

## Developing One-Stop Intelligent and Interactive Library Service Systems in Universities

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***Abstract** - Being a world-class university is always the goal of a university in the world. A first-class university is usually characterized by the broadcasting of knowledge, developing knowledge, globally networked, academic freedom, intellectually stimulating environment, internal self-governance by academics, pursuit cultural and scientific activities and social and civil life. It is important to understand how the library changes its services influence the development of the broadcasting of knowledge, developing knowledge, globally networked, academic freedom, intellectually stimulating environment, internal self-governance by academics, pursuit cultural and scientific activities and social and civil life. The library should turn the traditional service to the discipline service and transform its services to support research and innovation, especially on the library service for developing knowledge into a world first-class. The library services in universities that want to be a world-class should be centered on the establishment of first-class disciplines. And thus an interactive Library service system should be built for better developing first-class discipline.*

**Keywords:** Library services; first-class discipline; library management; Library; librarian.

### Introduction

In order to enhance the competitiveness and hierarchical positioning of higher education systems in the domestic and foreign market, the countries in both Europe and Asia restructure their education systems (Deem, 2008). For example, China has been supported by 42 universities and 465 disciplines in 140 universities to create world-class universities by developing first-class disciplines by 2050 (For example Peters, 2018; Song, 2018). Such a restructure has been driven by the desire of governments who want universities give a large contribution to their national economies, the ceaseless search for research funding and prestige, and the worldwide market for students. A global research university has been identified as globally networked, globally recognized and effective in local, national and global action (Altbach, 2011).

For achieving world-class universities, the first thing is to know what world-class universities are. Unfortunately, there is no agreement on a definitive concept of “world Class University”. For example, Altbach wrote “The problem is that no one knows what a world-class university is, and no one has figured out how to get one. Everyone, however, refers to the concept” (Altbach, 2015). And he suggested that a world-class university should include academic freedom, an intellectually stimulating environment, adequate facilities and funding, excellence in research, and internal self-governance by academics (Altbach, 2015). Levin

suggested that a world-class university should include research, development, and dissemination of knowledge, excellence in the education of his students, and activities contributing to the cultural, scientific, and civic life of society (Levin, 2006). Salmi suggested that a world-class university should be globally networked, globally recognized and effective in local, national and global action (Salmi, 2009). He also concluded that developing the capacity to compete in the global market through the acquisition, adaptation, and creation of advanced knowledge is more important than improving the quality of learning and research for a world-class university. Ahmed also suggested that a world-class university with academic excellence or appraising quality should include developing and broadcasting of knowledge, excellence in the education and research, and pursuit cultural and scientific activities and social and civil life (Ahmed, 2015).

According to the above discussion, developing and broadcasting of knowledge or pushing back the frontiers of knowledge recognized by peers underpins the idea of world-class. In other words, Excellence in research is the most fundamental factor for developing a world-class university. Other important factors include academic freedom and an atmosphere of intellectual excitement, the governance of the institution, adequate facilities for academic work, and adequate funding to support the research, teaching, and other functions.

One can note that appropriate libraries, laboratories, the Internet, and other electronic resources are key factors to the most innovative teaching and the most creative research. Therefore, the library in a university who want to develop him into a world-class university should improve his services to meet the goals of the university.

The library in these 140 universities, a key factor to the most creative research, should supply deep, meticulous, and comprehensive services for the university better develop him into a world-class university. Because there are still traditional service modes in the libraries of most universities, some transformation of the library is needed to be performed for the aim of building world-class disciplines and universities. For the aim that universities that want to be a world-class can develop their disciplines into a world first-class, libraries should transform their services and adjust their organizational structures to support them. Librarians will also need a new set of skills to adapt to the plan. It is necessary for a university library in such a university to establish the one-stop mode of services centered by developing and broadcasting of knowledge, innovative teaching, and cultural and scientific activities.

### **Libraries and Challenges of Change**

The traditional library service centers on documents and organizes document construction, document acquisition, document retrieval, and document delivery according to document work flow. For developing a world-class discipline in a university, its university should turn the traditional service to the discipline service. It means that the library service centers on discipline construction and is guided by discipline construction. The scientific and technological information services in such a library are organized according to disciplines, specialties and research projects. Thus, it makes information services disciplinary. The library services for such a disciplinary are systematic, individualized and in-depth, which is helpful to develop and broadcast knowledge related to students, professors, and researchers of the disciplinary. And the whole service content and process in the library service system will be improved through users' feedbacks. The aim of improving is that better help the students, professors, and researchers in the disciplinary push back the frontiers of knowledge.

In order to build a service system in a university that wants to be world-class, there need seven essential elements that are content, team, resources, platform, process, mode, and feedback. The construction of the subject service system aims to help the discipline develop into a world first-class. It will be constructed based on the actual development plan to clarify the contents of the disciplines service, establish a good librarian team of disciplines service, purchase disciplines literature resources, build a one-stop or an integrated disciplines service platform, standardize the processes of disciplines service, simplified the various modes of disciplines service, and timely optimization of subject services via frequent users' feedbacks.

## **Discussions**

According to the above literature report, a first-class university is characterized by the broadcasting of knowledge, developing knowledge, globally networked, academic freedom, intellectually stimulating environment, internal self-governance by academics, pursuit cultural and scientific activities and social and civil life. In the following, we will discuss the necessity of developing one-stop intelligent and interactive Library service systems for the universities that want to be a world-class based on these 7 aspects.

### **Broadcasting of knowledge (Teaching and Learning Support or excellence in the education)**

Because the library' is a knowledge repository and an agent for the dissemination of knowledge and knowledge is only useful when it is shared, transmitted, or acted upon (Branin, 2003), libraries should transform their services to better broadcasting of knowledge.

In order to better support universities to develop discipline into a world first-class, libraries should transform their services to support teaching and learning. Librarians will also need a new set of skills to adapt to the plan. Libraries need to develop a culture that embraces user awareness and engagement (Keisling, 2018). Therefore, the libraries should service in the following 5 main aspects: 1 Library should scale their services in teaching and learning using the latest technology, for example, developing a series of online courses and forums around the key subject knowledge. 2. Libraries should scale teaching resources support on teaching reference and learning resources database. 3. Libraries should scale daily and appointment training lectures. These lectures include information literacy course training, database usage training, freshman education training, mental health education training, job hunting training, traditional culture lectures, etiquette training, celebrity lectures, etc. 4. Libraries should scale the service of subject resource recommendation (all kinds of domestic and foreign paper electronic resources) according to the key subject knowledge. 5. Libraries should supply venues for learning, discuss, and exchanging information, and etc.

### **Developing knowledge (Research and innovation support or excellence in the research)**

It is well known that Libraries are transforming from simple repositories of books, journals, and items used in academic research and teaching into places of collaboration and knowledge creation (Zugg, 2018). But how can we develop knowledge, or what is helpful to creativity? Psychologists have discussed creativity (for example: Funder, 1991; Feist, 1999; Mischel, 1999; Malaviya,2005). These papers demonstrate that people in any given situation are generally more creative than those individuals. Therefore, the probability of creative behavior can be increased by university libraries creating and sustaining a culture and environment that is helpful to the creativity and faculties of the students. The development of a first-class'

university requires that librarians keep pace with the students and faculties' needs for developing knowledge.

In order to better support the students and faculties to develop knowledge into a world first-class, libraries should transform their services to support research and innovation. Therefore, the libraries should service in the following 8 main aspects:

1. Libraries should develop a one-stop interactive service platform to support research and innovation. In such a service platform, the information about regular analysis and statistics of hot research, hot authors, related industry dynamics, related disciplines dynamics, patent information and so on will be delivered in time to the students and faculties via e-mail and or other reference services (for example, QQ, Weixin, Facebook,). Thus the students and faculties wherever they are can get the information in time. The service platform aims at establishing an interactive platform of resources and services, realizing the dynamic publication and sharing of subject resources and disciplines, facilitating users, providing a convenient, fast, personalized and one-stop information environment, and providing users with in-depth knowledge services. This interactive service platform should integrate academic resources such as subject-related databases, domestic and foreign journal resources, expert results, hot-spot authors, hot-spot papers, teaching videos, authors of our school, achievements of our school, submission guidelines, lecture training and other academic resources and global trends of discipline development, national investment and support, technological developments and total research and development costs, speed of technology transfer and commercialization, patent protection and global industry dynamics. In other words, such a service platform should integrate all kinds of paper and electronic literature resources, the knowledge base of our university, and the application market dynamics related to disciplines. Most libraries still use commercial platform such as library Guides content management and knowledge sharing platform, latitude information management platform, Subject + subject knowledge service platform, LDSP library subject service platform, Disciplines + subject service platform and so on, third-party platform, and other third-party platforms, self-built platform built by using traditional disciplines blog, information portal, and others are developed by using subject platform.

2. Such a service platform should integrate common database resources, JCR partition, ESI-related highly cited journals, inclusion, subject-related core journals, hot journals and writing guide into the subject service platform. For example Fudan University that wants to be a world-class uses the domestic and Foreign Core Journal Query System to provide functions of browsing, searching, and linking journal impact factors in four databases or evaluation systems, such as citation reports of science and technology journals, an overview of key domestic journals, etc.

3. The platform should provide more convenient novelty retrieval and result in retrieval for the students and faculties. The library should update document retrieval technology along with the development of internet and information technology. For example, the platform can develop an efficient retrieval means for mobile users because more and more people use mobile.

4. The platform should establish the Institutional Knowledge Base. The university should establish an institutional knowledge base that combines the school's first-class disciplines and characteristic disciplines. It can be helpful to clearly understand the development of disciplines and existing problems clearly and finally make decisions.

5. The platform should provide one-stop service of patent information training, retrieval, analysis, declaration, and transformation. Library patent information service can be divided into basic service, deep service and advanced service, basic service based on patent resources, deep service based on patent retrieval, patent training, and patent consultation, and advanced service based on patent novelty search and patent analysis. Intellectual property service and patent service are important to measure of discipline because the ultimate goal of scientific and technological research is to promote the progress of mankind. At the same time, the application the knowledge and patent into the industry improve the reputation of the university. At present, most universities have carried out patent consultation, patent search, patent competitiveness analysis, patent analysis, patent technology analysis, and patent training. However, there are not many patents directly connected with enterprises and industries. In addition to the patent declaration, patent service is essentially to find enterprises for technology and technology for enterprises. Most of the current services remain in the patent application process. There are not yet achieved a two-way communication link for scientific research and technological achievements and the market of industrial enterprises. In other words, consulting in patent service is the foundation and transformation assistance is the key.

6. The platform should establish a data management system for scientific research. Such a system should include self-purchased and self-built data sources by the library and the external multi-source heterogeneous databases (the databases purchased by other departments, databases of the scientific research, personnel, finance, educational administration, etc. in the university, and data sources available on the network). Thus, based on such a data system the librarians or others can make information analysis report for decision-making and development support in time. For example, The university administration requires management and analysis of a large number of scientific research data. Librarian can give a distribution report of subject ESI (web of science-essential science indicators)/SCI (science citation index) papers published by the disciplinary that want to be a world-class, highly cited ESI papers and hot papers in the disciplinary, research frontier ranking the ESI on the disciplinary for policymakers, administrators, analysts, and information specialists in universities, and laboratories. More importantly, the scientific research data management system built by the library can have unique advantages. For example: Combining the collected data of research projects (for example National Natural Science Foundation, major projects, application for national 863, 973 and other high-tech research and development projects, provincial and Municipal Fund projects, innovation fund projects for small and medium-sized enterprises) and the research documents (such as research papers, doctoral dissertations and reports of researchers) with common database resources, librarians can recommend to the students and faculties the latest global publications and funding projects related to their work via e-mail and or other reference services.

7. The platform should establish an embedded research service group. Then, the students and faculties can get help from librarians into the whole process of developing knowledge. Embedded services are individualized services designed to avoid the inadequacy of library information services and users' needs. In order to establish direct links between libraries and users and effective use of library resources and services, libraries set up subject working groups according to the needs of the discipline. Embedded services should be built after an in-depth understanding of the needs of the discipline. Embedded services include subject liaison, suggestion collection, subject resource push, subject personalized information service, participation in relevant academic activities organized by counterpart colleges and

departments, timely understanding of the development trends of the disciplines, the regular and active promotion of research reports, project cooperation, subject consulting, personalized customization services, etc. There are two virtues. One is that can better support the development of the discipline. This is because all factors (resources purchase, push, science and technology novelty search, science and technology project establishment, resource use, retrieval courses, invention patent declaration, new product declaration, transfer of results, subject development planning and development planning) has been together combined. For example, the novelty search of science and technology will be embedded in the whole process of establishing, applying, researching and concluding scientific research projects, so as to improve the ability and quality of the library in serving the subject construction. The other is that also better serve teaching and learning by embedding information literacy education into the retrieval of resources and curriculum application of the discipline. For example, the library supply services of teaching users information access channels and acquisition skills based on domestic and foreign databases related to the disciplines.

8. The platform should establish an interactive forum. Through it, libraries robust user assessment programs that can scale what they learn about changing populations to revise and extend services with limited growth in the resource. The most important thing for good service is communication and feedback. Only by accurately understanding the needs of the service object, the service can be better. A good service requires effective communication with users, timely feedback and timely improvement of their services. Most of the university libraries that want to be a world-class have established subject service platforms, but there are also problems such as single content, inconsistent classification, poor interaction, unstable update frequency, and poor information interaction. To solve this problem, libraries need to develop a one-stop interactive platform which combines resources and services to achieve rapid access to and interactive exchange of information resources and improve users' efficiency and satisfaction. Firstly, the library should provide guidelines for searching resources, whose contents include the retrieval methods of various databases, the acquisition of literature information resources and the use of common software in libraries. Secondly, librarians should timely answer the questions of teachers and students about library resources and services by telephone, e-mail, and other services. Lastly, librarians should pay attention to evaluation and feedback. The evaluation of the platform focuses on the resources and service platforms to see whether it meets the users' needs. The evaluation of the service team depends on whether the ability and quality of subject librarians meet with the requirements of a world-class university.

### **Globally networked (Internet)**

Digitizing materials and offering full-text documents or images to users become more and more important libraries via their web sites. Thus, a new mode of delivery is applied in libraries. Standards for traditional reference service could be valid for digital reference services. Far before the expansion of digital archives, libraries were found that can help shape the digital revolution (Brindley, 2002). Libraries are no longer 'just libraries,' but a hybrid of different specializations and services that have come together to create a new public space (Mickiewicz,2016). Due to the advent of the internet, libraries have greatly changed (Woodward,2013).

Because a world-class university should be globally networked and globally recognized, libraries should provide globally networked service for developing the capacity to compete in

the global market. The main function of reshaped as “redistributive technology” (Wyatt, 2015). In other words, digital reference services evoke a new set of rules. For example, libraries should develop information, reference, and directional services; provide the information found by the user; offer finding aids; provide instruction on how to effectively use resources; provide how to access the services and resources; add value to information; and timely answer the questions of teachers and students or others about library resources and services by telephone, e-mail, and other services refer either the user or the question to another agency, expert, or another library (Wilson, 2004).

### **Academic freedom**

Academic freedom concerns in libraries have been detailing discussed (Ellern, 2015). Academic freedom in librarianship means freedom to think or believe what one will, freedom to express one’s thoughts and beliefs, and freedom to access information and ideas. For the purpose of academic freedom, librarians should be guided by the following principles: the inviolable privacy of library users; transcending the personal values of the selector; maintaining controversial materials; open and unfiltered access to the Internet; freedom of information and of creative expression; library services without available whenever possible; and so on (Usman, 2018). One can note that a set of beliefs that support quality service, intellectual freedom, curiosity and an overarching desire to make library use as easy, friendly and satisfying as possible is just what the library wants to do. Therefore, Libraries should retain employees with non-traditional life styles as long as their work performance is acceptable because this value is congruent with principles of academic freedom and the balanced collection. (Holley, 2016). As we know that academic freedom is also required by first-class universities, librarians in libraries should have principles of academic freedom to get creativity in the library and information sciences and meet the needs of all users in the disciplines that want to be world-class. Thus, the libraries in these universities should provide a multifunctional environment within the library to the students, faculties, and others.

### **Intellectually stimulating environment**

It is vitally important that students have an intellectually stimulating environment to learn and study (Pang, 2015). For meeting increasing users’ satisfaction required competitive and dynamic library services environment is tasked by libraries. It requires actively engaging the skill, talent, and creativity of all librarians. Thus, a number of critical operational challenges (for examples advances in computer and communications technology, unmediated digital access) occur (Castiglione, 2008). As we know that developing and broadcasting knowledge is the main aim of first-class universities. And an intellectually stimulating environment is very helpful in developing and broadcasting knowledge. Librarians in libraries should have principles of academic freedom to get creativity in the library and information sciences and meet the needs of all users in the disciplines that want to be world-class. Thus, the libraries in these universities should use their activity, talent, and creativity to provide an intellectually stimulating environment within the library to the students, faculties, and others.

### **The Internal self-governance by academics**

Libraries services face students, faculties, and administration department. It should be determined according to the object of developing a first-class discipline. Therefore, its internal self-governance should be guided by academics. For example, the main services should be guided by content support, resource support, tool support, spatial support, platform

support, data support, etc. In order to build one-stop service system, libraries should establish a high-quality service team focusing on the development of the discipline, especially on resource acquisition, platform construction, subject analysis, patent service, novelty retrieval, embedded service, and service feedback. This requires libraries to change the extensive resource acquisition method by few people, establish a special team of librarians with a professional background of the disciplines, refine the acquisition method centered on disciplines, strengthen the construction of journal resources, and ensure journals for researchers. Thus, the purchased literature resources match with the subject specialty accurately and improve the utilization efficiency of resources. At present, the library of Peking University has established such a professional acquisition team with disciplinary knowledge background, to ensure the matching degree between literature resources and discipline specialty to the greatest extent.

### **Pursuit cultural and scientific activities and social and civil life**

Publication activity is a prioritized university task. In order to provide high-quality service and the best possible satisfaction of requirements, and exhibit great flexibility in its activities, the service must smart and intelligent (Baryshev, 2018). The university that wants to be a world-class not only requires the discipline developing into a first-class, but also to train talents for serving the society and developing national economics, emphasizing the integration of science, and education and production and education

### **Conclusion**

Because a first-class university is characterized by the broadcasting of knowledge, developing knowledge, globally networked, academic freedom, intellectually stimulating environment, internal self-governance by academics, pursuit cultural and scientific activities and social and civil life, it is important to understand how changing library services influence the development of the discipline. The library should turn the traditional service to the discipline service. Librarians should transform their services to support research and innovation, especially on the library service for developing knowledge into a world first-class. The best choice is to build a one-stop intelligent and interactive library service system. Experts from different fields, including information professionals, professors in different disciplines, organizational and technical specialists, students in the universities, psychologists and engineer have to be involved in developing one-stop intelligent and interactive library service systems to meet the requirement of developing disciplines into a first-class in the world.

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