration and intelligent sorting, batch-transporting requested resources to designated locations. The system records book usage, borrowing statistics, and reader evaluations, providing foundations for resource procurement and service optimization.

---

2. Speculative Quality and Risk Analysis

2.1 Technological Risks and Challenges

While ChatGPT enhances services, it presents significant risks. The technology lacks transparency—users obtain answers without understanding the operational process, potentially leading to fragmented knowledge systems and the proliferation of misinformation. When accessing library knowledge bases, users may become overly dependent on algorithms, losing critical thinking capacity. This intellectual dependency risks transforming education into robotic training, diminishing human capacity for transcendence.

Privacy leakage represents another critical concern. ChatGPT, as a language transmission tool, can penetrate private spaces through its technological facade, dynamically monitoring user activities and preferences. User data becomes digitized, with privacy systematically extracted and replicated as commodified labels. In smart library construction, frameworks must be established based on

information lifecycle theory and stakeholder theory to protect user privacy.

2.2 Ideological and Sovereignty Concerns

Capital-controlled intelligent technology may manipulate ideological dissemination, with information redundancy inducing fragmentation risks. Algorithmic colonization discourse can emerge when technological hegemony dominates. The EU's concept of "digital sovereignty" highlights the need to protect national cultural sovereignty and data security. Smart libraries must construct general language models aligned with mainstream socialist core values, ensuring cultural interoperability while maintaining national security.

Over-reliance on ChatGPT may lead to physical and mental degradation, with users becoming subordinate to intelligent technology. The technology erodes bounded subjectivity, transforming individuals into appendages of the system. Additionally, copyright ambiguity arises as ChatGPT-generated texts derive from training corpora, creating intellectual property conflicts between users and original content owners.

---

3. Optimizing Development Paths

3.1 Technological Innovation and Infrastructure

Smart libraries must prioritize data currency, continuously updating databases to maintain validity throughout the data lifecycle. Deep learning and automatic updates provide technical support for breaking through bottlenecks. Libraries should introduce intelligent equipment such as automated borrowing systems, smart retrieval terminals, unmanned robot consultants, and automatic book sterilization machines. Integration of IoT and smart warehousing technologies enables high-density storage, automatic access, and unmanned distribution of physical resources.

3.2 Data Supervision and Intelligent Services

Constructing dynamic monitoring and real-time early warning systems is crucial. Libraries should establish intelligent identification systems for generative AI, strengthening algorithmic robustness to ensure stability and security across different conditions. Algorithmic robustness refers to maintaining operational stability despite system instabilities or unpredictability. Libraries must implement encryption technologies to strengthen data storage security and establish comprehensive protection systems for reader personal information.

The state has issued regulations including the "Generative AI Service Management Measures" and "Personal Information Protection Law," requiring libraries to build privacy protection models based on blockchain technology. Smart libraries should establish detection and control mechanisms, setting regulatory

nodes to prevent cultural colonization and ideological infiltration.

3.3 Talent Cultivation and Capacity Building

Talent teams constitute a critical factor for service enhancement. China must clarify educational positioning, establishing AI technology learning modules throughout library science curricula. Smart libraries should leverage general education, cultivating skilled professionals with interdisciplinary knowledge who can adapt to technological development. The "Grand Education" concept emphasizes cultivating talents through university-industry cooperation, integrating knowledge literacy, digital skills, and innovative capabilities.

Library professionals must master digital resource management, intelligent retrieval and classification, and develop basic competencies across disciplines. Professional ethics and scientific literacy are essential for integrating smart library construction into the broader framework of safeguarding socialist core values and world civilization community building.

---

4. Conclusion

Whether ChatGPT empowering smart library construction represents an artificial intelligence technological revolution or a tool of technological capital hegemony remains a profound question worthy of deep reflection. As technologies like 5G/6G, blockchain, and big data mature, smart libraries must adopt correct concepts and value positions as fundamental support. The integration of innovative factors into library practice will provide immersive learning experiences for users.

The activation of librarians' learning efficacy is crucial for intelligent transformation. Libraries should establish specialized talent foundations, encouraging cognitive self-evaluation and continuous reflection. By fostering positive, upward-looking scientific ethics and integrating into the global civilization community, smart libraries can truly serve as public cultural spaces that meet people's needs for a better life while maintaining security and sovereignty.

References

[1] Model Embedding in Digital Library Construction: Risks, Challenges, and Legal Norms [C] // Shanghai Law Society. Shanghai Legal Research Collection. Shanghai People's Publishing House, 2023: 228-237.

[2] The Impact of ChatGPT on the Library Industry [J]. Library and Information Science, 2023(3): 43-44.

[3] Government of China. The 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives Through 2035 [EB/OL]. [2023-08-25]. https://www.gov.cn/xinwen/2021-03/13/content_{5592681}.htm.

[4] National Bureau of Statistics. Sustained Growth in Investment and Continuously Optimized Structure [EB/OL]. [2023-08-25]. http://www.stats.gov.cn/sj/sjjd/202307/t20230718_{19413

[5] National Bureau of Statistics. Statistical Communiqué on National Economic and Social Development 2022 [EB/OL]. [2023-08-25]. http://www.stats.gov.cn/sj/zxfb/202302/t20230228_{19

[6] National Bureau of Statistics. Modern Service Industry Statistical Classification, National Statistics Bureau Order No. [EB/OL]. [2023-08-25]. http://www.stats.gov.cn/sj/tjbz/gjtjbz/202307/t20230728_{1941612}.html.

[7] Hongmei Chen. Smart Library Based on Mobile Intelligent Terminals [J]. University Library Work, 2019(5): 42-45.

[8] Xi Jinping's Speech at the 20th Academician Conference of Chinese Academy of Sciences, 15th Academician Conference of Chinese Academy of Engineering, and 10th National Congress of China Association for Science and Technology [N]. People's Daily, 2021-05-29(2).

[9] Conger, J. A., & Kanungo, R. N. The Empowerment Process: Integrating Theory and Practice [J]. Academy of Management Review, 1988(3): 471-482.

[10] Xi Jinping's Speech at the Symposium with Experts in Education, Culture, Health, and Sports [N]. Tianjin Trade Union Management Cadre College Journal, 2020(4): 1-4.

[11] Xi Jinping. The Governance of China [M]. Foreign Languages Press, 2022: 213.

[12] Bo Jiang. Research on the Texture of Urban Public Cultural Space from the Perspective of Better Life [J]. Library and Information Science Knowledge, 2023(3): 104-115.

[13] Karl Jaspers. What is Education? [M]. SDX Joint Publishing Company, 1991: 35-36.

[14] Blockchain-Based Privacy Protection Model for Library Users [J]. Computer Technology and Software Engineering, 2023(5): 190-196.

[15] Strengthening Digital Security Barriers [N]. People's Daily, 2023-06-19(19).

[16] Clarke, B., & Rossini, C. The Cambridge Companion to Literature and the Posthuman [M]. Cambridge: Cambridge University Press, 2016: 153.

[17] Research on Data Resource Security Sharing Mechanism for Library Self-Built Databases Based on Blockchain [J]. University Library and Information Science Journal, 2023(5): 118-121, 145.

[18] Construction and Service Model of Integrated Space for Smart Library Based on Metaverse [J]. Library Work and Research, 2023(8): 3-10, 18.

[19] Theoretical Connotation and Improvement Strategies of Smart Library Services [J]. University Library Work, 2022(1): 49-54.

[20] Research on Personal Information Protection of Smart Library Readers [J]. Library Work and Research, 2023(8).

[21] Personal Information Protection Law [J]. Library Work and Research, 2023.

Source: ChinaXiv — Machine translation. Verify with original.