Opportunities and Challenges: Strategic Analysis of Libraries in the Context of DeepSeek's Ascendancy

Shuiwang Lei*

Xuzhou Vocational College of Industrial Technology, 221140, Xuzhou, Jiangsu, China

*Corresponding author.Email: 37277952@qq.com

Abstract. This study investigates the transformative opportunities and formidable challenges that libraries confront amidst the meteoric rise of DeepSeek. Through a comparative analysis of DeepSeek and ChatGPT's applications within library ecosystems, this paper dissects the multifaceted impact of DeepSeek on library service paradigms, resource aggregation, and user expectations. It further explores a comprehensive suite of strategies for libraries to navigate digital metamorphosis, resource enhancement, user enlightenment, service innovation, talent development, and collaborative synergy.

Keywords: DeepSeek; ChatGPT; Intelligent Inquiry Systems; Library Services; Artificial Intelligence

1 Introduction

In the contemporary epoch characterized by the exponential evolution of information technology, the modalities of knowledge acquisition have undergone a seismic shift. DeepSeek, an avant-garde knowledge service platform, has garnered widespread acclaim and adoption due to its cutting-edge technological infrastructure and user-centric interface. This phenomenon has precipitated a profound reevaluation of traditional library service models, compelling the academic and professional communities to reassess the role and strategic positioning of libraries in the digital milieu. This research endeavors to elucidate the opportunities and challenges that libraries face in the wake of DeepSeek's ascendancy, proposing innovative strategies to harness these dynamics. By scrutinizing the distinctive attributes of DeepSeek and its ramifications for libraries, this study delves into actionable measures for libraries to undertake in the realms of digital transformation, resource enhancement, user enlightenment, service innovation, talent development, and collaborative synergy.

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2 The Genesis and Pivotal Attributes of DeepSeek's Ascendancy

DeepSeek, an emerging vanguard in the knowledge service domain, has rapidly ascended to prominence, becoming a focal point of attention within academic and public spheres. Its success is attributable to a confluence of strategic factors. Firstly, DeepSeek has adeptly identified and fulfilled the contemporary user's insatiable appetite for expedient and efficient knowledge acquisition, offering an intuitive and seamless user interface complemented by robust search functionalities. Secondly, the platform has aggregated an extensive repository of academic resources and multimedia content, catering to the diverse and evolving information needs of users. Additionally, DeepSeek has harnessed advanced artificial intelligence technologies, such as natural language processing and machine learning, to deliver personalized recommendation services, thereby significantly enhancing user engagement and satisfaction.

The ascendancy of DeepSeek has precipitated a paradigm shift in traditional library service models. On one hand, it has introduced novel avenues for knowledge acquisition, partially supplanting traditional library functions. On the other hand, it has catalyzed a reexamination of library positioning and service delivery mechanisms. This dual impact presents both formidable challenges and unprecedented opportunities for libraries to undergo transformation and innovation. Libraries must confront the competitive pressures exerted by emerging platforms like DeepSeek while simultaneously recognizing the potential for collaborative synergies and developmental trajectories.

DeepSeek's sensation is primarily attributed to the disruption of two entrenched monopolies: First, it has shattered the monopoly of closed-source models, irrefutably demonstrating that the open-source trajectory is the most conducive to technological advancement. Second, it has dismantled the hardware monopoly, illustrating that the evolution of large-scale models does not necessitate brute-force solutions through excessive hardware resource allocation. Instead, algorithmic optimization can achieve rapid evolution with significantly reduced hardware demands (DeepSeek has achieved substantial reductions in hardware resource requirements through low-rank compression of KV data in the Transformer model and parallel computing). Thus, DeepSeek's triumph represents a rare and monumental victory in the IT industry, particularly in the realms of infrastructure and algorithmic innovation, marking an epochal significance in the annals of China's IT industry development. [1]

3 Comparative Analysis of DeepSeek and ChatGPT in Library Applications

DeepSeek is an artificial intelligence system specializing in professional knowledge services, underpinned by core technologies such as deep learning, knowledge graphs, and natural language processing. Its strengths are epitomized by a robust domain-specific knowledge base and precise information retrieval capabilities, enabling it to deliver professional and in-depth academic resources and services. DeepSeek excels in

handling complex queries and offering expert advice, making it an ideal solution for academic and specialized libraries.

ChatGPT, developed by OpenAI, is a large-scale language model renowned for its exceptional natural language understanding and generation capabilities. Leveraging the Transformer architecture and trained on vast datasets, ChatGPT can engage in fluid conversations and perform a wide array of text generation tasks. Its versatility and natural interaction make it suitable for handling queries across diverse topics, rendering it an apt choice for everyday consulting services in public and comprehensive libraries. ChatGPT's operational characteristics are marked by interactivity, proactivity, intelligence, and development, which can profoundly influence library operations. From a challenge perspective, ChatGPT can be applied to areas such as resource collection and updating, query and reading service delivery, in-library equipment maintenance, inter-library communication and business model adjustment, and librarian recruitment and technical training. [2]

In the realm of reference consulting services, both DeepSeek and ChatGPT have demonstrated significant prowess. DeepSeek, with its professional knowledge base and precise retrieval capabilities, can provide in-depth literature recommendations and research suggestions for academic researchers. For instance, in a university library application, DeepSeek successfully facilitated researchers in swiftly locating the latest research advancements and pivotal literature in their respective fields. ChatGPT, conversely, excels in handling general reference consulting queries, responding to users' diverse inquiries in natural and fluent language. A public library, for example, utilized ChatGPT to offer 24/7 instant consulting services, thereby significantly enhancing service efficiency and user satisfaction.

In the domain of information retrieval services, DeepSeek's professionalism and precision confer it an advantage in academic resource searching. It can decipher complex academic queries and deliver highly relevant documents and materials. For instance, a research-oriented library developed an intelligent retrieval system utilizing DeepSeek, markedly augmenting the utilization rate of academic resources. In contrast, ChatGPT performs admirably in general information retrieval, handling a broad spectrum of query topics and providing information in conversational form. A municipal library integrated ChatGPT into its OPAC system, enabling users to swiftly locate the desired resources through natural language queries.

In the sphere of user education and information literacy training, both technologies exhibit unique attributes. DeepSeek can develop professional information literacy courses to equip users with the skills necessary for searching for and utilizing academic resources. For example, a university library leveraged DeepSeek to create a series of online courses, effectively enhancing graduate students' information literacy. ChatGPT, with its strong interactivity and ease of use, is more suited for foundational information literacy education. A community library, for instance, developed an interactive information literacy training module using ChatGPT, disseminating information retrieval knowledge to the public in an engaging and accessible manner.

4 Disruption of Library Service Models by DeepSeek

4.1 In Reference Consulting Services

The immediacy and convenience of intelligent question-answering systems have led users to increasingly favor these online tools over traditional library visits. This trend poses a significant challenge to library reference consulting services, necessitating a reevaluation of their service positioning and value proposition.

4.2 In Information Retrieval Services

The efficiency and precision of intelligent question-answering systems render traditional keyword-based retrieval methods somewhat obsolete. Users can now obtain the information they need swiftly through natural language queries without mastering complex retrieval skills. This development compels libraries to upgrade their retrieval systems to provide a more intelligent and user-friendly experience.

4.3 In User Education

The proliferation of intelligent question-answering systems has altered users' information acquisition habits and expectations. Users are increasingly reliant on instant and convenient information services, which presents new imperatives for library user education. Libraries need to recalibrate their educational content and methods to help users better navigate and utilize information in the era of intelligent question-answering systems.

5 Challenges Posed by DeepSeek to Library Resource Building

5.1 In Terms of Resource Types

Intelligent question-answering systems can integrate a diverse array of data formats, including text, images, and videos, whereas traditional library resources are predominantly print literature and e-books. This necessitates libraries to expand their resource types and increase the proportion of multimedia resources to meet users' diverse information needs.

5.2 In Terms of Resource Acquisition Methods

Intelligent question-answering systems can capture the latest information from the internet in real-time, whereas library resource updates often lag behind. This prompts libraries to explore innovative ways of acquiring resources, such as strengthening the collection of open-access resources or collaborating with internet platforms to obtain real-time data.

5.3 In Terms of Resource Organization and Management

intelligent question-answering systems organize information through complex algorithms and knowledge graphs, whereas libraries traditionally rely on classification and subject indexing methods. This requires libraries to enhance their resource organization methods by introducing artificial intelligence technologies and elevating the intelligent level of resource management.

6 Strategies for Libraries to Respond to DeepSeek's Challenges

6.1 In Terms of Technology Application, Libraries Should Proactively Embrace Artificial Intelligence Technologies, Develop or Introduce Intelligent Question-Answering Systems to Enhance Service Efficiency

For instance, libraries can construct AI-based consultation robots to provide 24/7 online intelligent consulting services. Additionally, libraries should explore the application of AI technologies in resource organization and user behavior analysis to elevate the intelligent level of services.

6.2 In Terms of Resource Building, Libraries Should Intensify Digital Resource Construction and Broaden Resource Coverage

This includes increasing the proportion of open-access and high-timeliness resources, exploring cooperation with internet platforms to integrate external data resources. Concurrently, libraries should focus on the construction of unique resources, such as local literature and special collections, to maintain their unique advantages.

6.3 In Terms of User Education, Libraries Should Bolster Information Literacy Education to Assist Users in Improving Their Information Evaluation and Critical Thinking Skills

This encompasses conducting training on the use of intelligent question-answering systems, instructing users on how to assess the accuracy and reliability of information. Additionally, libraries should innovate educational methods, such as developing online courses and producing micro-videos, to meet the demands of digital learning.

6.4 Service Model Innovation Represents Another Crucial Strategy for Libraries to Respond to Challenges

Libraries can leverage the advantages of intelligent question-answering systems to introduce personalized recommendation services based on user behavior analysis or de-

velop mobile applications to provide more convenient service access. Moreover, libraries should explore new service domains, such as data services and research support services, to meet the evolving needs of users.

6.5 Talent Cultivation Forms the Bedrock for Libraries to Achieve Sustainable Development. Confronted With New Technologies and Environments, Libraries Need to Cultivate a Team of Inter-Disciplinary Talents Who Are Proficient in Both Library Science and Information Technology

This can be achieved through various means, such as strengthening on-the-job training, recruiting high-end talents, and collaborating with universities for talent cultivation. Additionally, libraries should focus on fostering employees' innovation awareness and cross-disciplinary thinking, encouraging them to actively explore new service models and technological applications. [3] Furthermore, libraries can establish talent exchange mechanisms to conduct talent visits and cooperative research with other institutions, promoting knowledge sharing and experience exchange.

6.6 Cooperation for Mutual Benefit Constitutes one of the Vital Strategies for Libraries to Respond to Challenges

Faced with competition from emerging platforms like DeepSeek, libraries should eschew a confrontational stance and actively seek out collaborative opportunities. For instance, libraries can engage in resource co-building and sharing with platforms like DeepSeek, digitize their unique collections, and disseminate them through these platforms to amplify their influence. Additionally, libraries can collaborate with these platforms in technology research and development and service innovation to jointly explore new models of knowledge services. Moreover, libraries can establish collaborative relationships with other cultural, educational, and research institutions to construct a knowledge service ecosystem, achieving resource sharing and complementary advantages. [4]

7 Conclusion

The ascendancy of DeepSeek presents libraries with unprecedented opportunities and formidable challenges. Libraries must respond with an open and innovative mindset. By fully leveraging artificial intelligence technologies, libraries can enhance service efficiency, expand service boundaries, and deliver higher quality and more personalized services to users. [5] Concurrently, libraries must preserve their unique strengths, such as professional information organization capabilities and rich unique resources, to continue playing a pivotal role in the era of intelligent question-answering systems.

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