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DIGITAL LIBRARIES IN CHINA

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In July 2002, the Internet using population in Mainland China reached 45.8 million, ranking the second largest in the world.\textsuperscript{1} It is natural that the demand from the Internet user community for networked digital content keeps growing. Compared with developed countries, Chinese digital libraries (DL) got off to a late start, but are developing at an amazing speed. Hundreds of DL projects are underway across the country. They aim to meet a variety of needs: sharing cultural resources, supporting learning and research, and integrating the digital libraries into conventional library services. This paper will report on the development of national, academic, private, and local DL projects in China that put much emphasis on their digital content and services. It will also list the challenges that the nation is facing and the areas that need improvement.

National Endeavours

China began to take up research and development of DL in the middle of the 1990s. Since then, the Chinese government has been making substantial investments in digitizing cultural heritage materials. Experts have successfully sent out the message that DL is not just within the library world; it is instead a comprehensive project that needs the joint effort of every industry, every region, and the nation as a whole. So far, the national endeavours are represented by the following two projects:

China Digital Library (CDL, \url{http://www.d-library.com.cn})

After years of testing, the Joint Conference on the Construction of the China Digital Library Project was set up in April 2000. The Ministry of Culture served as the convening unit and 21 ministries and commissions took part.\textsuperscript{2}

The CDL project is aimed to structure the basic framework and build the largest repository of online information on Chinese culture and heritage in the world. The centre of this project was set up in the National Library of China, one of the largest libraries in the world. As of this writing, it has developed over 30 multimedia databases featuring Chinese customs, book history, antiquities, ancient architecture, Chinese who's who and China's military. A permission-based online lending service allows a registered reader to borrow from 170,000 Ebooks and download up to three at one time to a local disk. Over 10,000 of these Ebooks are free to access.

National Cultural Sharing Network (NCSN)

Based on the experience of the CDL project, an expanded telecommunication network, and a solid technological foundation, the NCSN was announced in April 2002 by Xinhua News Agency. The network, which is to be completed in 2005, aims to enable people in remote and poor western areas to share the cultural resources found in libraries, museums, art galleries and research institutes in the
affluent east. By 2005, an inter-linked library network that includes a collection of multi-media resources in Chinese equivalent to 30 million books, 6 million photos, and 8,000 films and TV programs will be available.

At a July exhibition in Beijing, many local cultural networks demonstrated their digital products made up of digital museums, digital archives, digital theatres, digital schools, etc. There seemed to be a good foundation and an urgent demand for the national network that allows local digital information to be shared and exchanged.

On top of the national network, some international DL collaborations have been actively developed. The Northeast Asian Digital Resources Centre was established in Liaoning Province, Shanghai is involved in building an Asian Pacific Data Centre and more are coming.

**Academic Projects**

The first revolution of this millennium in China is the way people conduct learning and research. You can easily feel this revolution when you are actually there. Many parents started the new learning experience of their children using the China Middle School and Primary School Digital Library. A college student from Fudan University told me that he could easily read books or journal articles online, therefore he did not need to visit any library buildings physically. Scholars do not have to be constrained within their own institutional libraries any more. The following two networks not only have been utilized in China, but have also spread worldwide.


Co-ordinated by the Chinese National Committee of Universities and Colleges Library Work, CALIS is a resource network based on the China Education and Research Net (CERNET). Its purpose is to preserve and to build research resources in digital formats and to promote digital resource sharing between China and other countries. There are eight regional centres across the country, each focusing on the development of special disciplines and subject areas that are strong in its collection. CALIS will enhance the efficiency and quality of Chinese academic library and information systems as it provides rich and immediate resource sharing to support teaching, research, and studying.

CALIS is expected to be completed in the year 2010. “Its public service software system consists of its online co-catalogue system, self-building database system, OPAC, and interlibrary loan system.” Now CALIS only allows non-member Internet users to search through indexes of its dozens of full-text databases, including dissertations and subjects on Dunhuang and Chinese emigrants. One of the databases particularly appealing to me is the Northeast Asia Documents that covers resources in Chinese, Japanese, Russian, and other languages.

Another related project, the Sino-US Million Book Digital Library, was officially announced in June 2001. Its steering committee has programmed the project, constituted a policy and guaranteed sources and qualifications. The resources will be selected from the unique collections of major academic libraries in China and the US. The technical centre for this collaboration was set up in
Zhejiang University. “There are also 12 digital resource centres based in 12 universities such as Peking University and Tsinghua University, and some 30 large data banks.”

**China National Knowledge Infrastructure (CNKI, [http://www.cnki.net](http://www.cnki.net))**

Launched in 1998, CNKI is a national key project to construct a Chinese digital resource system with the support of the Chinese government. Led by Tsinghua Tongfang Optical Disc Co. Ltd., the project has been focusing on academic periodical digitization called Century Journal Project. The project was planned to be completed by the end of 2002. The entire academic journal database will collect “18 million full-text articles of 5,120 journals since the start of publication and grow to be the most integrated Chinese document information resource.” It will reflect the growth and latest development in all research fields in China for over 100 years. Many East Asian libraries in North America are CNKI users.

Taking advantage of its experience in developing electronic journals, CNKI offers complete DL solutions to fundamental education as well as government and enterprise administration.

**Efforts from Private Companies**

DL must be built on the basis of a large amount of digital content. In China, some private companies are rescuing invaluable Chinese cultural heritage materials with their Chinese digitizing technology. In addition to the digitization of classical or old library collections, they also work with publishers to create and disseminate digital information. Besides Tsinghua Tongfang mentioned above, which is focused on academic periodicals, the digital efforts by the following three companies are noteworthy.

**UniHan** ([http://www.unihan.com.cn](http://www.unihan.com.cn))

UniHan Digital Technology Co. Ltd. provides digital content and Chinese digital technology. It has completed many classical Chinese digitization projects in the past few years. Besides serving Chinese readers, its digital products are extremely popular among Japanese researchers, and warmly embraced by scholars in North America as well. Si Ku Quan Shu, Si Bu Cong Kan, Shi Ke Shi Liao Xin Bian and Kangxi Zi Dian are just a few examples of their products. Sun Yat-Sen Digital Library, one of the collaborations of many libraries in Mainland China, Taiwan, Hong Kong and Macao is fulltext accessible on UniHan’s web site (accessed on December 21, 2002). Its DL software, UniHanDler and e-Cataloger, are developed and applied to the company’s digital products.

**Superstar** ([http://www.pdg.com.cn](http://www.pdg.com.cn))

Since 1998, Superstar has digitized 700,000 Chinese books and made over 300,000 of them available on the web to its registered readers. Superstar Information Technology Co. Ltd. is the earliest and largest digital content provider in China. Its digitized resources are strong in textbooks, reference books and historical resources, and 60% of them are in humanities and social sciences. Superstar cooperates with dozens of libraries, publishers, and other institutes such as Peking University Library. At the same time, it provides a platform for all the member institutes to share their digital resources and work jointly to offer better digital reference services.
Superstar has attracted the most online readers compared with other digital libraries in China by offering large-scale digital collections, reader discussion and reference services. Its searching features have been developed to include title, table of contents and even full-text. Other featured functions that Superstar’s portal supports are reader’s comments, book reviews, reader’s personal digital libraries, etc.

The University of California in San Diego is the first library in North America to use its digital resources. Superstar is planning to set up a mirror site in the US in 2003.

Digital Projects by Libraries

Library service in China has lagged far behind that in Western countries. Many invaluable collections are not well preserved and processed, which makes it almost impossible for users to access them. Reference service is still very limited, especially in public libraries. The rapid development of DL provides libraries with a crucial opportunity to survive and grow. With the support of the digital content providers and the rapidly developing techniques of network and computer, libraries in China are actively integrating DL into their conventional services. Two outstanding examples are Shanghai Library and Guangdong Zhongshan Library.

Shanghai Library (http://www.library.sh.cn)

Serving the most populated city in China, Shanghai Library holds one of the largest collections in the world with many unique and treasured materials. It started with a digital conversion of its own rare books in 1997. Shanghai Library finished 7 digitizing projects and cumulated 200 GB of its own digital resources by 1999.

At the end of 1999, the Library imported the IBM digital library solution aiming to update traditional library and information services, to provide an infoport centre and a research and public library in an international metropolis. Now Shanghai Digital Library contains not only Chinese classics, but also historical local images and audio materials of Chinese traditional drama and opera. Its digital collection can be accessed by its registered users via the Web. Shanghai Library also designed an online cataloguing system for the Chinese materials on the Internet. It is hoped that this system will help with Chinese metadata applications.

Its branch libraries across the city take advantage of their rich resources and are attracting more users through electronic means. The special databases of various subjects are one of the main features in the city’s community library movement and have influenced many public libraries all over the country.

Guangdong Zhongshan Library (http://www.zslib.com.cn)

Facing an era of hybrid traditional and digital libraries, Zhongshan Library in Guangdong province has integrated 350,000 Ebooks and over 100 databases from a variety of digital content providers into its library portal. Now its circulation rate of digital resources is 10 times more than that of its print items. Every month, 4.6 million pages on average are downloaded, and 400 reference
questions are answered; over 2,000 periodical articles are delivered to its users who are not able to visit the library physically.8

The library workers have shifted their workflow into the digital world as well. They organised the digital collection by creating metadata and a cross-database search engine. Their users can access most of the major digital collections across the country and enjoy reference services provided online by librarians scattered all over the world. It is linked with the National Library of China, the Library of the Chinese Academy of Social Sciences, the Superstar Digital Library, and other libraries in the province.

Remaining Problems

As I mentioned at the beginning, China has the second most Internet users in the world after only the US. But that is only less than 3% of China’s population. Currently, about 95% of the information on China’s domestic Internet is from outside and only 5% is native. The potential demand for shared knowledge in digital format is incredible; and the future of DL in China is optimistic. However, the development is still at a very early stage, and the following problems should be taken into account by the future developers.

1. Poor quality and no standards

“We are building up a house quickly without considering much about the usage and appropriate strategies” said an expert in China. Many overlapped digital collections are being created; some fragmented and non-interoperable digital systems are being developed. Despite 100 so-called DL programs in China, there are not that many large-scale public databases available. Some materials of the public interest have their digital format, but free access is not available to Internet users. In this aspect, Taiwan is leading the way. On the other hand, some useful and free Chinese resources on the Internet are not well organized and properly presented to users. The users’ needs so far are not considered as the focus of the development.

2. Legal issues

Legal issues are called the “bottle neck” of the further development of DL in China. According to the Copyright Law, only publications that are more than 50 years old are not protected by copyright and have constraints on their use. Early in 2002, Professor Chen Xingliang of Peking University won the first copyright lawsuit against the China Digital Library. This case sent out a clear warning to all the DLs in China that they need to abide by the law even if they are in the non-profit and public welfare sector.9

The case caused heated debate about the inevitable but seemingly elusive digital future. Now the major DLs that were mentioned above are actively seeking the authorisations from individual authors. They are also working with the National Copyright Protecting Centre on a collective license program. In this program, the fees charged to users are used to pay for this collective license. Balancing the interests of the owner, user, and society will be crucial to the growth of the DL projects.
3. Slow and congested infrastructure

The government and the communication industry are making substantial investments in broadband networks. But compared with the growing demands for more Chinese materials on the web, the networked information environment has a huge space to improve. Digital divides between the Southeast and Northwest and between the rich and the poor also need to be bridged.

Conclusion

Digital library projects sprang up in China despite some problems such as poor quality and legal infringement. The drastic DL development will obviously challenge the Chinese studies librarians here in North America, while it provides us with opportunities as well. Are those digital libraries in China pulling the users out of our East Asian libraries? Are we ready to integrate those DL products into our traditional services? How are we going to gain financial support in acquiring digital collections? What are our strengths in this competition with those information service providers in China? Are there any ways to collaborate with them instead? While many questions remain, we should definitely follow up on the promising beginning of digital libraries in China.

NOTES

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