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Underutilisation of self-service libraries in Chinese cities: The absence of a patron-centric perspective

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Underutilisation of self-service libraries in Chinese cities

Self-service
libraries

The absence of a patron-centric perspective

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Abstract

Purpose – Self-service libraries (SSLs) have been regarded as an effective approach to provide convenient book services to the enormously large populations of China's cities. These SSLs are in fact automatic book service machines, which provide a combination of services, including reading card issuing, book lending and returning, and book reservations and collection. However, despite acclaimed success, SSL services are not well received by patrons and are underutilised. The purpose of this paper is to identify and understand the causes of the underutilisation of SSL services in Chinese cities.

Design/methodology/approach – This study adopted an inductive approach and a case study research design. The SSL services in Wuhan, the capital city of Hubei Province, were adopted as the case study, in which 20 public librarians, SSL workers and managers, and library patrons were approached and interviewed using semi-structured question scripts. The interview data were analysed using a thematic analysis approach.

Findings – The analysis pointed to 13 causes in three main themes: management problems, service limitations, and the implicit role of government. Further conceptualisation of the findings revealed that the underutilisation of SSL services has resulted from the absence of a patron-centric perspective and the negligence of patrons' needs and requirements. Therefore, to increase the popularity and usage of SSLs, it is necessary to develop patron-centric management mechanisms through which patrons' needs and requirements can be effectively understood and responded to.

Originality/value – This study aims to develop specific suggestions to improve the usage of SSLs. Furthermore, although this study focuses on SSL development in China, this research can provide useful suggestions and implications that can be shared across international borders.

Keywords China, Case study, Library services, Public library, Self-service libraries, Underutilisation

Paper type Case study

1. Introduction and research background

The Chinese economy is undertaking a critical turn because the traditional manufacturing industry is no longer able to sustain economic growth. As noted in the "12th Five-Year Planning Report" (State Council of China, 2011), which is the national steering report issued by the State Council, the future of the nation relies on knowledge creation, innovation, scientific achievements, and the protection of intellectual property. This report delivers a very clear message that the nation should turn from "Made in China" into "Innovated in China" (State Council of China, 2011).

In this light, the Ministry of Culture published another high-level political report, titled the "12th Five-Year Plan for Public Libraries". This report points out that it is essential to encourage active reading and learning, as well as spontaneous knowledge innovation from the general public (Wang, 2012). Therefore, as also stated in the report, public libraries should become more active and strategically important for economic growth (Xiao, 2014; Li, 2015).

To support this strategy, the central government of China significantly increased public spending and financial support to the public libraries (Chen, 2014; Yu, 2015). According to *The Statistical Yearbook of Chinese Public Culture and Cultural Relics*



(Ministry of Culture, 2014), from 2011 to 2013 the central government invested CNY 7.56 billion, CNY 9.35 billion, and CNY 10.71 billion annually to support the development of public libraries in China.

In this case, self-service libraries (SSLs) have been widely regarded as an effective approach to extend the services of public libraries and to provide convenient book services to the enormously large populations of China's cities (Yang and Liu, 2010; Yang, 2013; Zheng, 2015).

SSLs are not a new technology, but are typically referred to as "book vending machines" or "book dispensing machines". In fact, SSL services were initially experimented and implemented in Japan and Sweden (Hampshire and Sanford, 2009; Tseng and Kuo, 2009), and subsequently accepted, established, and well received worldwide, such as in the USA, the UK, Denmark, Australia, Singapore, and the UAE (Tseng and Kuo, 2009; Monley, 2011; Johannsen, 2012). Moreover, Monley (2011) identifies three major advantages of adopting SSL services: first, they provide 24/7 access to collections with minimal staffing cost; second, they have the ability to locate library services in densely populated neighbourhoods and high traffic locations; third, SSLs enhance the flexibility and innovation of library services. As such, experiences gained from global SSL development can provide international perspectives and success stories to the development of SSLs in China.

SSLs were introduced to Mainland China in recent years (Xiao *et al.*, 2010; Hsiao and Tang, 2015). In some major cities, such as Beijing, Shanghai, Shenzhen, Guangzhou, Fuzhou, and Wuhan, SSLs have been deployed in commercial centres, transportation hubs, and residential areas (Zhong, 2009; Zhai, 2012; Li, 2013; Wu, 2015).

SSLs in these cities are really automatic self-issue and return service machines, which are designed to provide a combination of services ranging from issuing cards to lending and returning books and reserving books (Wu, 2008; Jia, 2010; Mo, 2011). Each SSL can accommodate up to 400 books. Patrons can borrow and return books in as fast as 15 seconds. Patrons use a touch screen to complete book borrowing and returning processes at their convenience, 24 hours a day (Zhai and Wang, 2012; Wang, 2012; Yan, 2015).

A number of Chinese librarians and researchers have praised the development of SSL. Comments made by Xiao (2014) and Zheng (2015) have stated that SSLs provide a brand new horizon to public library services and revolutionise traditional public services from static into dynamic and proactive. Huang (2014) and Wu (2014) claim that by using flashy new technologies, fully automated systems, and personalised services, SSLs can quickly win people's hearts.

However, very recently, it has been reported that SSL development in Chinese cities has not been as successful and popular as claimed (Hu and Lu, 2012; Tian, 2012; Zhao, 2015; Wang, 2015). On December 26, 2015, a news report on China Central Television News revealed that SSLs have been greatly underutilised. A CCTV reporter visited and observed the SSLs in Chaoyang District in Beijing. Shockingly, based on several hours of observation, not a single user paid any attention to the SSL facilities. Other regional media have reported similar findings. For example, on August 5, 2015, Hubei Daily reported that although the SSL network had been in operation for more than three years in Wuhan, the capital city of the Hubei province, only 221,073 books had been borrowed using the city's SSL machines between 2012 and 2014. This is a disturbingly low number considering that there are more than ten million residents in this city.

This paper reports on one of the very early research studies, which aims to identify and understand the causes of the underutilisation of SSL services in China. It is expected that through systematic research and analysis, pragmatic strategies can be

developed to promote the popularity and acceptance of SSL. Finally, although this paper focuses on China, the research can provide useful suggestions and implications that can be shared across international borders.

2. Research design and methods

2.1 Research aim and questions

The main aim of this paper is to investigate, identify, and explain the causes of the underutilisation of SSL services in China. Accordingly, the following research questions were formulated:

RQ1. What are the causes of the underutilisation of SSL services in China?

RQ2. What are the relationships between the causes?

RQ3. What strategies can be established to promote popularity and acceptance of SSLs?

These research questions were employed not only to overarch the research design and the selection of research methods but also to guide the processes of data collection and analysis in the field.

2.2 Research design

This study utilises a qualitative research design, which combines critical literature review, case study, and data collection and analysis.

2.2.1 Critical literature review. The research process started with a critical review of existing literature. There were two purposes for the literature review: first, to gain a holistic overview of SSL development in China; and second, to identify potential perspectives that can guide the data collection and analysis. Therefore, in January 2016, the Chinese National Knowledge Infrastructure (CNKI), the most comprehensive and widely used academic database implemented in the Chinese language, was searched using the following search strategy:

“self-servi*” of “self-help” or “ATM” or “vending” or “street” or “block”) and “librar*”.

Overall, 351 articles were retrieved from the database. Finally, 59 articles were selected and included for review, after applying three inclusion criteria: clear focus on Chinese SSLs; relatively scientific, neutral and unbiased views; identifies and reports on the underutilisation problems of the SSL services. Moreover, after careful consideration, the research team decided not to review news reports, which could be biased by political and subjective opinions of the reporters.

The literature review provided three major conclusions:

- (1) there is a lack of coherent and systematic investigation into the causes of the underutilisation of SSL services in China;
- (2) because there is no existing theory, this study needed to take an inductive approach that would allow theory to emerge from the data collected; and
- (3) the literature review pointed to 11 tentative causes, which can be categorised in three tentative themes, as shown in Table I.

As suggested by King and Horrocks (2010) and Chen *et al.* (2011), the tentative themes and codes shown in Table I were used for two purposes: the development of semi-structured interview question scripts; as a starting point for the analysis of interview data collected in the field.

Table I.
Tentative themes
and codes from the
literature review

Tentative themes	Tentative codes (causes)	Resources
System usability problems	Lack of anticipation and protection from damage caused by natural events	Yin (2012), Nan (2013) and Yan (2015)
	Lack of anticipation and protection from vandalism	Jia (2010), Yuan (2012), Wang (2013), Yan (2015) and Yin (2012)
	Unstable system	Zhang (2014), Yan (2015) Ji (2013), Zhai and Wang (2012) and Chen (2014)
Book collection and arrangement problems	Absence of necessary system functions	Zhang (2014), Ji (2013), Zhai (2012), Zhang (2013) and Zhai and Wang (2012)
	Steep learning curve	Chen (2014), Zhao (2015) and Wang (2015)
	Book collection not updated in a timely manner	Yuan (2012), Zhang (2014) and Zhao (2015)
Management problems	Narrow range of book collection	Zhang (2014), Yan (2015) and Chen (2014)
	Lack of basis for book selection	Zhang (2013), Hou (2012) and Zhao (2015)
	Lack of public training programmes	Zhang (2014), Ji (2013) and Chen (2014)
	Lack of effective management strategy	Chen (2014), He (2011) and Wang (2013)
	Lack of necessary supervision	Chen (2014), Qi and Ai (2010), Liang (2014) and Zhang (2013)

2.2.2 Case study. As discussed previously, because there is a lack of coherent and systematic research, an inductive research approach and a case study research design were adopted.

A case study is a common approach in social sciences, which is often used to explore and understand complex and localised human activity systems and social environments (Zhou and Nunes, 2012). The case study approach is generally accepted as a qualitative research method and is particularly suitable to generating answers to “why”, “how”, and “what” questions (Saunders *et al.*, 2002; Zhou *et al.*, 2008). Furthermore, a qualitative case study can be used for multiple purposes, such as providing descriptions, theory testing, and theory generation (Eisenhardt, 1989). Therefore, a case study is suitable for this research study.

This research considers SSL development in the city of Wuhan as the case study. Wuhan is the capital city of Hubei Province and is geographically located in the centre of China. The city has a total area of 8,570 km² and a population of 10.6 million (Wuhan Government, 2016). In 2015, the gross domestic product of Wuhan was CNY 1,091 billion (approximately USD 168.6 billion) (Wuhan Government, 2016).

Wuhan has established a comprehensive public library network, which includes 16 public libraries in total. There are three city-level public libraries, namely, Wuhan Library, Wuhan Children’s Library, and Wuhan City Branch Library. Wuhan Library undertakes the administrative and leadership roles and oversees the provision of library services across the city. Moreover, there are 13 district libraries (seven urban and six suburban district libraries), one for each sub-city district in Wuhan. A list of the public libraries in Wuhan is shown in Table II.

According to the Publicity Department, Wuhan Government (2016), Wuhan currently has over 610,000 library cardholders, accounting for 5.75 per cent of total city residents. The public library network in the city holds around 13.25 million print and digital items (Wuhan Statistics Bureau, 2015). Furthermore, public libraries in Wuhan circulated a total of 6.85 million items in 2015 (Publicity Department, Wuhan Government, 2016).

Public libraries in Wuhan	Service population (1,000 people)	Area (km ²)	Print holdings (1,000 items)
<i>City-level libraries</i>			
Wuhan Library	All city residents	City-wide	3,980
Wuhan Children's Library	All city residents	City-wide	1,280
Wuhan City Branch Library	All city residents	City-wide	50
<i>Urban district libraries</i>			
Jiang'an District Library	937	80.28	190
Jiangnan District Library	719	28.29	220
Qiaokou District Library	856.3	40.06	213
Hanyang District Library	624	111.54	158
Wuchang District Library	1,255.1	64.58	270
Qingshan District Library	517	57.12	217
Hongshan District Library	1,498.9	573.28	200
<i>Suburban district libraries</i>			
Dongxihu District Library	508.2	495.34	208
Hannan District Library	129	287.05	117
Caidian District Library	676	1,093.17	20
Jiangxia District Library	846.5	2,018.31	19.2
Huangpi District Library	911	2,256.70	15.1
Xinzhou District Library	860	1,463.43	11.7

Table II.
A list of public
libraries in Wuhan

Sources: Wuhan Statistics Bureau (2015), He (2016)

In December 2011, Mr Liangzhi Tang, the Mayor of Wuhan, formally announced that Wuhan should become a “reading city”. He specified that reading should become an indispensable daily ingredient of the residents and claimed that “the scent of books should be smelled at every corner of Wuhan”. In 2012, the City Government published an official report, titled “Implementation Plan for the Development of a Reading City in Wuhan” (Publicity Department, Wuhan Government, 2014). According to this plan, in addition to the development and promotion of traditional public library services, the implementation of a comprehensive SSL network across the city is necessary. To support the development of the “reading city”, the City Government decided to input a maximum of CNY 30 million (around USD 4.55 million) yearly during 2012-2015. This financial support is supposed to be used specifically for further developing public library services, including the SSL network (Publicity Department, Wuhan Government, 2014).

Thus, the Wuhan City Government decided that SSL development needed to be completed and fully operational by 2014. The SSL development occurred in two stages. First, by December 26, 2012, 25 SSLs were put into service. These SSLs are referred to as “Street SSLs” and are solely managed and maintained by the Wuhan Library. Wuhan Library articulated three selection criteria for Street SSL locations: first, densely populated communities (more than 30,000 residents) or popular public sites, such as public squares, shopping malls, commercial streets, and bus interchanges; second, an empty public space larger than 30 m² with solid and concrete ground; and finally the Administration Office at a local community is willing to participate and sign a Management and Safety Agreement with Wuhan Library. Second, by December 28, 2013, concurrent with the construction of Wuhan's underground transportation system, 21 SSLs were installed and put into operation at the Metro stations,

one for each station. These SSLs are referred to as “Metro SSLs”. It is expected that with the expansion of the Wuhan Metro network, more Metro SSLs will be deployed. Finally, it is important to note that the Wuhan Library is intended to oversee the operation of the entire SSL network but in fact only controls the operation of Street SSLs, whereas Metro SSLs are controlled and managed by the Wuhan Metro Company. Moreover, in December 2013, 25 more Street SSLs were put into service.

Each SSL machine holds as many as 470 books and is equipped with a 17-inch touch screen. A SSL machine has an approximate height of 2.9 m, an approximate length of 4.5 m, and a width of 1.5 m, and costs around CNY 400 thousand (approximately USD 60 thousand) (Figure 1).

The SSLs in Wuhan are relatively easy to operate. A patron can complete user registration, reader card issuing, book search, book issuing and returning, and user account payment operations on the touch screen in a few taps. He/she can borrow a maximum of three books and is expected to return them within 30 days. All borrowed items can be renewed once for another 30 days. However, currently, all services provided are in Chinese and it is not yet possible to borrow DVDs and audio books.

A deposit of CNY 100 (approximately USD 15) is required for new user registration in order to ensure that books will be returned on time, undamaged. If a book is not returned on time, a CNY 0.5 fine will be charged from the deposit for each day overdue. Moreover, if a book is lost or damaged, the patron will be asked to pay for it, usually

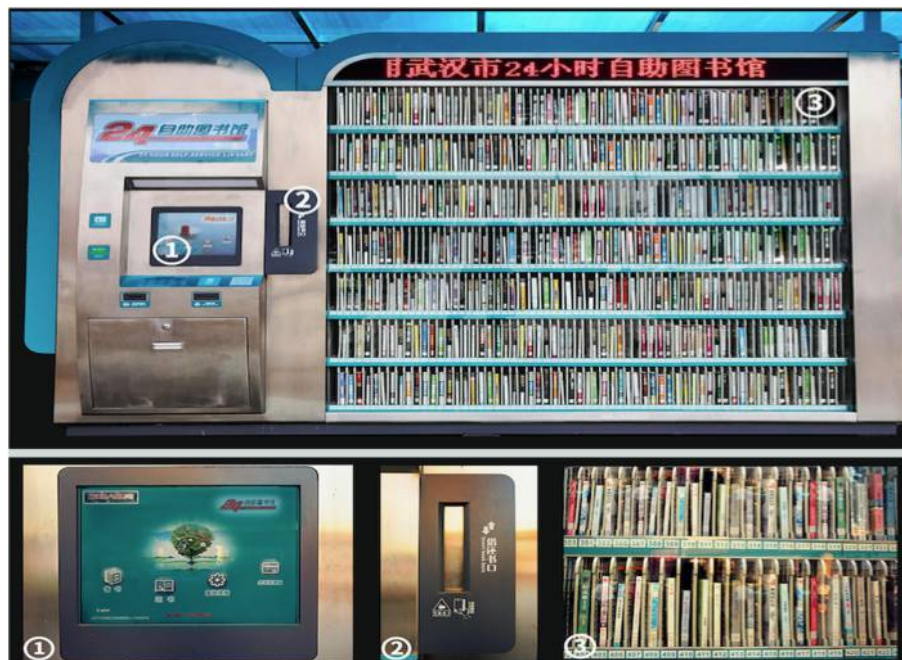


Figure 1.
A Photo of Wuhan
Street SSL

Notes: ①, The main user menu, which consists of four main operations: borrow books, return books, search and renewal, and reader card account management; ②, slot for insert and collect books; ③, book collection display, a reader can browse books titles here or search a book on the touch screen

two or three times the original price. The patron can choose to either pay through the user account on SSL machines, or pay personally in cash at the nearest public library. Furthermore, Metro SSLs are not equipped with payment systems. Therefore, all payments need to be handled manually at one of the two Metro SSL service offices.

2.2.3 Data collection and analysis. Librarians, SSL workers, managers from both Street and Metro SSL systems, and library patrons were approached and interviewed. The informants were interviewed using semi-structured interview scripts and open-ended questions. The questions were derived from the literature review and were designed based on the tentative themes and causes shown in Table I. The final question script contained two ice-breaking questions, 14 questions, and a conclusion question. Two different versions of question scripts were developed, one for library patrons and one for librarians and SSL workers.

Overall, 20 people were interviewed from February to April 2016. Interviews with public librarians and SSL workers and managers lasted approximately 40-60 minutes. The duration of the interviews with library patrons varied widely; the shortest was only approximately five minutes, whilst the longest lasted an hour. The interview participants consisted of six public librarians, one Metro SSL manager, three Metro SSL workers, and ten library patrons.

Thematic analysis was used to analyse the interview data. Thematic analysis is widely accepted as systematic processes of coding and representing data in order to identify and describe patterns (King and Horrocks, 2010; Chen *et al.*, 2011). In this research, interview data were examined and interpreted, coded, and compared against the potential themes and codes shown in Table I. In fact, Table I provides an early identification of a set of causes that were represented by codes, which then were used to further examine, label, and categorise valuable interview data segments.

It is also important to note that instead of just deductively verifying and validating the original set of causes, these initial codes were used only at the data collection and early stages of the analysis and then reconceptualised, expanded, and discussed in detail according to the statements, interpretations, and perspectives of the individual interview participants.

3. Research findings

3.1 SSL development in Wuhan

We [librarians] hope that SSL will no longer be cold, isolated and mechanic machines, but those which can reach out and develop emotional ties with our readers (Public Librarian, Interview 2).

According to the interview participants, the development of SSLs is “purely for the benefit of people living in Wuhan” (Public Librarian, Interview 1). The librarians interviewed asserted that “the development of SSLs in Wuhan follows three patron-centric principles: convenience, equality, and personalisation” (Public Librarian, Interview 1). Convenience means that SSLs should “bring library services a few steps away from where people live or work, even to remote communities away from the city centre” (Public Librarian, Interview 1). Equality indicates that “all residents can access and benefit from SSL services, regardless of differences in age, gender, education background, or ethnicity” (Public Librarian, Interview 2). Finally, SSLs are expected to provide personalised services with meaningful user experiences. Several interviewed librarians claimed that SSLs are not just “simple book issuing and returning machines”, but “frontiers to let people realize the true values of libraries and library services” (Public Librarian, Interview 2).

The library patrons interviewed view the emergence of SSLs as very positive cultural development. Some claimed that SSLs have “become a new symbol of the city” (Patron, Interview 17) and “brought a bit of culture into the fast-growing industrial city” (Patron, Interview 11). One of the patrons even shared an interesting story:

As a mother of a 5-year-old boy, I think the SSL in our community has changed not just myself but my son. Since an SSL machine was put in our community, I started to borrow books about children’s education. I began to read to my son. After a while, I noticed that reading with me has become his favourite activity (Patron, Interview 15).

According to these statements, it can be established that SSLs in Wuhan deliver active and innovative library services. Additionally, the development of the SSL network has encouraged and reinforced public awareness towards reading and learning.

However, the data analysis revealed that despite significant public spending as well as effort in designing, implementing, maintaining, and advocating SSL services, “the [SSL] services are not as well received as expected” (Public Librarian, Interview 5):

There are not so many new readers. After two years of operation, SSLs have gradually formulated a relatively stable reader group. Probably in the first, or second year, some people applied for SSLs reading cards. Not so many nowadays (Metro SSL Worker, Interview 8).

[At Metros stations], the monthly rate of book issuing, well, some stations are comparably higher. For instance, Zhong Jiacun Station and Meiyuan Community Station probably can issue a few hundred in a month. I would say two or three hundred in a month. We are a less popular station, so we only have a few dozen (Metro SSL Worker, Interview 10).

Through the data analysis, three main themes have emerged and have been confirmed: management problems, service limitations, and the implicit role of government.

3.2 *Management problems*

The analysis of the interview data identified four specific management problems as causes for the underutilisation of SSL services in Wuhan. These causes are as follows:

- (1) isolation of Street and Metro SSLs;
- (2) rigid top-down management structure for Street SSLs;
- (3) overly segmented management structure for Metro SSLs; and
- (4) lack of an effective protection mechanism from vandalism.

To ensure success in SSL development, the Wuhan Library established an SSL Management Office as an independent office in the Reading Service Department. This office has a very clear role: to “oversee, organise, manage, and coordinate all SSL-related issues in the city” (Public Librarian, Interview 1).

However, the data analysis revealed that this department failed to enact its designated leadership, managerial, and mediating roles. In fact, the SSL network in Wuhan consists of two almost isolated and co-existing SSL systems, i.e., the Street SSLs are managed by the Wuhan Library, and Metro SSLs are solely operated by the Wuhan Metro Company. There is little communication and interaction between the two systems. For instance, a librarian at the SSL Management Office claimed that:

The Metro SSLs are completely operated on their own. We, as professional librarians, were consulted at the very beginning of their development, and we were happy to give some ideas and opinions. But we were not involved in any of their development and operation. Nor have we input any money to support their development (Public Librarian, Interview 1).

Additionally, the two SSL systems have very different management structures. Street SSLs adopted a top-down distributed management structure. The SSL Management Office at the Wuhan Library is at the top of the structure and organises and supervises all Street SSLs. Nevertheless, actual operation and management are performed by the district libraries individually. According to the data collected, district libraries have four areas of responsibility: first, “to closely monitor and maintain SSL machines” (Public Librarian, Interview 6); second, “to advocate the SSL network to the local community” (Public Librarian, Interview 4); third, “to teach interested users how to use the machines” (Public Librarian, Interview 3); and fourth, “to handle any complaints and inquiries” (Public Librarian, Interview 5).

It has become clear from the analysis that this top-down structure does, in fact, rely on the decisions made from the top. In this case, patrons’ complaints, needs and requirements, which are usually dealt with by the district libraries, are probably not communicated to the top of the hierarchy and have therefore been neglected.

Compared with the Street SSLs, the Metro SSLs have a very different and more complex management structure. The operation of Metro SSLs is divided into four parts, which are managed by four different parallel departments in the Wuhan Metro Company. Specifically, the Passenger Service Department takes care of patron services, account payment, inquiries, and complaints; the IT Department is responsible for system maintenance; the Operation Department ensures that all SSLs are in working order; and the Publicity Department is responsible for advertisement and promotion.

Additionally, it has emerged from the analysis that there is no specific department to oversee and mediate the management processes across the four individual departments. Clearly, this very segmented management structure not only could have caused “very limited communication between the departments” (Metro SSL Worker, Interview 10), but also “each department only cares about their own work” (Metro SSL Worker, Interview 9).

Furthermore, the isolation of the two SSL systems has caused unnecessary confusion, dissatisfaction and thus severely reduced the quality of patron services:

I find it a bit annoying that I need to have different cards for different machines. I have a card for the Wuhan Library and another card for Street SSLs, for which I paid 100 Yuan as a deposit. I have just realized that I need to have a new card for Metro SSLs. It is really confusing and tiring (Patron, Interview 12).

Additionally, a lack of effective protection from vandalism has emerged as another managerial problem. During field trips to several SSL sites when collecting data, the research team noticed that several machines were written and painted on, whilst some were covered with commercial posters and flyers. Some interviewed librarians added that “some people urinated behind the machines during the night” and “some parts of the machine were even stolen” (Public Librarian, Interview 2). To prevent and control vandalism, the current approach is to “simply put a camera on each machine” (Public Librarian, Interview 2). This is clearly not enough to ensure all SSLs are running properly and seamlessly.

3.3 *Service limitations*

The data analysis revealed severe service limitations, which have become causes for the SSL underutilisation. Specifically, six service limitations have emerged have been and identified as follows:

- (1) two parallel service standards;
- (2) steep learning curve;

- (3) severe digital divide;
- (4) unsatisfying book selection;
- (5) absence of patron-centric service view; and
- (6) low patron satisfaction.

A major complaint raised by the patrons interviewed was that the Street SSLs and Metro SSLs are completely different in service and have resulted in severe inconvenience and unnecessary confusion to patrons. The patrons we interviewed have complained, “not only do the two SSL systems use different library cards, but the book collections are entirely different” (Patron, Interview 12) and “a book borrowed from a Street SSL must be returned to a Street SSL” (Patron, Interview 20). A Metro SSL worker stated that “we often receive complaints about books that cannot be returned to our machines. Very soon we realize that they wanted to return books borrowed from Street SSLs into our machines” (Metro SSL Worker, Interview 10).

Moreover, even the SSL machines used by the two systems are very different and were produced by different manufacturers. When compared to Street SSLs, the machines used for Metro SSLs are much less comprehensive and less convenient for patrons. First, the cancellation of a user account and payment procedures must be handled manually. Manual services are hugely inconvenient because “there are only two SSL service offices, which are located at two very distant Metro stations” (Metro SSL Worker, Interview 8). Second, on Metro SSL machines, the search operation can only be performed on the local book collection, whereas Street SSLs can search across all service machines.

An interviewed public librarian claimed, “they [Metro SSLs] not only almost ignored our management and technical suggestions completely but also decide on their own selection of books” (Public Librarian, Interview 1). Therefore, it seems that without effective communication and management mechanisms, the two SSL systems are never going to collaborate and integrate as one.

Additionally, there is a steep learning curve to use both SSL systems, which could be a challenge for senior citizens. For instance, an interviewed Metro SSL manager stated that “in our calculation, very rarely do senior citizens use our machines” (Metro SSL Manager, Interview 7). Many public librarians confirmed “the majority of our patrons are in their 20s and 30s, sometimes 40s” (Public Librarian, Interview 3). One of the public librarians working at the SSL Management Office at Wuhan Library provided the following statement:

It [the digital divide] is a big problem, especially considering that we are becoming an aging society. Our current services may have neglected the needs of senior people, including some personal acquaintances, who pointed out that our machines are not easy to learn and to use (Public Librarian, Interview 2).

Furthermore, there is clearly a lack of an appropriate mechanism for the selection of books. Surprisingly, for Street SSLs, apart from formulating a suggested book list once in a while by the Wuhan Library, the actual work of book selection has been outsourced to the logistics personnel of an external company. One of the interviewed public librarians claimed “the logistics people know which books are popular and more appropriate to put into the machines” (Public Librarian, Interview 1). Another librarian stated that “the logistics people can check the records; if some books are not borrowed for a while, these books are simply taken out and replaced with others” (Public Librarian, Interview 2).

Compared with Street SSLs, the selection of books for Metro SSLs is even more problematic because there is no selection and updating mechanism at all. Certainly, this is not acceptable when providing library services. It is also perceived that SSL services in Wuhan are not really well planned and managed.

Additionally, the interview data revealed that there is an absence of a patron-centric perspective in the existing service provision. To understand patrons' views, an interviewed public librarian explained that they "use questionnaires to gather patrons' interests in principle every month" (Public Librarian, Interview 2). However, in practice, "questionnaires are not always useful" (Public Librarian, Interview 3) because "there is no mandatory [management] requirement demanding questionnaire surveys" (Public Librarian, Interview 5) and "it often requires a lot of work" (Public Librarian, Interview 6). Consequently, patron's perspectives, interests, and needs cannot be understood and reflected in SSL services. This evidently contradicts the "patron-centric principles" as proclaimed by some public librarians during interviews.

3.4 Implicit role of government

As discussed previously, the SSL development in Wuhan was decided, initiated, and encouraged by the City Government. However, the data analysis noted that instead of providing an active leadership, the actual role of the City Government was very implicit. Specifically, the analysis pointed to three causes for SSL underutilisation in Wuhan:

- (1) absence of government leadership;
- (2) absence of detailed planning for deployment; and
- (3) lack of systematic planning for financial support.

It has become clear from the analysis that although SSL development is a government project, the actual work is expected to be finished by the SSL Management Office, which is merely one of many offices at the Wuhan Library, and which has limited political power to successfully drive the processes of SSL development. The City Government should provide a strong and active leadership role to resolve all potential problems and conflicts between administrative agencies in the city. This problem was reflected in interviews with the public librarians. For instance:

Without appropriate government planning and assistance, SSL development can hardly achieve the expected goals because we need help from different government agencies. A main problem we have is that we need to locate SSLs at specific locations. We therefore need to work with all types of government agencies, such as City Management Bureau, Traffic Management Bureau, City Landscape Bureau, Electricity and Power Bureau, Community Services, as well as Industrial and Commercial Bureau. The installation of one SSL machine requires permissions from all of these agencies (Public Librarian, Interview 1).

Moreover, the data analysis revealed that the Wuhan City Government aimed to create an integral SSL system. In fact, it was never planned to develop two insulated SSL systems in the city. As discussed by the interview participants, the City Government is now attempting to create interconnections and to synchronise the operation of the two systems. Nonetheless, without a very determined leadership, this is unlikely to be successful because the government needs to resolve "all sorts of problems, ranging from merging the management of two systems to breaking technical barriers"

(Public Librarian, Interview 1). Moreover, until now, neither have any real actions been made, nor has any detailed plan been developed:

The progress is actually very slow, only the political leaders know ‘when’ and ‘how’ [to make real progress] (Metro SSL Manager, Interview 7).

A few months back [in 2015], some government leaders visited us; they wanted to create links and interactions between Street SSLs and Metro SSLs. Yet, nothing happened so far (Metro SSL Worker, Interview 10).

Furthermore, through the data analysis, financial deficiency has emerged as an additional obstacle to the development and operation of SSLs in Wuhan. The main source of funding for SSL development is intended to be the City Government. As promised, the City Government secured a significant financial investment from Governmental Public Culture Development Spending.

However, this financial investment has been deemed to be very limited, not only because it was directly provided to the Wuhan Library and in turn used on Street SSL development but also because the operational cost of SSLs was not included. As noted by several interviewed librarians, “nearly all of the government support has been spent on the purchase of SSL machines, necessary facilities, and network installment” (Public Librarian, Interview 2). As a result, “there is no financial plan for book procurement and updates. Wuhan Library has to use our own procurement budget for SSLs” (Public Librarian, Interview 1):

Truthfully speaking, SSL development is much cheaper than the development of any types of actual libraries. There is no need to develop any buildings, right? But the operational cost was not accounted for at the beginning (Public Librarian, Interview 1).

According to the interview data, there are five additional costs, which were not included in the government investment, and needed to be subsidised by the Wuhan Library: book storage rental fees – Wuhan Library rented a special warehouse to store books for SSLs; procurement of additional and specialised books for SSLs; outsourcing services – book delivery, shelf management, and updates are outsourced to an external logistic company; system service and maintenance; other expenses, such as utilities, advertisement, and publicity. Thus, SSLs could have become an additional liability for the Wuhan Library.

Furthermore, it is necessary to highlight that no government financial support was given to the Metro SSLs. An interviewed Metro SSL manager discussed, “despite the fact that SSLs cannot generate any profits, all expenditures are expected to be paid by the Wuhan Metro Company” (Metro SSL Worker, Interview 9). Thus, this imbalance of government support between Street SSLs and Metro SSLs could have reinforced and further exaggerated the isolation between the two systems, as well as resulted in barriers to joint operation and collaboration.

4. Discussion

As discussed in Section 2, this research project adopted a thematic analysis. This type of inductive approach is very useful for producing a list of themes and for generating a structured theoretical narrative, such as the one presented in the previous section, which have explanative power to the research questions and the social phenomenon being investigated (Zhou and Nunes, 2016).

On this basis, it is expected that a conceptual model could be developed to study and resolve problems encountered in SSL development in the future and to guide the

practice of SSL management. Thus, the data were re-analysed to understand the relationships between the themes identified from the interviewees' perspectives. As a result of this analysis, a conceptual model is developed and presented in Figure 2.

Figure 2 presents the interrelationships between the three emerging themes as well as the individual causes identified. There are three types of relationships. First, the solid single-arrow lines represent the cause-consequence relationships between individual causes for SSL underutilisation. Second, the dotted lines represent the relationships between the causes and the emerging themes. Finally, the bold arrow lines exhibit the relationships between the three emerging themes, which are shown in ovals.

Moreover, as shown in Figure 2, the three emerging themes are arranged at the outer layer. These three themes reflect a three-layer hierarchical structure for SSL development and management:

- (1) City government appears at the top of the hierarchy and the core of the SSL development. The Wuhan case reveals that the city government should become a driving force with strong leadership and clear vision to develop systematic, realistic, and detailed strategies and plans.
- (2) SSL management, at the middle layer, should take a mediating role. On one hand, the SSL management should respond to the decisions, strategies, and guidelines articulated by the government. On the other hand, and more importantly, the SSL management should be able to develop SSL services in accordance with the needs and requirements raised by the individual patrons.
- (3) SSL services emerge at the bottom of the structure and is the closest to patrons. The Wuhan case shows that, instead of shaping patron services based on their requirements and needs, the SSL services are constrained and developed according to the government and management decisions. The absence of a patron-centric perspective should be considered to be the main cause of the underutilisation of SSL services.

Consequently, to increase the popularity of the SSL services in Wuhan, it is important to create bottom-up communication mechanisms. That is, a system where the needs, requirements, and demands of individual patrons not only can be captured and quickly

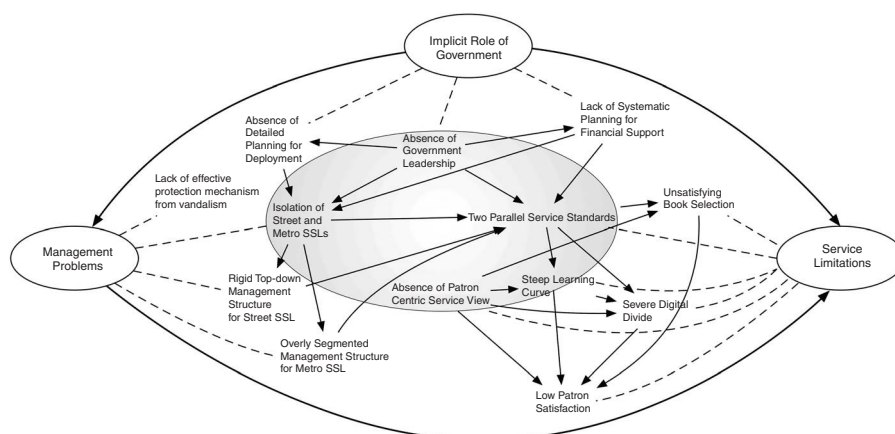


Figure 2.
A model of SSL
underutilisation
causes, relationships,
and themes

responded to by the SSL services but can also be consulted during the processes of decision-making at the management and political layers.

Moreover, Figure 2 presents a cause-consequence network, which exhibits relationships between individual causes for the SSL underutilisation in Wuhan. In this network, four causes emerged as central links, namely, absence of government leadership, isolation of Street and Metro SSLs, two parallel service standards, and absence of a patron-centric view. Thus, in order to increase the popularity of SSL services in Wuhan, efforts should be made to focus on resolving the four main causes. Specifically, three strategies can be formulated: clearly define the role and responsibility of the City Government in the development of SSLs; seek political, managerial, and technical solutions to merge and unify Street and Metro SSL services; establish dynamic mechanisms that can effectively respond patrons' requirements and needs in the provision of SSL services.

5. Conclusion

This research study aims to investigate the underutilisation of SSL services in Chinese cities. This study adopted the SSL network in Wuhan as a case study, in which 20 public librarians, Metro SSL workers and managers, and patrons were approached and interviewed. It has become clear that the absence of a patron-centric perspective is the main cause for the underutilisation of SSL services. Specifically, it is necessary to develop dynamic communication mechanisms, which can provide effective channels to connect individual patrons, through SSL services and management, to the politicians and decision-makers in the government. In this case, patrons' actual needs and requirements could be effectively understood and quickly responded to.

It is important to highlight that the resolution lies with the government, which should not only become a source of strong, decisive, and determined leadership driving the development of SSLs but also establish very clear, practical, and systematic strategies, plans, and guidelines.

This paper raises important issues, which are not only of interests to library researchers and professionals, but also of critical importance to library managers, as well as politicians and administrators at relevant government agencies. However, since this paper reports on one early investigation into the underutilisation of SSLs in Chinese cities, it adopts a theoretical perspective and focuses on identifying and understanding the causes of the underutilisation. In future research, it is necessary to establish specific and pragmatic strategies to promote the usage of SSLs. Please note that the development and implementation of these strategies will require consultation, negotiation, and strong leadership, as well as political will. Moreover, the research findings and theoretical propositions in this paper can provide useful implications for the SSL network and service development, not only in Chinese cities, but also in different national and cultural contexts.

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