

7. Three National/Regional Snapshots

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The conference began its discussion of the different ways in which the information revolution may proceed in various regions of the world by considering three national/regional snapshots: Japan, India, and Africa. It then separated into breakout groups for in-depth discussions of different regions.

This section covers the three national/regional snapshots. Section 8 (North, Central, and South America), Section 9 (Europe), Section 10 (the Asia Pacific region), and Section 11 (Middle East, Africa, and South Asia) present the results of the breakout group discussions.

The Present Status and Characteristics of the Information Revolution in Japan

The first speaker began by presenting his image of the development of the information society, as a whole, that has occurred and will eventually occur in all countries. In his view, the first phase of the information society started around 1990 when PCs were first connected by networks, especially by the Internet.²² At this point, computers changed their main function from information processing machines to network terminals, with people using the network for information gathering and communication. The network covers individuals as well as small offices and is changing the way we conduct business as well as our lifestyles.

²² This first phase of the information society, beginning roughly in 1990, was preceded by a 20 to 30 year period during which the computerization of society occurred. During this time, computers were used primarily for information processing, leading to increased efficiencies of business activities mainly in big companies and organizations.

Now, according to the speaker, the second phase of the information society is beginning: some people are saying good-bye to their PCs. Within 5-10 years, fixed PC networks will be replaced by multi-media networks that will enable broad-band communications and various mobile digitized services. Finally, the information society will reach the third and final stage: an ubiquitous network that will come into being within 20 years, enabling everything to be connected to the network.

The speaker then presented a variety of statistical information regarding the current status and characteristics of the Japanese information society, including the following:

- As of March 1999, the penetration of IT appliances into Japanese homes (40 million total families) was as follows: PCs, in 29.5% of Japanese homes; PCs connected to the Internet, in 13% of the homes; fax machines, in 26.4% of the homes; VCRs, 77.8%; CD players, 60.1%; video disc players, 15.2%; video cameras, 36.3%; satellite TV receivers, 36.6%; and TV game machines, in more than 50% of the homes. In addition, 40% of the Japanese population have cellular telephones.
- The Internet took only five years to reach 10% penetration of Japanese homes. This compares to the PC, 13 years for 10% penetration; cellular telephones, 15 years; fax machines, 19 years; pagers, 24 years; and telephone service, 76 years to reach 10% penetration of Japanese homes.
- The Internet revolution in Japan started in 1995, when commercial use of the Internet began and Windows 95 was put on the market. The number of people who use the Internet from the office, school, and home has jumped from 4 million in March 1996 to 17 million in March 1999 (40% of the population). Although the use of the Internet first occurred in big business organizations and the central government, as of March, 1999, the number of home users slightly surpassed that of office and school users.
- Internet shopping companies first appeared in Japan in 1995. Their number is increasing rapidly, from about 100 in December 1995 to about 7000 in December 1997, and to about 18000 in October 1999. The total size of the Japanese business-to-consumer e-commerce market in 1998 was about 17 billion Yen. The business-to-business e-commerce market was much larger, about 243 billion Yen.

Reflecting on these statistics, the speaker said that the Internet is becoming a necessity for young high-school and college students, as well as for the average businessman. During the last 5 years, most big Japanese companies, central and

local governmental organizations, and major non-profit organizations have launched home pages on the Internet. Most Japanese industries are very anxious now to introduce the Internet and extranets into their business structures, for functions such as supply chain management or marketing. The Internet is now becoming a kind of infrastructure for Japanese industries and society. These drastic changes have taken place over only 4-5 years. The Japanese people are now recognizing that they are experiencing an “Internet Revolution” or “Digital Information Revolution.”

The speaker then summarized the results of a recent international survey of people’s attitudes towards the information revolution in four countries: Japan, the U.S., South Korea, and Singapore.²³

- Of the four countries, only the Japanese thought that the age of information does not bring about more active interaction and communication among people; a majority of the Americans, Koreans, and Singaporeans thought it did.
- The Japanese were the least anxious of the four about being left behind by the information revolution.
- The Koreans and Americans had the strongest desires for self-expression, and the Koreans were the most positive about having their own web pages. The Japanese ranked last in both of these categories.
- The Japanese have the most negative attitude regarding the use of cellular phones in public places – much more negative than the other three countries.
- The Singaporeans were the most positive regarding having additional TV channels, followed closely by the Koreans. The Japanese and Americans were the least positive.

The speaker then listed a number of characteristics of Japanese society and other factors which he believed may influence the future course of the information revolution in Japan. He classified these factors into accelerating types (i.e., those that will aid the revolution and decelerating types (i.e., those that will hinder the revolution, and he identified which ones impacted the political, business, and social dimensions. His list of factors is shown in Table 7.1

²³ This survey was conducted by the Nomura Research Institute at the end of 1997. The sample sizes were 1400 persons in Japan and 500 in each of the other three countries.

Table 7.1
Characteristics of Japanese Society
Which May Influence the Information Revolution in Japan

	Political/ Governmental Dimension	Business/Financial Dimension	Social/Cultural Dimension
Accelerating Factors	Strong central government which intends to keep strong leadership of Japanese information society	Highly established industrial structure and powerful companies Hardware appliance-oriented manufacturing industry High scientific and technology level in IT Deregulation of industries Worldwide strength in TV game software and animation industry	Diversified cultural tradition including entertainment Strong upward thinking High level of education (but lacking diversity and flexibility)
Decelerating Factors	Strong central government which may lead to too much standardization and uniformity High population density and centralized land use pattern Population structure in the future (aged people)	Regulations for industry by central and local governments Conservative and passive consumers Traditional practices in the marketing and distribution systems High price level for telecom services	Language barrier Long history of printing culture (paper) Social customs and traditions (e.g., face to face) Strong influence of mass media (centralized TV networks and newspapers) Keyboard phobia Homogeneous and uniform values Not so open society Lack of challenging attitude to change society

Regarding this list, the speaker elaborated on the following four factors which he thought were most important for the future course of the information revolution in Japan:

- The great inertia which Japanese society has regarding its traditional culture, values, and social customs bears considerable emphasis in any discussion of IT-induced change. For example, the Japanese regard face-to-face communication to be of the utmost importance, no matter whether it is for business or for private purposes, or for educational or religious purposes. Commuting by train to the work place and having face-to-face meetings with colleagues or supervisors is still one of the most important customs in Japanese society. Also, Japanese consumers have some tendency to place an emphasis on face-to-face service at shops or financial counters.

In addition, a sizeable portion of Japanese consumers prefer cash payments and do not use credit cards. Also, Japanese consumers are very cautious when using the Internet for shopping. They hesitate to put their credit card numbers into the open network. The majority of Japanese consumers who have access to the Internet are waiting to see how their risk will be decreased by government regulation or industry standards. As individuals they do not like taking on risk by themselves. They also prefer to maintain the status quo when possible.

It is true, as the speaker noted, that the passage of 10 to 20 years will change some of those traditional customs that affect the spread of Internet usage. However, he pointed out that the “slow changing society” is deeply rooted in the customs and traditions of Japan. This culture is not likely to change in a short period.

- The impact of regulations and traditional practices within the Japanese market, especially with regard to distribution systems, is another impediment to IT-induced change. There are a number of Japanese industries whose traditional distribution systems are becoming an obstacle to the introduction of Internet-oriented business systems.

For example, in the case of automobile sales, the existence of a Japanese automobile dealers association, organized by manufactures and area sales agents, builds up some barriers for newcomers. In addition, many Japanese consumers welcome the automobile salesman who makes house-calls. Some Japanese groups and Auto-by-Tel are now trying to challenge and change the structure of this market.

As another example, the travel service agent industry is obliged by law to sell tickets and services over the counter. The travel agent must employ

staff members who have government qualifications at every branch office. The Ministry of Transportation is gradually alleviating these regulations.²⁴

In the case of books, the Re-sale Price Maintenance Rule is applied for books in Japan. This means that no one may discount new books and magazines. In addition, the existence of cartel-like distribution networks between book stores and publishing companies makes it difficult for newcomers to enter the market. Many Japanese consumers seem to be satisfied with the neighborhood book stores that are found in every town in Japan. Amazon.com and similar online book sellers have to compete with those small, entrenched book stores that already control the Japanese market

- The speaker's next point dealt with the effect of the Internet on the centralized and uniform media within Japan. Japan has good television networks and good newspapers on the national level.²⁵ People have been talking about the de-centralization of Japanese society in terms of political, economical, and cultural dimensions for long time. However, the influences of central government, large financial and industrial groups, good universities, and famous cultural and artistic organizations, mostly located in Tokyo, are still very strong. These influences are reinforced by the centralized Japanese news media.

In addition, in Japanese society people tend to put a higher priority on the values of the organization or group rather than on the individual. Clearly, this does not necessarily lead to totalitarianism. Rather, Japanese people do not like to express their opinions clearly or insist on individual beliefs too much. They dislike projecting themselves outside the group, especially in public or formal circumstances. Japanese people value consensus as opposed to open, conflicting discussions.

This characteristic of Japanese society has a good compatibility with television. TV is a mass media that is good for passive people. People can enjoy nationally based, one-way broadcasting services at any time.

However, the Internet is different. Television only requires from the consumer a passive acquiescence to the flickering images on the screen. The Internet requires an active attitude. The user has to think about what he or she wants and then actively engage the various navigation and

²⁴ Many young Japanese businessmen are now using the Internet to reserve airline tickets and hotel rooms. However, they still must pay by separate means.

²⁵ Of course, there are also local TV stations and newspapers, but most of them are supplementary to their national counterparts.

communication tools required for its gain. It is difficult for inherently passive consumers to recognize the merits of the Internet.

The speaker believes the Internet is a media oriented around de-centralization. This lack of center is the essential nature of Internet as a media. In its ideal form, it will give power to the individual rather than to organizations or central powers. For the moment, the Internet, as a social media, is facing "friction" from those characteristics of Japanese society that guaranteed the success of television.

- Next, the speaker talked about the unique characteristics of the Japanese information technology industry. It is often mentioned that the strength of Japanese industry rests in its ability to develop and manufacture hardware and not in software. The speaker believes that this is fundamentally true and will remain true for the next 10 to 20 years.

Although Japan has no Microsoft or Netscape, Japanese electronic companies are now strengthening their power in the market of home information technology appliances. According to the speaker, people in Japan are saying goodbye to their PCs and the market for various home telecom terminals and electronic appliances is becoming far larger. This growth will be accelerated with the advent of even more advanced multimedia networks, and, the speaker believes, will increase even further with the advent of the ubiquitous network age which we will someday achieve. The Japanese electronic industry has traditionally been strong in the home electronic-appliance arena. In the future, they will focus their research and development on the eventual integration of those electronic appliances into the home LAN and mobile networks. This kind of technological emphasis will constitute another strength of the future Japanese information technology industry and will insure its high value in the new market.

Concerning software, some unique software industries are now growing rapidly in Japan, for example, the television or computer game software industry. Together with hardware game-machine manufacturers like Sony, Sega, and Nintendo, many young and creative game software companies with high computer graphics technology are attracting attention internationally. The Japanese animation industries are also trying to digitize their business. These entertainment software industries may be changing into a sort of "Virtual Hollywood" whose market is far larger than the real movie market.

The speaker believes that U.S. companies are stronger in business oriented software or efficiency-improving software, whereas Japanese companies

are stronger in entertainment software or “emotion moving” software. He expects this trend to continue.

The speaker concluded his talk by discussing some emerging new developments which may accelerate the Japanese information revolution by five or ten years:

- *The recent rapid increase in i-Mode mobile telephone service*, which combines digital mobile telephone and Internet service. In the first six months after this service started in April 1999, two million subscribers signed up and 1700 i-Mode websites were established. Some people say that this type of Internet utilization might be mainstream in the future in Japan, edging out the use of the fixed terminal.
- *The new Sony television game machine, Play Station 2*, introduced in September 1999. This machine has a specially designed, powerful CPU inside with four functions: game machine, Internet terminal, DVD player, and CD player. Projected sales in Japan are 20 million units. This would mean 50% family penetration in a few years. Play Station2 might even become the new home terminal that is more than “just” a game machine.
- *The broad-band fiber-optic telecommunication network* that NTT is rushing to construct all over Japan that covers the “last one mile” in urban areas, and the digitized satellite broadcasting systems that will start in a few years. Both of these will enable interactive services at home through the television set. These new systems may be another driver for the Japanese information revolution because, as the speaker indicated earlier, TV penetration in Japanese society is very high.
- *The emergence of new net consumers*. Within a few years all the Japanese primary and secondary schools will be connected to the Internet. Computer and network literacy lectures will be given to children in the school. They will be the future net consumers. Presently, the younger generation, from university students to young businessmen under 35 years old, have already had plenty of Internet experience at their offices and homes. Their life style and communication patterns are now changing, through the Internet and the use of mobile communication tools. For many university students, personal computers and the Internet are becoming absolute necessities in their campus lives. Some retired persons more than 60 years old are also becoming new net consumers. They experienced PC and Internet usage at their offices and, after retirement, they continue using the Internet for various purposes.
- *New distribution channels*. A new distribution channel related to the Internet which reflects uniquely Japanese characteristics is the Multi-media KIOSK

Network at convenience stores. In Japanese urban areas, convenience stores like 7-11 are placed in very dense patterns and most of them are open 24 hours per day. They are becoming a necessity for urban consumers. Recently, in relation to Internet shopping, these convenience stores are gathering attention as a means for paying or receiving goods, like books, CDs, or other commodities.

The speaker believes that these are some of the emerging trends that will be characteristic of the Japanese Information Revolution over the next 10 to 20 years. He closed by stating that the speed of change in Japanese society as a whole is generally not fast. However, he expects the areas of technology, business, the market, and consumption to change faster than other areas of human life such as emotion, culture, and social customs.

Bridging the Digital Divide: The Indian Story

The next speaker discussed the course of the information revolution in India. After providing background information on relevant events in India over the period since independence in 1947, he described the current state of the Indian IT industry:

- The Indian IT industry is focused primarily on computer software, and is largely export oriented. In addition to software developers working in India, there is a large Indian diaspora of IT professionals, in the U.S. and elsewhere around the world.
- Today there are some 250,000 software professionals in India. Each year, about 170,000 engineers graduate from Indian universities, many of whom go into the software area.²⁶
- There are several hundred software companies operating in India today, with annual revenues totaling over \$2.5 billion in 1997-1998. Industry-wide, total revenues have been growing at a rate of about 50% per year over the last few years. Many individual companies have 50-70% annual revenue growth rates. Many of these Indian companies are listing on the NASDAQ over-the-counter stock market.²⁷
- New Indian software companies are constantly emerging; recently there have been an average of two initial public offerings (IPOs) every week.

²⁶ India graduates more engineers every year than the U.S.

²⁷ The speaker described listing on NASDAQ as having replaced attaining "Nirvana" as the life dream of many young Indian professionals.

- In addition to software firms in India itself, Indian professionals are among the most numerous founders of Silicon Valley start-ups in recent years.
- Software companies in India tend to be grouped in geographic clusters. The two largest clusters are around Mumbai (Bombay), with roughly 21% of the firms, and around Bangalore, with about 19% of the firms.
- These Indian software companies are very much “wired in” to the global software market, and diversified across a wide range of software products. Many of them work as software subcontractors and vendors to major North American and European information technology and information/financial services companies (e.g., Microsoft, Citigroup, etc.).
- Successful Indian software firms are all run along “democratic” rather than traditional hierarchical lines. Thus far, no family-owned firms with hierarchical management structures have succeeded in the Indian software industry.

The speaker mentioned two other nations that are emerging as major international software players: Israel and Ireland. Taken together, India, Israel, and Ireland are sometimes referred to as “the three I’s” insofar as their software industries are concerned. Table 7.2 compares the software industries in these three nations. Today the Irish software industry is considerably larger than that of India.²⁸ However, the Indian industry is growing much faster.

Table 7.2
The Three I’s: Ireland, India, and Israel

	Total Software Revenues (1997-1998)	Annual Revenue Growth Rates
Ireland	\$6.5 billion	14%
India	\$2.7 billion	50%
Israel	\$1.5 billion	17%

Thus far, the Indian IT industry, for all its vitality, has had a minimal impact on the Indian national economy and society. The roughly 250,000 software professionals working in India represent less than 0.3% of India’s population (960 million). The roughly \$2.5 billion in annual software revenues represents

²⁸ Indeed, Ireland is the second largest exporter of software products in the world today, after only the U.S.

about 0.6% of India's annual GDP (\$414 billion). Thus far, the Indian software industry is a thin veneer of top of the Indian economy and society.

The speaker listed several obstacles that India must overcome to spread the benefits of the information revolution more widely across Indian society:

- *The three C's: connectivity, computers, and contents.* Less than 1% of Indians have access to computers; even fewer are connected to the Internet. Much/most of the content of the World Wide Web today is not relevant to the average Indian.
- *Computers versus jobs.* There is a concern in some Indian circles that computers, viewed as a labor saving device, will eliminate jobs. This mitigates against the introduction of computers into many areas of the Indian economy.
- *The digital divide.* In India, this divide exists not only between rich and poor, but also between north and south. Today, most of the educational institutions training software professionals and other engineers, and most of the clusters of software firms, are in the southern portion of the country. The south is well ahead of the north, insofar as the information age is concerned.
- *Transparency versus controls.* Historically, the Indian economy has been subject to extensive state controls, with little transparency into government decisions affecting the economy. In recent years there has been the beginnings of a move to privatization, freer markets, etc., but India still has a way to go.
- *Human resources.* Insofar as information technology and the information age are concerned, India has vast untapped human resources. Tapping these resources is a major challenge.

As one step towards overcoming these obstacles, India has recently begun the Sankhya Vahini program. Over the next three to five years, this program will:

- Create a high-speed (2.5 Gbps and higher), optical-fiber national Internet backbone for India, extending across the entire country.
- Connect large numbers of Indian towns and provide them access to the national backbone and international gateways.
- Create "metro rings" (i.e., metropolitan area networks) in key cities (six in the first year).
- Provide users (corporations, software companies, ISPs, educational institutions, etc.) high-speed Internet access.

- Provide enriched education and entertainment content and other value-added services.
- Create a data network that is commercially viable and amenable to scaling up.

The speaker views this program as a major step towards bringing India more fully into the information age and using IT to improve the lot of the Indian citizenry. As the speaker said regarding India: “We missed out on the industrial revolution. We don’t want to miss out on the information revolution.”

The Information Revolution at the Margins: E-Economy, E-Security and E-Equity in Africa

The speaker began by noting that throughout the world there is a strong correlation between national income and Internet penetration. Generally speaking, nations with higher GDPs have greater Internet penetration into their societies; nations with lower GDPs, lower Internet penetration. Africa is one of the poorest regions of the world.²⁹ As such, its nations have (with a few exceptions) among the lowest GDPs in the entire world and, along with this, the lowest penetration of the Internet, other aspects of IT, and the information revolution into their societies and economies.³⁰

What IT penetration there is into Africa is very unevenly distributed. For example, of the roughly 3 million computers in Africa today, about half are in South Africa, 1/6 in Nigeria, 1/6 in North Africa, and the other 1/6 scattered across the rest of Africa.

And the “IT” generally available to the average person in Africa is of quite a different mixture than in developed nations. For example, for every telephone line in Africa, there are about 2000 TVs.

The speaker noted that the economic structure of any nation can be divided into three major components: agriculture, manufacturing, and information work. In many/most of the G-7 nations today, information work has become the largest component, with manufacturing smaller, and agriculture smaller still. In Asia and Latin America, speaking broadly, manufacturing is the largest component,

²⁹ As one example of how poor Africa is, relative to the industrialized world, the speaker noted that the wealthiest 15 individuals in the world, taken together, have a greater net worth than all of sub-Saharan Africa.

³⁰ Today, 99.5% of Africans are not connected to the Internet.

with agriculture smaller, and information work the smallest component, but growing rapidly.

In most of Africa today, in contrast, agriculture is by far the largest component. Manufacturing and information work are both tiny. To a large extent, Africa is still in the agricultural age. Most of Africa, and most Africans, never made it into the industrial age, let alone the information age.

That is today. What about tomorrow? The speaker identified three key things required if Africa is to get into the information age: leadership, vision, and institutional change. Today, these are lacking in many -- but not all -- African nations.

In their reaction to the information revolution, the speaker believes that African nations will fall into three categories:

- *Leaders.* Insofar as sub-Saharan Africa is concerned, South Africa is the only nation in this category today.
- *Adaptors.*
- *Late comers.*

It is too soon to tell which African nations will be Adaptors and which Late Comers. He listed the following structural factors as serving to determine this in each nation, along with the aforementioned leadership and vision factors:

- Employment patterns
- Domestic trade and investment
- Population distribution across regions
- Elite structure and interests
- Political party alignments
- Definition of national interest
- Definition of foreign policy

In closing, the speaker envisaged three possible scenarios for the future course of the information revolution in Africa:

- Africa is most affected by the information revolution of all regions on Earth (e.g., by the use of telemedicine, e-education, etc.). Leapfrogging occurs.
- Africa becomes even further marginalized. There is a continuing lack of communication services and reliable institutions. No leapfrogging occurs.

- Africa becomes even more internally heterogeneous. Some governments seize the initiative; others don't.