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ABSTRACT

This paper discusses access to scientific and technical information in Asia. The first section considers the economic crisis, including the growth in information service as a major indicator of the success or failure of the economies of developing countries. Libraries' response to the economic crisis is addressed in the second section, including cancellation of journal titles and copyright issues. The following challenges to access are summarized in the third section: (1) uneven distribution of wealth in the area: (2) the role of cultural issues; (3) problems poséd by lack of organized access; (4) lack of technological sophistication; (5) view of copyright as denial of access; and (6) lack of a critical mass of professionals. The appendix notes recent development of systems to access scientific and technical information in Bangladesh, China, India, Indonesia, Japan, Korea, Malaysia, Pakistan, the Philippines, Thailand, and Vietnam. (MES)

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The economic crisis and other challenges in accessing science and technological information in Asia

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Paper

Introduction

I must state one caveat at the beginning of my presentation. Although I have been asked to talk about access to scientific and technical information in Asia, I do not pretend to be an expert, one knowledgeable about the situation in every country in Asia and the Pacific Rim, not to even mention Australia and New Zealand which have contributed both financial and professional resources in the development of access to materials in South, Southeast and East Asia. Having said that, though, I have been fortunate enough to have worked with colleagues in over a dozen Asian countries, starting in 1981 in China[1] but recently in Southeast Asia, starting in 1986 and most particularly in Thailand where I have spent most of my professional life since 1994. I have consulted with colleagues and observed and used systems and services developed to access scientific and technical information in countries ranging from China and Vietnam in the east through Laos, Cambodia, Thailand and Myanmar and into Malaysia, Indonesia, the Philippines. In addition, I have made professional visits to Japan, South Korea, India and Nepal. Systems and services vary greatly, as one might expect, among those and other countries in the region. In each of those situations, though, colleagues are providing the best possible service under sometimes rewarding, yet always challenging conditions. If I fail to mention certain developments I must apologize since my remarks are constrained only by my own observations, readings and discussions. This presentation, then could be subtitled according to the Chinese expression "flowers from horseback," meaning that it is difficult to see the flowers if one is traveling by horseback - likewise it is difficult to cover this complicated subject with one broad stroke.

Economic Crisis

A recent report from the International Development Research Center states that "The most vital difference between developed and developing, rich and poor nations, is the knowledge gap - the capacity to generate, acquire, disseminate and use scientific and technical knowledge." This reemphasizes an earlier point made by Malaysia's Prime Minister Mahathir Mohammed who said, "It can be no accident that there is today no wealthy developed country that is information-poor, and no information-rich country that is poor and underdeveloped."[2] The greatest challenge for Asia, then, was set at the beginning of this decade at a time when some economies were experiencing double digit growth while others were robust and growing.

But the economic bubble was not to continue. What has happened in Asia during the last two years has halted a pattern of unprecedented growth of the previous half dozen years. The world's economic crisis shook Asia first, in July of 1996 and has crossed borders and continents, with shock waves reverberating to this day. It has forced governments to reexamine economic policies and priorities and has had an impact upon individual institutional budgets. This crisis is simply the latest challenge for many developing countries that traditionally have relied upon the oral tradition, rather than even print-on-paper for information dissemination.

It has been argued that the growth in information service is a significant factor underlying the economic well-being of countries and is therefore a major indicator of success or failure of the economies of developing countries.[3] Some few decision makers in Asia now recognize that timely access to information is one of the most important factors in economic recovery and growth. While some have not yet reached the point, several are developing or in some cases arguing for strengthening, national information policies with the goal of recapturing the momentum that once drove the so-called "Tigers of Asia," as well as others that were newly emerging when the crisis hit. Just at the point when many Asian countries were moving into what one might call the third phase of development, having moved from the sole reliance on the oral tradition through an exclusive reliance on print-on-paper sources into establishing technological infrastructures with strong economies and an opportunity to become knowledge rich, they were faced with new challenges, primarily financial because of this economic downturn. As an example, in Thailand most large academic libraries, before the crisis became obvious, had newly installed integrated systems, most are INNOPAC systems by III. At the time of the free-fall of their currency those libraries' new priority had become further networking by developing resource sharing schemes and identifying strengths of collections and assigning institutional responsibilities for subject representation and journal coverage, either through subscription or by license. Further, two previously independent networks, THAILINET, formerly covering only Bangkok metropolitan universities, and PULINET, composed of provincial universities, began initial steps in their merger. Cooperation and resource sharing were reaching a sophisticated level for libraries in Thailand, who were building upon previously developed bibliographic tools, such as union catalogs and union list of serials.[4] An early example of that cooperation was the Ministry of Science, Technology and the Environment (MOSTE) efforts in the establishment of a network linking databases and sharing union catalogs of books and journals, as well as CD-ROMs. Access to databases in science and technology are now available through these efforts. Full-text CD-ROM journals and online full-text access to their science and technology literature are also available, while online bibliographic searches for non-Thai materials, through such services as OCLC's First Search and CARL UnCover are common among a number of academic institutions. Further, the National Electronics and Computer Technology Center (NECTEC), through MOSTE, has provided valuable funding to both academic and special libraries in establishing networks. The Ministry of University Affairs and the Ministry of Education have also provided economic support and guidelines through various committees of professionals.

A similar pattern can be identified in other countries of the area. For instance, in the

Philippines the TINLIB system by IME had been installed in many of the larger academic libraries and cooperative networks have been developed with similar goals. By the way, with the costs of powerful hardware and sophisticated software many libraries, both large and small, in countries of the region still use PC-based hardware and Micro CDS/ISIS software, which is free from UNESCO to library organizations in developing countries,.

If there is a positive side to this economic crisis, it is that many institutions, either through conviction or design, now are concentrating on coordinating information strategies at both the local organizational level and the national level. This greater emphasis upon cooperation and coordination of resources and services, particularly in the scientific and technical areas, presents librarians and other information managers with new challenges to provide timely, accurate, relevant, accessible, as well as cost-effective information to their by-now information-dependent societies. In this process governments and organizations are being forced to consider the value of information and not simply the cost of acquiring it. We all know that two questions are essential in this debate of value. First, "What does it cost to have the materials and services available?" But equally important is the question of "What does it cost not to have access to the information necessary for the organization or individual to meet a goal or make a vital decision?" I am reminded of a statement by Oscar Wilde who once wrote, "nowadays people know the price of everything and the value of nothing." Decision makers in Asia are all too slowly beginning to recognize the economic benefits of access to information.

Libraries' Response to the Economic Crisis

At the same time Asian libraries are simultaneously struggling in an effort to remain current with the explosion of print-on-paper resources and their accelerating costs, while introducing new technologies and training staffs to more speedily access the vast array of information sources while coping with the cost of both. It is unfortunate that just as libraries began to explore the use of new technologies to make a breakaway, they also began to experience a period of accelerated inflation in the regular cost of scientific and technical resources and the deflation of local currencies. Additional financial resources are easy to justify yet difficult to secure in the current environment, particularly with fluctuating currencies. A good example is what has happened here in our host country, Thailand. In July 1997 the Thai government decided to allow the local currency, the Baht, to float. Previous to that point the exchange rate was about 25 Baht per US dollar. Distressingly, at one point last year the Baht reached a 50 Baht per dollar exchange rate, reflecting a one hundred percent increase in the purchasing price of foreign materials. Of course that inflation trend is not limited to one country or even to the Asian region. During the past two years "40 percent of the world's economies have been tugged from robust growth into recession or depression."[5] What institution can maintain library resource development with that rate of increase? Many libraries in Asia have been obliged to cancel research journal titles and to pull back on full-text online journal licenses, a trend that could result in not being able to keep pace with scholarly output. The pinch is being felt by all countries in the region, from the so-called "Five Tigers" to Japan and China, and certainly by those whose economies are less well off. Academic libraries now are continuously, not just occasionally, reviewing what is core in their institutions' curriculum offerings and adhering strictly to those factors as guidelines in purchasing materials and subscribing to the periodical literature. Tough choices are being made. Needless to say, those prohibitive costs produce shortage of resources that ultimately limits services. On top of all of this, an Asian library's ability to support information needs of users is severely threatened by current forces that seek to create a total Internet commerce. The current debate, reflected in the deliberations of the World Intellectual Property Organization, focuses on considerations about copyright of databases.[6] Encouragingly for libraries in Asia, while the whole issue of "fair use" has yet to be determined, the preamble of a proposed new copyright treaty discussed by WIPO recognizes the need to maintain a balance between the interests of the authors and the larger public interest, particularly education, research and access to information

Other Challenges to Access

In addition to the economic situation, many other challenges in providing access to scientific and technical materials can be identified in Asian as institutions try to develop comprehensive access. Again, I reemphasize that Asia is not alone in this struggle, but it is definitely more pronounced in some countries of the region. These manifest challenges include:

1. Uneven distribution of wealth in the area: There seems to be a widening gap in resource development among countries and those with the weakest economies and information infrastructure are becoming even more dependent upon the richer countries of Asia, on non-governmental organizations (NGOs), and elsewhere for new knowledge. This simply emphasizes the uneven development with weaker countries remaining weaker because their need to absorb new technology requires a greater proportion of effort in the form of funds for training and other start-up costs.[7]

2. Cultural issues play a major role: There is concern regarding the availability and accessibility of domestic or local information in the international arena, which of course raises the companion issue of the relationship between open information flow as opposed to other national interests. Examples of this are evident in at least one neighboring country where access to the Internet is still officially not available, the reason most often cited being cultural. External influence on genuine domestic resources is also viewed with a certain amount of resentment. Cultural sovereignty, including the values relating to indigenous heritage, customs, language, and national security are arguing points in this scenario. This reminds us that, although information production and information industries are global, information policies are local. For example, a local telecommunications policy has an impact on the use of information within the general economy and this perpetuates debate on the effects of international data transfer, with these cultural issues being the ones most exploited for political arguments. Several countries have limited access to the Internet for various reasons. Arguing on another side, think about scientific and technical information on the Internet, isn't it almost assumed that everyone knows English? In addition, influences from foreign broadcasting, imported radio and TV programs, films and other foreign language products of the information industry are rampant. The "right to know" debates are couched in terms of cultural issues and national security. In this region there is a visible clash between the need to exchange information and cultural value protection. This even includes the area of remote sensing. Remote sensing is viewed by some as a threat to developing countries because those countries have little control over the use of data collected by satellite.

3. Lack of organized access poses problems: This includes insufficient classification or retrieval systems with a need to develop and apply common standards. An example is that of our colleagues in Vietnam and Mongolia who wish to facilitate wider access to their resources. Having decided to abandon the formerly used BBK system, they are currently engaged in efforts to determine which existing classification system is most appropriate for the development of their library and information systems. There is also the problem of machine-readable record formats to follow the same standards. Challenges to be conquered include adapting systems to local scripts, whether it is CJK (Chinese, Japanese, Korean), or another non-romanized script, including Thai. Thai professionals have successfully overcome most of those obstacles that they initially faced when developing online systems. Most of you by now know that Thai is not a romanized script and that it possesses rather unique characteristics - the script is written continuously, no break between words or sentences, and vowels are written before, after, above and below the consonants. Besides the organization of materials, there is a more basic lack of depth in many collections. In some countries, as far as collections are concerned, they are not sufficient in quality, particularly the serials collections which have gaps and duplications at the national level. A few countries have been unable to purchase materials in the past several years, or have been limited to UNESCO coupons

for purchasing. There is little funding for books, periodicals and other materials in Laos, Cambodia and Myanmar. Government taxes also constrain development in some situations. For instance, a couple of years ago the National Library of Laos, a government entity, received a donations of book shelves from the Buddhist Society of Japan but was unable to install the shelves because the library lacked funds to pay the import taxes imposed by the government and therefore they languished in a warehouse. There are also examples of no legal depository law and no bibliographic control through national bibliographies, both important factors in the development of information services. Those short comings mean that sometimes needed information may be in existence but not available, since there is no place to look for it, even if it is in print. It is even more astounding to realize that only about one percent of all the bibliographic and numeric databases in existence are produced in developing countries.

4. Lack of technological sophistication, including compatibility of systems, unreliability of telecommunications and in some cases interrupted electrical supply, insufficient maintenance of equipment, and even shortage of supplies plagues efforts in some locations. In some countries there are not enough telephone lines for institutions to develop basic online networks. Lacking in some instances is an infrastructure to ensure continuity of access. Traditional methods of information collection, processing, storage and dissemination are prevalent in some countries.

5. In Asia, copyright tends to be viewed as denial of access. Of course, no discussion of barriers would be complete without some brief mention of this. It is a major issue because intellectual property is a basic national information policy issue. In the meantime there is ineffective enforcement of intellectual property laws evidenced in the indiscriminate and sometimes wholesale copying of whole texts. Positive decisions relating to fair use of electronic resources and a revisit to interpretation of copyrighted printed materials could greatly enhance access in many Asian countries. There must be "the balancing of the rights to use information resources with the rights to control the use of them."[8] The main purpose of copyright legislation is "not to reward authors, but to promote the progress of science and useful arts," as a ruling by the U.S. Supreme Court so eloquently stated. Resolution of how the rights of distribution should be adapted to digital technology and networking will resolve many headaches.

6. Finally, there is lack of a critical mass of professionals: This is my abiding theme. In several countries, there is a severe shortage of educated information professionals who can develop the services to store, process, analyze, package and deliver scientific and technical information. "Effective management of information requires professionals who understand information, how it is created, organized, sought and used by people in both their work lives and their professional lives. One of the most important activities in an information society is to maintain a cadre of qualified information professionals.[9] Of course that cadre must be up to date with both resources and technology, this requires a commitment to continuing education on the part of the individual and further staff development support on the part of the individual organization. Such a pattern is not yet ingrained in Asia. Obsolescence is one of the most serious problems facing the profession everywhere, but particularly here. "Obsolescence is the degree to which professionals and other workers lack up-to-date knowledge or skills necessary to maintain effective performance in current roles."[10] The causes of obsolescence are many, but include: "1) the information explosion and dynamic change stimulated by the knowledge revolution; 2) personal characteristics, particularly those which are psychological in nature; and 3) the work environment and climate."[11] Several of the countries, surrounding our meeting place today, have no library science programs or, in some instances, very basic library science program staffed with faculty now reaching or passed retirement age and whose credentials were earned 40 or 50 years ago and who have had little or no exposure to advanced technologies.

Conclusion

Still, the greatest threat to access for libraries in Asia is not technology, rather in the cost and pricing and the eventual policies and regulations that enforce it, while the greatest frustration, for professionals trying to facilitate access, is to find that full-text scientific and technical information cited in bibliographic databases remains outside the financial grasp of many of those libraries. The education of professionals and individuals users regarding their own use or misuse of information can contribute greatly to resolving the problem, perhaps even more than the development of complex systems or the introduction of advanced technologies.

APPENDIX I

Libraries' Response

Basic resource sharing and interlibrary cooperation has a long history in this part of the world. Recent developments illustrate a continuing commitment. This is not intended to be a comprehensive listing, simply an example of the development of systems to access scientific and technical information in Asia.

Bangaldesh: BANDASOC (Bangladesh National Scientific and Technical Documentation Center) provides Science and Technology information to scientists, technologists, industrialists, planners and policy makers to develop the country's economic welfare, through BANSLINK (the Bangladesh National Scientific and Library Information Network).

China: ISTIC (Institute of Science and Technical Information of China) collects and processes Chinese and other materials, as well as develops databases of Chinese materials and coordinates a national online network. NSTC (the National Scientific and Technical Commission) is responsible for collecting and distributing government information in those subject areas and the DSTI (Department of Scientific and Technical Information) of the State Scientific and Technical Commission is responsible for scientific and technical information services in the country.

India: INSDOC (Indian National Scientific Documentation Center) is responsible for developing relevant sources of information in the field of science and technology to complement and supplement all other national-level sources; to develop appropriate linkages with information systems throughout the country; to establish a national repository for all reports and scientific works in India (both published and unpublished). Its National Science Library has built a substantial collection of Indian scientific literature. NISSAT (National Information Systems in Science and Technology) functions as the national focal point for the field of science and technology information.

Indonesia: PDIN - one part of the Indonesian National Scientific Documentation Center - is a national network for library, documentation and information sciences is a designated center and the national focal point for 1) development of national collections of literature and provides information transfer and 2) manages the science and technology literature of Indonesia, produced by Indonesia through the national bibliography. It also 3) promotes regional and global cooperation to transfer scientific and technological information for national development.

Japan: NSCIS (National Center for Science Information Systems) is similar to others discussed here.

Korea: KIET (Korean Institute of Science and Technology) is responsible for disseminating technological information, and the National Technological Information System operates a centralized database and is supported by the KAIST (Korean Advanced Institute of Science and Technology).

Malaysia: MASTIC (Malaysian Science and Technology Information Center) acquires and organizes science and technology materials and conducts information processing and analysis. MOSTE (Ministry of Science, Technology and the Environment) supports the JARING (Joint Advanced Research Integrated Networking) project to exchange scientific and technical information

Pakistan: PASTIC (Pakistan Scientific and Technical Information Center) offers the same coordinating activities as those mentioned above.

Philippines: DOST (Department of Science and Technology) supports a network to:1) build library resources and services and 2) provide connectivity by means of the information highway in the Philippines. Its ESEP (Engineering and Science Education Project) was made possible through a loan from the World Bank (as are several of the other projects mentioned here. The Asia Development Bank also provides major funding for such activities). The S&T InfoWeb is the basis for science and technology information and communication services in the Philippines. It is developed and maintained by the Science and Technology Information Institute, an agency of the Department of Science and Technology. Their NISST (the National Information System for Science and Technology) integrates the science and technology information system into one database.

Thailand: NECTEC (the National Electronics and Computer Technology Center) provides funds, through the Ministry of Science, Technology and the Environment (MOSTE) to create library networks at the national level. NIDCST (National Documentation Center for Science and Technology), in addition to those organizations already mentioned in the paper, is involved in coordinating scientific and technical information.

Vietnam: MoSTE (The Ministry of Science, Technology and the Environment) is responsible for management of science, technology and the environment at the national level and, through its National Center for Science And Technology Information and Documentation (NACESTID), is responsible for the nationwide network of scientific and technical information and supports a Scientific and Technological Information network. The SCITEC database describes Vietnamese documents and articles in the science and technology area.

Endnotes:

1 Where the second edition of my textbook, titled Library Management, was translated into Chinese, as well as in Korea, where a later edition, Library and Information Center Management, has been translated into Korean.

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