

# Framework and Implementation of Intelligent Library System Based on Big Data

Liqiong Gao

Yunnan Open University, Kunming, Yunnan 650500, China

**Keywords:** Big data; Smart library; Information revolution

**Abstract:** Big data not only brings opportunities and challenges to intelligent libraries, but also innovates the service forms of libraries. Building a smart library under the big data environment is a realistic demand for the development and application of smart technologies. The information revolution brought by big data has entered people's daily life and work, and has started a major transformation of the times. The library's intelligent service management and service system construction have developed rapidly, and the demand of readers has increased rapidly. With the coming of the era of big data and smart city, the library is facing great challenges in construction and development, and it also provides a growth point for the academic research of the library itself. In the era of massive big data, libraries, especially the construction of modern intelligent libraries, will face great challenges in data storage, data mining, data analysis and so on. This paper analyzes the innovative service of the Intelligent Library in the big data environment, and seeks the corresponding countermeasures, which has a certain practical significance.

## 1. Introduction

With the rapid development of the Internet, people's lives are increasingly dependent on the Internet. From the frequent use of mobile phones to the application of science and technology, we can strongly feel that the era of big data has come. With the vigorous development of various intelligent terminals, the Internet of Things and social networking, a large number of data different from traditional storage have been generated. They show unstructured and semi-structured data characteristics. Once they appear, they have attracted great attention of the Internet community and produced significant social effects [1]. The information revolution brought by big data has entered people's daily life and work, and has started a major transformation of the times. The library's intelligent service management and service system construction have developed rapidly, and the demand of readers has increased rapidly. People's personalized reading needs are constantly improving with the progress of the times and science and technology. In the modern society where Internet information is extremely expanding, all walks of life are sensitive to the pace of big data development and follow suit [2]. Society is gradually moving towards the world of big data era. As an earlier research object, the significance of intelligent library and its construction environment have also changed [3]. The coming of the era of big data is a double-edged sword, which poses huge challenges to the library's resource structure, service form, technology application and development concept, but also provides new ideas for the development of libraries [4].

The processing of complex data will also become the main theme of the development of smart libraries. We can use a large amount of unstructured data and semi-structured data to find the mystery hidden behind the data, and then serve the library model and future development trends. Provide more references [5]. As an important part of the social organism, the library's services have been continuously improved as the social environment and social needs change. In the era of massive big data, libraries, especially the construction of modern smart libraries, will face huge challenges in data storage, data mining, data analysis, etc. [6]. The library uses various high-tech to realize intelligent management and services, such as access control system, self-service borrowing and returning system, attendance system, seat reservation management system, virtual reference consultation, etc., to realize the intercommunication between readers and smart library [7]. The era of big data has brought huge impacts and challenges to libraries, and at the same time, it has

provided new growth points for the development of libraries. Libraries have innovated service concepts and used their own advantages to continuously develop new service models to avoid being marginalized. Crisis [8]. This article analyzes the innovative services of smart libraries in the context of big data, and seeks corresponding countermeasures, which has certain practical guiding significance.

## **2. Opportunities and Challenges Brought by Big Data to Smart Libraries**

University libraries should not only combine traditional libraries with digital libraries, paper resources and electronic resources complement and coexist, but also realize the sharing of big data and attach importance to knowledge service on the basis of digitalization of resources. With the rapid development of society, library buildings have not kept pace with the trend of the times. The development of modern information technology has given more intelligent connotation to library construction [9]. The emergence of large data analysis technologies and tools such as cloud computing and data mining provides new methods and ideas for library intelligence analysis. Information resources should be transmitted across time and space, people-centered and reader-demand-oriented. The entire business process of the library revolves around services, and resources and capabilities in all aspects should be fully exploited and utilized to meet readers. In the era of big data, traditional data processing and data management technologies are being directly challenged by today's "massive data". For the smart library, massive data means more severe challenges. Better organization and use of these data will help us to turn great opportunities into reality [10]. Intelligent technology has gradually become the most important part of the intelligent library. The intelligent technology has brought more comprehensive resource utilization and service management efficiency to the intelligent library, making the modern library appear in front of people with a new look, thus also Bring more speed and convenience to user needs.

In the era of big data, data has become the core resource of libraries. These data include not only structured literature resource data, but also semi-structured and unstructured data such as scientific data, video and audio resources, and user behavior data. As the number of digital collections in libraries continues to grow, the value and quality of data are increasingly valued. As a result, data services have emerged, and in order to meet the information needs of users, the scope of their services is also expanding. Through data analysis and mining technology, generating service methods and forms to meet user needs is a new issue and new development opportunities facing smart libraries. As a new type of service carried out by smart libraries, data service has huge application potential. For readers, big data includes a large number of information sources such as the identity, location, time, reading preferences, social relations of each user. Through the smart library service, users can browse and utilize the library's information resources at home, office, railway station, airport and other places. In particular, University Libraries and provincial and municipal libraries with rich digital resources and advanced technology should break the original administrative restrictions, provide high-quality information resources for the society and serve the readers with new ideas. In the big data environment, resource construction includes document information resource construction and data resource construction. The core of resource construction is the possession, fusion, mining, analysis and utilization of a large number of multi class data. In the era of big data, with the help of big data technology, the library can manage big data and excavate the great value of big data, so as to seize the opportunity and remain invincible.

## **3. Construction of Intelligent Library System Framework**

### **3.1. Building Data Sharing Mechanism**

The intelligent library's innovative service is an orderly, dynamic and sustainable process. In order to ensure the effective and lasting service, an effective sharing operation mechanism should be established. The traditional book acquisition work focuses on the construction of information resources and emphasizes the systematicness and integrity of the book collection. As there is little

interaction with readers, it is not very accurate to grasp the needs of readers. Under the big data environment, the library's technical means and management methods have not adapted to the needs of the development of the times. The library needs to establish a big data platform based on data mining, processing, development, integration, analysis and utilization to improve the library's resource management ability and accurate service level. The intelligent library can establish a systematic and detailed data sharing system and formulate a series of rules and regulations on resource construction and open sharing based on its industry standards and specifications, school running characteristics and collection structure characteristics. Big data and smart library are the most cutting-edge and practical technologies. Libraries need compound talents with different professional backgrounds and learning experiences. Due to the aging structure of librarians and the incomplete professional coverage of librarians, it is the key point to improve the professional quality of librarians.

### **3.2. Establish Coordination Agencies at all Levels**

The road of innovation of intelligent library is bound to go forward in twists and turns. In order to make effective and reasonable use of resources, advocate high quality and efficiency of resources, and eliminate waste caused by repeated construction, coordination organizations at all levels should be established. Only through continuous flow and full sharing of data can there be vitality. For individual collections of their own core information resources, it is recommended that they be stored differently from public clouds, and that they be placed on a private cloud platform using the advantages of private cloud and cloud computing technologies to improve their security. In the field of data sharing, we should attach importance to the attempt of incentive mechanism and establish a set of realistic and feasible incentive mechanism for data cooperation and sharing. Only by further providing more resources can we maximize the utilization of the collection and make the collection resources meet the needs of readers more. For data resources, the library should focus on collecting relevant data such as readers' borrowing behavior and reading habits in the library to meet the personalized and diversified knowledge needs of readers [11]. In the construction of data resources, the library should first accumulate and store a large number of multi-type data to make digital preparations for big data. For each unit to use its own funds or independently developed data resources, it can be paid to open up or give appropriate financial or material incentives to mobilize the enthusiasm of all types of libraries to participate in the sharing.

## **4. Conclusion**

The era of big data is coming towards libraries and towards librarians. The innovation and creation speed of digital data is amazing, and its growth trend is also expanding day by day. With the development of the big data era, the smart library has gradually entered into the daily life of human beings. The change of human knowledge demand has posed a challenge to the construction of the smart library. In the big data environment, the services of smart libraries will increasingly reflect their necessity and importance. The library community is still in its infancy to carry out research on smart libraries based on big data. The library's intelligence analysis in the big data environment is not only the requirement of social development for the library, but also the necessary stage in the process of library's own innovation and transformation. Intelligent library is based on the study of users, with the help of big data technology to analyze the access traces of users using the library to retrieve bibliographic records, combined with the user's personal identity information, mining the user's behavior and interests, pushing information to users, greatly improving the service efficiency. The library can find out the association, discover the rule, verify the hypothesis from the collection data, predict the future trend and demand of the reader service, so as to realize the intelligent service.

## **References**

[1] Qiu Shenghui. Exploring the application of big data in smart libraries. Heilongjiang Science, no.

1, pp. 144-145,2016.

[2] Wang Yingpei. Discussion on several research issues about smart libraries in the era of big data. Dossier, no. 1, pp. 338-339,2015.

[3] Chen Shun. Thinking of "Internet + Library". Fujian Library Theory and Practice, no. 4, pp. 12-14, 2015.

[4] Qian Dandan, Liu Yang, Hu Shanshan, et al. Research on the constituent elements and service architecture of knowledge services in smart libraries. Information Science, no. 12, pp. 52-56,2019.

[5] Yao Guozhang, Yu Xing, Xiang Huihui. Research on the Overall Design and Application System Construction of Smart Library. Journal of Nanjing University of Posts and Telecommunications (Natural Science Edition), no. 2, pp. 18-28,2016.

[6] Li Ying. Internet + -based smart library model and feature analysis. Information Exploration, no. 3, pp. 116-121.2016

[7] Chen Yuan, Cai Jinkui, Xu Liang. Thoughts on the development of smart libraries under the Internet thinking environment. Modern Information, no. 11, pp. 38-42,2015.

[8] Yu Linhai. The role of university libraries in the construction of smart campuses. Journal of Library Science, no. 9, pp. 9-11,2019.

[9] Xu Qiang, Yang Jia. Big data helps library smart reading. Shanghai Informatization, no. 3, pp. 69-73, 2016.

[10] Zheng Lianguang. Research on the construction of library smart wall system based on big data. Library Science Research, no. 21, pp. 31-35,2016.

[11] Wang, Xiaoyan. Literature analysis and thinking on the application of big data in the library. Journal of Library and Information Science, no. 1, pp. 55-60,2015.