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AUTHOR	Yang, Chunhua
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ABSTRACT

The purpose of this study was to compare the quality of information service provided in Swedish and Chinese medical libraries and to judge the information gap between China and Sweden. Two libraries of key Chinese medical universities and a Swedish medical library were selected for the study. Based on the number of databases, print journals, electronic journals, user education courses, level of library research activities, and other services such as navigation systems and biomedical links, an evaluation of information service quality was given. Results are presented in the following areas: (1) differences in library collections, including a comparison of the latest shelved journal issues in the libraries; (2) information services in library management, professional promotion, knowledge sharing, user-centered library service, and contents of library services; (3) research activities; (4) extensive services in information technology; (5) continuing education for librarians; (6) the ability for library development; and (7) the future of medical libraries in China. The conclusion was that a large information gap exits between China and other developed countries. (Contains 10 references.) (MES)

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Bridging the information gap between China and developed countries: compare library information services in China and in Sweden

Chunhua Yang
Medical Library of the Chinese PLA
Beijing, China
Email: chunhuayang@hotmail.com

Information services provided by libraries may reflect utilization level of IT of a country well.

The widening information gap between the developed and developing countries has resulted in the wide and increasing knowledge gap between rich and poor countries in the areas of science and technology. Highly recognized by Chinese government that information advantage is related to the countries' scientific competence and quality of higher education, investment from the university budget and government budget to information infrastructure has increased continuously. By initiating an integral library system from 1998(CALIS, China Academic library and Information System), traditionally isolated and separated operations of China academic libraries has been changed. CALIS subscribed databases and electronic journals by group licensing agreements to cut down the costs, built collections cooperatively, developed automated systems jointly. These libraries support their learning and research communities more effectively and efficiently than they did before.

In this study, we selected two libraries of key Chinese medical universities and a Swedish medical library. Based on the number of holding databases, print journals, electronic journals, user education courses, level of library research activities, and other services such as navigation system, biomedical links, an evaluation of information service quality was given. The conclusion is that big information gap still exists between China and other developed countries. Poor information resource is a big problem for Chinese libraries. This can be reflected by the goals of CALIS that in a few years it will struggle to satisfy user requests by 80%. Chinese librarians should pay more attention to the research in knowledge and information management. Research

in utilization of information technology in libraries should be enhanced. The most important thing for Chinese libraries is that they need more competent librarians. It takes both time and money for Chinese libraries to keep the pace with the developed countries in information utilization.

Introduction

No one argues that there is a big information gap between the developed and developing countries. How big it is? With the advancement of IT, is it possible for developing countries to benefit from IT advancement much more than developed countries and thus strengthen the competence of developing countries with the rising of knowledge economy?

Over the past decades a rapid development has taken place in the field of information and communication technologies. The transformation from collection-oriented to access-oriented libraries and **information** centers is the trend of library development in the world. The information **gap** between the developed countries and developing countries is widening and has resulted in a wide and increasing knowledge gap in the areas of science and technology. The gap between the information poor and information rich is widening and continues to divide the developed and developing countries.
Academic libraries in China are supposed to collect, manage and provide information resources that serve university teachers, researchers and students. Traditionally their operations are isolated and separated with limited information resources. By initiating an integral **library** system from 1998(CALIS, China Academic library and Information System) to connect all key academic libraries nationwide, and to connect with other information networks abroad, their information services are significant enhanced. Till now total 61 key Chinese university libraries are participating CALIS. CALIS subscribed databases and electronic journals by group licensing agreements to cut down the costs, built collections cooperatively, developed automated systems jointly. These libraries support their learning and research communities more effectively and efficiently than they did before. Shanghai Medical University Library (SHMUL) is one of CALIS members.

In 2000 I was financed by Chinese Education Ministry to study in Karolinska Institutet Library(KIB) for 1 year. Karolinska Institutet is a famous medical university in the world. KIB is the National Resource Library for medicine, dentistry and nursing research in Sweden. My library, Medical Library of the Chinese PLA(MLPLA), is one of the biggest medical libraries in China. By comparing the library holdings, information services, the ability of utilizing new information technology, research activities, and the library staff quality, some big differences were found between Chinese medical libraries and Swedish medical library. These differences are resulted in not only because the culture difference, economy condition difference, but also because the different development level of the libraries. In general the difference is that Swedish libraries are information rich and access-oriented libraries while Chinese libraries are information poor and still collection-oriented libraries.

I would like to take medical libraries as example to present my personal opinion.

Purpose of this study

To compare quality of information services provided in Swedish medical library and Chinese medical library, to judge the information gap between China, an eastern developing country, and Sweden, a western developed country.

Methods

- How many databases are provided by library?
- How many user education courses do the library provide? What content is it?
- How many current journals are available in library?
- How many electronic journals or full text available?
- Are there any extensive services in IT?

Two top Chinese medical libraries and one top Swedish medical library are selected to compare with..
Shanghai Medical University Library: http://202.120.76.225/
Medicla Library of the Chinese PLA: http://www.mlpla.org.cn/
Karolinska Institutet Library: http://www.kib.ki.se

Results

I. Difference in library collections

In information resources, Chinese medical libraries are information poor and collection-oriented. Swedish Medical Libraries are information rich and access-oriented.

Information resources are very important for library's information service. Most scientists rely on academic journals to keep them on the cutting edge. Without excellent libraries they can't really excel at the front line of his/her research field. An effective and efficient information support system can keep them as up-to-date as they should be. The ideal online resource for scholars and scientists would be: all papers in all fields, systematically interconnected, effortlessly accessible and rationally navigable, from any researcher's desk, worldwide for free."

In China poor information resources have limited the creativity of Chinese researchers. Skyrocketing costs have forced most Chinese medical libraries to slash journal subscriptions and made many medical journals are getting harder to find in 1990s. In the year 1999, only about 3500 journals published by Taiwan, HongKong and foreign countries were subscribed in China.

Highly recognized by Chinese government that information advantage is related to a country's competence in science and technology, and higher education quality, funds from the university operational budget and government budget to information infrastructure increased. A national consortia CALIS makes it possible to afford databases that previously could not afford. Hopefully these libraries will support their learning and research communities effectively and efficiently. Yet the situation still needs to be of improved.

This problem seems not so serious in KIB because of better finance condition. Using access codes issued by their institutions, professors and students in Karolinska Institutet are able to print full-text versions of journal articles from their desktops. KIB provides links to articles in full text with databases of Pubmed, Web of Science, and Chemical abstracts. It facilitates the important change from a print to electronic information environment, supporting research by providing desktop access to scientists.

This kind of service is not available in Chinese medical libraries. Chinese users can only use these databases and full text articles separately.

Comparison of the Latest Shelved Journal Issues in the Two Medical Libraries
(Checking date: February 2, 2001)

Journal Title	ISSN	Year, vol, Issue (MLPLA)	Year, Vol, Issue (SHMU)	Year, vol, issue (KIB)
ANNUAL REVIEW OF IMMUNOLOGY	0732-0582	1999; 17 CD-ROM	---	2000; 18
ANNUAL REVIEW OF BIOCHEMISTRY	0066-4154	1999; 68 CD-ROM,	1999,68	2000; 69
CELL	0092-8674	2000; 103(6), Dec.8,2000	2000□103□4□	2000;103(7), Dec.22,2000
NATURE GENETICS	1061-4036	2000; 26(4)	2000□26□1□	2000; 26(4)
NATURE	0028-0836	2000; 408(6808), Nov.2,2000	2000□408□6813□	2001; 409(6819), Jan.25,2001
NEW ENGLAND JOURNAL OF MEDICINE	0028-4793	2000; 343(24), Dec.14,2000	2000□343□21□	2001; 344(5), Feb.1,2001
NATURE MEDICINE	1078-8956	2000; 6(12)	2000□6□10□	2000; 6(12)
ANNUAL REVIEW OF CELL AND DEVELOPMENTAL BIOLOGY	1081-0706	1999; 15 CD-ROM	---	2000; 16
CURRENT OPINION IN CELL BIOLOGY	0955-0674	2000; 12(6)	---	2000; 12(6)
SCIENCE	0036-8075	2000; 290(5494) Nov.10,2000	2000□290□5496□	2001; 291(5503) Jan.19, 2001
PHYSIOLOGICAL REVIEWS	0031-9333	2000; 80(3) July,2000	2000□80□4□	2000; 80(4) October, 2000
ANNUAL REVIEW OF NEUROSCIENCE	0147-006X	2000;23 CD-ROM	2000□23	2000; 23
CA-A CANCER JOURNAL FOR CLINICIANS	0007-9235	2000; 50(5)	2000□50□5□	2000; 50(5) Nov./Dec, 2000
ANNUAL REVIEW OF PHARMACOLOGY AND	0362-1642	2000; 40 CD-ROM	1999□39	2000; 40

TOXICOLOGY				
IMMUNITY	1074-7613	2000; 13(1) July,2000	2000□13□3□	2000; 13(6) December 2000
ENDOCRINE REVIEWS	0163-769X	2000; 21(3) June 2000	---	2000; 21(6) December 2000
TRENDS IN NEUROSCIENCES	0166-2236	2000; 23(10) Oct., 2000	2000□23□9□	2000; 23(12) Dec., 2000
ANNUAL REVIEW OF PHYSIOLOGY	0066-4278	1999; 61	1999□61	2000; 62
GENES & DEVELOPMENT	0890-9369	2000; 14(21) Nov., 2000	---	2000; 14(24) Dec., 2001
MOLECULAR CELL	1097-2765	2000; 6(2) Aug., 2000	2000□6□4□	2000; 6(6) Dec., 2000
ADVANCES IN CANCER RESEARCH	0065-230X	---	---	2001; 80
MICROBIOLOGY AND MOLECULAR BIOLOGY REVIEWS	1092-2172	2000; 64(3) Sep., 2000	2000□64□3□	2000; 64(4) Dec., 2000
NEURON	0896-6273	2000; 28(2) Nov., 2000	2000□27□3□	2000; 28(3) Dec., 2000
JOURNAL OF EXPERIMENTAL MEDICINE	0022-1007	2000; 192(5) Sep.4, 2000	2000□192□8□	2000; 192(12) Dec. 18, 2000
TRENDS IN CELL BIOLOGY	0962-8924	---	---	2000; 10(12)
EMBO JOURNAL	0261-4189	2000; 19(23) Dec. 1, 2000	---	2000;19(24) Dec. 15, 2000
NATURE STRUCTURAL BIOLOGY	1072-8368	2000; 7(12)	---	2000; 7(12)
JOURNAL OF THE NATIONAL CANCER INSTITUTE	0027-8874	2000; 92(16) Aug. 16, 2000	2000□92□21□	2000; 92(24) Dec. 20, 2000
JOURNAL OF CELL BIOLOGY	0021-9525	2000; 148(2) Jan. 24, 2000	2000□148□2□	2000; 151(6) Dec. 11, 2000
CURRENT	0959-437X	2000; 10(6)	---	2000; 10(6)

OPINION IN GENETICS & DEVELOPMENT				
GASTROENTEROLOGY	0016-5085	2000; 119(3) Sep., 2000	2000□119□5□	2000; 119(6) Dec., 2000
FASEB JOURNAL	0892-6638	2000; 14(11) Aug., 2000	2000□14□12□	2000;14(15) Dec., 2000
JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION	0098-7484	---	2000□284□20□	2001; 285(4) Jan., 2001
BEHAVIORAL AND BRAIN SCIENCES	0140-525X	---	---	2000; 23(4) Aug., 2000
ARCHIVES OF GENERAL PSYCHIATRY	0003-990X	---	---	2000; 57(12) Dec., 2000
JOURNAL OF CLINICAL INVESTIGATION	0021-9738	2000; 106(4) Sep., 2000	2000□106□5□	2000; 106(12) Dec., 2000
AMERICAN JOURNAL OF HUMAN GENETICS		---	2000□67□4□	2000; 67(6) Dec., 2000
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA	0027-8424	2000; 97(25)	2000□97□24□	2000; 97(26)
LANCET	0140-6736	2000; 355(9220) June 10, 2000	2000□356□9244□	2001; 357(9249) Jan. 6, 2001
NATURE BIOTECHNOLOGY	1087-0156	2000; 18(12)	2000□18□10□	2000; 18(12)

Some different work contents:

- Because of the limited information resources in China and many scholars are not information-literate, librarians in Chinese medical libraries evaluate the projects for the administration to avoid repeated, low level research by given a short summary on the project
- A trusted group of scholars in different disciplines evaluate the subscription choice of journals and books each year, play an important consultant role for library's acquisition. They also write book review (in Chinese) to introduce new English books to users.

II. Information services

First, in library management

As one of the basic social unit in China, the library is supposed to be responsible for the staff in most areas of the life. Except professional development, duties of the library include many social functions and make it to be bigger and need more staff.

Because the culture difference and economy difference, Medical library in China has to spend much of energy and human resources in reading room administration. The librarians have to put the journals in order from time to time, help users to find the journals or books they want, answer different questions, and to ensure that journals or books are properly used and kept.

While in KIB, much energy and big part of human resources are spent in user consultation, the research of utilizing new IT in library services, user education and training program of librarians.

Second, in professional promotion

Chinese libraries are more academic while KIB is more pragmatic.

Salary difference between a novice and a senior librarian in China is not big. The academic promotion system plays an important role to encourage people work hard. Academic title of assistant librarian, librarian, associate professor, and professor are awarded according to the work experience, education background, published papers/books, and the available positions. Staff with professor title can differentiate from others in:

- have a respectful position
- A longer working period if they want (55 for woman and 60 for man)

The achievements and higher academic title are what most librarians in China struggle for.

The positive role of this system is clear but some adverse effects are accompanied. Usually the small project that may not lead to an achievement or a paper but needed by information services may be neglected. It doesn't facilitate cooperation and knowledge sharing among the library staff well.

In KIB, it's not necessary for librarians to publish papers. To attend international conferences is learning opportunity for them.

Third: in knowledge sharing

knowledge sharing and good cooperation among the staff of KIB create a very active work atmosphere. Their strong team spirit make its work more effective and efficient, and competent in utilizing new information technology.

Most librarians in China are not computer literacy. This has resulted in the low level of IT utilization in library services and limited the ability of information service in Chinese libraries very much.

Fourth, user-centered library service

User-centered library service is reflected in each aspect of KIB's work. The librarians do their best to satisfy different users' requests. Kind user-centered services are provided such as: group rooms, telephone answers, quick process of the latest journals and shortest shelving time, separated journal issues for many years for the convenience of users, various user education courses

In Chinese library, this idea should be enhanced and many services towards users should be improved.

Fifth, contents of library services

User education: User-education is considered as a primary library activity in Sweden. Many user-education courses aim at different specific customer groups have been developed and given by librarians in KIB for the purpose of empowering the information literacy of users. Web-based library guides and self-instruction tutorials are provided to users. Teaching materials are published in the intra web of the library for all library teachers who have then been able to liberate time from a pressed schedule and instead, concentrate on pedagogic development and creativity. Librarians involved in user-education in KIB have the opportunity to take courses in pedagogy, ensured the quality teaching skills.

III Research activities

Since 1997, some 60 projects have been run in KIB. Most of these projects are related to IT utilization. For example, evaluation and collection of medical links, evaluation strategy of e journals subscription, development of web-based teaching materials, teaching method based on webquest, text mining project which aims at to facilitate knowledge discovery.

The main research activity in CALIS is building bibliographical databases and internet navigation system. Chinese libraries have not realized the value of Knowledge discovery. In research level Chinese medical is much lag behind KIB.

IV. Extensive Services in IT

KIB's services have extended to IT field. A web agency run by the KIB with the aim of providing services in all areas of web development to the Karolinska Institutet as well as external customers. The team includes project leaders, information architects, educationalists, web designers and programmers, working together to create and maintain effective web systems.

An electronic university press in KIB facilitates dissertation publicaion. They also maintain 3 medical databases.

Most Chinese medical librarians are not computer literacy, they have no ability to provide such services to users. Many libraries' websites are not as ideal as they should be. Value-added library service is very limited in Chinese medical libraries.

V. Continue Education of the librarians

In KIB almost every librarian who involved in user education has the opportunity of continuing education in library school to improve their knowledge and their skills.

Although everyone knows the importance of continuing education for the development of Chinese libraries, it's almost impossible for most Chinese librarians to get continuing education because of education cost. There is not a systematic training program for librarians in China. This problem limited the development ability of Chinese libraries.

VI. The ability for library development

In KIB, staff use their web site as a teaching tool to support library instruction programs, use the web's interactive capacity to establish services between library users and library staff, maintain a dynamic web site to meet the needs of its users.
Different level of staff quality makes it clear that Chinese libraries have lower ability to utilize new information technology. Money shortage is another problem.
Lack of IT talents and Chinese librarians are not computer literacy with the rapid development of information technology, we can say that this information gap between China and developed countries is not static but dynamic.

VII. Future

Medical libraries of China will benefit a lot from this kind of offer:

- More and more free and unrestricted e journals available on the internet. Within 5 years, scientists will be able to access most of the last 10 years of the literature electronically, especially for the 1000 most-consulted journals. But

- An integral library system is centrally funded. By group licensing agreement, a resource-sharing network is available for most university libraries in China.
- Investment from government is increasing. China government has recognized that information advantage is related to the country's competence and quality of higher education, science and technology. Library information resources has been given the importance of "knowledge innovation and creativity support system"
- Information gap between Chinese medical libraries and Swedish medical libraries is dynamic but not static. The biggest problem for development of Chinese medical libraries is not information resources but the serious shortage of IT talents. The low level in IT utilization of libraries cannot lead to information advantage.
- Chinese libraries must hire staff with the technical expertise to work with web technologies or train their staff to obtain such expertise.

Conclusions:

In the network environment and the times of knowledge economy, Chinese libraries should draft new development strategies regarding the ideas, facilities, resources, and its services.The transformation from collection-oriented to access-oriented libraries and information centers is the trend of library development in the world. To bridging the information gap between China and developed countries, organizing training and other forms of continuing education of librarians must be taken into account.
With the increase of investment in libraries, I'm confident that China can have a great progress. The purpose of this program is to invest in research infrastructure to provide Chinese with the tools needed to conduct high level research and to stimulate creativity in research, in order to enhance China's role in the global knowledge society.

Although Chinese librarian is catching up with the development of IT by hard work, big gap still exists. Quality information service facilitates scientific innovation and information policy may influence a country's scientific competence. Information service should be improved for the purpose of the whole country's science and technology competence in the world.

By this study we can see that there is still a big information difference between China and other developed countries. The developed countries are entering "information age". It is hard for developing countries to keep up with all IT innovations. IT utilization ability in Chinese medical libraries is much lower than Swedish medical library. The ILL fulfill rate is less than 80% because of shortage of current journals in China. Chinese scholars and scientists reach fewer databases than Swedes researchers. We anticipate that libraries in China can get a wide range of advantages from internet by accessing to a lot of information and will have the ability to smooth interaction with the rest of the world. It is crucial for integration into the world economy..

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