Survey and Analysis of University Libraries’ Information Resources Construction under the Digital Information Environment: Taking Key University Libraries in China as Examples

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Abstract—Based on the surveys of information resources construction of 75 key university libraries in China and the literature survey of China National Knowledge Infrastructure database (CNKI) and Wan Fang data, the paper analyzes the characterizes of university libraries’ information resources construction in China, that is: the paper-based resources still hold the larger propositions; the digital resources are increasing rapidly and their types are diversified; the characteristic resources have become one of vital resources and have been widely acknowledged; the forms of OA resources are simpler, and their number is fewer; building national and regional library consortia among libraries have made a great progress. Through data survey, we think digital information resources should be paid more attention to in E-Era and they can be constructed by the following methods: increasing the proportion of digital resources; raising the OA resources rate; building co-construct and co-sharing library consortia.

Index Terms—digital information environment, digital libraries, university libraries, information resources sharing, web survey

I. INTRODUCTION

Along with the development of the computer technology, communication technology and network technology, we have been surrounded gradually by a digital world, such as e-commerce, e-government, digital publication, digital earth, digital city, digital community, digital campus and digital library. Take digital publication as an example, nowadays there are 500 thousand kinds of e-books, 9,000 kinds of Internet periodicals, more than 600 digital newspapers in China. And in the following five years, there will be 30% of mobile phone users reading e-books and digital newspaper [1].

So what is the present situation of information resources construction under digital information environment? What measures should be taken to meet requirements of digital environment? We plan to give these answers by investigating 75 key university libraries in China.

II. METHODOLOGIES

The concrete methods are: firstly, we get 75 key university lists through the website of Ministry of Education of China [2], and then enter these university library websites to carry on the investigation. At the same time, we carry out the literature survey and study by usage of China National Knowledge Infrastructure database (CNKI) and Wan Fang data, etc, in order to summarize the main features of these libraries’ information resources construction, including the paper-based resources, digital resources, characteristic resources, open access resources, e-print resources and resource sharing.

III. SURVEY RESULTS

A. PAPER-BASED RESOURCES CONSTRUCTION

There are the paper-based resources in every university library. The largest collections are the library of Peking University (600 million volumes), Jilin University Library (692.46 million copies), Wuhan University Library (613 million copies), Sun Yat-Sen University Library (535.708 million copies), and Sichuan University Library (550 million copies). These are all super large library, and their affiliated universities are also comprehensive ones that were
merged by several colleges, which makes their collections expanded greatly in a certain degree. On their geographical distribution, they distribute on north China, northeast China, central China, south China and west China, which ensures there is a large-scale university library in every large area in China.

The survey has shown an average collection is 244 million coppices, which in general can meet the development needs of teaching and scientific research.

B. DIGITAL RESOURCES CONSTRUCTION

With the rapid development of digital documents and the unceasing growing digital demand of users, university libraries pay more attention to digital resources construction, which also complies with the rules of “PRC Academic Library Trial Rule” issued by Chinese Ministry of Education (hereinafter short for "Rule"): we should take account of paper-based resources, e-documents and other ones in literatures acquisition [3].

Their types are diversified, such as e-books, database, e-journal and full-text electronic theses in the surveyed libraries.

In addition, in recent years the proportions of digital resources are obviously increasing, for example, there are 30 surveyed university libraries whose e-books are more than one million copies, accounting for 40% of the total. The network and digital literature resources have been energetically strengthened in Wuhan University Library for the past few years. They adjusted the types of literature resources construction by increasing digital resources collections gradually [4], and its databases are 412, which lies in the first in all investigated libraries. The average number of databases is 93, which can cover the basic disciplines, meet the information demands of every professional reader.

C. CHARACTERISTIC RESOURCES CONSTRUCTION

The characteristic resources construction is another important topic of university libraries. In digital information times, with carrying out resources sharing, characteristic resources have become one of vital resources that determine libraries' survival and development. It was also stipulated in "Rule": the university libraries should develop characteristic resources construction in accordance with the demands of teaching and scientific research, and according to the collections features and the distribution in area or system's literature guarantee hierarchy building [5].

There are 60 surveyed libraries developing characteristic resources construction, their propositions are 80%, which shows they have been widely acknowledged by libraries. Their characteristic resources mainly are self-constructed database, and they build their peculiar resources, such as all kinds of libraries according to their universities’ position, characteristic and resources.

D. OPEN ACCESS RESOURCES CONSTRUCTION

The relative purchasing power of libraries is declining for the prices of books and periodicals are increasing; scientific researchers require to timely gain academic research achievements; the voices of information resources’ open access (OA) from users are so rise high. All above lead to OA development vigorously in foreign countries and many libraries also join in them. However, in China, there are 24 surveyed libraries collecting OA or e-print resources, only accounting for 32% of total investigated libraries. Their forms are simpler and the number is fewer, which indicates OA movement of domestic libraries fall behind overseas ones. We must strengthen it energetically.

E. THE RESOURCES SHARING

It isn’t adapt to meet the development of times and reader information demands as well as goes against general planning of literature resources and can’t avoid overlapping projects if the library
individually combats to provide the services for readers under the network environment. Therefore, building national and regional library consortia among libraries will win more interests and conveniences in harmonious construction of literature resources, largescale database in combined purchase, cooperative cataloging, cooperation reference and document delivery resulting to build the omnidirectional-graphic formula service network. We survey the related situations of 75 university libraries and carry on statistics as shown in Figure.1.

![Diagram of library consortia](http://www.sinoss.net)

Fig.1. 75 university libraries participating cooperative organization situation

According to above figure, the proportions of 75 university libraries participating nationwide professional library cooperative organizations CALIS,CASHL and CADAL respectively are 100%,77.3%,20.0% , which shows these libraries have been conscious of the importance in developing co-construction and sharing library consortia in order to meet users’ information demands in the higher degree.

There are also many regional alliances emerging in many places. University Library Combo in Beijing area composed of 39 university libraries cuts off on March 14, 2008, was initiated by Beijing University of Posts and Telecommunications, who are in line with principles are “resource sharing, complementary advantages, mutual profitable, voluntarily participation, equally cooperation” to develop borrowing reading and documents delivery [6]. Another University Library Combined System in Tianjin area shared of a set of software, server and central database and realized seamless connection with the systems of Tianjin University and Nankai University, among which can reciprocally be retrieved [7]. The management of Jiangsu Academic Library & Information System (JALIS) promotes the correlation service plan of CALIS and plans literature resources construction, supervises service work of subject-center that there are special staffs presiding in document delivery [8]. Library and information committee of Zhejiang universities and colleges (ZADLIS) relies on construction achievements of CALIS and CADAL to set up a digital information guarantee service system. According to the principles of “concentration resource, division and cooperation, balanced load, unifies with Tibet” , ZADLIS service system is composed of 1 provincial, 6 higher education zones and some subcenters as well as documents delivery system [9].

IV. DATA ANALYSIS

In above investigation, 75 libraries’ paper-based resources are very ample, however, their digital resources are fewer, and there are only 5 libraries whose e-books are more than two million copies. But under digital information environment, library’s traditional resource outlook is strongly impacted on.

Therefore digital information resources should be paid more attention to and they can be constructed by the following methods:

- Adjusting resources’ structure. We should increase the proportion of digital resources. For example, 44% members of International Internet Preservation Consortium (IIPC) make network information collection work become a regular business [10]. The digital projects have been
implemented by USA Congress libraries, and they centralize the amount of plastic recording and video on one place, and then digitalize them [11].

- Increasing OA resources construction. University libraries should conform to development of the environment and demand of readers, and then vigorously develop OA resources. With the progress of OA movement, the promotion to open network by Web2.0 technology and ceaselessly increasing of users’ requirements in information resources, OA resources that the quantity and quality are improving have become significant information sources of university libraries. What’s more, they can relief funds and limited spaces pressure to some extent.

- Building co-construct and co-sharing library consortia. American university libraries have a consensus: either collaboration or death [12]. Because under digital information environment, resources are greatly enriched and the technologies are mature, libraries and readers will be connected by a huge network. The idea that meeting information demands of users by simple library’ collections are obsolete in the digital age. On the contrary, firstly we should build own characteristic resource, and then develop cooperation with other libraries, such as joint development and purchasing database, united cataloging, inter-library loan and document delivery, so as to avoid repetitive constructions, and can satisfy the information requirement of readers to the biggest extent.

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