Research on the Construction of Intelligent Library in the Age of Big Data

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Abstract. In today's Internet age, great changes have taken place in the way people live and work. Under this social background, the future development direction of libraries must be adjusted to keep pace with the times, and new technologies such as artificial intelligence should be driven to build an intelligent development mode. Taking big data as the breakthrough point, this paper summarizes the current problems faced by Chinese libraries in the process of intelligent construction, and puts forward its countermeasures from the aspects of information resources, service management mode and technical capability.

1. Introduction
The library is an important information integration system containing massive information resources. In the past, the way people obtained knowledge and information was basically through paper-based reading. However, with the development of Internet information technology, paper-based information acquisition channels can no longer meet the modern needs of contemporary people. Therefore, the use of Internet science and technology to make information resources electronic and intelligent is a change that libraries need to make in accordance with the development of the times, which is also a response to meet the needs of contemporary people. To make intelligent libraries accept big data thinking, we must first recognize a series of problems in the intelligent construction in China, such as the lack of information resources and material allocation, and the low professional level of librarians. All these problems are new requirements for the intelligent library construction. After clarifying these issues, we can continue to explore, innovate, promote, and successfully complete the construction of the intelligent library.

2. The Main Problems of Library Intelligent Construction in the Age of Big Data

2.1. Lack of Resources
Resources are not only the basic elements, but also the core elements for the construction of intelligent library. This resource mainly refers to two aspects, one is various information resources, such as scientific data, audio data, image data, notes, precious documents and so on. The shortage of this resource is mainly due to the its limited sources and coverage, and the lack of corresponding resource sharing mechanism. The other is the lack of equipment and technical resources, such as intelligent equipment, technical platform, and environmental places, usually due to insufficient funds and low attention from leaders, which are the basic obstacles faced by libraries in the intelligent construction, so the realization of comprehensive informationization of libraries is hindered.
2.2. Solidified Management Mode
The management mode of intelligent library in the age of big data is mainly carried out from three aspects, namely, intelligent sensing, network media and application practice. However, the current management mode of libraries in China is still relatively solidified. The first is the management of resource sharing platform. Although most libraries have established a basic resource sharing platform, the sharing function has not been realized between the platforms, and there is a lack of mutual transfer of resources, which makes the platform a display. If things go on like this, the utilization rate and enthusiasm of users will be greatly reduced. The second is the management of collections. Most libraries only focus on the quantity of books, but not the quality. Although the number of books is abundant in this mode, the book loan quantity has not increased correspondingly, and the efficiency of books utilization is low. The third is the management of bookmark. The labels of many books in the library are illegible and missing, and the maintenance and update work is not timely. At the same time, the corresponding electronic catalogue has not been established, and the borrowers cannot find the books they want.

2.3. Limited Technical Capability
In the past, people took the library as the main channel to obtain information, because the library can not only provide people with a quiet and comfortable reading environment, but also have a large number of books and abundant resources, which can meet the needs of most readers. However, with the rapid development of Internet technology, the traditional library mode has been strongly impacted. People gradually feel that it is time-consuming and laborious to search for materials and obtain information in the library, which is far less than the amount of information on websites like Baidu Baike and CNKI (China National Knowledge Infrastructure) which are time-saving. Under this contrast, the disadvantages of library's limited collection ability and weak information analysis ability are exposed completely, and the importance of library is gradually weakened. On the other hand, Internet platforms such as Baidu Wenku and Wikipedia have the advantages of immediacy, rapidity and large storage capacity, which just meet the needs of contemporary people for knowledge and information.

2.4. Librarians with Low Professional Level
The professional quality of librarians is directly related to the service level and development direction of a library. In terms of service content, the service items provided by most librarians for readers in China are still the continuation of traditional functions, such as book borrowing and reading environment maintenance. Their daily work is basically, book classification, document collection, book catalog compilation and so on. From the educational background, more than 75% of the current librarians in China are from Junior Colleges or Specialized Secondary Schools. From the perspective of age structure, the librarians are aging, which leads to the lack of understanding of new situation, new technologies and new ideas, so they can’t respond in time in the process of construction and development. In addition, at present there is no normative references standard for judging the professional quality level of librarians in China.

2.5. The Contradiction Between Popularization and Personalization
The so-called popularization here is the essential and biggest characteristic of the library. It provides information services to every user in a fair, just, and extensive manner. Personalization refers to the personalized needs of readers. In the Internet, when users search or visit web pages, the network big data will memorize the user's behavior data, and provide users with accurate and useful information services according to the memorized data, while other useless information will be ignored. Users don't have to search and choose in the vast ocean of information for a long time in person. This personalized service of the Internet is contradictory to the popular characteristics of the library, which needs to be reconciled in the construction process of intelligent library.
3. The Strategy of Intelligent Library Construction in the Age of Big Data

3.1. Integrate and Update the Knowledge and Information
In the age of big data, in order to achieve long-term development, libraries must make intelligent countermeasures. By using cloud, big data, artificial intelligence and other technologies, we can integrate knowledge and information, and establish a platform for information exchange and resource sharing, so that library is no longer limited to data search, but can realize information exchange and resource sharing. In the aspect of book collection, the collection forms and contents in the library should be expanded. In addition to the collection of paper books, audio books, video materials and precious cultural relics also can be included in the library collection. Under the background of big data, the library should fully implement digital electronic archiving for the collected data to form a 'cloud library' mode, so as to prevent the data from being missing or lost. Using big data cloud computing to provide information services for readers, and pushing valuable information materials for readers based on their search information and reading materials, it provides readers with more accurate services, reduces their screening time, promotes the personalized service of the library, and solves the contradiction between the popularization of libraries and the personalization of readers.

3.2. Innovate Service Management Mode
In the past, the library service mode was open and autonomous, that is, allowing readers to search for and obtain on their own according to their own needs. If readers need to take the documents away from the library, they need to go through relevant borrowing procedures. This service mode has some disadvantages nowadays. Firstly, from the reader's point of view, it takes a long time to search for information. In addition, after the readers take away the documents, they are very likely to be lost or damaged, which is a loss for both the readers and the library. In the context of big data, this potential risk can be avoided to the maximum extent. First of all, the library can make corresponding electronic catalogue for the collected documents, which is convenient for readers to search and retrieve, saving time and effort. Meanwhile, open the copy function of e-books. In this way, readers are not only exempted from complicated borrowing procedures, but also avoid the loss and damage of documents after borrowing. Besides, when establish the digital library platform, a special communication section can be created for readers, so that readers can put forward suggestions on the library construction there, and also leave messages to communicate with other users. The combination of intelligent library and big data can provide readers with efficient access to information and make readers have a more wonderful experience. This can not only highlight the popularization features of the library, but also give full play to the personalization features of digital information to meet the personalized needs of readers, which is a new concept and new mode of library development.

3.3. Strengthen Service Technology
In the past, when the library performed book search, book classification management, and book borrowing, it was usually operated by librarians in the ERP system. However, in the age of big data, these operation functions can be added to the management platform of intelligent library. The comprehensive digital management of library resources optimizes the searching time and operation time of readers and librarians in both directions, achieves the efficient acquisition of information resources, and provides richer data resources for the intelligent library construction.

3.4. Improve the Professional Quality of Librarians
In the age of big data, the work of librarians is not limited to the daily work about books. Librarians are important promoters in intelligent library construction. It is necessary to for them to change both cognitive concepts and ways of thinking. They should be keenly aware of the emergence of new things, be good at summarizing the development rule of things, and be able to adapt to the ever-changing working environment in the age of big data. Librarians should have the ability of self-learning, constantly improve their professional ability in their work, provide personalized and high-quality services for readers, so that readers can feel the intelligent service of intelligent library.
4. Suggestions on the Application of Big Data in the Construction of Intelligent Library

4.1. Make Data Plan
The construction of intelligent library is an innovative measure, and its system is huge and needs to be dynamically adjusted. Therefore, it is necessary to have a rational understanding of big data before construction, and do a good job in data collection and planning in every construction process, so as to combine data with application, form aggregation effect and promote the development of intelligent library at the application layer. It is worth noting that big data is an important tool for libraries, but it cannot be used as a decisive tool for the construction of intelligent libraries. When obtaining data, it needs to be carefully selected and promoted.

4.2. Select a Reasonable Big Data System Platform
On the basis of referring to the flow of big data, each level in the big data platform will use corresponding software components to serve different businesses according to the data flow. Therefore, libraries need to refer to their own business needs in the process of intelligent construction. In addition, after selecting an appropriate big data system platform, it is necessary to formulate corresponding data evaluation standards, so as to facilitate the collection of core data, grasp the distribution of data value in time and facilitate subsequent use.

5. Conclusion
Libraries play an important role in promoting social development and enhancing humanistic spirit. The construction of intelligent library not only inherits the information knowledge service provided by traditional library to readers, but also becomes the promoter of new technology application. In the age of big data, the construction of intelligent library still has a long way to go. Its environmental space, resource integration, service mode, technology application and IT personnel training all need to make new responses according to the changes of the times, and finally push the intelligent library to practical application.

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