An overview of current document delivery and interlibrary loan services of Chinese libraries

JIA Ping
National Science Library, the Chinese Academy of Sciences, Beijing 100190, China

Abstract  In this article, the author introduces the basic information and the historical development of document delivery and interlibrary loan services conducted by Chinese libraries at different organizational levels and in different geographical areas. It compares and analyzes the commonalities, peculiarities and service-effectiveness of three most important systems of document delivery and interlibrary loan currently available in China. The author also discusses the developing trend of such services in the future.

Keywords  Document delivery, Interlibrary loan, Resource sharing

As an important type of cooperation and mutual support among libraries, library resource sharing is a reasonable way to readjust the uneven distribution of library resources, to refine the work of information service, and to optimize the rate of library resources utilization. Resource sharing in modern times is a kind of collaboration based on shared-resource construction. Nowadays, as the network information environment and resource construction grow rapidly, the resource sharing has become a developing trend in the arena of information services not only in China but also on a worldwide scale as well. Document delivery and interlibrary loan services are the most efficient and effective mechanism for realizing the service objectives of resource sharing.

1  Background of development of current document delivery and interlibrary loan service

Strengthening the cooperation between libraries not only can reduce the redundancy of library resource procurement and/or development, but also can increase the capability to know and to get a hold of the desired piece of information/document by harnessing the desired information or documentary resources in any type of format via the Internet. Such cooperation appears to become more important in the networked information environment.

Interlibrary loan is a traditional form of sharing of documentary resources between two libraries. Libraries get to know the bibliographic information of collections of other libraries by means of searching a union catalogue to get the specific bibliographic

Correspondence should be addressed to Jia Ping (E-mail: jiap@mail.las.ac.cn). The author would like to express her sincere thanks to Prof. Charles C. Yen for the language revision.
information at a given holding library, then sending a book loan request to that library. It can be a regular mail, an express delivery or a transportation system within the established library network. Such interlibrary loan service has been in existence for a long time in the Chinese and overseas library circle. Interlibrary loan has realized the resource sharing between libraries. The document delivery means a kind of service of delivering the documents needed by the user from the document source to the user. As the networked information technology develops, another type of “interlibrary” loan grows into a new service model of resource sharing and shared information reconstruction. Document delivery and interlibrary loan services under the networked information environment are enjoying the advantage of simplicity, swiftness and convenience in operation, which are ideal[1] for realizing resource sharing between libraries. The rise of the networked information environment has drastically altered the service mode of libraries in terms of depending on the strength of one particular library’s collection in meeting users’ information demands to a new mode of operation among libraries for shared resource development, mutual knowledge exploration and also for mutual enjoying the benefit of such cooperation.

In past ten years, the Chinese library circle has paid much attention to document delivery and interlibrary loan services. Many libraries have already started to experiment the document delivery service, which is to form a new vision of development in this area augmented with the integration of theories and practice for document delivery and interlibrary loan service.

2 Current development of document delivery and interlibrary loan services of Chinese libraries

A few large international document delivery service organizations came into being between 1970s and 1980s. They enabled the computer to provide remote information retrieval. As a result, users could find the desired documents and obtain copies of original documents instantaneously via remote online retrieval, which constituted much of early electronic interlibrary loan service.

In 1990s, delivery service for a single piece of document was developed in China in line with traditional interlibrary loan service. The National Science Library of the Chinese Academy of Sciences set up a Document Supply Center in 1991, which was the first library providing such service. The National Library of China (called Beijing Library then) also set up a Document Supply Center in 1995. Furthermore, a few university libraries such as Tsinghua University Library and Peking University Library also provided such service at this time one after another. From then on, the document delivery service of Chinese libraries has been in remarkable progress continuously.

2.1 Three systems of document delivery and interlibrary loan services in China

Communication and computer technology boost the development of document delivery and interlibrary loan services. In recent years, with swift growth of
information and network technologies, a few well-known international libraries or information service organizations, like British Library Document Supply Centre and German SUBITO document delivery service system, have provided users with document retrieval and delivery service through online network. Similarly, there are also a number of document delivery service systems and service mechanisms, which are based on online network environment in China that has also greatly promoted the development of document delivery and interlibrary loan in China.

At present, there are three prominent systems of document delivery and interlibrary loan being selectively used by Chinese libraries. These systems include the following, namely, the document delivery systems of 1) National Science and Technology Library (NSTL), 2) Chinese Science Digital Library (CSDL) and 3) China Academic Library & Information System (CALIS), which express concretely the content of library resources and service sharing and support mode under the online network environment in China. These three document delivery service systems are established by different organizations in different locales for different users. In spite of their different construction backgrounds, they have the same construction purpose: that is, to take full advantage of the online network environment to maximize the shared resources development and to enjoy the benefits together as a result of such endeavors in providing information service via an online network platform.

The practical use of any of these three systems among Chinese major libraries in recent years amply demonstrates that some special characteristics in the development of modern information technology system and service mechanism under the online network environment are being established in China. It also represents the fulfillment in a significant way as well as on the developing trend of current document delivery and interlibrary loan operations among Chinese major libraries.

2.1.1 The document delivery system of National Science and Technology Library (NSTL)

The Ministry of Science and Technology, based on the principle of “unified procedure for purchase, standardized procedure for processing, and open access to the networked online information”, led in 2000 the establishment of the National Science and Technology Library (NSTL), which is a virtue library for providing sci-tech document service, including those of the following 9 document information organizations: 1) National Science Library of Chinese Academy of Sciences, 2) Chinese Institute of Science and Technology Information, 3) Mechanical Engineering Information Center, 4) Metallurgical Engineering Information Center, 5) Chemical Engineering Information Center, 6) Library of the Chinese Academy of Agricultural Science, 7) Library of the Chinese Academy of Medical Science, 8) Library of National Institute of Standards and 9) Library of National Institute of Metrology. NSTL focuses on the construction of document information resource system, the revealing and reporting of document information and the construction of document information service system. NSTL network service system provides users all over the country with complete document information service. Academia, education organizations,
government agencies and all types of libraries as well as their end-users in China can obtain the document/information services offered by NSTL through the Internet[2].

2.1.2 The united service system of Chinese National Science Digital Library (CSDL)

Established in 2002, the United Service System of Chinese National Science Digital Library is a supporting platform for uniting the distributed, and expandable scientific research information coming from all levels of information sub-organizations within Chinese Academy of Sciences, to provide scientific researchers with reliable, convenient, customized, digital and networked online information service. Document delivery and interlibrary loan services are a sub-project in the CSDL overall construction project, aiming at realizing the document resource sharing within the entire Chinese Academy of Sciences and also making full use of any possible resources beyond the Academy so as to form a secured system within the Academy for document delivery and interlibrary loan services. CSDL consists of more than 120 members including but not limited to the headquarters and branches of National Science Library of Chinese Academy of Sciences as well as the libraries of all the institutes of Chinese Academy of Sciences. It serves scientific researchers, graduate students and libraries at all levels of the Chinese Academy of Sciences. Its establishment is an important symbol of having a preliminary securing system formed in accessing desired information and document resources.

2.1.3 Document delivery service of China Academic Library & Information System (CALIS)

China Academic Library & Information System (CALIS) is, under the aegis of the Ministry of Education, a united document assuring system for the storage and retrieval of higher education based documentary resources. It is the fruitful result of an undertaking in attracting abundant document and labor resources invested by the country in colleges and in adopting advanced applicable information technology and modern library theory to have developed the China Academic Digital Library & Information System as the core of such a document assuring system. It realized collaborative resource construction, joint knowledge exploration and benefits sharing to maximize social benefits. CALIS, through document delivery and interlibrary loan service, provides its member libraries and all individual teachers and students with rich information resources and services and it gives assurance for providing adequate information and document resources for academic research and teaching in institutions of higher education in China[3].

2.2 Regional interlibrary loan system

The successful development of these three notable systems of document delivery and interlibrary loan services also stimulated the growth of similar operations in several
An overview of current document delivery and interlibrary loan services of Chinese libraries

JIA Ping

An overview of current document delivery and interlibrary loan services of Chinese libraries

Progress Reports

National Science Library,
Chinese Academy of Sciences

geographical regions of China, which were based on the service alliance of libraries in a given region. Regional alliance of libraries (or library consortia) is a cooperative organization established within one particular region or among several regions of mutual proximity with the purpose of promoting the development of libraries within the region, the collaborative construction and mutual sharing of information/document resources and the cooperation and communication between libraries within the region[4]. Moreover, document delivery and interlibrary loan is just an effective way in actualizing such collaborative resource construction and sharing among libraries of a regional alliance or consortium.

Now, some regional alliances of document delivery and interlibrary loans also play a significant role in such library service. For example, the document delivery and interlibrary loan system of Shanghai Online Academic Library, the document delivery and interlibrary loan system of Beijing Academic Net Library and Jiangsu Academic Library Information System all provide document delivery and interlibrary loan services in their respective regions. The constructions of such regional service systems greatly enhance the document delivery and interlibrary loan services in the nation as a whole.

2.3 Centralized document supply service by a single library

In addition to the above mentioned interlibrary loan systems, document supply service is also rendered by a host of individual public libraries. For instance, the Document Supply Center of National Library of China and that of Shanghai Library, who by way of adopting the mode of the British Library Document Supply Centre, are providing document delivery and interlibrary loan services to people of all walks of life in the society with the unique strength of their own collection resources. Such is the centralized document delivery service mode, which is more suitable for large libraries with rich library resource collections to operate in scale.

Document delivery and interlibrary loan services have shown steady growth in various modes of operation in different regions in China. They have an important role to play. In short, the creation and development of these three mentioned systems of document delivery and interlibrary loan service including their singular important role in actual service indicate that the growth of these three systems — NSTL, CSDL and CALIS, represents the progress being made in the area of document delivery and interlibrary loan service in China.

3 Development of document delivery and interlibrary loan service system

We can see that all these three nationwide systems of document delivery and interlibrary loan service, namely, NSTL, CSDL and CALIS, have actually achieved more rapid development, wider influence and an enviable track record of success among its peers in the practice of Chinese document delivery and interlibrary loan service in recent years. Their development, from the perspectives of different administrative
levels and in different regions, represents the course of development and unique characteristics of Chinese libraries’ document delivery and interlibrary loan service.

3.1 Commonality of service organizations and capabilities of major systems of document delivery and interlibrary loan services in China

The commonality of three major systems of document delivery and interlibrary loan will become instantly apparent once when we analyze and compare their background of development, service object, service mechanism and system capabilities.

3.1.1 Common purpose of service construction

Along with the rapid development of science and technology, published materials in various formats and in each and every subject fields have increased in such an enormous quantity with such an accelerating speed that no library can, nor they should, collect all desired library materials. It is only through closer cooperation among libraries to make full use of one another’s unique collections and service programs and also to tap the information resources of the whole society that a higher level of meeting the society’s general information demand can be assured. It has already become a piece of daily conversation to talk about meeting library users’ satisfaction for their immense information demands and about the need for library resource sharing. Owing to unbalanced regional economic development in China, the information needs of the populace can be met to a certain extent within the confines of a certain region/district if the principle of library resources sharing can be materialized through the establishment of the document delivery and interlibrary loan service systems in different regions. Such is precisely the common objective of the creation of the document delivery system of NSTL, the interlibrary loan and document delivery system of CSDL and the interlibrary loan system of CALIS in China.

3.1.2 Web-based information service systems

Users’ demand for information has changed greatly under the network environment. They want to obtain comprehensive, multifarious and customized information service in a convenient way through online network; to realize online information searching and business transactions of request and supply of documents between them and libraries. Technological advancement has brought the efficiency and quality of information service to a higher level of statement, which in turn has substantially promoted the transformation as well as the rapid development of interlibrary loan and document delivery services of traditional library practice. The three systems of document delivery and interlibrary loan — NSTL, CSDL and CALIS — have changed the traditional service mode by taking the lead in realizing document delivery and interlibrary loan services under the networked online environment. They have made it possible to handle the online request of documents by users and the supply of documents by libraries.
3.1.3 Abundant document resources

All the NSTL, CSDL and CALIS are document delivery service systems created separately by several of national libraries which have altogether contributed much to the abundant document resources of each and all of such systems. The significant common characteristic of these three systems is displayed mainly in the following two aspects.

(i) Document resources consisting of various subject disciplines  The preliminary search of the document delivery and interlibrary loan system of National Academy of China is based upon the Union List of Serials which embodies nearly 100 thousand journals in Chinese, Western languages, Japanese and Russian collected from 499 libraries and document centers including all the library information agencies and institutional libraries of the Chinese Academy of Sciences, libraries of some colleges, public libraries and specialized libraries, of which about 100 libraries that formed as core library group are subsidiaries of the Chinese Academy of Sciences. The core unit establishes the document delivery and interlibrary loan system of the Chinese Academy of Sciences. Users can access those journals in Chinese, Western languages, Japanese and Russian collected in Chinese Academy of Sciences by searching the union catalogue and obtain the documents listed in the union catalogue and beyond the serial holdings of the Chinese Academy of Sciences via the information service. Documents in this system cover a wide range of subject fields[5].

NSTL cooperates with 9 libraries including the National Science Library of CAS in processing the data of their collected document resources uniformly and normatively, to form a virtual document center covering four subjects — science, engineering, agriculture and medicine in which users can search and access documents in full text. The center contains over 53 million articles abstracts since 1995 and provides an access through which requests can be made directly. It broadens the range of available resources and makes up for the deficiency of retrospective the processing of resources[6].

CALIS covers the widest range of subjects, including natural sciences as well as abundant documents about humanities and social sciences. It contains rich resources in four subject fields, which are art & sciences, engineering, agriculture and medical science, making it possible to access not only printed document resources but also electronic resources in various degrees as they are procured under a joint program[7].

(ii) The diversity of document types  The wealth of the document resource is also embedded in the diversity of document categories, and any one of NSTL, CSDL or CALIS provides document delivery service in a variety of documents categories. Apart from books, periodicals and conference proceedings, NSTL also includes such document categories as technical reports, dissertations, patent documents, standard documents, etc. With the steadily rising demands of documents and increased user expectations, the resources recorded on the union catalog often do not meet the demands of users. CSDL in recent two years has expanded its access channels for
getting varieties of document categories such as the technical report, conference document, standard document and dissertations in its document delivery service. It provides over 320 million document searches, thus assured special document demands of users are met according to the special demands of users. In addition to the normal document delivery service rendered for periodicals document in Chinese, Western languages, Japanese and Russian as well as the conference documents in Chinese and Western languages. CALIS provides a variety of document delivery services such as current periodicals in Chinese and Western languages, dissertations in colleges and universities, conference papers in colleges and universities as well as technical reports\(^5\textit{-}\textit{7}\).

The availability of diversified document categories provides possibilities for meeting users’ expectations for a range of document category delivery service, which in turn make the users group become increasingly larger.

**3.1.4 Great capability for information retrieval**

Under online network environment, users do not only hope to receive information services from local libraries via online network, but also hope to receive the information services from libraries in different regions or countries. As far as meeting users’ document demand is concerned, users are not satisfied with the receipt of document clue in time, they expect to receive the full text of the document instead on their desktop right away. Therefore, it is the powerful document retrieval function that provides clues for users to receive documents on the basis of abundant resource, which are important contents for the construction of document delivery as well as interlibrary loan system.

**(i) Offering second-tier document retrieval** The member libraries of NSTL make the standard data processing collaboratively to create an abstract database for the collections of all member libraries including a variety of document types. It provides retrieval capability by searching article title or by way of scanning periodicals content pages resulting in bringing much convenience for users to acquire the full text document.

CALIS system provides 7 searching possibilities such as searching the table of contents of current periodicals in Chinese and Western language, the dissertation abstract database in colleges and universities, the conference papers database in colleges and universities and the union list of serials, etc. CALIS’ own document delivery system does not provide automatic document retrieval service. The user once identified the desired item on the database, can request his local affiliated library to obtain the item through interlibrary loan\(^3\).

**(ii) Offering union catalog retrieval** As the resource sharing mode of document delivery is adopted, the CSDL document delivery and interlibrary loan system collaborates with over 100 libraries of CAS to jointly launch the document delivery services. Its information retrieval system is based on a union catalogue of periodicals in Chinese, Western languages, Japanese and Russian. This union catalog collects
more than 100 thousand of periodicals in Chinese, Western languages, Japanese and Russian from the periodical holdings of 499 libraries throughout the country, which the document delivery system of CSDL is based upon. End-users submit the document delivery requests directly through searching of the online union catalog. NSTL also provides the searching function of the union catalog of 9 member libraries. Although CALIS offers union catalog searching as well, full-text could not be obtained via the retrieval result. It could only be obtained via a document delivery clerk.

The searching functions of the two above mentioned document deliveries fully display the important roles of collaborative undertakings among libraries for indexing and data processing in the network environment.

3.1.5 Government subsidized operation and cost reduction for service rendered

The three systems, NSTL, CSDL and CALIS, are the major domestic document delivery and interlibrary loan services systems and they serve their users in different subject concentrations. The government provides subsidies in different degrees and in various ways in order to attract more users to use the service system at a reduced cost. Thus these three systems are able to benefit research and development personnel, teachers and students of colleges and universities as well as scientific and technological workers to obtain desired documents. This is one of the shared common features of the three systems and their major attraction to users.

3.1.6 Formulating policies for copyright protection

The document delivery service policies clearly specify that the service can only be rendered to individuals for study and research purposes, not for commercial purposes. This is the service policy for all document supplying centers and document delivery systems. There are also such policy statement in the document delivery and interlibrary loan service systems of NSTL, CSDL and CALIS. This policy plays an active role for protecting copyright and intellectual property right. Moreover, each system has taken a restrictive measure of its own. For instance, NSTL clearly states that the copying service is provided only to those individuals for their study but not for profit-making purposes. The user shall be responsible for the piracy of copyright in case of overstepping the boundary of “reasonable use”. NSTL shall reserve the right to reject the requests or cancel out the right of user’s original text-copying requests in case that the request of this user oversteps the scope of “reasonable use” stipulated in the copyright law. Such statement and service policy have effectively protected the copyright jurisdiction and guaranteed the normal operation in such services[2,5].

3.2 The characteristic peculiarities of these three domestic document delivery systems

3.2.1 Fundamental organizational mode of these systems

The service organizations of these three systems are based on the characteristics and requirements of their particular clientele. Basically, they can be divided into
centralized system and distributed (non-centralized) system. The so-called centralized control means that the central system is responsible for all the interlibrary loan transaction, user management, statistical analysis, fee settlement as well as the connection with other interlibrary loan systems. While distributed management means that the member libraries are responsible for functions such as system parameter setting, the verification of individual identity in the college, system registration as well as individual user account payment and settlement.

The three systems have their own characteristics in their organizational structure, especially the CSDL which is based on a combined organizational mode of centralized control and dispersed management. The adoption of centralized control and dispersed management mode could reduce the load of technical work such as installation and maintenance of the system done by local library personnel at the institute level. It is good for the maintenance operation and for upgrading the system. Meanwhile, it is convenient for individual users to settle their document via the Internet or at local libraries. It is an information platform type system which suits the document delivery service operated by multi-member libraries[8].

NSTL is a fully centralized system organization. The central system is responsible for all the transactions, user registration and management, statistical analysis and fee settlement. Its advantage is that the member libraries need only to be responsible for the transactions of full-text delivery instead of user management and it is a full functional service system, which better suits such delivery service systems that have limited the number of membership units[9].

CALIS adopts particularly the centralized system. The advantage is that the member libraries could implement their own interlibrary loan rules in this system[9].

3.2.2 The diversity of the service contents

The three service systems all stemming from the full-text delivery service, gradually developed from full-text delivery to a range of multiple types of resource sharing services.

Users could directly submit requests for document delivery and obtain desired full-text documents from any of the three systems, which provide different access in points such as book name, abstract retrieval or joint periodical name index retrieval, etc. This is the basic full-text delivery service provided by each and every one of these three systems.

As there are searching limitations in each and all of these systems which hamper users satisfaction for document demand, all these document delivery systems have extension service for the expanded search of resources beyond the local system in order to satisfy the inquiry. In CSDL system, apart from submitting document requests via joint index retrieval, the system also provides “consignment inquiry” service and the users could obtain documents from other libraries out of CSDL system. Due to the late starting date of data processing, the direct full-text delivery of NSTL could only be dated back to the year 1995. Therefore, NSTL also adds this “consignment
inquiry” after 5 years in operation in order to meet the users’ demands for documents of previous years.

In recent two years, with the changing pattern of information demands and more stringent requirements of users, CSDL increasingly enlarged the scope of its resource available, reasonably brought in the third party resources, and have them connect with document delivery system. It opened up the channels for end users to obtain directly the special resource of a third party, which is a new mode of service created by CSDL.

Based on the characteristics of user’s information demands, CSDL also adds the interlibrary loan service of books into the system. It introduces a third party book resource services to the vast users engaged in science and technology and thus buttressed the traditional interlibrary loan service with new contents and forms[4]. This is also a unique feature and a very popular service item of CSDL system.

3.2.3 Different service targets and management modes

(i) Different service targets  The service orientation of these three systems differ greatly, NSTL system serves those scientific research institutes and users engaged in science and technology throughout the country with very few restrictions to any individual users. The number of its individual users tops those of the other three systems. CALIS system is a system providing guaranteed document supply for colleges and universities throughout the country, while CSDL serves those users engaged in science and technology as well as graduate students in CAS. CALIS pays more attention to offer services for their own colleges as well as their own readers. They adopt the policy of making inter-library loan librarian verify the college and university that the reader belongs to and meet the information demands of readers in their own colleges and universities.

(ii) Different management modes  The three service systems, NSTL, CSDL and CALIS have different service organization modes which result in their different service management modes.

NSTL is a centralized control and management system and its member libraries do not shoulder the responsibility for user management. The major management task is accomplished by the service center of users and the service management is administered by a department composed of all the member libraries[9].

CSDL has a two-level management, namely, the center and the local library management. The center manages the member libraries, including the registration of member libraries and their system operators as well as the member libraries accounts, etc. In addition to requesting assistance from the function of application for the center, the member library system also provides individual user management function in line with the requirements of each member library, including all the user management functions aiming at individual users such as individual registration, opening of financial account and management of user account. Therefore, a two-level management mode is formed due to this peculiar system mode. The service planning and daily services are administered by service workgroup and the service center[8].
CALIS actually does not have the centralized user management function. Both the user registration management and the control of the total operation of the entire system are handled by each member libraries\(^9\).

### 3.2.4 Flexible service mode

**(i) Applications for full-text retrieval by users** NSTL displays its apparent superiorities over document searching and ordering. It provides a one-stop service for special document searching as well as for full-text ordering. It promotes resource development by means of offering free document retrieval to entice the Internet users to become full-text subscribers. The methods of article and biographic searching meet the information needs of different users and solved the retrieval requirements for different types of documents to ensure a flexible approach for users.

CSDL system only offers the function of biographic retrieval instead of retrieving of articles or of any other searching functions. CSDL users could directly submit their requests to the member libraries and gain speedy access for the special retrieval system and for the third party special resource and linkage with the document delivery system. This makes the user feel that the document delivery services were omnipresent.

While CALIS system is a management system for service processing. It has achieved the integration with the OPAC system, the CCC Western Periodicals Index and Content Database Integrated Service System, the CALIS Integrated Retrieval System, the China Academic Humanities and Social Sciences Library and CALIS Resource Scheduling System. Readers may submit an application for interlibrary loan directly via Internet\(^9\) and carry out the library-to-library mode interlibrary loan mainly within a district (city). Therefore, all end-users shall make a document request through interlibrary loan service via an ILL clerk.

**(ii) Express delivery mode** As to the mode of full-text document delivery, all three system centers depend heavily on using e-mails. The top-choice for document delivery of users is the e-mail method and perhaps sometimes also aided by regular mailing. These two document delivery methods could basically meet the demands of users. In addition, CSDL and CALIS systems give added means to speedy delivery for “local-express-delivery”. This has met the special requirements of users who demand for an “additional and urgent” delivery service. NSTL allows its special mail servers in the central system to open a free “NSTL special mailbox” of 50 M for registered users to receive full-text documents from eight member libraries of NSTL.

As a matter of fact, the development of network makes a majority of users choose to transmit documents by e-mail and this mode could also satisfy the demand for the users to receive their documents on their desktop computers.

### 3.2.5 The commitment of service time-frame

In order to meet user’s urgent demand for documents, all these three systems provide quick delivery services, NSTL carries out the document delivery service within
24 hours and it is available 7 days a week; While CSDL provides documents within 24 hours with service available 12 hours per day and 7 days per week. Such swiftness of service is yet not to be surpassed by any of their competitors domestically.

3.3  **Service development from service statistics**

It is the commonalities and the individual features of these three service systems that have shaped their functional role of importance. These three systems all have developed rapidly after an initial period of service construction. The set of data below reflects the development conditions of these three systems.

3.3.1  **The development of the service in terms of quantity**

The rate and trend of the number of services of the two systems, NSTL and CSDL, can be seen from Figs. 1 and 2. The number of services of CALIS has reached 491,031\(^1\) from 2003 to 2006, and 122,757 on average annually (Tables 1 and 2). This shows that the services of these three systems have been broadly used and developed.

---

**Fig. 1**  The service provided by NSTL during the years of 2003–2007.

---

**Fig. 2**  The service provided by CSDL during the years of 2003–2007.
3.3.2 Popularization of the services

With a broad service target, NSTL service mainly serves the libraries and users throughout the country. There are more than 18,000 valid registered accounts, 71 of them are group users and each with $N$ affiliated individual users. Thus, the real number of service users has far exceeded the number of registered accounts and has broadly spread over the thirty-one provinces, cities and municipalities. This suggests that the impact of NSTL service is relatively far-reaching. In 2007, NSTL added several service stations which further broadened the affected scope and enhanced the utilization rate of the service. CSDL document delivery and interlibrary loan services mainly serve the libraries of CAS system as well as the research personnel in China. There have been 127 member libraries and more than 6,800 registered users and the services have covered all the institutes in the CAS, and realized the objective that all the member libraries start using document delivery service. It has become an indispensable and effective way for the research personnel in the whole CAS to obtain their needed scientific and technological documents.

There are 57 member libraries which constitute the CALIS document delivery and interlibrary loan system. These member libraries both give support to and use services of this system. There are also several dozens of pure user libraries. Its services cover over 100 colleges and universities throughout the country and play an important role in higher education.

The increasing rate on the number of services as well as on the popularization of services suggest that these three major document delivery services, namely, NSTL, CSDL and CALIS, have developed rapidly in the last five years and the document delivery services have been popularized in the network environment. They symbolize the current development situation of domestic document delivery as well as inter-library loan services.

### Table 1 Statistic number of service rendered by NSTL from 2003 to 2007

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of services in NSTL/Article</td>
<td>113,448</td>
<td>109,575</td>
<td>125,924</td>
<td>152,157</td>
<td>180,018</td>
</tr>
<tr>
<td>Growth rate (%)</td>
<td>–</td>
<td>–3.4</td>
<td>15.0</td>
<td>20.8</td>
<td>18.3</td>
</tr>
</tbody>
</table>

### Table 2 Statistic number of service rendered by CSDL from 2003 to 2007

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service number in CSDL/Article</td>
<td>10,171</td>
<td>19,179</td>
<td>26,456</td>
<td>36,787</td>
<td>53,156</td>
</tr>
<tr>
<td>Growth rate (%)</td>
<td>–</td>
<td>88.6</td>
<td>38.0</td>
<td>39.0</td>
<td>45.0</td>
</tr>
</tbody>
</table>

4 The future development of Chinese document delivery service

According to the above mentioned comparison and the analysis, the service mechanism, functions and characteristics of the three systems are pretty clear. Each
of the CSDL document delivery and interlibrary loan system, or the CALIS interlibrary loan system or NSTL document delivery system has its own unique characteristics and superiorities over the other systems. To different extent, they have met the document demands of varied formats and object complexity of all kinds of users in different fields of study, fields of science and technology as well as other fields in different levels of sophistication. However, these three systems still have their limitations and deficiencies and they are still far behind those in foreign countries in terms of both service quality and efficiency. It is a problem worth pondering as how to further improve the document delivery and interlibrary loan services as well as the library service systems in general.

4.1 Strengthening the general unified planning and guidance of document delivery and interlibrary loan services throughout the country

The domestic document delivery and interlibrary loan enterprise has roughly taken shape and is steadily moving toward routinization and standardization. In such development, all the document delivery and interlibrary loan systems have played an important role. However, despite there are coordinated efforts in acquisitions to realize the resource sharing to a certain extent among these systems, job repetitions and omissions are still inevitable and are apt to result in splintering the strength potential. So, it is only through a centralized overall planning and coordinated undertaking in national scope and on a major magnitude of efforts that the document delivery service system can really meet the need of different fields with different requirements[11–12].

4.2 Improving the horizontal integration among systems to buttress from one another’s deficiencies

The current domestic document delivery and interlibrary loan systems have their own distinctive advantages and features in terms of the wealth of resource as well as in their service and management modes. They realized the resource sharing within the systems and to meet the multiple requirements of the users. If the data communication and networking among the three systems were enhanced, the resource coordinated distribution and sharing among these systems were realized; the service integration created and the advantage of each system were demonstrated, then there would be greater support and assurance of the scientific documents supply to the users throughout the country[13].

4.3 Making full use of information technology for improved access to documents

The development of information technology gives great promise to the development of document delivery service. Technology is indispensable to the networking of systems, the linkage and interconnections between systems and the revelation
of deep-hidden resources and the searching of resources in large scope are all made possible by means of technology. Therefore, the convergence of information technologies is instrumental in promoting the rapid development of document delivery and interlibrary loan services.

4.4 Improving the professional qualifications of the library staff

With the establishment of all kinds of domestic document delivery service systems, the document delivery service has stepped into a mature stage of operation. Document delivery is a specialized information service with special professional requirements for the librarian to perform this task satisfactorily.

The librarian shall be well aware of the importance and scientific position for the work of document delivery. Document delivery service is one essential type of library information services. It is supported by information technologies and by operational techniques. It takes document resource as its basis of operation and of its knowledge about library collection as a prerequisite of good job performance. It is not a routine service in common sense and shall not be confused with services in general, but a customized service which should tailor the multiple and multi-layered document information requirements of end-users. The librarian shall also be mindful about his own professional qualifications to handle document delivery work. The quality and efficiency of document delivery service do not depend only on the external environment such as computer technology, network technology as well as database technology, etc, but also depend even more on the knowledge-based qualifications of the librarian himself. Only by continuously accumulating subject knowledge and practical work experience could one become a qualified librarian with high professional standing and who could launch new services with creativities in their work domain. Such qualifications are also indispensable to the further development of document delivery and interlibrary loan services.

5 Conclusions

It takes Chinese libraries more than 10 years to develop the interlibrary loan service from the traditional mode to the current document delivery and interlibrary loan in modern sense which is based on online network, multi-libraries participation. It makes the document delivery a key service component of modern libraries.

The course of the development of three documents delivery and interlibrary loan service systems in China accounts for the partial development of scientific and technological document information services in recent years and the significant achievement of library services by domestic libraries. From a viewpoint of both practice and development, it is reasonable to conclude that the three systems could be further developed into a joint documents assuring and providing system at a national level. It shall provide services to different end users in the country and document information services and knowledge with differentiating and customized characteristics.
References