

Research on Knowledge Service Pattern Innovation in University Libraries under Ubiquitous Environment

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Abstract - The rapid development of ubiquitous technology, mobile technology and information technology and the ubiquitous environment have a profound influence on university library knowledge service. Ubiquitous service has become the focus of university library study; the traditional service patterns in university libraries have changed dramatically; the knowledge service is more flexible and diverse. By analyzing their own advantages, university libraries should integrate, organize and utilize various resources, actively construct mobile service platforms and explore new ways of knowledge service in university libraries under ubiquitous environment.

Index Terms - ubiquitous environment, university library, knowledge service, mobile service platform

1. Connotation of Ubiquitous Environment and its Impact on Knowledge Service in University Libraries

Ubiquitous environment is a new knowledge infrastructure composed of network equipment, hardware, software, information resources and human beings. It is a ubiquitous, natural, easily used learning environment and anyone can gain what information resources he needs anywhere anytime by any portable devices around him [1]. Ubiquitous environment makes university libraries expected to be ubiquitous libraries that can provide resources and service anytime and any place.

A. More emphasis on the acquisition and utilization of resources

Under ubiquitous environment, it demands that the means and channels of users' obtaining knowledge information should be more concise, flexible and fast, breaking the time and space limit of knowledge acquisition. Hence, on the basis that the traditional library service mode can no longer meet the information needs of modern users, when thinking of resource construction strategies, university libraries should put the emphasis on the construction of digital resources, especially on the acquisition and utilization of resources so that users' ever-present and omnipresent need for knowledge information can be satisfied [2].

B. More demand for the openness and personalization of the service mode

Under ubiquitous environment, users' personal subjective consciousness is increasing gradually. The users require that the information resources that university libraries provide can satisfy users' own development needs more [3]. On the one hand, they hope to obtain information resources that are more concrete, accurate and can meet their own personalized demands. On the other hand, they hope that no longer

restricted to only one library, information can reach any organization or person that can get the service by mobile communication, new media technology and network equipment so that their desire for knowledge information in life, work and study can be met. Therefore, the users need university libraries to provide more diverse and open knowledge service, to provide the flexible personalized knowledge service of information acquisition, analysis, reorganization, integration and innovation, so to truly realize the idea of "where there is user demand, there is library service".

C. More attention to establishing user-driven embedded service mechanism

The rapid growth of knowledge information makes users difficult to differentiate between true and false, good or bad in "information explosion" and "information overload". Mass information hinders users from obtaining information effectively and wastes their precious time. Under ubiquitous environment, university libraries have the responsibility and obligation to target user demand as drive force, to establish organized knowledge organization in all stages of knowledge management of knowledge dissemination, knowledge storage and knowledge processing, to embed in users' information demand in time and to help users describe, link, organize and construct knowledge maps that conform to users' own characteristics so that to provide users with user-demand-oriented knowledge service mechanism [4].

2. Three Advantages of University Libraries' Construction of Mobile Service Platform

A. Resources

Being as the distribution center of university documents and information, university libraries have the advantage of rich resources. They have electronic books and self-built characteristic databases like Superstar Digital Library and American Star Foreign Digital Library, E-journals like CNKI, Wanfang Data and many learning, entertaining electronic resources. These resources are of abundant types, various kinds and great number and provide a sufficient resource support for the construction of mobile service platform in university libraries.

B. Technology

Currently, with the gradual deepening and maturing of social information construction, the majority of universities have completed the e-campus construction project. The

opening and use of e-campus provides the technology premise for the construction of mobile service platforms in university libraries. Moreover, university libraries have their own professional technical forces, which can effectively guarantee the good operation of mobile service platforms.

C. Service

The construction of mobile service platforms in university libraries can not only provide online reading service for the readers, but also in accordance with readers' different information needs, provide some personalized, disciplinized and intelligent services like new books introduction, information query of borrowing and returning, online guide, reference service, subject tracking service and subject information feeds, providing the service guarantee for the deepening of readers' reading and research.

3. The Construction of Mobile Service Platforms in University Libraries

A. Thinking of construction

The thinking of construction of mobile service platforms in university libraries is to construct a mobile service platform that is rich in resources, fully functional, easy to use and strongly interactive with the help of advanced network technology, mobile communication technology and digital media technology, so to provide ever-present, ubiquitous, intelligent, personalized and disciplinized knowledge information service for the readers and users.

B. The system structure of mobile service platform

This platform design includes a three-layer frame structure of information service, comprehensive management and resources integration. The information service layer includes user registration, service navigation and accounting management. It is on this interface layer that university libraries integrate, optimize their service modes and realize their interactions with readers, the comprehensive management layer includes resource management, template management and user management. It is the technical core of the construction of mobile service platform in university libraries. It externally examines and approves readers' using permission, monitors the condition of resource distribution and utilization, internally manages and authorizes various services in libraries and at the same time takes charge of the data management and technical maintenance of all kinds of resources in libraries. The resources integration layer includes virtual server, library electronic resources and network resources and it is the integration center of data information of this platform. The three-layer frame structure relies on each other, constitutes an organic connection of the whole and guarantees the good operation of mobile service platforms in university libraries [5].

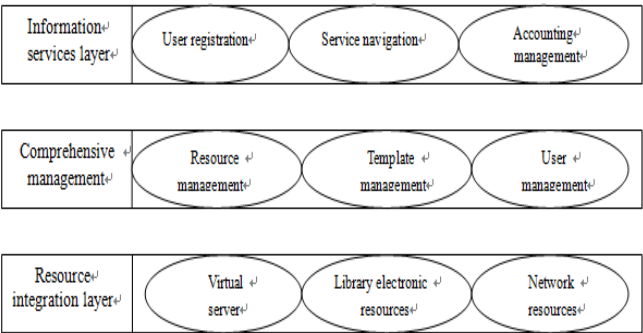


Figure 1 System Structure FIG

C. Analysis based on users' function

The objective of the construction of mobile service platforms in university libraries is to meet in time users' information needs anytime anywhere. The original intention of the design of this platform's function module is to make users enjoy ever-present and ubiquitous resources and services like in libraries once they log in. Hence, users' demands are the evaluation index and the basis of the design of users' function modules of this platform. At present, integrating ways and means of information services in university libraries and based on users' knowledge information needs, its basic function modules contain the following six parts.

1) Mobile online reading and online learning

By using smart phones, tablet computers and other electronic equipment, readers can search, read and download libraries' electronic resources, read online and learn the lectures online, and browse other resources online through the cooperation with other websites. This brings great convenience to the readers and makes readers truly "walk into libraries" while remaining doors.

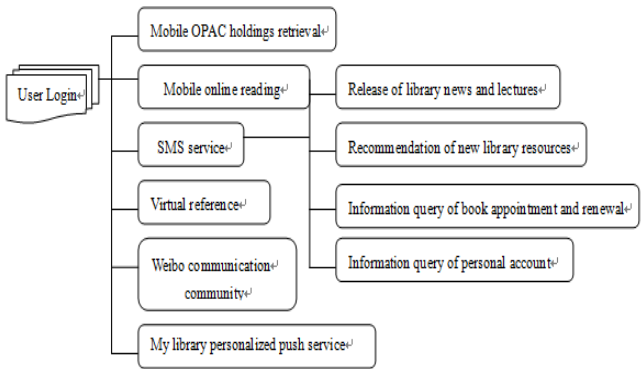


Figure 2 mobile service platform system function structure diagram

2) Mobile OPAC and library retrieval query

It is a handy service the libraries provide for the readers with the help of mobile communication technology. By means of mobile OPAC, readers can utilize course breaks, outings, waiting time and other trivial time to search for information as library resources, book appointment, borrowing and returning etc., thus bringing great convenience to the readers with regard to time and mode.

3) Virtual reference

This is a virtual instant reference service that libraries provide for the readers. It means that readers can communicate with libraries by using instant messaging softwares like QQ, SMS, mails, phone calls and audio message technology and the librarians make references in time to answer questions and solve problems for the readers, so to promote the communication between librarians and readers.

4) Weibo communication community

This is a platform that libraries and readers exchange ideas and interact. On Weibo, libraries can post timely library news and new services and to expand libraries' influences. Readers can timely post their own information needs and confusion, give back their suggestions and advices for the library services and exchange ideas among themselves. By virtue of Weibo communication community, libraries can provide personalized reference services aimed at readers' confusion. This can promote library services and highlight the pertinence and initiative of information service.

5) SMS and My library personalized push service

Short message service (SMS) is an active notification service that libraries provide for the convenience of readers. It means that the libraries can actively, regularly and timely send short messages to registered users about library news, lectures, book appointment arrival, recommendation of new library resources, overdue notices of returning and payment and at the same time users can use short messages according to certain instructions to voluntarily conduct information query about book loan period, book appointment, renewal, library service introduction and so on. And the "My library" personalized push service is a personalized information notification service that the libraries customize for the users according to their knowledge structure, characteristics of information needs and information needs tendency. It means that users can, in accordance with their own needs and interests, by means of personalized information technology software, customize voluntarily library information resources and make the mobile service platforms their own electronic studies. In this way, libraries can actively provide push services according to targeted users' personalized needs [6].

4. Three Problems that Need Close Attention in the Process of the Construction of Mobile Service Platform

A. Intellectual property problem

The construction of mobile service platform makes the readers enjoy the ever-present and omnipresent resources and services of the libraries. But because the digital resources are duplicable, downloadable, easy to modify and the service is networked, copyright security is of crucial importance. As the provider of mobile service resources, libraries must control the access security strictly and have the responsibility to develop and utilize more integrated, comprehensive and systematic technologies, such as user access technology, information encryption technology, information storage technology, anti-copying technology [7], digital copyright management technology and so on to guarantee that the copyright owners' statutory intellectual properties are not damaged.

B. Unified identity authentication and user management problem

In order to not only facilitate users but also guarantee data security, the mobile service platform carries out a unified identity authentication and user management system. It strictly censors users' qualification and access permission. When the users apply successfully, they can enjoy the one-stop service of the libraries. But once they have any rule-breaking operations during the process, the user management system will immediately terminate their access.

C. User mobile terminal and data format problem

Mobile service platform realizes the interaction between libraries and users with the help of mobile communication equipment and the network and the level of intelligitization of the user terminal plays a vital role in the function of platform service. Meanwhile, the system and the data format of the digital resources in libraries should keep in line with the system and the data format supported by the mobile terminal devices that are held by the users. Therefore, the data format and the standardization of library digital resources and user terminals are the key problems to the realization of the service function of the mobile service platform.

5. Conclusion

Ubiquitous libraries represent the development trend of library in the future and the knowledge service under ubiquitous environment has become increasingly important and crucial. University libraries construct mobile service platforms by virtue of mobile communication and network equipment. This is very promising but there is still a long way to go. Therefore, university libraries should actively grasp the opportunity brought about by ubiquitous intelligence, constantly change development strategy, improve and complete the service function of university library mobile service platforms, innovate service patterns, guarantee the better implementation and perfection of the idea of ubiquitous service in university library knowledge service so that the level of ubiquitous service in university libraries can be promoted and university libraries can provide more convenient, personal and professional knowledge service for the readers.

Acknowledgment

This work is partially supported by the National Social Science Fund of "Study on the Core Competency of the Library", China (09BTQ002) and Wuhan Science and Technology Association Foundation of "Study on the Human resource gathering Innovation of East Lake High-tech Zone", (WHKXD201402). The author also gratefully acknowledges the helpful comments and suggestions of the reviewers, which have improved the presentation.

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