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Research on the Optimization of University Library Services Supported by Information Technology: A Case Study of S University in Hebei Province

Huan Zhao

College of Information Technology, Philippine Christian University, Manila, Philippines

ABSTRACT

With the advent of the intelligent era, cutting-edge information technology has permeated various global fields. To provide better services to students and faculty, university libraries must adapt to the ever-changing information technology environment and meet the evolving needs of their users. Diversification of services has become an inevitable requirement for university libraries to implement technology-supported services. Taking the library of S University in Hebei Province as a research object, this paper explores the practical approaches and prospects for optimizing library services from the perspective of information technology support. By analyzing the application of information technology in resource management, user services, and smart library construction, it proposes service optimization strategies centered on user needs and technology integration, aiming to enhance library service efficiency and user satisfaction.

KEYWORDS

Information Technology; University Libraries; Service Optimization

1. INTRODUCTION

Driven by the digital and intelligent wave, informationization has become a significant trend of the times. The rapid development of information technology and the emergence of new technologies and equipment present unprecedented opportunities for optimizing university library services while posing severe challenges. Traditional library service models struggle to meet users' growing and diverse needs.

As key support institutions for teaching and research in universities, libraries are transitioning from traditional libraries to digital libraries and further towards intelligent libraries. This transition has brought significant changes to service models, resource management methods, and user experiences. However, many university libraries still face challenges such as low resource utilization rates, limited service formats, and insufficient innovation, making it difficult to meet the modern education and research needs for efficient information resources.

How to leverage information technology to improve library service efficiency and user satisfaction and construct innovative service models that meet the demands of the new era has become a crucial issue for university libraries. This research, using the library of S University in Hebei Province as an example, delves into the inadequacies and improvement directions of current library service models in line with trends in information technology, explores practical paths for service optimization, and provides references for the intelligent development of university libraries.

2. CURRENT STATUS OF SERVICE OPTIMIZATION IN THE LIBRARY OF S UNIVERSITY

2.1. Continuous Improvement of Software and Hardware Infrastructure

Library resources have always been a core aspect of library development, with the construction of print resources being a key part. At S University's library, resource management has gradually shifted from traditional models to digital and intelligent development. The digitization of library collections has enabled the coexistence of print books and electronic resources, offering readers richer search and reading options.

The library has also purchased self-service book borrowing/return machines, smart shelves, and access control systems, which are placed in the main hall. Additionally, a comprehensive service desk staffed by professional and student librarians has been established in the library's central lobby to assist readers. These intelligent devices have significantly enhanced resource management efficiency, improving users' borrowing experiences.

2.2. Personalization and Convenience of User Services

The development of information technology offers new possibilities for diversifying and personalizing user services. In 2014, the Westport Library in the United States began incorporating intelligent robots into its services to provide personalized assistance to its readers and users [1]. According to Xie Fang (2014), the construction of smart libraries can provide high-quality personalized services to readers. By utilizing wireless networks and terminals, libraries can offer services such as customized recommendations, searches, collections, knowledge management, and personal account management[2]. Based on user data analysis, S University's library has developed a personalized recommendation system driven by big data. This system matches users' reading interests and provides customized resource recommendations tailored to academic needs.

Users can also access library resources and services through mobile platforms anytime and anywhere, including querying collection information, reserving books online, and engaging in remote learning. Additional features like due-date reminders, renewal applications, and updates on the latest academic resources further enhance the convenience of library services.

2.3. Preliminary Exploration of Smart Library Construction

Smart libraries represent the future of university library development. According to Ren Shuoshi and Yin Hanxiong (2019), artificial intelligence technology significantly aids the integration of library information resources, service innovation, and decision-making feedback systems. Leveraging AI technology, libraries can establish advantages in intelligent retrieval, push notifications, and consulting services[3]. S University's library actively explores the application of IoT and AI technologies. For example, unmanned book storage facilities have markedly improved borrowing efficiency, and an online virtual consulting system is in its early stages, offering users 24/7 resource consultation services.

Additionally, the library has created virtual learning spaces utilizing Virtual Reality (VR) and Augmented Reality (AR) technologies, providing immersive learning experiences for readers. These efforts breathe new life into library services and lay a foundation for future intelligent library development.

3. CHALLENGES IN SERVICE OPTIMIZATION AT S UNIVERSITY'S LIBRARY

3.1. Superficiality of Reader Services

The primary service objects of university libraries are faculty and students, aimed at providing information resource support. Despite efforts to optimize services, the depth and breadth of reader services remain insufficient. Service formats are relatively limited, focusing mainly on basic resource lending and simple information queries, which fail to meet the diverse and personalized needs of researchers and students.

Although intelligent devices have been introduced, their actual utilization rate is low. Some users are unfamiliar with the new technologies, while insufficient promotion of services prevents potential users from fully benefiting from optimized services.

3.2. Inadequate Matching Between Technology Resources and Service Capabilities

The library has incorporated various information technologies such as big data analytics, artificial intelligence, and mobile service platforms. However, the integration of these technologies has been insufficient, and some systems lack interoperability, leading to inefficiencies in resource integration.

Additionally, the rapid iteration of technologies makes it difficult for the library's existing resources to keep pace with user demands. For example, users often report complex interface designs or slow response times when using digital resource search systems, negatively impacting the user experience.

3.3. Insufficient Awareness of Service Optimization

While S University's library has explored the construction of smart libraries, its overall awareness and capacity for service optimization need improvement. For instance, academic support services remain traditional in format and content, lacking support for interdisciplinary collaboration and international academic exchange.

Promotion and awareness of library services are also inadequate. Many user-oriented services and resources are not effectively communicated through appropriate channels, resulting in low utilization rates of high-quality resources.

3.4. The Comprehensive Competence of Librarians Needs Further Improvement

Under the support of information technology, the role of librarians has gradually shifted from traditional resource managers to technology application promoters and supporters of user services. However, some librarians at S University’s library lack sufficient proficiency in information technology and show delays in accepting and applying new technologies. As a result, they struggle to fully leverage technological advantages when providing services to users.

Additionally, limited opportunities for professional training and further education constrain their ability to learn and develop in emerging technological fields. As key implementers of library services, the insufficient capabilities of librarians directly impact the effectiveness of service optimization.

4. STRATEGIES FOR SERVICE OPTIMIZATION SUPPORTED BY INFORMATION TECHNOLOGY

4.1. Prioritize Service Optimization with a Top-Level Design

University libraries should prioritize technology-supported service optimization from a conceptual perspective and implement a top-level design. This design approach can systematically address optimization methods and determine the overall framework for service improvement.

Firstly, technology-supported service optimization should be integrated into the library's overall development plan, emphasizing systematic and routine adoption of technological solutions. The core principle should center on user-oriented services while enhancing the interdisciplinary competencies of library staff.

Secondly, specific processes and supporting policies for technology-supported services should be formulated. Libraries should allocate necessary software and hardware resources, and where resources are limited, partnerships with enterprises can facilitate resource sharing. Comprehensive service procedures and policies should be established to ensure the orderly implementation of services and define user responsibilities. This creates an efficient and regulated framework for service delivery.

4.2. Base Service Optimization on User Needs

Regardless of changes in the times, user needs remain the starting point and foundation for university library services. Therefore, service optimization must be based on user needs to drive library development and transformation.

Libraries must continually upgrade themselves to meet increasingly diverse user demands. Aligning with industry trends, libraries should adopt modern service concepts, integrate cutting-edge technologies, and provide advanced facilities as part of regular operations. Since university libraries cater to a unique audience, service design should consider faculty and students' characteristics and needs, offering targeted solutions for different user groups.

Additionally, libraries should proactively identify and address latent user needs. By analyzing historical user data, libraries can predict future requirements and offer forward-thinking services. This data-driven approach ensures service precision, improves user satisfaction, and ultimately contributes to the library's sustainable development.

4.3. Build a Team of Technologically Skilled Professionals

Enhancing the professional competencies of library staff is critical for successful service optimization. A twofold approach can achieve this: (1) training existing staff and conducting regular skills assessments; (2) adopting a selective recruitment process that prioritizes candidates with strong technical backgrounds and expertise.

For current staff, fostering a mindset of lifelong learning and practical application is essential. Libraries should organize regular technical training to familiarize staff with operational procedures and modern tools such as library management systems, data analytics software, and other relevant technologies. Furthermore, cultivating openness to new technologies and improving professional capabilities through periodic evaluations is essential for continuous improvement.

For new hires, selective recruitment processes should evaluate technical proficiency and subject expertise to ensure new staff can effectively meet modern library needs. A well-rounded, skilled workforce is the backbone of service optimization and technological advancement.

4.4. Develop Discipline-Specific Services and Platforms

The quality of academic disciplines is a key indicator of a university's overall strength. Providing discipline-specific services and establishing platforms to support academic development is a vital strategy for improving the quality of higher education.

First, libraries should establish dedicated discipline service departments, staffed by librarians with specialized skills. These librarians can analyze research outputs and academic trends to provide customized services for each discipline, aiding their growth and development.

Second, discipline-specific platforms should be developed using information technologies to integrate academic resources and offer one-stop services. For example, LibGuides-based platforms have been successfully adopted by some universities to streamline academic services.

Embedded discipline-specific services should also become a norm for university libraries. Librarians should collaborate with academic departments and research teams, providing tailored support such as trend analysis, resource recommendations, and data analytics for projects. These collaborative efforts allow libraries to integrate deeply into academic disciplines, delivering professional and efficient services.

By implementing these strategies, S University's library is expected to achieve service innovation and optimization under the guidance of information technology, effectively meeting the diverse needs of students and faculty.

5. CONCLUSION AND FUTURE OUTLOOK

The integration of information technology provides university libraries with unprecedented opportunities for service optimization while posing challenges to traditional service models. Based on the case study of S University's library, the following conclusions can be drawn:

(1) Information Technology Drives Service Transformation

University library services are transitioning from traditional resource management to intelligent, personalized service models. Tools such as big data recommendation systems and mobile service platforms significantly enhance resource management efficiency and user experience.

(2) Top-Level Design and Demand-Driven Services as Core Principles

Service optimization requires careful planning and systematic implementation. Prioritizing user needs ensures the long-term sustainability of service models.

(3) A Professional Workforce as the Foundation

Skilled librarians are essential for integrating technology with knowledge services. Systematic training and rigorous recruitment processes are necessary to build a versatile and capable team.

(4) Discipline-Specific Services Support Academic Development

Deepening embedded services and fostering collaboration between libraries and academic departments can enhance research and teaching effectiveness, leveraging libraries as a critical resource in discipline development.

In the future, university libraries should explore new smart development scenarios through partnerships with technology companies, improving resource sharing and utilization. Additionally, continuous professional development for library staff will further broaden and deepen services, ensuring libraries remain at the forefront of academic and technological advancement.

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