ISSN 2706-6827 Vol. 3, Issue 16: 132-137, DOI: 10.25236/IJFS.2021.031620

The Prospect of Application and Future Development of Library Information Technology in the Era of Big Data

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Abstract: *Big data technology plays an important role in information collection, collation, analysis and refining. It also plays an important role in the application of information technology in university library. This paper uses big data technology to mine the behavior of hidden readers in structured and semi-structured data information, and find the needs of hidden readers, so as to improve the optimal allocation of library services, resources and readers' needs. The results show that the maximum consultation times of Library B is 6425, and the minimum consultation times of library A is 5316.*

Keywords: *Big Data, Library, Information Technology, Digital Service*

1. Introduction

With the rapid development of information technology and the arrival of big data era, the library has also realized the innovation of the construction mode of document resources in the transformation and development. At such a context, many experts have studied the application of library information technology. For example, some domestic teams have carried out the research on the integration of library information technology and humanistic spirit. Through the analysis of the data collected by the teaching resource database and the positive education system, the paper puts forward that the two processes of "big data analysis" and "data modeling implementation" should be combined with the model driven architecture (MDA). In order to verify the data model and find new data sources for the service, the data modeling of these two processes in MDA needs to be repeated quickly, which can improve the value of library culture construction. The application status of big data is compared, which provides a good platform for library to realize office automation, information resources digitization and service network. Based on the explanation of the meaning, characteristics and functions of big data, the paper analyzes the problems existing in the acquisition and management of big data information in digital library [1]. Some experts have studied the process optimization of composite library. By implementing and running an esper-based event processing application on Xen-based virtualization system, we can observe the effect of these performance parameters on performance. The influence of the number of virtual machine cores and the sharing of resources between virtual machines on performance is analyzed. Based on the actual situation, the paper investigates the current situation of Library and think tank construction in China by means of literature research, telephone questionnaire survey and inductive analysis, summarizes the characteristics and problems of Library as think tank, and analyzes the existing capacity and function of Library as think tank [2]. Some experts have also studied the intelligent books under 5g environment, analyzed the current situation and problems of the communication sharing mode of university library, designed and implemented a new communication sharing and interconnection system of university library based on cloud computing. Graphical and database tables are used to explain the relationship between user information, cloud Internet resource information, administrator information, and other entities. The paper discusses the characteristics of big data, the principles and functions of the library consulting knowledge base, and the development opportunities and challenges faced by the public library consulting knowledge base. This paper introduces the service mode, 5g mobile communication technology and key technology of intelligent library, analyzes the application scenarios of 5g mobile communication technology, uses the theme extraction method of LDA model, summarizes and compares the key points of knowledge absorption and knowledge diffusion of Library Information Science, and analyzes the composition and influencing

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factors of collaborative creation ability of library service value, the paper constructs the evaluation system of collaborative creativity of library service value, uses the network analytic hierarchy process to determine the index weight, obtains the basic data through interviews and questionnaire survey of provincial libraries, and evaluates the level of collaborative creation ability of service value of provincial libraries by using the established evaluation system of collaborative creativity of Library service value. The paper uses the multi-level fuzzy comprehensive evaluation method to deal with the collaborative creation ability of library service value [3]. Although the research results of the application of library information technology are quite abundant, there are still some deficiencies in the application of Library Information Technology in the era of big data.

Although the research results of the application of library information technology are quite abundant, there are still some deficiencies in the application of Library Information Technology in the era of big data. In order to study the application of Library Information Technology in the era of big data, this paper studies big data and library information technology, and finds out the network center analysis.

2. Method

2.1 Big Data

(1) The concept of big data technology

Big data is an information disclosure tool [4]. It presents data in different ways, promotes information mining, and enables users to understand what they really want [5]. As a new information technology, big data will have a huge impact on the traditional library by testing the data storage, data analysis and computing capabilities of the library [6]. For the library itself, by paying attention to user data and information, and using data analysis tools to improve service innovation ability, it challenges service testing [7]. The philosophy of big data is evolving into a two-level discipline [8]. First is the discipline. As a wide expression of concepts, theories and systems, it constitutes the overall behavior of big data science [9]. The other is to consider the broader impact of big data science on individuals, society and the world outside this field [10]. This paper evaluates the methods, tools and concepts from two aspects of industry practice theory and social impact [11].

(2) Library and big data technology

In the network and big data environment, university library is mainly in the form of information technology talents and information resources, actively research and apply the latest information technology achievements, promote a variety of academic resources to relevant information users, so as to enhance the core competitiveness of Library and teaching and research personnel, which is the research topic that university library talents need to face [12]. The data storage and management technology of big data on the Internet has two advantages: one is management. Through the establishment of data cluster, the same operating system can be migrated to different devices in a very short time, so as to reasonably allocate and adjust the resource use of different users. Secondly, the client can use a variety of platforms to share a variety of software and hardware resources, so that the service system can get more users. Based on these characteristics, some scholars call the data storage and management technology of cloud computing "resource scheduling" and "multi-tenant technology".

2.2 Library Information Technology

(1) One stop service of Library

The library one-stop interactive service platform is an open platform which provides one-stop service and integrates resources, technology, ability sharing, sharing, co construction, CO creation and win-win. This kind of multi-agent participation open platform needs a new flat management mode, which can improve the service value by reducing the management level and compressing the intermediate management level of operation sequence, and has strong flexibility to solve the problem of multi-agent management, resource fragmentation and coexistence of multiple interactive services. The higher the openness of the interactive platform, the more participants, and the greater the service value created together. When the scale of the platform is larger and larger, it is more necessary to simplify the management mode, improve the agreement and system, and coordinate the whole process of library service value co creation. When users put forward information needs, the internal and external network of participants can provide a strong and perfect background service system and

ISSN 2706-6827 Vol. 3, Issue 16: 132-137, DOI: 10.25236/IJFS.2021.031620

service team, form a good value co creation and synergy effect, accurately analyze and distinguish the needs, and clarify the information needs of users, so as to provide accurate information service scheme and content.

(2) Library Information Resources

Libraries are also facing the situation of serving the society, enterprises and maximizing benefits. The rapid development of the Internet makes us live in the era of big data. In the new era environment, the various information needs of users put forward new requirements for network information services. Library is not only the center of collecting, storing and disseminating knowledge information, but also an important medium of providing knowledge information services. Therefore, the university library must use the computer, network and communication technology, constantly absorb the latest information technology, and apply it to its own field, improve the service level. The latter not only provides the necessary technical support for the construction of university library, but also promotes the continuous transformation of University Library in the digital era.

(3) Library Digital Service

Under the current technical conditions, the information that the library digital reference service can use has gone beyond the scope of the traditional library. Rich information resources improve the response rate and access rate of user consultation, accelerate the speed of user information acquisition, and meet the needs of users for information diversity, timeliness and efficiency. Compared with the traditional reference service, the scope of digital reference service in the new era is more extensive. From the perspective of users, those who can seek consulting services are no longer limited to local or local libraries. Users from all over the country can consult through the Internet. The development of network technology provides a solid foundation for the reference service of the library. The intelligent function makes it more humanized and more convenient for ordinary users. This also makes the consultation mode no longer limited to the traditional face-to-face service. Digital reference services use e-mail, QQ and other convenient means of network communication.

2.3 Network Centrality Analysis

The number of relations directly connected to a node is the centrality of vertex degree. In digraph, vertex degree center is divided into two parts: in degree center and out degree center. Externality centrality refers to the sum of the number of external relationships of nodes, as shown in equation (1)

$$C_{DO}(n_i) = d_i(n_i) = \sum X_{ij} \quad (1)$$

The centrality of the degree of penetration is equal to the sum of the number of relationships between other nodes and a certain node. The calculation formula is formula (2)

$$C_{IO}(n_i) = d_i(n_i) = \sum X_{ij} \quad (2)$$

Proximity centrality describes the overall influence of a node in the network. The calculation formula of approaching centrality is equation (3)

$$C_{c(ni)} = [\sum_{j=1}^{g} d(n_i, n_j)]^{-1} \quad (3)$$

3. Experience

3.1 Extraction of Experimental Objects

RDF association refers to the internal association of related objects or the same entity in two different datasets. Through RDF Association, the discovery and integrated application of related information entity objects can be realized. The RDF association method based on linked data is to find and establish the association relationship by analyzing the context and attribute value of the instance object in the dataset. This method establishes the non-equivalent relationship of data sets, establishes RDF links of different relationships, expands the web data of the network, and can develop data applications based on RDF links. Based on http referer method, RDFS of related data sets is transformed into reverse attribute relation owl: or reciprocal symmetric attribute relation owl: or reciprocal symmetric attribute relation quantity data set: symmetric attribute to establish the connection between data sets

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(reverse link service).

3.2 Experimental Analysis

Before the implementation of data mining, we should make a practical plan, determine what steps to take, and the tasks and objectives of each step, which are basically related to our own software products. First of all, using Internet technology, fully mobilize the infrastructure, network platform and application programs that can be shared by large and small libraries, and form the equipment and resource system of the whole Internet system. Secondly, technology can establish efficient collaborative information services on the network. With this advantage, the Internet can aggregate all kinds of information resources, expand the interface of network services, and benefit more users. Finally, technology can help the Internet design a variety of applications to meet the different needs of users. Users' access devices are no longer single, but can use fixed devices, mobile devices and handheld devices to enjoy various Internet services.

4. Discussion

4.1 Keyword Co-occurrence Network Centrality Analysis

In order to show the relationship between keywords more vividly, the node size is determined by the centrality of keywords in the network, and the common frequency of keywords determines the thickness of lines. The keyword co-occurrence diagram is shown in Table 1.

Table 1: Analysis of knowledge diffusion characteristics of big data research in the field of Social Sciences in China

keyword	average value	standard deviation
big data	0.43	1.38
library	1.63	2.01
information service	0.78	1.93
cloud computing	1.83	0.93

It can be seen from the above that the average value of big data intermediary centrality is 0.43, with the standard deviation of 1.38; the average value of Library intermediary centrality is 1.63, with the standard deviation of 2.01; the average value of information service intermediary centrality is 0.78, with the standard deviation of 1.93; the average value of cloud computing intermediary centrality is 1.83, with the standard deviation of 0.93. The results are shown in Figure 1.

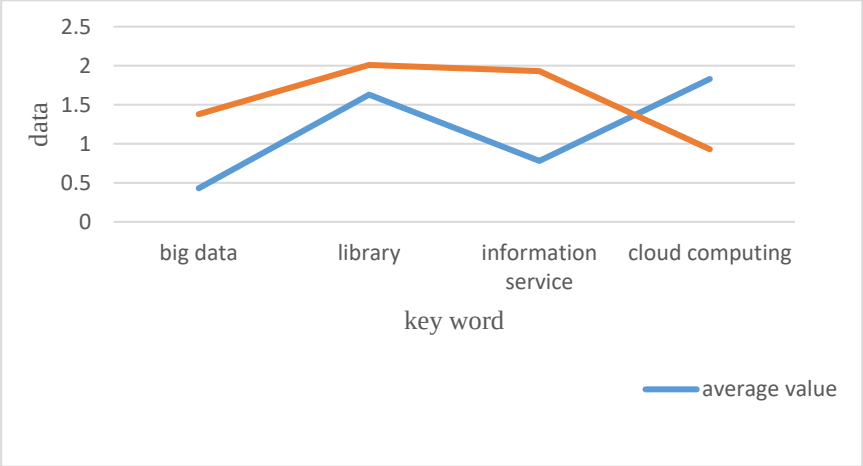

Figure 1: Analysis of knowledge diffusion characteristics of big data research in the field of Social Sciences in China

It can be seen from the above that the maximum average value of cloud computing

ISSN 2706-6827 Vol. 3, Issue 16: 132-137, DOI: 10.25236/IJFS.2021.031620

intermediary centrality is 1.83, and the minimum standard deviation is 0.93.

4.2 Promoting Joint Reference Services

Joint reference service is based on the network service platform, facing the majority of users, to carry out synchronous or asynchronous consulting services. Through the cooperative reference service among libraries, it is helpful to expand the depth and breadth of the consultation questions, solve the problems that users can't answer because of the wide range of consultation fields, and ensure the normal operation of the library's consultation knowledge base in quantity and quality. As shown in Table 2.

Table 2: The consulting amount of the National Library Reference Union

Reply unit	Total consultation
A library	5316
B library	6425
C library	5497
D library	6772

It can be seen from the above that the consultation amount of library a is 5316 times, that of Library B is 6425 times, that of Library C is 5497 times, and that of Library D is 6772 times. The results are shown in Figure 2.

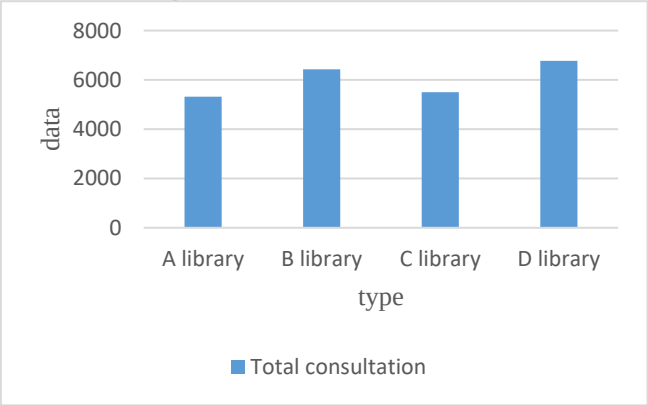

Figure 2: The consulting amount of the National Library Reference Union

It can be seen from the above that the consultation amount of Library B is 6425 times at most, and that of library a is 5316 times at least.

5. Conclusion

In the era of the information age, as an important part of information technology, big data technology has profoundly changed people's way of thinking and way of life. Based on the background of linked data and cloud services, this paper studies the new measures of expanding and deepening the library, improving service quality, carrying out innovative services and improving social status, and constructs the cloud service platform of digital library under the linked data environment. This paper introduces the concept and theory of library cloud service and related data,and through the research on the cooperative reference service between libraries, it is found that users have a great demand for the network service platform set up by the library. By seizing the opportunity and adjusting its resource type, service mode and management concept, the library will occupy a more favorable position in the future information service and radiate new vitality.

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