

# Study on the Openness and Knowledge Sharing of Knowledge Service in University Libraries under Large Data Background

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**Abstract**—We have the consensus that data is resource, wealth and capital in the era of big data. Open data, information disclosure have become represent the general trend. The form and content of the knowledge service of university library must keep up with the pace of the information age, and it needs to be scattered, fragmentary existence of digital resources integration into a complete "big data", extract valuable information, into useful knowledge and rules, and make use of them. It is very necessary that actively cooperate with governments, universities, intelligence institutes and enterprises to upgrade or build a library open and sharing alliance platform, so as to achieve real sense of openness and sharing, and strive to achieve data value creation and value-added of knowledge services. Based on analyzing the current situation of Library's data resources opening and sharing, this paper clarifies the problems existing in the library's data opening and sharing services, and further clarifies the operation mode and content strategy of the open sharing of library knowledge service in the era of large data.

**Key words**—Knowledge services, big data, university library, knowledge sharing.

## I. INTRODUCTION

Big Data is the hottest word in the IT industry following "cloud computing". The first "big data" concept was proposed by the McKinsey consulting company in the United States, which set off a big data frenzy in the IT industry and business field [1]. In February 2012, the Obama administration announced the launch of the "Research and development plan for large data". In March 29th, it released the big data research and development initiative on the White House website. It launched a big data wave in the field of government management and social application [2]-[14]. As Steve Lohr announced to New York Times in the paper "The Age of Big Data" [6], the era of big data is coming.

The core of big data is data integration and data management. In the era of big data, data is resource, wealth and capital, which is not empty words. Data and information have become important assets of the organization. How to make full use of historical information and generated massive amounts of data every day, how to handle and store these precious resources, how to extract valuable information from the massive data, how to transform data and information into

useful knowledge and rules, which are very important for the survival and development of an organization, and they are crucial for enhancing the core competitiveness and competitive advantage of an organization. To extract valuable information from large data and massive data, we must implement data opening and information disclosure, and integrate distributed, fragmented data and information into complete "big data".

"Big data" is a data revolution, but also a change of thinking, which has been widely used in government, business, health, transportation and other fields. It will have great influence on our work, life and thinking, and it is changing the government, business, and our way of life.

Twenty-first Century is the era of knowledge based economy. Under the background of knowledge economy and big data, social organizations advocate knowledge management, knowledge sharing and knowledge creation. As one of the public welfare organizations of the society, the library carries rich knowledge resources, but also shoulders the function of social culture and education. How to adapt to the changes of the times, the entire library of the explicit knowledge and tacit knowledge resources to maximize the share with readers, without boundary exchange of knowledge, is a serious challenge facing libraries in economic times, but also fulfill the functions of the mission of the library is the only way which must be passed.

In the era of big data, the library is not only the competition between library resources, building space and service level of competition, but also the big data quantity and large types of data mining and analysis capabilities will become a key index of big data library in the era of competition, and the formulation of development strategy of the library will depend on the analysis and prediction of large data. Secondly, large data will become the core assets of the library. With the understanding of the value of big data is agreeing with the industry on big data analysis technology, big data will become increasingly valuable, such as a large number of readers' habits, service consumption traces for the future development of library service mode, trend analysis, development forecast and supporting big data will become into the core asset library. Thirdly, large data processing brings opportunities and

challenges to the library. Big data requires that the library needs not only through structured data to understand what customers now enjoy the service of library, but also need to use a large number of non structured data, semi-structured data in the library user service in relation to dig what is happening, prediction and analysis of what will happen in the future, in order to find the library crisis and challenges better service marketing to deal with the unknown model.

With the rapid development of information technology, the library is changing the way of library management and service gradually by using information technology. The level of open and sharing of scientific and technological information resources is an important means to measure the development of national innovation driven development. In September 2015, the State Council issued the "Outline" to promote the development of big data to action, from the national strategic level to promote public open data resources, overall planning of large data infrastructure, including information resources, accelerate science and technology innovation resources open sharing, deep big data in all walks of life innovative applications [1]. With the rapid development of information and Internet, the society has entered the era of big data. Big data can effectively integrate various kinds of information resources, facilitate relevant personnel to analyze and predict massive amounts of information and make decisions, which is profoundly changing people's work and life style. From the perspective of digital knowledge application, the excavation and utilization of big data will help to break the "isolated island" state of self governance and realize the opening and sharing of scientific and technological information resources. Facing the new situation, college library must have scientific literature resources massive advantage, based on the traditional mode of production data, analysis, interpretation, learn to use and open big data [2], and actively create the opening and sharing platform of knowledge service, and strive to build a total of sharing in the whole society, to provide a full range of services for society, three-dimensional, a multi-level, comprehensive data and information resources sharing.

## II. CONNOTATION OF UNIVERSITY LIBRARY OPENING AND KNOWLEDGE SHARING

### *A. The opening of the University Library Has a Full, Three-dimensional, Multi-level and Comprehensive Data Information and Resource Sharing Service*

In a narrow sense, university libraries open to the society, that is, the open door of university libraries, the admission of social readers, and the enjoyment of basic literature lending services. Public cultural sites, such as museums, exhibitions, art galleries, etc., allow social personnel to enter the tour. From the point of view of the general social readers and media publicity, they think that the "opening to the society" is the meaning of the university library.

From the broad perspective, including not only allow

readers to enter the society and enjoy the basic library service of university library open to the public, also includes other open service school readers have to social readers, such as online reference, personalized information service, knowledge navigation service, information retrieval, education and training, the use of a variety of electronic database remote education document delivery, information push, etc.. Along with the network technology and further promote the construction of more powerful vitality will inject, operation mode and service mode of the traditional library, the library can build a educational virtual learning community, for inside and outside all kinds of information users provide a more ecological free and open learning environment.

University library open to society refers to the higher school library according to their functions, capabilities and resources, do a good job in the school teaching and research services at the same time, taking into account the sharing of resources, to as many people as possible, as far as possible to all the documents to open society, take the initiative to meet the various needs of the information society the resources. Although opening to the society is a concept that is easy to misread and not easy to define, a widely accepted view is that when the concept of resource sharing has reached a consensus, it is an inevitable trend for university libraries to open to the society.

### *B. Connotation of Knowledge Sharing in University Library*

Library knowledge sharing is the knowledge transfer, exchange and discussion between librarians and readers through various channels, so that each individual or organization has the right to maximize the use of knowledge resources, promote knowledge innovation and deepen reader service. Library knowledge sharing is the process of interaction, transformation and sharing between knowledge providers and knowledge recipients in Libraries in narrow sense. Library knowledge sharing in broad sense should include knowledge sharing and knowledge exchange and sharing among departments among librarians, users, librarians and users in the same sector. In the process of library knowledge sharing, the indispensable factors are knowledge providers, knowledge resources (explicit and recessive resources), knowledge transformation, knowledge sharing environment and knowledge acceptor. It is the process of knowledge transformation that plays an important role in the knowledge sharing of the library. The transformation of knowledge refers to the process of transformation between explicit knowledge and tacit knowledge, including socialization (transforming tacit knowledge to tacit knowledge) and integrated (transformation of explicit knowledge into explicit knowledge) and outside (transform the tacit knowledge to explicit knowledge), internalization (explicit knowledge to tacit knowledge converting) four process. The library has also experienced a process of knowledge sharing, which is personal implicit

knowledge, explicit knowledge, explicit knowledge and tacit knowledge.

Study on library knowledge sharing model, can improve the efficiency and effectiveness of knowledge sharing in the library, the library to promote the knowledge sharing activities, on the other hand the application mode of library knowledge sharing can promote the knowledge service of the library and reader service to the deep level development.

### III. PRESENT SITUATION OF OPEN AND SHARED SERVICES OF DATA RESOURCES IN UNIVERSITY LIBRARIES

The library is an important platform for the application of information technology. At present, the construction of big data infrastructure in China is gradually improving, such as the NDLC project of China National Library, data integration and data mining project of Tsinghua University library. In addition, the Chinese Academy of Sciences Academy of Sciences Chinese mechanism knowledge base of National Science Library integrates more than 100 research based on institutional repositories, covering all open service, full text of open access rate reached nearly 80%, is a network database cluster in our country, the largest and most influential. At the same time, China's higher education literature support system (CALIS) and the National Library Reference Service Alliance and other institutional repository alliances also develop large data resources, and actively build a shared platform based on data resource services. The local science and technology intelligence has gradually formed the sci-tech information resources sharing service network coverage areas, and provide special information service related, construct the literature of science and technology and innovation service platform for local norms, provide fast and efficient service of literature. The digital library has accumulated a large amount of basic data, is committed to building a university resources for the industry to provide information services and information consulting center, knowledge innovation and communication center, network teaching center and service center sharing service platform, to promote the construction of information infrastructure, service, innovation and development strategy of Higher Education provide technical support and information security.

### IV. PROBLEMS OF LARGE DATA OPENING AND SHARING SERVICES IN UNIVERSITY LIBRARIES

In recent years, the data resources of domestic university libraries have made positive progress in opening and sharing, and have gained successful experience. However, compared with the expanding demand for science and technology information in the process of economic and social development, compared with the leading level of international big data application, there is still a great gap between them, which is far from effective in realizing the huge utility of big data. The main manifestation is "three deficiencies".

#### *A. The Basic Understanding is Biased, and the Overall Planning of Open Sharing is Insufficient*

The library and information research institutes lack enough knowledge of the necessity and importance of opening and sharing the platform of science and technology information. At present, the relevant policies of the country are not perfect, and there is a lack of open and sharing planning of scientific and technological resources around the overall strategic demand. This understanding of the bias and lack of unified planning to open big data platform of Library sharing progress is slow, low level of the restricted care function data and service value; data resource of innovation information resources duplication process lack of coordination, and there is a long way to go in terms of macroeconomic management data resources and coordination.

#### *B. The Lack of Policies and Laws and Regulations, and the Shortage of Open and Shared System*

The applicable regulations and policies for large data open sharing of knowledge service, or guidance documents need to be improved, for big data open operation instructions are not clear; either the low level of effectiveness is not enough, the authority is limited, it is difficult to open and use the knowledge service to the public interest for the planning and adjustment of the overall. It is difficult to provide legal support and protection of [3] effectively. In addition, in the aspect of system, regulations and policies related to the lack of a comprehensive strategic demand as the center of science and technology resources sharing and unified planning mechanism, most of the problems caused by the knowledge of data duplication, scattered, closed, sharing platform can not communicate, still cannot provide effective legal safeguard mechanism for opening and sharing of library knowledge service.

#### *C. There is a Gap in Market Consciousness, and the Supply of Large Data Innovation Information Resources is Insufficient*

The library knowledge data should not only meet the needs of the readers, but also provide the necessary technical innovation and scientific and technological support for the market subject. In the process of innovation, enterprises often need to use external knowledge to improve performance and innovation ability. These external resources can be acquired through library information resource platform. However, in reality, though there is a relatively perfect system of industry university research cooperation, it is hard to directly serve readers and enterprises outside the library, and the awareness and ability of knowledge service need to be improved. Only with the help of big data, can university libraries innovate their services and open and share data of digital libraries, so that we can provide readers with better quality information services for science and technology.

## **V. OPERATION MODE OF OPEN SHARING OF RESOURCES OF UNIVERSITY LIBRARY UNDER DATA ENVIRONMENT**

Based on the efficiency and efficiency of resource construction, the operation mode of information resources opening and sharing can be integrated not only on the original basis, but also on the basis of information popularization and big data. These two models are all based on the stock to obtain the incremental effect.

### ***A. Maintenance, Upgrading, Operation and Integration of the Original Research Infrastructure***

In the era of big data, the library is facing the double impact of knowledge economy and digitalization of network. The big data environment requires that the library data storage mode has the unique structure of big data, and the technology processing of data information achieves high speed, fast and automation. Therefore, we can learn from the advanced experience of western countries such as the United States open sharing of data, relying on public colleges and scientific research institutions in the original literature sharing platform, understand and use distributed data resources libraries throughout the country, to share the network facilities to drive application framework plan as the main support channels, bottom-up and priority method the goal of combining the necessary transformation, upgrading and integration. For example, computing technology reconstruct the library information platform based on cloud, from the previous single software upgrade and social knowledge network and large data public knowledge platform for the integration of the information storage system, between the knowledge service platform with a terminal, the reader information research society, scattered academic institutions closely woven a link technology that will maximize the demand of information resources and services up to the reader is closely related to the mode of [4], expand the amount of knowledge of literature and the method of acquiring knowledge, to meet the large data analysis of massive data processing, the value of mining operation requirements, to further improve the library data resource sharing.

### ***B. Building a New Open Sharing Alliance Platform with Large Data Technology***

With the rapid development of big data technology and information network, readers' demand for data resources from the contents and methods have undergone a fundamental change, from the service search routine digital resources to the deeper information analysis, data mining and other diversified information services. In order to meet the information needs of large data this comprehensive comprehensive, and can use cloud computing technology, network hardware, the effective integration of the college library equipment and digital resources, with the help of various disciplines resources to the digital resources of the library data scattered in the extract and index, and then gradually the digital data storage to large data alliance

platform, the eventual establishment of a data storage, data query, data analysis and other functions, and to achieve on-demand access, personalized information services such as the open sharing alliance platform. Open sharing alliance platform should be intelligent, interoperability and openness, and open to any reader platform in the Library Resource Sharing Alliance is not restricted, and unified management and deployment, to achieve open and large data resources on the true meaning of sharing large data resources to promote the library is full effective use, and maximize the social value of information resources.

## **VI. CONSTRUCTION STRATEGY OF RESOURCE OPENING AND SHARING PLATFORM OF UNIVERSITY LIBRARY**

### ***A. Work Hard to Build a Diversified Service Model***

University library data open and sharing is a new field, under the background of big data, large number of semi-structured data and unstructured data document type, learning and reading habits of readers have changed greatly, from the traditional way of information transfer to the individual, thematic, specialization and socialization the diversified needs of extension, service for readers, and the content of environmental conditions and therefore had a huge change, need to use the new mode of thinking, change the service concept, service content update, expand the service, realize the transformation of library resources service. In the service concept, the library should be from the "search view" to "the view", which focuses on the core needs of users, and fully explore the various aspects of the use of resources, to meet the various needs of users of information, and meet the users' demand on the dominant let the reader to release its implicit demand [5]. In the service content, should from "simply provide a collection of resources for the development of access to resources inside and outside of the pavilion for readers, according to user needs, analysis of the potential value of all kinds of information inside and outside of the pavilion is rich in resources, and for the purpose of development organizations, and fully dig, the collection of information into relatively isolated the public can enjoy the learning resources and then the value of cultural assets. The library should also strive to broaden the types of services, through micro-blog, WeChat, the mobile client mode to provide online lending, remote document retrieval and download, virtual reference, MOOC education, online broadcast and other new types of services, to attract more readers to participate, interaction, exchange and utilization. To understand the hidden needs of different readers, enhance the user's contribution to use innovative service consciousness, meet the needs of different types, different ages, different sectors of the needs of readers, and the formation of cultural products and services of high quality, so as to form a diversified service mode of library.



### ***B. Energetically Improve the Degree of Data Opening Sharing and Data Innovation and Value-added Space***

The library open sharing platform is not a linear, single innovation process, but a process that many units participate in the interaction and cooperation to make data resources complement each other and make effective use. Library has huge data resources of massive and multi-data types. Its latest research achievements and output information resources decide its important position in big data Knowledge Service Sharing Alliance. Therefore, we must cooperate with the government, intelligence agencies and enterprises. With the help of the government to promote the development of the open sharing alliance platform, we will provide better foundation for the library open sharing platform with intelligence research institutions, and help enterprises understand the market demand of knowledge services. In the study, and the government information and business exchanges and cooperation on the basis of resources through expansion, share and integration of these units the advantage of data resources, build the library open sharing alliance platform, the data source is infinite knowledge of data acquisition, finally realize the knowledge service data open innovation value-added library.

### ***C. Establish and Improve the Safe and Effective Operation Guarantee Mechanism***

Under the environment of big data, because the data sharing library consortium has the characteristics of complicated structure, heterogeneous system, large amount of data storage and increase the difficulty, especially the data up to PB or TB online alliance platform, while the library is also facing security threat data quality and user privacy data was leaked. In order to make the reader more convenient and quick to obtain and share the large data of the library, it is necessary to establish a safe and effective open and sharing operation guarantee mechanism. Therefore, we should actively draw on the advanced experience of foreign countries and promote the application of relevant laws and regulations in domestic large data.

First, big data storage structure considering cloud computing architecture, based on the functional design should comply with the relevant safety standards of big data, accelerate research to establish technical standards, data classification standard and the data standard, data construction of independent intellectual property rights with a unified standard system, lay a foundation for the large-scale data sharing and open make full use of.

Secondly, we should establish the basic principle of data opening as soon as possible. Because library data will generate some interest disputes in the sharing process, and it is not conducive to the protection of intellectual property rights. We should formulate and improve relevant laws and policies on data sharing and migration, and make clear the library's responsibility of opening and sharing as the public domain.

Finally, we need to evaluate cloud services scientifically and objectively, so that we can pick out more suitable cloud providers with the help of evaluation results, so as to enhance the safety level of library itself and data sharing service. The establishment and improvement of the safety and security mechanism of the open sharing of knowledge services in the library can provide a guarantee for the advancement of data sharing.

### ***D. Efforts to Form an Open Sharing Mechanism***

The opening and sharing of large data resources in the library should be normalized and institutionalized. It is necessary to rely on the perfect and sound incentive mechanism of open and sharing resources [6].

First of all, to promote the library knowledge service open sharing service consciousness, through the promotion of the scientific literature at home and abroad open sharing of information, and the future development of the investigation and Study on the current domestic open sharing, enhance service innovation and popularization of open sharing concept of knowledge service.

Secondly, we should carry out the popularization training of the big data application skills and knowledge services for different groups of people, and initiate all members of the open sharing alliance platform to participate in the management and control of knowledge data.

Finally, to build a scientific and practical evaluation system of knowledge sharing, security standard library knowledge service open sharing and operational evaluation system from the information content, quality of service, subject librarian and the use effect, can improve the library knowledge sharing system construction quality, optimize the library knowledge service data the environment, guarantee the readers' information acquisition fair pavilion. Thus, the open sharing of library knowledge service is promoted in the aspects of innovation services, technical problems and follow-up services.

### ***E. Give Full Play to the Leading Role of the Market***

The consumer of the knowledge product of the library is also the end user of the large data resources. In the big data ecosystem resources library knowledge service production, supply and consumption of knowledge producers from the consumer (Readers) get demand information, and combining the knowledge from the library data resources in information mining, legal compliance, meet the needs of the readers of the knowledge products, the big data market through the place and its unique mechanism and provide convenience for the free exchange of knowledge from both sides of supply and demand, promote the information interaction between the subject and the surrounding environment, the formation of the ecological supply chain [7]. The ecological system in the market economy, the knowledge service of the library of production, supply and marketing of sports and the development of the various ecological subject is carried out according to the rules of the market, and can provide specific

knowledge products to meet the information needs for free or below the market price for the majority of readers, so the supply of knowledge service can not only achieve equilibrium state, some external negative effects can also overcome the knowledge of traditional service brought by social problems such as monopoly, supply and demand is not fair, to create better conditions for the market of big data, to mobilize the enthusiasm for people to use and processing of large data, but also makes more and more enterprises benefit, attracting more and more technology, experience, resources of the companies involved, the knowledge involved in big data applications and the development of the tide, more perfect realization of map The transformation and upgrading of the library and the benign development of the library.

## VII. CONCLUSION

In the environment of big data, big data as a resource, technology and tools to bring new opportunities and challenges to the University Library Knowledge Service Innovation and transformation, we must actively adapt to the new environment, make full use of new technologies, will the library science and technology literature data in a sealed or semi sealed state open sharing, knowledge data the value of innovation. This is not only beneficial to the knowledge sharing and transformation of the library, but also can improve the scientific and technological innovation ability of the whole society and promote the sustainable development of the society. We must look at the library knowledge service with the thinking big data open sharing, on the base of learning, summing up the domestic and foreign knowledge data open sharing model, constructing the operation mode of knowledge service sharing with domestic practice, to improve the utilization efficiency of knowledge open sharing of data results and literature data.

Due to the imbalance in the development of University Libraries and the differences in the community environment faced by university libraries, it is still necessary to achieve a general sense of opening to the outside world in a general sense. Moreover, opening up can not be generalized. We must adjust measures to local conditions and step by step. We should not be open to society in a level, a way or a scope. Instead, we should adopt various levels, ways and strategies.

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