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Multi-library union, promoting ILL/DD of the Chinese science digital library
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Abstract

Purpose – This study aims to describe and analyse interlibrary loans and document delivery (ILL/DD) in the Chinese Academy of Sciences and to evaluate the ILL/DD service quality of one particular library.

Design/methodology/approach – ILL/DD at the Chinese Science Digital Library (CSDL) is described. The success of ILL/DD at CSDL is analysed. Finally, the service quality of one library's ILL/DD based on LibQUAL+ is evaluated.

Findings – ILL/DD at CSDL can be improved through a multi-library union, and a modified LibQUAL+ model can be used to evaluate a library's ILL/DD service quality.

Social implications – More patrons can access a better service, and the work efficiency of librarians can be improved.

Originality/value – This study is helpful to librarians interested in ILL/DD and resource sharing in China.

Keywords China, Document delivery, Interlibrary loan, Evaluation, LibQUAL, CSDL

Paper type Research paper

1. Introduction

The Chinese Science Digital Library (CSDL) was established in 2003 to support libraries in supplying their users quickly from the vast amount of published material available. It consists of a system of interlibrary loans and document delivery (ILL/DD) and is the result of a project of the Chinese Academy of Sciences (CAS). The library of CAS (main library in Peking) collaborated on the project, along with more than 75 libraries of the subordinate research institutes of CAS (located throughout China).

The CSDL first unified all the resources (books and journals) in the collaborating libraries by creating a union catalogue. Subsequently, the CSDL enabled subordinate libraries to appoint their own ILL/DD librarians. The CSDL implemented ILL/DD in its member libraries to achieve the aim of catalogue co-building and resource sharing. Since 2003, the CSDL has also integrated many member libraries inside and outside CAS, expanding its resources and raising its ILL/DD fill rates. This combined mode is unique and deserves to be studied and promoted (Chinese Science Digital Library, 2003a). In addition, CSDL has given a copyright notice on its website (Chinese Science Digital Library, 2003b), demonstrating that it is adopting fair use practices.

Although the CSDL was being built, some consortia had been set up in other countries, for example, RapidILL and OhioLINK in the USA and Developing Library Network (DELNET) in India, among others.

RapidILL is a borrowing and lending system (Delaney and Richins, 2012); (Cristi, 2013); (Irwin and Favaro, 2015) located at Colorado State University. RapidILL is one of the few systems to have created enhancements in ILL. The ILL has been specifically designed to provide an extremely fast, low-cost and low-maintenance system, but, perhaps, its most important feature is that it is highly automated. Another facet of RapidILL is that the demand for technical support at member institutions is minimal. Moreover, RapidILL has integrated with ILLiad, Clio, Relais, VDX and OCLC First Search. There are more than 200 participating libraries and the number is growing.

OhioLINK is a world-famous US consortium (Sanville, 2007); (Kohl, 1998); (Wiley *et al.*, 2011). Ohio academic libraries have been delivering documents to their patrons through the OhioLINK programme since 1992. By 2007, OhioLINK had over 80 participating institutions with over 500,000 full-time-equivalent students. It had state government funding of US$$11m annually.

DELNET is a resource-sharing library network in India (Kaul, 2010); (McGrath, 2009); (Connolly, 2000). DELNET is a non-governmental, non-profit organisation and is located at Jawaharlal Nehru University, New Delhi, India. It is a major operational resource-sharing library network connecting 1,674 libraries in 32 states and union territories in India and seven other countries. DELNET mainly aims to promote resource sharing among the member libraries by collecting, storing and disseminating information and providing networked services to researchers and scholars. DELNET

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does not receive any government funding, is based on a self-sustainable model and is considered to be a role model for other library networks, especially those in developing nations.

2. Chinese Science Digital Library operation mechanism

2.1 Management system

To better manage ILL/DD, the CSDL set up a management system, as shown in Figure 1:

- A coordination group for ILL/DD was created, mostly of members from subordinate libraries of the CAS. They discuss and decide on major issues.
- A service centre for ILL/DD was created in the main library of the CAS. It deals with routine management, following the decisions of the co-ordination group.
- Daily duties related to ILL/DD are completed by the ILL/DD librarians of member libraries.

In addition, some corresponding regulations and rules were stipulated regarding management and economy. A uniform charging standard was adopted for the CSDL's ILL/DD system. This is based on the following factors:

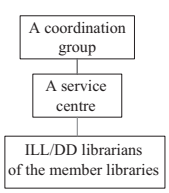
- For the paid service, all member libraries should follow a non-profit principle.
- Profits of the three involved parties, namely, the institutes, librarians and readers, should be considered comprehensively.
- The ILL/DD system will be sustainably developed.

In addition, a central platform of the ILL/DD system will process payments. This platform will automatically record and conduct statistical analysis of all charge information and settle accounts for each member library at fixed periods. Every member library will manage its own user affairs, which include opening accounts, ILL/DD, receiving charges and settling accounts. The platform manager will count and analyse users' requests with the platform software and handle all kinds of matters related to user services. The operation mode of the CSDL's ILL/DD is a hybrid, centralised-distributed; the control of the technical platform is centralised, but the management of daily services is distributed at every library.

2.2 Process of interlibrary loans and document delivery at the Chinese Science Digital Library

The main customers of the CSDL's ILL/DD system are post-graduates and scientific researchers. The users submit their own personal information to an ILL/DD librarian's e-mail account at their library, pay the required fee and open an account; or log into the homepage of the ILL/DD system, click the "register" button, select their library, provide their personal information, pay the fee and then activate the account (Library of Chinese Academy of Sciences, 2009).

Figure 1 The CSDL management system



The CSDL's ILL/DD system supplies an uninterrupted 12-h service (09.00 a.m.-09.00 p.m.). ILL/DD periods depend on the collection library in question. The period is one-two days if the collection library is a subordinate library of CAS; and the period is three-four days if the collection library is a third-party library. The method of document delivery is post when the document is copied or e-mail when the document is scanned into PDF or TIF format (Xu and Zhu, 2007).

2.3 Development of interlibrary loans and document delivery at Chinese Science Digital Library

After a few years, catalogue co-building and resource sharing was achieved in most subordinate libraries of CAS, and ILL/DD developed between these libraries. At present, CSDL has 155 member libraries, 133 of which are subordinate libraries of CAS, and the remaining 22 member libraries are at other universities. The CSDL's union catalogue database has become a literature information system accessible all across China. In the ILL/DD field, the CSDL is recognised as one of four famous systems being the most successful in their operations and having the most influence in China, together with the China Academic Library & Information System (CALIS), the National Science & Technology Library (NSTL) and the China Academic Social Sciences and Humanities Library (CASHL).

Since 2003, CSDL's ILL/DD has developed greatly, as shown in Table I. In the past 12 years (2003-2014), the number of satisfied requests increased from 7,066 to 76,322, (Jia, 2006); (Yao, 2010); (Jia, 2010); (General, 2015). Table I shows that the fill rate increased from 2003 to 2008 and then fluctuated around 94 per cent from 2009 to 2014. Figure 2 shows the changes in the numbers of satisfied requests and total requests. It also shows that ILL/DD rapidly developed from 2003 to 2010; however, it experienced a slight decline since then. This decline is attributed to the increase in electronic databases that give instant access to material and more open access journals (Koyama *et al.*, 2011); (Lobban, 2006); (Missingham and Moreno, 2007).

3. Resources of the Chinese Science Digital Library

The home page for the ILL/DD system at CSDL provides access to many databases. These resources can be divided into three categories; the CSDL union catalogue database, various integrated resource databases and resources from third-party companies (Jiang *et al.*, 2003). CSDL's ILL/DD system and resources are shown in Figure 3 and are described below.

3.1 Union catalogue database

As a document and information system, the union catalogue plays an important role, providing researchers with high-quality literature and information. First, all Western-language journals and books present in the collections of all CAS libraries were catalogued. Subsequently, by agreement, the library bibliographies of some of the other large institutes outside CAS were included in the database, and all users of the member libraries were permitted to use the literature. This includes 12,000 hardcopy Western-language journal titles collected at other institutes, namely, Peking University,

Table I The development of the CSDL's ILL/DD

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Satisfied requests	7,066	19,012	19,992	36,787	53,156	63,973	70,666	79,232	78,542	70,602	75,232	76,322
Made requests	9,314	23,692	24,086	42,725	59,063	67,340	75,176	83,403	82,071	76,741	80,807	81,107
Fill rate (%)	75.8	80.2	83	86.2	90	95	94	95	95.7	92	93.2	94.2

Figure 2 CSDL's ILL/DD requests

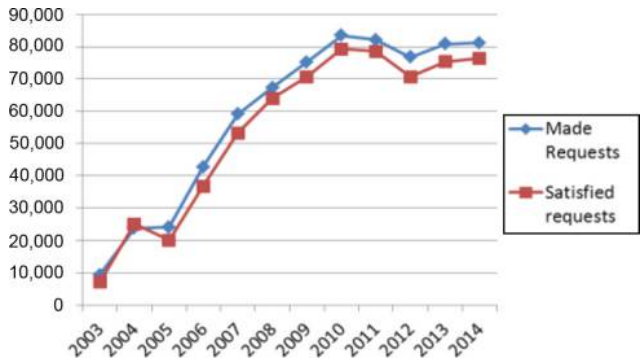
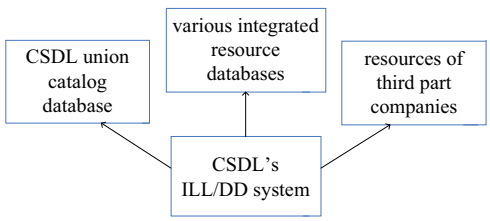


Figure 3 CSDL's ILL/DD system and resources



Tsinghua University, China Defence Science and Technology Information Centre, CASHL, etc. All subjects are covered in these journals.

3.2 Integrated resource databases

Since 2006, various digital resources have been integrated into the union catalogue. These include several dozen large full-text and abstract databases, such as Elsevier, Springer and Wiley-Blackwell, which comprise over 15,000 Western-language electronic journals. The catalogue has also integrated various Chinese- and English-language electronic journals and books owned by the NSTL. The union catalogue database has, thus, become a union of multiple and multi-carrier catalogues.

3.3 Resources of third-party companies

Through the development of Web technology, many users, including scientists, increasingly use search engines to retrieve information. To adapt to this change in user habit, the CSDL has cooperated with numerous companies to enhance its database resources. This cooperation is described below:

3.3.1 Co-operation with search engine companies

In 2006, the service centre of the CSDL actively worked on resource integration with third-party search engine companies, including Google Scholar and Baidu. The union catalogue database has been linked to books and journals available in Google Scholar. Moreover, the union database has been linked to books available in Baidu, but book contents are provided in Chinese only.

3.3.2 Linking to third-party information systems

The union catalogue database has been linked to Cambridge Scientific Abstracts (CSA), ISI's Web of Knowledge and other third-party systems through OpenURL technology. So, over 200 companies and libraries have been linked to the union catalogue database. This linking not only extends the resources available but also provides its patrons a more convenient service. For instance, if a certain information that has been covered by the union catalogue database is found in a third-party system, the user can return to the union catalogue database by clicking on "local bibliography" to obtain detailed document information and enjoy CSDL's ILL/DD service.

4. Chinese Science Digital Library's interlibrary loans and document delivery system feature

The ILL/DD system at CSDL is a part of a centralised construction (Zhen, 2008) which embodies several technical superiorities in the form of its multi-library union service. These superiorities are described below:

4.1 Simple user operation

The CSDL's ILL/DD system is an information service Web that is accessible across China. Its users include individual patrons and ILL/DD librarians from all member libraries. For the member library, the centralised construction is free of technology management burdens, such as client software instalment, maintenance and other tasks. ILL/DD librarians do not need to deal with technical tasks and are only required to retrieve information and deliver literature. This centralised construction is very well suited to the current situation of literature resources and available staff at all member libraries of CSDL and will be helpful for the long-term and stable operation of the platform.

4.2 Easy system control

In the ILL/DD system, all data are managed by a central control module which can identify failures in the system and take action to solve the problem. Funds, equipment and technicians for CSDL are arranged by the service centre. In addition, the platform's function to improve and upgrade software is very easily managed.

4.3 High fill rate of non-returnable document delivery

Because of the seamless connection between the retrieval of resources and request submissions, an increasing number of domestic and foreign libraries provide interlibrary loans. ILL/DD librarians are able to provide a service for non-returnables with a high fill rate at a lower charge.

4.4 Convenient and fast returnable document delivery

At CSDL, hardcopy journals and books come from all libraries of CAS, the National Library of China and 12 other libraries. When an individual patron sends a request to the service platform, an ILL/DD librarian will review, borrow the book and ensure its secure return. There are two forms, the first is the EMS form, serving non-local users, and the second is the form of the main library of CAS, which appoints dedicated service personnel and vehicles to deliver the documents in question to the libraries in Peking. This demonstrates to users that the return document delivery of CSDL is convenient and fast.

4.5 The embedded third-party library service

To expand the professional literature resources of CSDL, some resource systems of third-party libraries with specific characteristics or those that are difficult to obtain have been embedded in the CSDL platform. These resources come from the National Defence Science and Technology Information Centre, Standard Literature Information, National Defence Nuclear Information, etc. Moreover, the ILL/DD services from these third-party libraries are also accessible.

5. Interlibrary loans and document delivery service quality assessment based on LibQUAL+

To evaluate ILL/DD quality, this study applied a modified LibQUAL+ model to the service quality assessment of a university library.

5.1 Service quality assessment model

Parasuraman *et al.* (1985) first presented an instrument for assessing service quality, called SERVQUAL, based on the gap theory. They proposed to measure service quality at various levels, such as minimum service level, perceived service level and desired service level. Differences in scores of these three levels indicate a gap in service quality. For example, superiority gap = desired service level − perceived service level; adequacy gap = perceived service level − minimum service level.

Cook *et al.* (1999) developed and modified the SERVQUAL protocol to make it suitable for use in libraries (Cook *et al.*, 2000). They proposed to the Association of Research Libraries that this alternative protocol, which they subsequently named LibQUAL+, would be developed for non-profit use towards the improvement of libraries.

In the period from 1999 to 2006, LibQUAL+ was used to collect data from over 600,000 users in over 800 institutions (Thompson *et al.*, 2008). LibQUAL+ was created in three dimensions and 22 indexes and proved to be highly applicable to library service quality assessment (Thompson, 2015). Experiences at LibQUAL+ project member libraries indicated that it could be used effectively to identify and validate the factors affecting library service quality (Yu *et al.*, 2005).

The model was not only popular at most universities in North America but was also introduced at many universities in China for library service quality assessment (Tang *et al.*, 2006; Xie, 2009; Bai *et al.*, 2014). For instance, the library of Tsinghua University in China conducted empirical research using this model (Wu and Guo, 2012). But, the LibQUAL+ model is not used specially to assess the ILL/DD service, which is only 1 of 22 items of the model. Hence, it is necessary to set a new evaluation instrument to assess every aspect of ILL/DD.

This study modifies the LibQUAL+ model to meet this necessity. It examines the gap between the reader's desired service and perceived service during the ILL/DD process and analyses the cause of this gap. It provides a basic theory to improve library ILL/DD services. In practice, one library was first selected as a test case study. Subsequently, based on the current condition of that library, after consulting many experts in the field of library science and senior librarians with ILL/DD experience, a questionnaire with three dimensions and 18 indexes was created (based on LibQUAL+). The main content of the questionnaire is shown in Table II. Finally, the library's ILL/DD service was surveyed and assessed through the questionnaire. The survey results show that the LibQUAL+ model can be used effectively for the assessment of ILL/DD quality.

The questionnaire includes three dimensions – service ability, service quality and service condition – having 18 indexes. Every reader was asked to score the three levels of each index: desired service level (desired SL), perceived service level (perceived SL) and minimum service level (minimum SL). In practice, the scale of the index was a Likert scale, with points ranging from 1 to 9. The results were analysed using SPSS software.

From 1 to 10 July 2015, the questionnaires were sent to three kinds of readers that had used the ILL/DD services at least once:

1 80 questionnaires were sent to teachers.
2 220 questionnaires were sent to doctoral students.
3 300 questionnaires were sent to master's students.

In total, 600 questionnaires were distributed, and 582 responses were returned. The survey subjects came from various colleges of the University, including the School of Life

Table II Index set of the library service quality questionnaire

Dimension	No.	Index
Service ability	*Q1*	Level of supplying document timely
	Q2	Level of offering urgent ILL/DD
	Q3	Level of finding ILL/DD obstacles
	Q4	Level of preventing ILL/DD faults
	Q5	Level of tracing a document request
	Q6	Level of professional knowledge
Service quality	*Q7*	Degree of sending documents correctly
	Q8	Degree of promoting ILL/DD
	Q9	Degree of support
	Q10	Strictness degree of supervised
	Q11	Speed of consulting
	Q12	Speed of handling requests
Service condition	*Q13*	Quality of literature resources
	Q14	Quality of ILL/DD service system
	Q15	Quality of software and hardware
	Q16	Suitability of management and cultural environment
	Q17	Quality of ILL/DD process
	Q18	User acceptance level of ILL/DD cost

Science, School of Chemistry, School of Information Management, School of Physics, School of Electronic Science and the College of Environment. To gather sufficient and significant data for analysis, a judgment standard for questionnaire validity was created. If more than fourth-fifths of the indexes in the questionnaire received an effective answer (i.e. if the reader gave three scores to each index), the questionnaire would be considered valid. For this survey, this standard means that at least 18 indexes in the questionnaire should be effective. Of the 582 questionnaire responses received, 434 were valid and 148 were invalid; hence, the efficiency rate was 72.3 per cent.

5.2 Results and analysis

This section is organized as follows: first, the average values of the perceived SL, desired SL and minimum SL were calculated with the arithmetic mean. Subsequently, a radar map was used to show the readers' satisfaction degree for the 18 indexes. Finally, through an importance-performance analysis (IPA), the relation between the perceived SL and desired SL was discussed, and some suggestions regarding the rationalisation of library service quality were presented.

When the survey was completed, the average values were calculated for the three levels of each index. The details are shown in Table III.

5.2.1 Satisfaction degree analysis

This study used the following parameters to express the readers' degree of satisfaction with the library:

1. Desired median = (desired SL + minimum SL)/2.
2. Simple satisfaction degree = perceived SL/desired SL × 100 per cent; the higher the simple satisfaction degree, the more satisfied the reader.
3. Relative satisfaction degree = (perceived SL − desired median)/(desired SL − minimum SL); negative values show that readers lean towards dissatisfaction, whereby the higher the absolute value, the more dissatisfied is the reader; positive values show that the reader leans towards satisfaction, whereby the higher the absolute value, the more satisfied is the reader.

Table III Average values of the three levels of every index

No.	Perceived service level	Desired service level	Minimum service level
Q1	7.50	8.70	5.80
Q2	6.79	8.40	5.01
Q3	6.91	8.12	5.69
Q4	6.85	8.08	5.47
Q5	6.70	8.11	5.33
Q6	7.40	8.29	5.20
Q7	6.95	8.70	6.01
Q8	6.80	8.28	5.20
Q9	7.06	8.42	5.45
Q10	6.90	8.19	5.45
Q11	6.80	8.31	5.31
Q12	6.85	8.70	5.29
Q13	7.37	8.40	5.38
Q14	7.60	8.60	5.50
Q15	7.03	8.18	5.18
Q16	6.75	8.12	5.22
Q17	7.19	8.19	5.02
Q18	6.51	8.01	5.01

According to the average value for the three levels of every index (Table III), two satisfaction degrees were counted among the three dimensions. Likewise, the simple and relative satisfaction degrees were counted using the above formulae. Table IV lists the service levels and satisfaction degrees for the three dimensions of the questionnaire.

As shown in Table IV, the simple satisfaction degrees of the three dimensions were more than 80 per cent. The simple satisfaction degree for the "service condition" dimension, which includes "quality of literature resources" and "quality of ILL/DD service system", reached 87.62 per cent. Seen from the right column, the relative satisfaction degree for "service quality" was negative. There is clearly a greater difference between perceived SL and desired SL in this dimension, or there is a greater area that still needs to be addressed by the library in question.

5.2.2 Radar chart analysis

To analyse the satisfaction degree for every index, according to the average values shown in Table III, the subsequent distribution of these average values is rendered in a radar chart in Figure 4, where every axial line stretching from the centre expresses an index. The three values that represent the perceived SL, desired SL and minimum SL of the same index are marked on every axial line. The same kinds of values at every axial line are linked to form a closed ring (Asefeh *et al.*, 2010).

In the radar chart, the perceived SL is located between the desired SL and the minimum SL. Therefore, the radar chart shows a reasonable distribution. Several details can be derived from Figure 4:

In six indexes of the first dimension, the perceived SLs for *Q2*-*Q5* (offering urgent ILL/DD and finding ILL/DD obstacles, etc.) were lower than the first dimension's average value. To improve the service ability of its librarians, this library should train them according to these four indexes. The score of *Q5* (tracing a document request) was the lowest in the first dimension, indicating that the tracing level of the librarians in this library needs to be increased.

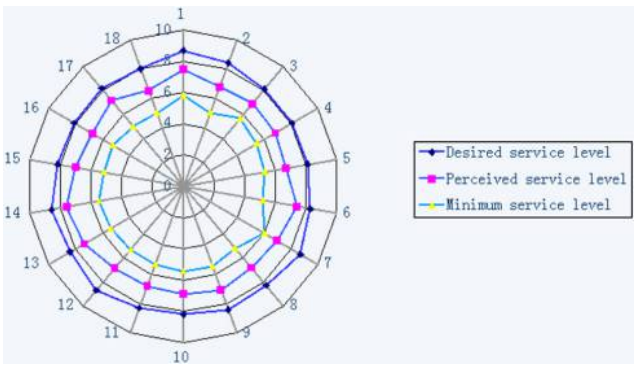
Six scores in the second dimension fluctuated, and the average value of the perceived SL of the second dimension was the lowest of the three dimensions. The perceived SL of *Q9* was 7.1, which is higher than the average for that dimension, which indicates that the librarians serve patrons patiently and kindly. However, the perceived SLs for *Q8* and *Q11* (promoting ILL/DD and consulting) were lower in this dimension; therefore, the library should enhance its ILL/DD promoting and relational consulting. In addition, improvements should be made regarding the content of *Q7*, *Q10* and *Q12* (sending documents correctly, supervised and handling request).

In the third dimension, the perceived SLs for *Q13* and *Q14* were higher. In particular, the perceived SL of *Q14* (ILL/DD service system) was the highest out of all 18 indexes, meaning that the library provides satisfactory ILL/DD system for its readers. In this dimension, readers were not satisfied with the management and cultural environment and ILL/DD cost

Table IV Service levels and satisfaction degrees for three dimensions

Dimension	Perceived service level (average)	Desired service level (average)	Minimum service level (average)	Simple satisfaction degree	Relative satisfaction degree
Service ability	7.02	8.28	5.42	84.78	0.059
Service quality	6.90	8.43	5.45	81.85	−0.013
Service condition	7.08	8.08	5.22	87.62	0.150

Figure 4 Radar chart



(*Q16* and *Q18*). However, the management and cultural environment of the library can be modified based on its existing conditions. Moreover, the ILL/DD cost can likewise be changed through various efforts.

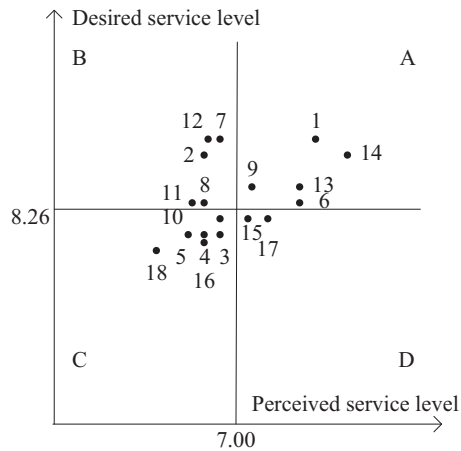
5.2.3 Importance-performance analysis

The IPA is a method used to measure client satisfaction. It recognizes satisfaction as a function of two components: the importance of a service to a client and the performance of a business in providing that service (Martilla and James, 1977); (O'Neill and Palmer, 2004). It examines the performance and importance of an item as a determining factor in satisfaction to the respondent. This method is relatively easy to administer and interpret, resulting in extensive use among researchers and managers in various fields. It consists of a pair of coordinate axes where the "importance" (*y*-axis) and "performance" (*x*-axis) of the different elements involved in the service are compared. In this study, although "importance" is replaced by desired SL and "performance" by perceived SL, IPA was used to show the relevance between perceived SL and desired SL (Figure 5).

The values of these 18 indexes are displayed in a scatter diagram. Special point coordinates were determined by using the average value of all perceived SLs as *x*-value and using the average value of all desired SLs as *y*-value (7.00, 8.26). Four quadrants were drawn by taking this point as the centre; hence, these 18 indexes are expressed in the four quadrants according to the mode of their coordinates.

In Figure 5, *Q1*, *Q6*, *Q9*, *Q13* and *Q14* are located in Quadrant A. Both the desired SL and perceived SL are high, indicating higher readers' attention to these indexes; they felt more satisfied. Therefore, the library should maintain its existing service level. *Q2*, *Q7*, *Q8*, *Q11* and *Q12* (offering urgent ILL/DD, sending documents correctly, promoting ILL/DD, consulting and handling requests) are located in Quadrant B. The desired SL was higher in this quadrant, but

Figure 5 IPA diagram



the perceived SL was lower, indicating that the library should raise its service level for these five indexes. *Q3*-*Q5*, *Q10*, *Q16* and *Q18* are located in Quadrant C in which both the desired SL and perceived SL are lower, indicating that the readers were not very interested in these six indexes, and the library only pays moderate attention to these areas. *Q15* and *Q17* are located in Quadrant D, where the desired SL is lower but the perceived SL is higher, meaning that readers did not have high expectations for these two indexes, but they were met with unexpectedly good outcomes. Hence, librarians at this library should maintain their current service level.

Overall, because all perceived SLs in the three dimensions of the questionnaire received scores of 6.5 or higher, the service provided by the library in question was sufficient for readers' demands. However, some problems should not be neglected. So, after this survey is completed, for items located in Quadrant B, especially, some suggestions are presented below:

- *Q2 (offering urgent ILL/DD)*: The library should plan for urgent document delivery. As soon as a request of urgent document delivery is submitted, the librarian should act fast in fulfilment.
- Q7 *(sending documents correctly)*: The library manager should train their librarians, emphasise that ILL/DD accuracy is important and encourage them to achieve 100 per cent ILL/DD accuracy.
- *Q8 (degree of promoting ILL/DD)*: The library should actively promote ILL/DD frequently via many channels.
- *Q11 (speed of consulting)*: One solution is to create a full-time consulting position. This full-time librarian would have the time to deal with relational matters through e-mail, QQ (chat software in China similar to

Skype or MSN) and WeChat (popular mobile chat software in China).

- *Q12 (speed of handling requests)*: The library director should constantly underline the importance of handling requests quickly and give material rewards to librarians who resolve ILL/DD requests quickly. It could also be useful to hold a contest, as it can promote librarians' ability and speed of handling requests.
- Further, for items of low perceived SL, located in QC, for example, *Q18* (user acceptance level of ILL/DD cost), efforts should be made to reduce the ILL/DD cost and to receive a higher degree of satisfaction from users.

6. Conclusion

The CSDL first united all book and journal resources from CAS by creating a union catalogue database. Subsequently, it organized service staff by enabling every member library to appoint its own ILL librarian. The CSDL not only implemented ILL/DD throughout CAS but also developed many member libraries outside CAS to reach its target of catalogue co-building and resource sharing. The CSDL has become a pioneering ILL/DD system in China. Its integrated mode is unique and deserves to be studied and promoted. Some conclusions from the analysis on CSDL ILL/DD are as follows. The CSDL plans a role of guarantor and supporter of libraries and campaigns for resource co-building and sharing. It encourages developing countries to build an ILL/DD system. In addition, the LibQUAL+ model was modified to assess ILL/DD service quality. Using this modified model, an ILL/DD quality evaluation was conducted for one university library. The evaluated result has shown that the modified LibQUAL+ model can be used effectively for ILL/DD service quality assessment.

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