

# Internet and its impact on developing countries

Countries



**ASSIGN  
BUSTER**

## **Introduction**

In the new information climate, many countries are relying on electronic access to information through the Internet, which is revolutionising information management and information technology. Developed countries have improved their communications systems and are able to share information in a user-friendly environment.

They have used the Internet in various sectors:

- agriculture;
- health;
- public sector management;
- industry;
- environment;
- telecommunications;
- trade;
- etc.

The Internet is now penetrating in developing countries. This paper discusses the role of the Internet in such countries, with specific reference to China and India. The idea of the Internet originated about 25 years ago at the US Defense Department Advanced Research Projects Agency (ARPA), to keep track of data through computer hardware and software. The Internet is now a complex web of networks connected with high-speed links cutting across countries. From international perspective access to and use of the Internet is unbalanced; there are obvious gaps between developed and developing countries in terms of the numbers of nets, hosts and users. As a

study from the Panos Institute indicated: The Internet and its impact on Table I provides data on hosts and connection dates for selected countries in China and India Africa, Latin America, Asia and Pacific, along with G-7 countries for comparison. Of the hosts, 56 per cent were in the USA, 26 per cent in Europe, 16 per cent in Canada and Latin America, 12 per cent in Asia and the Middle East, and the remaining 1 per cent were in African countries. The G-7 countries took about 80 per cent of total nets connected with the Internet, and the number of nets in 55 developing countries in Asia, Africa and Latin America amounted to only 5 per cent. According to another study, based on data from World Bank economic and social indicators, the correlation of Internet nodes with GNP per capita is 0.88 per cent.

Adjusted for population size, the country with the highest density of nodes for the population was Switzerland. The USA ranked sixth, and India was one of the lowest. So the revolution in electronic publishing and accessing is not really global. The timing of a connection to the Internet is significant. For instance, while most developed countries obtained their connections to the Internet between 1988 and 1990, developing countries began around 1994-95. Even now many developing countries do not have Internet facilities. The World Bank has published data on various economic and social indicators for 133 countries. The data show that the higher the GNP per capita and the lower the illiteracy rate, the greater the number of links to the Internet, whereas indicators such as higher population, higher illiteracy and lower GNP per capita accompany fewer connections to the Internet. For most developing countries Internet connections brought the golden opportunity of “leapfrog” development through participating and competing in global

trade, sharing information globally in education, research and manufacturing/productivity sectors, and alleviating poverty, contributing to improved social and economic indicators. Information environment in China and India China and India are the two most populous countries in the world. With more than 2 billion people in these two countries, the market for the Internet is vast.

In addition, both China and India are information-rich countries with a long tradition of learning, publishing and media activities. Both countries have recently experienced phenomenal growth in economic terms. According to a World Bank report, the annual average growth of GNP during the period 1985-94 in China and in India was around 7 per cent and 3 per cent respectively. There are 350, 000 libraries of different types – public, university and school, research, military and labour union libraries. There are plans to have at least one library in each village and urban area in China by the year 2000. Government has always been the biggest information producer and consumer. A total of 34 information centres belonging to different central government departments, China Statistical Bureau, China Economic Information Centre and National Scientific and Technical Commission (NSTC) distribute and collect information from the central government at provincial, city and county levels.

Chinese general information systems are divided into six categories:

1. information centres affiliated with the National Scientific and Technical Commission;
2. information centres belonging to central government ministries;
3. information centres of a provincial nature;

4. information centres of a specialised nature affiliated to regional governments;
5. information centres affiliated with state enterprises, universities and other research institutions; Asian Libraries 7, 9 204
6. information centres of non-governmental, regional, professional and similar bodies.

Since 1994, the global upsurge of the information highway has influenced Chinese decision-makers. China's information superhighway, consisting of "eight golden projects", covers networks among universities, industry and state enterprises. The public need for the Internet and its potential are vast. India, which gained independence in 1947, covers a vast area of over 3.2 million square kilometres and has a population of more than 900 million. In the area of information, India is relatively rich, being the seventh-largest publisher in the world. It also supports a flourishing book industry: some 11,000 publishers publish more than 18,000 monographs each year and there are more than 30,000 periodicals, of which 5,000 are in English. There are thousands of book-sellers, more than 196 universities and 8,100 colleges and research institutions. The student population in higher education alone exceeds 5 million. In Delhi alone, there are 360 booksellers, six universities, 80 colleges, approximately 40 research institutions and over 100 government agencies.

Government offices and quasi-government offices at central, state, district, subdistrict and village levels produce and consume vast amounts of information. At the national level, the main sources of information include:

- various line ministries;

- the Central Statistical Organisation (CSO);
- the National Sample Survey Organisation (NSSO);
- the Registrar-General of India (RGI);
- the National Information Centre (NIC);
- the Centre for Monitoring Indian Economy (CMIE);
- INSDOC;
- DELNET;
- Tata Energy Research Institution;
- the Centre for Science and Environment;
- the Federation of India Chamber of Commerce and Industries (FICCI).

There are hundreds of governmental bodies at state and local levels. The information output from these offices in the various sectors is considerable. In addition, information is created, acquired and disseminated in all manufacturing and service sectors. These sectors indicate the scope of the Internet in India. Over the years the demand for information has increased in India and China. In India, the market for information in English is enormous, as English speakers form a significant proportion of the literate population. They are generally well established in economic and social terms and need information in paper and electronic forms. This is also reflected in the fact that the majority of newspapers and periodicals are published in English. India, one of the largest publishers in the world, exports many books and periodicals to countries in Asia and Africa and also to Western countries. It imports much printed The Internet and material from abroad. its impact on China has made substantial progress in information management.

China and India According to a 1996 report, there were 1, 038 databases covering both Chinese and English sources, representing an increase of almost 30 per cent since the previous survey in 1992:

- there was 41 per cent of databases concentrated in science, industry and technology;
- economy and business databases accounted for 28. 6 per cent, a considerable increase over the 1992 figure;
- social science took 15 per cent;
- general, 5. 6 per cent;
- law and medicine gained 3. 5 per cent;
- news and mass media took about 2. 9 per cent;
- databases with abstracts represented 66. per cent
- full-text and number databases took less than 30 per cent.

With the inclusion of Hong Kong, China has become a superpower in information acquisition and dissemination, not only in Asia but also on a global basis. It is anticipated that the demand for information in China will continue to grow in significant terms in the next decade. In both India and China access to the Internet will be extremely valuable. Internet connections In China the first TCP/IP link to the Internet was established in 1994, in the Institute of Higher Physics (IHEP), Chinese Academy of Science.

The following are also connected with the Internet:

- Chinese Public Internet (Chinanet), established and run by the Ministry of Posts and Telecommunications, the backbone of Internet connection in Beijing. It is available through local post offices for a subscription.

- China Education and Research Network (CERNET), owned by the State Education Commission.

In 1996 CERNET connected 100 universities nation-wide. Eventually, it will connect to all universities and will become the basis for the booming educational and research development. National Computing and Networking Facilities of China (NCFC), started in 1989 and was the first high-speed network funded by the State Planning Commission and the World Bank. In 1994 its international route was opened. Gi Tong Company Network (GBNET), established in 1994, and supported by the Ministry of Electricity, has more than 1, 000 users. Over three years China has shown an increase in the numbers of computers and Internet users. According to statistics provided by the Information Centre of Asian Libraries 7, 9 206 China Internet, the number of Internet users increased dramatically between 1994 and November 1997. The number of hosts connecting with the Internet increased approximately 35 times, from 569 to 19, 739. The number of users increased steadily from 1, 600 in 1994 to 620, 000 in 1997, coming mainly from education, science, business and government. ChinaNet plans to cover 30 provinces, and nation-wide users will exceed one million. Internet users are generally scientists, social scientists, academics, university students, researchers and technical experts with higher-educational backgrounds and proficient in English. Access is gained, primarily, through universities, scientific and technical institutions and corporations. In India Internet access was initiated in November 1986 through the Education and Research Network (ERNET), with assistance from the Government of India and the United Nations Development Programme (UNDP).



Eight institutions were involved:

- the five Indian Institutes of Technology (IIT), the Indian Institute of Science (IISc) in Bangalore
- the National Centre for Software Technology (CST) in Bombay and the Department of Electronics (DOE) in Delhi.

The objectives included:

1. setting up a nationwide computer network for the academic and research community to promote research and development in India and abroad
2. strengthening national capabilities in information infrastructure
3. building specialised human resources through education and training to increase awareness of information resources available through the Internet
4. opening an India-USA technology gateway to provide a wide information base with other servers

Three other internal service providers became involved at a later date:

1. SOFTNESS by STP
2. National Information Centre (NICNET)
3. Gateway Internet Access Services (GIAS)

By September 1996, India had more than 100,000 Internet users, 70,000 through ERNET, 15,000 through SOFTNESS; 2,000 through NICNET and 8,000 through GIAS. User numbers are expected to grow to one million in the next three years; by then computer penetration will be around 10 million PCs. The education and research community has maximum penetration with

65 per cent, followed by business users of 25 per cent and other users of 10 per cent in the government and private households. Dramatic growth is expected once private sectors enter the Internet market. The city of Bangalore is expected to dominate the internal market because of its “electronic city” image.

#### Current issues and conclusions

The Internet and There are three major areas of concern about the Internet that are significant in its impact on developing countries: China and India

1. national information policy;
2. regulatory framework and information infrastructure;
3. education and training.

#### **National information policy**

Developing countries have a long tradition of oral culture; therefore, awareness of information sources in written form tends to be minimal. While national information policy in developing countries concentrates on trade, international relations, national security and technology, very little attention has been paid to accessing information electronically through the Internet and to deriving benefits. Developing countries, in order to achieve faster economic growth, should include in their official documents high-priority plans for implementing electronic information delivery systems. Policy statements should be integrated into national planning documents such as five-year plans and should be implemented on schedule. Sufficient funding should be allocated at the planning stage and should be made available quickly for implementation. Regulatory framework and information

infrastructure. The regulatory framework in developed countries enforces protection of investment, intellectual property and individual privacy in the information market. The legal framework addresses private sector involvement, skilled human resources, standards and implementation. In most developing countries regulatory frameworks concerning information do not exist.

Although the rapid growth in information technology is changing methods of doing business at home, at work and in organisations in both developed and developing countries, regulatory frameworks have had very little effect on developing countries. While information technology, including telecommunications, has penetrated every market in the developed world, developing countries still view information technology as a means to support management information systems, finance and accounting facilities, and data processing. Computer penetration per capita in both China and India in the area of small office/home office (SOHO) is still not significant in relation to population numbers. Telecommunications still remain a major issue in both China and India. If information infrastructure were to cover the widespread Chinese and Indian populations, and technology were to be made available to access global information through the Internet, then the economic scene would be revitalised. Awareness of the Internet and its importance for policymakers exists only at the executive level, but unfortunately, not at the political level. This needs to be addressed urgently in both countries. Asian Libraries 7, 9 208

**Education and training**

Workforces in developing countries, as in developed countries, are changing from labour-intensive to knowledge-based work. In developed countries, surveys have shown Internet use is associated with higher education. The same principle applies to develop countries. Thus, attention needs to be paid to improving literacy rates. It is the responsibility of governments, central, state and local, of learning institutions and civic associations to work together to raise literacy levels in developing countries. The training of information professionals should be given priority. Trained information professionals will be able to utilise the Internet more efficiently and will be more effective in acquiring, organising and disseminating information. Often, developing countries are concerned about safeguarding their heritage of language and culture and supporting political systems. They are wary of foreign economic formats. Appropriate training for information professionals is an immediate requirement. Trained professionals can then educate the masses and take advantage of the Internet, sharing the dissemination of knowledge through cyberspace and adding value to the global information sector. The information revolution is real, and an information economy has already emerged, accelerating economic and social change. Information is crucial and is the central resource and basis for competition.

The Internet will assist in development in the following ways:

- assessing the information capacity of the country and determining user needs, organising and synthesising information and providing access to internal and external information;

- disseminating information to meet the needs of the public and private sectors and the daily information needs of the general public.

The two items are almost inseparable and have a symbiotic relationship. In developing countries, it is urgent to train information professionals to support information infrastructure and information management. In the contemporary world, information is vital to all sectors. Thus, the role of governments in utilising the Internet is critical. First, it influences appropriate use of the Internet for social and economic change in the transition from labour-intensive production to knowledge-based information industries. Second, it defines public and private sector relationships and opens the market to a strong private informal sector. Third, it redefines telecommunication policies to break down monopolies and to encourage competition among international and indigenous vendors. In conclusion, there is no single solution that can be applied, uniformly, to all situations in developing countries. Each case needs to be evaluated and customised to meet individual country needs. Priorities must be determined, depending on available resources. Indigenous resources should be harnessed and other resources tapped, including funding from international organisations. The Internet has considerable potential in developing countries: it is relevant to lobbying for more government support and budget allocation; it offers delivery modes for the collection and dissemination of information; it may be used to mobilise support among specialised ministries, universities and its impact on industries to produce and manage information, and to emphasise institutional arrangements to influence

policymakers and information purveyors to promote the Internet for the country's development.

## Reference

1. Dong, X. (1995), " The development and management of secondary information systems and services in China", International Information and Library Review, Vol. 27, pp. 83-94.
2. ERNET to Academic and Research Community (1995), brochure. Gartner Group (1996), " Information industry in Asia and Pacific is catching up and will become a main player in the 21st century", China Infoworld, Vol. 41.
3. Ge, W. (1996), " Internet in China: the state of art and perspectives", China Computerworld, Vol. 9, September. Guide to Chinese Databases (1996), State Planning Commission and the State Scientific and Technological Commission, Beijing. Handbook of Press and Publication Statistics in China (1996), Press and Publications Administration, Beijing.
4. Information Centre of China Internet (1997).
5. " The current situation of Internet in China", China Computerworld, Vol. 10, November. Jacobson, T. L. (1994),.
6. " The electronic publishing revolution is not ' global' ", Journal of the American Society for Information Science, Vol. 45 No. 10, pp. 745-52. John, M. (1995).
7. " Third world faces ' information poverty' ", CD News Bank Comprehensive, Reuters America, 11 October. MIDS press release: " New data on the size of the Internet and the matrix", Nagy, H. 1991).

8. “ Information technology in World Bank lending: increasing the development and development impact”, World Bank Discussion Papers, Vol. 120, World Bank, Washington, DC. Ramakrishnan, S. (n. d. ), head, Information Infrastructure Division, Department of Electronics, Government of India, New Delhi, personal communication. Sherry, A. (1995).
9. “ The East is wired”, Far Eastern Economic Review, Vol. 15. The World Bank Atlas (1996).
10. World Bank, Washington, DC. About the authors, Dr Dong Xiaoying is Associate Professor in the Department of Information Management at Peking University.