

Transforming resource sharing in a networked global environment

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Digital Collection Development and Sharing on a National Scale: A Case Study of the Digital Library Promotion Project

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Abstract:

Digital Library Promotion Project is a digital culture boosting project launched by the Ministry of Culture of the People's Republic of China with National Library of China as its implementing unit. The project aims to build a nation-wide library network that could support and guarantee resource development and sharing among public libraries all over China, so as to achieve equalization in public culture service among people from different parts of the country.

This paper is a case study of digital collection development and sharing in a developing country where regional differences are large. The paper starts with the environmental scan of the resource situation of public libraries in China, which is the background and significance of the Digital Library Promotion Project (DLPP). The main part of the paper is the introduction and analysis of the collection developing method of the DLPP, including: union catalogue, co-construction of featured resources, Joint procurement of databases. Through analyzing the mechanism in collection development and sharing, this paper discusses the measures that guarantees the success of the project, these are: sustained financial support from the government, scientific mechanism for cooperation, unified standards in resource development and targeted training programs. The future development of the program is discussed at the end of the paper.

Keywords: Digital Resource Sharing, Resource Co-construction, Public Libraries, National Level.

1. Problems of Digital Collection Development of Chinese Public Libraries

Chinese libraries has been devoted to the digital library research and construction since the 1990s. Digital resource development is the core work of digital library construction. According to a survey done in 2013, the digital resources had totalled more than 5,050TB among provincial and city libraries in China, which is the best embodiment of the achievements done by Chinese public libraries in their efforts to meet the changing needs of people in this information era.

According to the survey, 90% of the provincial libraries and 53% of the city libraries developed their own digital collection. There are mainly two ways for libraries to do so. One way is by purchasing databases with information agencies both domestic and international. The other way is to organize their own databases by digitization or network harvesting based on their own regional cultural characteristics. Many of the libraries employed both of the ways. By doing so, the public libraries rapidly developed a large number of digital collections rich in contents and types, and provided user with splendid Chinese culture and excellent digital reading experience. Beside all these achievements, in a national level, there were still many problems to be solved.

Resource Repetition

Resource repetition is common among public libraries due to the lack of coordination in resource planning. For example, many libraries purchased the same database with limited using rights, and some libraries built similar databases based on the same historical figure or events, such as the anti-Japanese war. Resource repetition wastes money and efforts in collection development.

Resource Isolation

Many collections developed by the libraries are of great historical and local values. But they were not well used due to the lack of publicity and means for discovery. If there were a universal discovery system that can provide access to different kinds of digital resources stored separately in different libraries, the usage of the resources could be greatly improved.

Lack of Unified Standard

There were no unified standard in digital collection development among public libraries in China. In this condition, many libraries created their own standard, as a result, many resource were incompatible not only in data structures but also in retrieval languages and retrieval interfaces, which pose great challenge in resource exchange and integration.

Copyright Issues

Copyright issue is one of the main problems that hinder the rapid development of digital library, especially in digital collection development. Most of the libraries lacked awareness and experienced in dealing with copyright issues. They urgently needed some guidance in ideas and practices, at the same time, push forward the legislation and law enforcement in the copyright issues.

2. The Implementation of Digital Library Promotion Project(DLPP)

In order to bridge the information gap between public libraries, construct a one-stop search and discovery system, and promote the construction of a unified library service system covering the whole country, the Ministry of Culture and Ministry of Finance jointly launched the Digital Library Promotion Project in 2011. The mission of the project is to build a nationwide library system that could support and guarantee resource development and sharing among public libraries all over China, so as to better meet the people's growing cultural needs, and achieve equalization in public culture service among people from different parts of China.

The project is to be completed in five years, and the whole process is divided into 3 stages. The first stage is the foundation construction stage, in which the infrastructures such as the

software and hardware, virtual and private networks are constructed. The second stage is the collection development stage, in which a series of distributed digital collections are developed through co-construction and sharing. The third stage is the upgrading stage, in which a multi-level, diversified, and personalized digital library service platform is constructed to meet people's ever-changing needs.

Digital collection development and sharing is the core part of DLPP. In the process of collection plan and development, the principle of "Universal discovery, Co-construction and Sharing" is strictly observed. Resource co-construction and sharing can not only enrich the availability of the resources for individual library and greatly improve its service scope, but also boost the overall development of librarianship and accelerate the process of modernization in library field. In the joint effort of the member libraries, the project is to make effective integration of the isolated, differently structured collections, and develop a number of digital collections with featured themes, various types and well-organized structures. Through the resource sharing platform the DLPP constructed, the collections are to be available to users in all parts of China.

3. Collection Developing Method of the DLPP

The DLPP has been concentrating on resource co-construction from the year 2013 on. There are more than 300 public libraries (provincial and city) participated. Base on the situation and needs of the libraries, there are mainly 6 programs introduced involving library businesses in catalogue, digitization, web archive, database construction and public education. In terms of construction method, the DLPP mainly introduces three ways: union catalogue, construction of resource and joint procurement.

3.1 Union Catalogue

Union cataloguing is the best way to avoid resource isolation and expand discovery. In this way, a shared discovery and delivery platform is deployed to bring together catalogues from member libraries under one search. Thus, the DLPP can virtually collect a large number of available resources in a short period of time, and provide universal discovery to the public.

Metadata Repository Program

Metadata repository is one of the integration program that provides users with search experience built on a central index of metadata representing millions of articles, books and other information resources. As mentions above, different libraries adopt different metadata rules for their resource description, which pose great difficulty in data exchange and integration. Besides, different libraries store their metadata respectively, users have to go to different platforms to search for information. The metadata repository program is introduced to gather and integrate these scattered metadata so as to support unified discovery of resources in different libraries.

The libraries participated in this program are required to transform their metadata according to the DLPP metadata rule. The DLPP collects the transformed metadata and integrate them into a repository. Based on this repository, a discovery system is developed to make discovery of resources in individual libraries. This practice of "centralization of metadata, dispersion of resources" can greatly promote the discovery and acquisition of local resources, and provide big convenience to users with a one-stop discovery. Up to now, there are more than 200 libraries participated in the program. In the joint effort of these libraries, more than

340 thousand metadata have been gathered, which laid solid foundation for the resource sharing among public libraries .

Unified Identifier Program

The unified identifier program is another program supporting digital resource exchange and integration. In the construction of this program, member libraries are required to install a software which can automatically generate a code for each piece of resource. The code is unique, permanent, and is regarded as a kind of metadata of the resource. The resource should be first published before being given a identifier. The identifier is closely associated with the URL information of that resource, so that resources of any systems, regardless their type, structure or location, can be located and exchanged efficiently and effectively. The coding rule of the identifier is developed by the National Library of China, and is abided by member libraries. It is hoped that through the enforcement of this program within the DLPP domain, the unified identifier could be popularized all over the country.

So far, a total of more than 100 libraries participated in this program, more than 15 million pieces of resource have been assigned with unique identifiers. This program can greatly improve the efficiency and accuracy in information exchange and transfer, and promotes the effectiveness of resource sharing.

3. 2 Co-construction of Resources

The second way of collection development is the co-construction of resources on certain themes proposed by the DLPP. In the process of cooperation and coordination, the libraries can effectively avoid repetitive construction of resources and develop a number of large-scale and well-structured collections.

Document Digitization Program

Digitization is one of the most original and important way for libraries to develop their digital collections. It can give full play to the library collections and enrich the types of library collections. Besides, through the digitization of some rare and endangered literature, the libraries can achieve long-term preservation of the cultural heritage.

The aim of the document digitization program is to collect and preserve documents with distinctive regional characteristics and high historical and literature values. The documents to be digitized mainly include local chronicles, documents of historical and cultural values, and precious books, journals and newspapers written in minority languages. Within the scope of these literature, the participated libraries are required to submit a list of documents with copyright certifications. The DLPP makes examination of the documents on the lists, remove the duplicated ones, and return to respect libraries with a final list for digitization. The libraries then do the digitization according to the rules set by the DLPP. The digitized versions together the metadata are required to be handed to the DLPP for integration and further service. At the same time, member libraries can put these digitization into service locally.

This program was first introduced in 2014, a total of 196 libraries participated, and about 4.8 million pages of digitized document were completed by the end of 2015. These resources are the main achievements of DLPP co-construction, which are also the best embodiment of featured resources of Chinese libraries.

Web Information Archive Program

The web information archive program concentrates on the collection of government information, which are an important component of the national information resources to the public and the society. The amount of information produced by the governments are extremely large. Besides, they are produced by different institutions with different standards and data formats. The dispersion and incompatibility of these resources pose big difficulty and inconvenience for people to use. Libraries are specialized in information organization and integration, with powerful integration systems and knowledge organizing tools, the libraries can make good organization and preservation of government information and provide better access to the public.

In the construction of this program, the DLPP adopts the "cloud service" concept, in which the DLPP provides a unified platform. Based on the uniform, the National Library of China is responsible for the cataloguing and integration of central government information, and the provincial and city libraries collect the information of their local governments respectively. With this division of labour, the DLPP can not only collect government information of all levels with great efficiency, but also help local libraries set up their online government information services.

Member libraries have great enthusiasm in participating this program. There are totally more than 400 libraries participated and a total 5 million pieces of government information have been integrated and put into service in these 3 years. Users can get access to the resources by the website named "Chinese Government Information Integration and Service Platform", the page views of which have reached 80 million times in 2015 alone.

Library Open Lecture Program

The Open Lecture program is introduced as a new form of library's educational service based on the concept of MOOC(Mass Open Online Course). The aim of the program is to construct a series of library lectures with shorter length, more interaction and more online toolkits to support individual learning compared with traditional lectures. Library open lecture is an attempt of the libraries adapting to the characteristics and needs of people in the MOOC era by making full use of libraries' advantages in resource and lecture organization. The National Library of China has made preliminary attempts in the lecture planning, organization and service. Based on the standards developed, the DLPP introduced this program to its member libraries. There is no constraint on the contents of the lectures. The member libraries make lectures based on their resource and regional characteristics according to the rules set by the DLPP. All of the lectures should be allowed to use within the DLPP domain in terms of copyright. The DLPP makes organization and integration of the lectures, and put them into service to the public.

This program was introduced in 2015 with 141 libraries participated. About 12 thousand lectures can be finished by the end of 2016.

Construction of Database

China is a large country with a variety of splendid cultures, most of which are collected and preserved by local libraries. According to a survey, 95% of the provincial libraries constructed their own databases of featured resources, the types of which are of different kinds, including text, picture, audio, video and other types of multimedia. In addition to these well-organized collections, there are many other precious resources to be organized due to the lack of money or techniques. The DLPP introduced this program to support member libraries to continue with their database construction. Although there is no specific requirement on the

content or resource types, the databases should be content-centered and well organized which calls for great competence of the participating libraries in resource collection, organization and integration. For this reason, member libraries have to apply with detailed construction plan. After approved by the DLPP, the applying libraries can carry out their plan with financial supports.

This program is also a newly introduced program, with only 15 provincial libraries participating. The finished database can either put into service on the DLPP platform or provide access locally.

3. 3 Joint Procurement

In addition to self-developed collections, the procurement of databases provided by the information agencies is also an important way for the libraries to develop collections. As mentioned in the previous chapter, repeated procurement was very common among public libraries due to the lack of coordination in the purchasing stage. In this condition, joint procurement of databases is highly necessary. It can not only save money, effort and time, but also promote resource sharing among member libraries.

The DLPP has been actively organizing and promoting joint procurement since the beginning of the project. By the end of 2015, there were totally 26 databases accessible to all member libraries, including 1.53 million books in both Chinese and foreign languages(including more than 700 kinds of ancient books), more than 450 kinds of Chinese and foreign periodicals, 300 kinds of Chinese newspapers, 140 thousand images, 100 million pieces of music, 5,000 videos, 100 kinds of Chinese reference books and 70 thousand courseware for children and teenagers. The DLPP focuses on the purchase of databases on basic disciplines, as a kind of indemnificatory resource to member libraries. Some of the resources(mainly foreign languages) are purchased with “national license”, in which users in every parts of china have access to the resources. The rest of the databases are allowed to be accessible within the range of the DLPP through the private network.

4. Resource Sharing

The original intention and ultimate goal of the DLPP is to construct a resource sharing network among public libraries. With the tremendous amount of resources co-constructed and integrated, the DLPP has always been exploring a resource sharing mode between member libraries. “providing service in accordance with construction” is one of the principles developed in the process. For this cause, the DLPP constructed a private network for information exchange and resource sharing. Through this network, libraries can upload and download resources with more safety and efficiency, and can also get access to all the joint-purchased databases. Besides, a Unified User Management System(UUMS) was developed to combine all user information of member libraries into one user database, by which users, regardless their location, can get access to shared resources according to their rights assigned. By the end of 2015, more than 250 libraries get access to the shared resources trough private network, and 58 libraries have their users included into the UUMS. Up to now, the DLPP provides more than 140TB resources both self-built and purchased for public access, resource types includes: books, periodicals, newspapers, dissertations, rare and ancient books, reference books , audio and video materials and so on.

In terms of sharing method, the DLPP actively adapts to the multimedia environment, and take the lead in developing mobile library with cell phone and home library with TV. By the end of 2015, about 150 libraries got access to the resource by plugging into the mobile service system, and 8 libraries got access to the resources of TV library.

China is a large-populated country with 55 ethnic minorities with different cultures and languages. The DLPP attach great significance in the resource sharing with the minority groups. Resources in minority languages such as Mongolian, Uygur language, Tibetan, and Kazakh are specially organized. Because most of the minority regions are not well developed in network infrastructure, the resources are burnt into hard disks and disseminated to them by post. Up to now, more than 40TB resources have been shared in this way.

5. Implications

The resource development programs of the DLPP were launched in 2013. In the joint efforts of the member libraries, significant results have been achieved. The quantity of resources retained by individual libraries has been greatly improved. In the national level, a series of databases with a variety resource types and contents of significant regional characters have been built, and a national resource preservation system had taken its initial shape. The DLPP and individual libraries respectively carried out specialized and layered service for researchers, enterprises and institutions, army, special groups, ethnic minorities and other groups based on the resources co-constructed and shared. The service effects is becoming increasingly prominent, only in 2015, the visits of the DPLL website had amounted to more than 7.9million times. There are some implications can be drew from the success of the DLPP:

5.1 Sustainable Financial Support

The construction of DLPP is supported by the national finance, which is composed of central finance and local finance with certain ratios according to the local economic condition. The Ministry of Finance and Ministry of Culture are responsible for the management and distribution of the funds, which guaranteed the sustainable development of the project. By the end of 2015, more than 150 million Chinese Yuan had been invested to promote resource development. The investment increases steadily every year, with 6.3 million in 2013, 38.4 million in 2014, and 103.65 million in 2015. The money went to 33 provincial Libraries in 2013, 147 provincial and city libraries in 2014, and 272 provincial and city libraries in 2015, covered almost all of the public libraries above the city level in China .

5.2 Scientific Mechanism for Cooperation

The DLPP employed a three level(national-provincial-city) hierarchical cooperation system, in which the National Library of China is responsible for the organization and actual management of the project, including making annual plan, setting up working standards, and providing training programs; provincial libraries are mainly responsible for the management in the provincial level, including making supervision and guidance to the city libraries; city libraries are responsible for carrying out the plans set by the national and provincial libraries. In addition, the DLPP set up an expert committee for consultation and decision-making on key issues in the process of development.

In the process of resource construction, the DLPP makes overall construction plan annually with specific theme and detailed working processes and standards. The provincial and city libraries choose to participate in certain programs according to their own collection developing plans. By the end of the year, the DLPP assesses the construction outcomes of

each library to decide the work load of the next year. The National Library of China is responsible for the integration of resources and actual construction of the universal discovery platform. All the resources constructed by member libraries can be used within the DLPP domain without any condition.

5.3 Unified Standards

Standards and Specifications of resource construction are the basis of digital library, and they are also essential prerequisite to achieve coordinative development of resources. The DLPP attaches great importance to the construction of standards, the principle of "standard first" is strictly observed. The National Library of China has developed more than 30 kinds of standards in the process of its own digital library construction, including standards on unified identifier, object data, metadata, knowledge organization, resource evaluation and so on. Based on these standards, the DLPP developed its own standards supporting the universal discovery, description, process, organization, management and preservation of various kinds of resources. The standards are universal, in concord with international standards, at the same time, they are custom to meet the actual needs of DLPP resource construction. The standards are the basis of the DLPP resources co-construction, and guaranteed the success of the project.

5.4 Targeted Training

Staff training programs are essential part of the project construction, which provides a platform for staff members to get instructions, and communicate with each other in term of working practice. The DLPP provide various targeted training programs annually in accordance with the main tasks of the year. Big classes are often held at the beginning of the year to introduce the plan of the whole year to all members. Various small and professional classes are provided to solve practical and personalized problems of certain programs. Besides, the DLPP also encourages the provincial libraries to hold individualized training programs to the city libraries by providing corresponding teachers. In addition to the onsite trainings, online courses are provided to all member libraries on subjects from sight-opening lectures to detailed operational instructions. The training effects are very prominent. According to the statistics done in 2015, 21 onsite trainings were held with 2100 staff participated, and the online training program expanded the training coverage to nearly 50 thousand people. A team of talented people with professional knowledge and practical skills on digital library is formed, which provides solid personnel guarantee to the DLPP development.

6. Future Development

The DLPP is a big systematic project, which not only promotes the construction of digital library, but also pave ways for the construction of cultural infrastructure of a nation. In the future development, the DLPP will actively make full use of new technologies in its construction and service, including Big Data, Cloud computing and internet; attach more importance to the effectiveness and efficiency of library service in order to guide the green sustainable development of digital library; improve the cooperative mechanism and promote the coordinated development among public libraries of China.

References

- [1]. Baileyhainer B, Beaubien A, Posner B, et al. Rethinking library resource sharing: new models for collaboration[J]. *Interlending & Document Supply*, 2014, 42(1):7-12.
- [2].Li Xiaoming. A Study on the Development of Chinese Digital Library: Case Study of Provincial and City Libraries. Publishing House of National Library of China, 2014: 71-74.
- [3].Li Xiaoming, Jiang Xiaoxi, Han Meng. Analysis on Patterns of Resources Co-Construction and Sharing of the Digital Library Promotion Project. *Journal of the National Library of China*,2012(5):20-26.
- [4]. Liang Huiwei, Sa Lei. A Study on the Government Information Co-Construction and Sharing in Public Libraries. Publishing House of China National School of Administration, 2013:24-27.
- [5]. Wei Dawei, Liu Jinzhe, Xue Yaoyu. Using the Digital Library Promotion Project as a Driver: Construct a Country-Wide Digital Library Service Architecture. *Journal of the National Library of China*,2012(5):14-19.
- [6]. Xiao, L., & Yao, X. X.. Research on Group Purchase of Digital Resource in China. *Journal of Library Science in China*, 2004 (5):31-34.
- [7]. Yao Xiaoxiao, Zhu Qiang. An Overview of Resource Sharing Activities in China. Paper presented at IFLA World Library and Information Congress 2015, 15-21 August, Cape Town, South Africa (<http://library.ifla.org/1171/1/139-yao-en.pdf>)