Prospects • Quality • Pathways: ChatGPT Empowering Smart Library Development (Postprint)

Authors: Zhou Huan

Date: 2024-06-02T00:00:00+00:00

Abstract

ChatGPT has triggered transformations in library construction and evaluation standards, as well as library service models, gradually advancing innovative breakthroughs in the overall public cultural security strategy. It facilitates the upgrading of library services such as intelligent recommendation, retrieval, classification, translation, and editing, thereby enriching users' three-dimensional and immersive perceptual experiences. However, it also introduces risks and challenges to libraries concerning user privacy, information data, and ideology. Therefore, it is imperative to enhance libraries' intelligent services and security safeguards by optimizing development pathways. First, promote technological innovation and optimize infrastructure; improve the library intelligent service system and dismantle technological hegemonism controlled by capital. Second, construct a data supervision platform to enhance intelligent services; promote the establishment of a multi-party collaborative mechanism for libraries and safeguard the principal position of socialist ideology in our country. Third, cultivate talent teams and develop successor forces; coordinate multiple stakeholders to synergistically stimulate learning efficacy, and foster a contingent of scientific and technological talents with firm ideals and convictions who dare to break through and innovate.

Full Text

Preamble

ChatGPT-Empowered Smart Library Construction Research

Zhou Huan, School of Marxism, Nankai University, Tianjin

Keywords: Library; ChatGPT; Smart Services; Public Culture; Civilized Community

Abstract: ChatGPT has triggered transformations in library construction and evaluation standards, as well as library service paradigms, gradually advancing innovative breakthroughs in the overall public cultural security strategy. It contributes to upgrading library services such as intelligent recommendations, retrieval, classification, translation, and editing, thereby enriching users' three-dimensional and immersive perceptual experiences. However, it also introduces risks and challenges related to user privacy, information data, and ideology. Therefore, it is essential to optimize development paths to enhance both the intelligent services and security guarantees of libraries. First, promote technological innovation and optimize infrastructure by establishing a robust smart library service system and dismantling technological hegemony controlled by capital. Second, construct data supervision platforms to improve intelligent services, promote collaborative mechanisms for diverse library co-construction, and safeguard the primary ideological position of socialism in China. Third, cultivate talent teams and develop successor forces by coordinating multi-party efforts to stimulate learning effectiveness and foster technologically innovative talent with firm ideals and convictions.

With the continuous optimization and upgrading of intelligent technology, public attention toward smart services has grown daily, and the transformation of library services has become a consensus for high-quality development in public cultural services. As ChatGPT emerges, libraries face the choice between enthusiastically embracing or comprehensively banning the technology. Current research reveals that some scholars maintain a cautious attitude toward ChatGPT, concerned that its application in libraries may lead to potential disorder in artificial intelligence systems, threatening national data security, public administrative security, and personal data security. Through reviewing existing scholarship, it is necessary to technically regulate potential risks in library AI systems and plan response strategies from perspectives including service concept transformation, service team building, service mechanism optimization, and service security guarantees to further advance smart library construction.

1. Analysis and Optimization

ChatGPT demonstrates an accelerating development trend in research concerning technological robotics and artificial neural networks. According to National Bureau of Statistics data, high-tech industry investment in 2023 increased year-over-year, with growth rates exceeding overall fixed asset investment, accounting for a higher proportion of total investment compared to the previous year. From IBM's Deep Blue to humanoid robot Asimo, AlphaGo, and the iterative updates of generative AI like ChatGPT, technology has made a leap toward the stage of strong artificial intelligence. ChatGPT, embedded in human public cultural life spaces, showcases the leapfrog and innovative development of AI, changing user information acquisition methods and catalyzing intelligent upgrades in libraries.

Modern service statistics classifications indicate that digital cultural venues as carriers of digital cultural exhibition services have further promoted the trans-

formation of library service paradigms. ChatGPT undertakes new tasks and missions for innovative library service scenarios, enhanced user experiences, and smart library construction, providing powerful momentum. Some scholars hold relatively open views, suggesting that when a new technology emerges, the optimal response strategy is to learn and master it. Based on the historical positioning of public libraries, ensuring information equity and cultural inheritance constitutes an important mission. The 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives Through 2035 explicitly incorporates smart libraries into national future development planning, requiring accelerated digital society construction and expanded coverage of high-quality public service resources.

ChatGPT effectively enhances interactivity and diversified language environments, boosting the three-dimensional transmission of information. The language model, premised on large-scale corpora, constructs self-supervised learning models through powerful computing capabilities. Smart libraries utilize generative language models as information transmission media, leveraging the dual functions of digital software and information carriers to improve knowledge and technology acquisition capabilities. Through interactive dialogue mechanisms, ChatGPT enables users to participate deeply in resource co-construction, granting them rights to knowledge and information dissemination. This facilitates the transformation of users from passive objects to interactive subjects, accelerating service collaboration and enabling all parties to explore smart library service construction.

Smart libraries employ ChatGPT to analyze user language interactions, forming dialogue patterns close to natural human language. By detecting language and constructing user-centered service systems, information transmission demonstrates a trend toward three-dimensional development. Generative dialogue models can precisely analyze user needs regarding resources and emotions, further enhancing platforms for knowledge acquisition and resource processing capabilities. Smart library users can interact with ChatGPT, which provides intelligent responses that respect user queries, helping satisfy personalized emotional needs. Through intelligent analysis of interactive dialogue data, libraries can scientifically generate user profiles and design interface elements such as layout patterns and color schemes to provide rich sensory experiences.

1.1 Human-Computer Interaction Process

Human-computer interaction, also known as human-machine interaction (Human-Computer Interaction or Human-Machine Interaction), refers here to the interactive relationship between smart library systems and users. Smart library users can communicate with ChatGPT through natural language for Q&A, storing knowledge in personal account information libraries. Due to differences in personal knowledge reserves and environmental contexts, users require different literature and documents. This interactive dialogue becomes a medium-embedded tool, penetrating users' lives and dynamically transmitting

library knowledge information, thereby enhancing user information literacy.

[Figure 1: see original paper] Smart Library Human-Computer Interaction Flow

1.2 Unattended Library Management

Smart library management through unattended operations primarily utilizes intelligent robots for book classification and automated placement. By installing intelligent recognition systems, RFID technology, and visual sensors to collect book information, libraries ensure books are placed in designated locations. Second, smart libraries employ ChatGPT to improve service construction, using large computing power and data models to analyze and visualize user needs in real-time, enabling batch delivery of required resources to designated locations.

[Figure 2: see original paper] Smart Library Unattended Process

2. Analysis of User Preferences

2.1 Digital Civilization Community

President Xi Jinping emphasized the need for forward-thinking in matters concerning overall development and national security, deploying strategic and reserve scientific and technological R&D projects targeting frontier fields such as artificial intelligence and quantum information. The term "empower" originates from management studies, often used alongside authorization, connoting the granting of greater possibilities and breakthrough spaces. In psychology, most scholars interpret it as granting energy or capability. Empowering smart library construction involves analyzing quality enhancement issues from multiple perspectives: autonomous learning improvement, unmanned library operation optimization, human-computer interaction enhancement, governance efficiency improvement, and better life needs.

The digital civilization community represents the most intuitive experience object for the public' s perception of a better life. Public cultural space, mediated by public culture, provides the foundation for better life through spiritual and cultural supply and public activity participation scales. Smart libraries serve not only as cultural repositories but also as people-centered public cultural spaces reflecting people' s cultural pursuit and realistic examination of better experiences. From a practical perspective, they concentrate on subject needs, public needs, and realistic needs; from a value perspective, they are aesthetic spaces that integrate perceptual aesthetics and life practice.

2.2 Risk Challenges of ChatGPT Integration

ChatGPT' s operation lacks transparency. While users obtain relatively definitive answers in Q&A sessions, they remain completely unaware of the technology' s operation and answer acquisition processes. This fragments holistic, organized

knowledge systems and causes the proliferation of false knowledge. When using the technology to access library knowledge or resource databases, users are susceptible to algorithmic manipulation, losing rational thinking and succumbing to technological determinism. Human-computer interaction enhances user efficiency on one hand but also leads to intellectual laziness on the other, reducing people to single-function calculating beings and education to robot training, potentially causing atrophy in the state of merely maintaining vitality and obscuring transcendence.

ChatGPT, as a product of intelligent technological transformation, is not merely a tool for language transmission and information delivery. It penetrates people' s private spaces through its technological veneer, dynamically monitoring activities and preferences. Human entities become datafied under ChatGPT, with user data refracting and replicating human entities through systematic, symbolic language communication. In smart library construction, it is necessary to combine information lifecycle theory and stakeholder theory to construct library user privacy protection models. Over-reliance on intelligent technology may lead users' bodies into sub-health states, with bodies and minds being controlled and domesticated by programs, alienating the whole person into slaves of intelligent technology.

2.3 Development Path Optimization

2.3.1 Technical Means: Important Guarantee for Smart Library Service Quality Smart libraries must construct generative intelligent recognition systems and deepen exclusive graph technological transformations. Generative AI technology possesses powerful information processing capabilities, but smart library algorithm robustness requires improvement. Algorithm robustness refers to library systems or algorithms maintaining operational stability and security under different conditions. Due to technical defects or human operations, libraries may face instability and unreliability risks that could lead to privacy leakage.

First, smart library data must keep pace with the times. ChatGPT' s deep learning and automatic updates continuously provide powerful technical support for breaking through technical bottlenecks. Libraries should introduce intelligent equipment to improve operational efficiency, shaping intelligent information retrieval terminals and forming automated borrowing service systems. Second, libraries must emphasize data security, which concerns cultural credibility. Whether content quality passes standards significantly influences intelligent services. Libraries should evaluate data quality using technical methods to ensure healthy development and standardized application. Third, libraries should scientifically utilize generative AI, relying on intelligent technology reconstruction to rebuild physical service spaces. By introducing IoT and smart warehousing technologies, libraries can achieve high-density storage, automatic access, and unmanned distribution of paper resources.

2.3.2 Service Models: Core Link in Smart Library Construction Optimization Smart libraries employ digital and intelligent means to provide readers with superior reading experiences and learning environments. The construction process involves many core links whose optimization and strengthening are crucial for improving service quality and efficiency. Smart libraries should comprehensively build dynamic monitoring and real-time warning digital intelligence platforms, establishing and improving monitoring and early warning mechanisms. They should adhere to Party leadership as the core, construct general language large models conforming to mainstream ideology, and coordinate multi-party efforts to drive resource development.

Smart libraries should innovate portal website service models, using ChatGPT' s generative and conversational AI capabilities to achieve intelligent queries, precise identification of user needs, and interlibrary loan functions. Mobile convenient service models based on intelligent networked devices (smartphones, tablets) allow users to access and browse smart library resource libraries anytime, anywhere. Online AI consulting service models can provide personalized problem-solving, where users seek knowledge answers, problem assistance, and reading recommendations from intelligent librarians. Librarians can leverage digital platforms combined with intelligent service equipment to enhance professional service levels and efficiency.

2.3.3 Talent Teams: Key Factor in Smart Library Service Efficiency Facing challenges from new-generation AI technology, China must clarify educational positioning and jointly build talent cultivation with a broad education perspective. By establishing AI technology learning modules as core courses integrated throughout smart library retrieval services, libraries should cultivate comprehensively developed skills with interdisciplinary knowledge integration. This enables librarians to rapidly adapt to intelligent technology development and facilitates real-time learning and problem-solving.

Smart libraries should leverage general education' s foundational role, cultivating smart librarians equipped with innovative thinking abilities for smart library construction, interdisciplinary knowledge mastery, and proficient digital intelligence technology application. They can harness generative AI technologies like ChatGPT to actively contribute to smart library development. The library industry can establish specialized talent funds to encourage the development of smart librarians. Through self-cognition and evaluation, librarians can continuously reflect, progress, and generate self-motivation for improvement, integrating China' s smart library construction into the broader context of safeguarding socialist core values and building a global civilized community.

4. Conclusion

Whether ChatGPT empowering smart library construction represents an AI technological revolution or a tool of technological capital hegemony remains a question worthy of deep consideration. Smart library application of ChatGPT

must be supported by correct concepts and value positions. With the maturity of big data, 5G/6G, and other scientific technologies, libraries should enhance librarians' scientific management of databases, intelligent retrieval and classification of electronic resources, and basic application capabilities across disciplines. China must integrate knowledge literacy and innovative factors into the practical process of intelligent technology, promoting the revitalization of the nation through science and education.

The cultivation of smart library talent teams should adopt a broad education perspective, establishing three-dimensional talent cultivation models integrating industry-academia-research cooperation to provide immersive learning experiences for users. Digital knowledge and science-technology constitute core resources. When selecting knowledge for smart library construction, it becomes evident that digital knowledge encompasses not only traditional text but also multimedia information such as images and videos, as well as valuable information and data extracted through big data analysis. Smart libraries can utilize ChatGPT, which masters massive corpora, to design AI technology training courses, formulate content outlines, enhance librarians' scientific literacy, cultivate smart librarians, and activate learning effectiveness among principal actors. The activation of learning effectiveness among smart librarians represents the key point for achieving intelligent transformation.

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