

Research on the Unbalanced Development of Digital Library in China

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Abstract—The ever-extending bookshelves of the China Digital Library make searching for information much easier - it is just a few clicks of the mouse away. As China's key information infrastructure construction project, the digital library has been listed as a key project in China's "10th Five-year Plan". China began its digital library development in the mid-1990s with a series of studies and pilot projects. Beginning in 2000, a number of national-level digital library projects were approved some universities, colleges and industries have begun implementing their digital libraries. Due to the geographical, cultural and economic differences of these agencies, the development of digital library in China is unbalanced.

Keywords—*Digital Library; Unbalance; Free distribution*

I. INTRODUCTION

According to Wikipedia, digital library is a library in which collections are stored in electronic media formats, as opposed to print, microform, or other media and accessible via computers. It has so many advantages:

No physical boundary. The user of a digital library need not to go to the library physically; people from all over the world can gain access to the same information, as long as an Internet connection is available.

Round the clock availability A major advantage of digital libraries is that people can gain access 24/7 to the information.

Multiple access. The same resources can be used simultaneously by a number of institutions and patrons. This may not be the case for copyrighted material: a library may have a license for "lending out" only one copy at a time; this is achieved with a system of digital rights management where a resource can become inaccessible after expiration of the lending period or after the lender chooses to make it inaccessible (equivalent to returning the resource).

Information retrieval. The user is able to use any search term (word, phrase, title, name, subject) to search the entire collection. Digital libraries can provide very user-friendly interfaces, giving clickable access to its resources.

Preservation and conservation. Digitization is not a long-term preservation solution for physical collections, but does succeed in providing access copies for materials that would otherwise fall to degradation from repeated use. Digitized collections and born-digital objects pose many preservation and conservation concerns that analog materials do not. Please see the following "Problems" section of this page for examples.

Space. Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information; simply because digital information requires very little physical space to contain them and media storage technologies are more affordable than ever before.

Added value. Certain characteristics of objects, primarily the quality of images, may be improved. Digitization can enhance legibility and remove visible flaws such as stains and discoloration.

Easily accessible.

Since 1980, the widespread development of Internet technology has had a deep impact on people's daily life, especially in their way of study and research. In 1995, China began to collect information on digital library. In 1997, The National Library of China (NLC) began the first national-level research project. In future, China will create a universal free to read, open-source digital library containing millions of scanned books, papers and videos. Such a resource will lead to the democratization of knowledge by making available on the web, a unique library resource to scholars, students, and citizens in China. Today, more than 200 universities and colleges in 11 regions in China are connected to these networks. They are constructing their own digital libraries.

II. UNBALANCED DEVELOPMENT OF CHINA DIGITAL LIBRARY

A. Unbalance between universities Libraries

Access to academic information is very important for higher education. University researchers is paying more and more attention to digital resources which can search and get

through internet .University is an important base of higher education and training, teachers, students and researchers have a significant demand for academic information. Traditional library which is full of physical books are hard to meet these demand. Looking and copying information is not convenient. The development of digital library is becoming one of the most important directions of online academic information service for university libraries.The digital library construction involves the processing, storage, retrieval, transmission and use of information resources during the entire process. Historically, the overall status of libraries in China has reflected the lack of funding, quality staff, management skills and an overall vision for the sector. There are only 18 universities in China which have more than 100 databases. (Fig. 1) Most universities have failed to adequately perform the social functions of modern libraries. (Fig. 2)

B. Unbalance between Regional Libraries

The consortium of Libraries in JiLin started in 2002.it has 84 member libraries now. The construction of Digital Library o is one of the early digital library projects of the consortium of Libraries in JiLin .In 2012, based on the digital library system developed by IBM. The consortium of Libraries digitized more than 1,300,000 volumes of publications, and made them openly accessible over the Internet. You can visit 17libraries freely and search 520,000,000 data with passport number. A number of digital libraries specialized in local characteristics and/or history events were also established, including the digital library of Changbaishan culture, the digital library of General Manchu intangible cultural heritage, the digital library for the industrial development in northeastern states, etc.

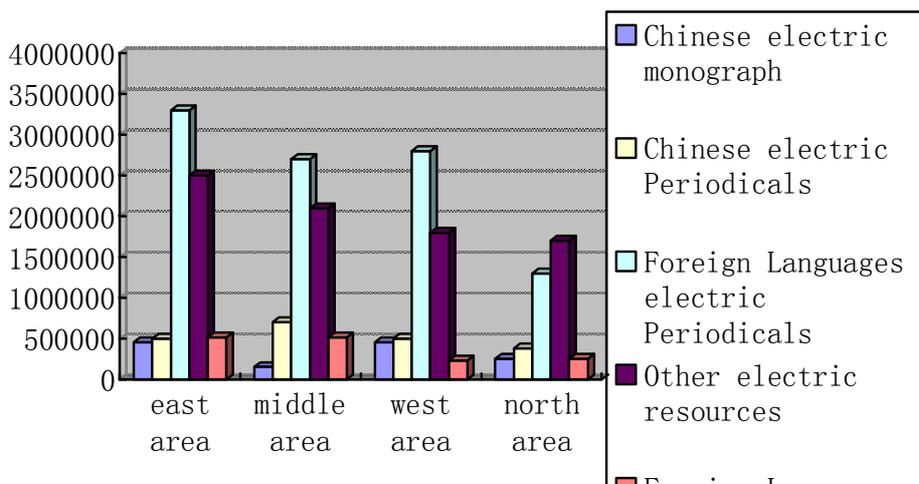


Fig.1. 2012 money spend on buying electric resources by college libraries (yuan)

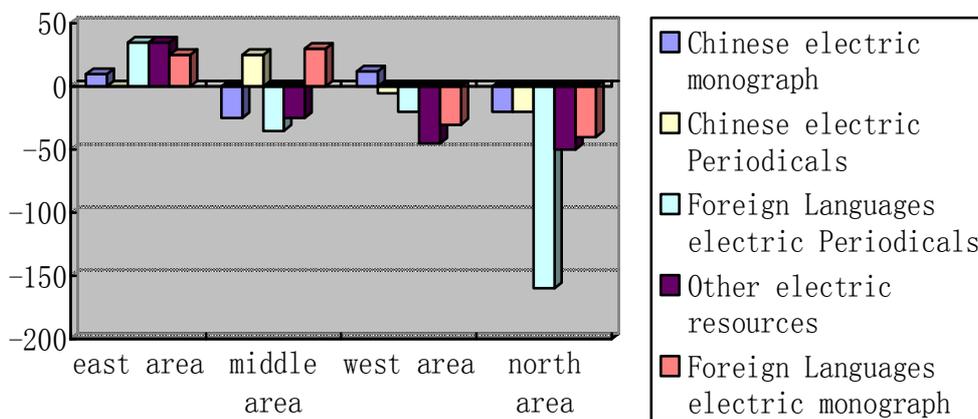


Fig. 2. Four area annual budget compared with the average-level of budget

The Digital Library of GuangDong Province is one of the largest and most advanced digital library systems developed by a state province. The project started in the year 2000, and has made major contributions in large volume resource integration and management, long distance resource acquisition, copyright

protection, and federated bibliographic search and inquiry. In 2012, Digital Library of Pearl River Delta of China established. Currently, the library contains more than 147,000,000 data, more than 4,160,000 volumes of electronic books, more than 99,530,000 volumes of journal publications, 6,680,000

volumes of doctoral theses. The library provides an integrated digital library service based on collections from more than 30 different database systems, and has made great contributions in public service.(TABLE I)

TABLE I. DIGITAL LIBRARIES IN CHINESE PROVINCES

province	libraries	province	libraries
BeiJing	20	AnHui	14
FuJian	10	JiangXi	12
ShanDong	17	ShanXi	7
TianJing	20	GuangXi	15
LiaoNing	15	XiZang	4
JiangSu	14	YunNan	17
ZheJiang	12	NingXia	6
GuangDong	22	XinJiang	15
ShangHai	22	GanSu	14
HeBei	12	ShanXi	7
HeNan	17	SiChuan	22
JiLin	10	GuiZhou	10
HuBei	14	NeiMeng	13
HeiLongJiang	12	QingHai	8
HuNan	13	ChongQing	7
HaiNan	3		

TABLE II. REPETITION RATE OF NUMBER 8 DIGITAL RESOURCES IN DIFFERENT AREA

Digital resources \ Area	East	Middle	West	North	China
CNKI	94.74%	100.00%	100.00%	100.00%	97.17%
Chaoxing Digital Periodicals	89.47%	100.00%	95.83%	100.00%	93.40%
Wanfang Digital Periodicals	84.21%	87.50%	95.83%	100.00%	88.68%
Proquest	75.44%	93.75%	83.33%	100.00%	82.08%
apabi	61.40%	68.75%	75.00%	55.56%	65.09%
New oriental multimedia	56.14%	68.75%	62.50%	88.89%	62.26%
CSSCI	64.91%	68.75%	50.00%	66.67%	62.26%
Replicated Journals by RenminUniversity of China	52.63%	93.75%	54.17%	44.44%	58.49%

III. THE SOLUTION TO THE UNBALANCED DEVELOPMENT OF DIGITAL LIBRARY

A. Joint procurement Chinese or foreign database

Digital library construction needs a considerable sum of money. The government plays an important role in library construction since a large portion of the construction fund come from it, especially university library. However, digital library investment in China is insufficient compared with that of other countries. From table II and table III we can see that money spent on digital resources are wasted. Joint procurement is the best way to solve this problem. The government should do research about library databases purchasing plan every year so they can operate fund. Joint procurement means that libraries who intend to buy the same database can buy it together. That could save a lot of money and the fund will have a virtuous circle.

TABLE III. DIGITAL PLATFORMS THAT CAN BE FREELY DISTRIBUTED

Serial number	Digital platform
1	National Children's Digital Library
2	China Digital Library for Visual Impairment
3	Document Supply Services Collaboration Network
4	China's Rare Books Bibliography Navigation
5	China National Microfilming Centre for Library Resources
6	Chinese Studies Navigation
7	Online Library Cataloguing Centre
8	National Library of China Concert Hall
9	International Exchange and Donation of Publications

B. Free distribution

The National Library of China (NLC) is the largest collector of traditional Chinese resources. Its massive collections enable the NLC to provide information service to the central government and other governmental organizations, educational, scientific, and research institutions, and the general public. NLC proposed to start from the construction of national digital library and build a multi-tiered distribution system for the preservation of digital resources, so as to realize the promotion of culture and civilization. NLC controls the latest technology in which it can construct abundant interconnected digital library platform and a group of widely-spread resource libraries. If all these resources can be freely distributed under the government support, it could highlight of public digital service of China.(TABLE IV)

C. Utilization of mature technology

Digital libraries represent the confluence of many interdisciplinary fields, from data management, information retrieve to web services, information systems. The construction of it is really hard for most small libraries which are lack of money and technology. For these small libraries, it's better to use mature technology and achievements which can share from big libraries to speed up the process. NIC could share its most advanced technology in library construction.

NLC controls most of advanced technology in digital library construction. For example, it provides mobile digital library service, which launches some featured columns such as NLC news and events, Culture Express, recommended books, and information retrieval according to its own resources and updates regularly. The service requires readers' mobile phone available for GPRS. After registration from the webpage of "Zhangshangguotu" on NLC's website or WAP site, download mobile digital library client software, and install it on the phone to the mobile digital library. The service enables readers to customize or cancel a specific service, or scan updated information. NLC also provide digital television service. The service allows the 3million digital TV households in Beijing to receive the resources and services which are suitable for digital television of NLC though the cable television network.

IV. SUMMARY

With support of advanced technology, and with more than ten years of research and implementation, digital library development has got great advances in China. Digital libraries systems have been established in the whole country. Digital library is a significant symbol to estimate the development of national information infrastructure. For China, digital library could serve the needs of scholars and researchers. For the world, Chinese information content on the Internet does not match with the language's position as one of the commonly used languages in the United Nations. China has to set up an Internet Chinese information base to change the situation and promote Chinese culture dissemination so that Chinese civilization can be widely made known to people throughout the world. I hope that sharing in fund and technology could break the unbalanced development situation and keep broadening the coverage of digital library services, making them more flexible and more efficient.

REFERENCES

- [1] Lan Yujie, Chen Xiaojian, "Define the Concept of Human Capital and the Nature of Research," *Science of Science and Management of S.& T.* vol.24, pp 80-81+90-94, April 2003.
- [2] He Xiaoping, Su Hui, "Library of Sustainable Development and Human Motivation ——A Waste of Talent Hidden Changes," *Library Science Research & Work*, pp 14-15+25, January 2001.
- [3] National library of China. [http://www.nlc.gov.cn/newen/\[2013-12-24\]](http://www.nlc.gov.cn/newen/[2013-12-24])
- [4] Xihui Zhen, "Overview of Digital Library Development in China," *D-Lib Magazine*, vol16, no. 5/6, May/June 2010.
- [5] Sun Wei, "The Development of China Digital Library and Its Influence on China and the World," *Chinese Librarianship: an International Electronic Journal*, no.20, December 1, 2005.
- [6] URL: <http://www.iclc.us/cliej/cl20sun.htm>
- [7] Zhang Tong, "The Development of the China Digital Library," *Electronic Journal of Academic and Special Librarianship*, vol3, no.3, Spring 2002.
- [8] Samuelson, P, "Legally speaking: encoding the law into digital libraries," *Communications of the ACM* 1998, vol41, no.8.
- [9] L.Crum, "University of Michigan digital library project," *Communications of the ACM*, vol38, pp.63-64, 1995.
- [10] NACSIS, National Center for Science Information Systems, and infrastructure, *Journal of the American Society* 1998, <http://www.nacsis.ac.jp>.