

22

Japan: Creating the Domestic and International Network

YOUICHI ITO AND ATSUSHI IWATA

Making a unified nation of islands that for over 200 years had intentionally restricted contact not only with the outside world but internally among its constituent parts was a daunting task confronting mid-nineteenth-century Japan. Communications has always been a key element of state building. It is thus not surprising that the telegraph was introduced into Japan in 1869, just a year after the Meiji Restoration, which is conventionally considered the beginning of the country's modern era.

This chapter traces the development of the telecommunications industry in Japan from these beginnings, concluding with a discussion of factors affecting policy change, including changes and goals and the means available to achieve them. The next chapter will cover the domestic deregulation process that began in the late 1970s as well as the data processing services that were part of the technological impetus for deregulation.

22.1 Establishing a Domestic Network

When Matthew Perry and his fleet visited Japan for the second time, in 1854, they brought some fifty items as presents from the president of the United States. Among them were two telegraph sets, the first ever in Japan; many others quickly followed. They were used experimentally and studied in many parts of Japan. In 1857 Nabeshima Naomasa, daimyo of Saga in Kyushu, had a Dutch set copied. The result was the first telegraph instrument made in Japan. Production soon was underway in several places (see KDT 1968, pp. 15–28).

A decade later two merchants petitioned for permission to construct a telegraph line between Tokyo and Yokohama “to contribute to the trading business” (see KDT 1968, pp. 80). The plan was approved by the central govern-

ment the next year, but was not realized because of the government's collapse later in 1868—an event known as the Meiji Restoration.

The new government received several petitions in 1868 for private telegraph lines, including one from a Frenchman for service between Osaka and Kobe. Acting on the recommendations of Terashima Munenori, who had studied telegraphy since its arrival, the government decided it should operate the telegraph itself. Terashima's report emphasized the importance of the technology for national integration and administration, effective use of the military, and economic development. One of the government's slogans was "prosperous country strong military" (*fukoku kyohei*), and telegraphy was considered critical in achieving these goals.

Telegraph service began December 25, 1869, as a direct enterprise of the Ministry of Technology with a line between Tokyo and Yokohama. Service rapidly expanded all over Japan. When a rebellion against the central government broke out in 1878 in southern Kyushu (the Seinan Civil War) the nationwide telegraph trunk network, which had been completed in 1876, was a key communications channel in mobilizing soldiers and supplies and in executing the government's military operations. This incident reinforced government leaders' recognition of the telegraph as vital to their ability to govern all of Japan. As a result, the government invested heavily in the construction of a nationwide telegraph network. Thus, despite a relatively late introduction, the network covered the country as effectively as those in continental Europe by the 1920s.

Records from the nineteenth-century show a much higher percentage of telegrams were of a commercial nature than was the case in Europe or the United States, where many messages were congratulations or condolences. In 1881, when the population was around 36 million, over 2 million telegrams were sent (see KDT 1968, p. 126).

When news of the telephone reached Japan in 1877 (the year after Bell's patent), a number of private companies expressed interest in entering the field. They were opposed, however by advocates of a government monopoly, who stressed the importance of preserving communications secrecy for the military, police, and other government agencies. There was also a fear that investment would be made only in urban areas under private management, so diffusion to rural areas would be delayed. In addition, foreign countries were mostly opting for government monopolies—the United States and Canada being notable exceptions. Others in the government—such as the Ministry of Finance, which was concerned about the huge investment required for this new enterprise—supported private initiatives.

The controversy over the appropriate structure of telephony lasted several years. During this time the government rejected all requests from private parties seeking to establish public service. Finally, in 1889 it was decided telephone service should be run by the government. This was codified in the Telegraph Law of 1900, which prescribed that all wired telegraph and telephone services be directly operated by the Ministry of Communication (MOC) and managed as a complete government monopoly.

At the time, many in and out of government felt that the telephone was less

important than the telegraph, in part because its quality was such that messages often were misunderstood if not unintelligible. The government was thus pushing expansion of the telegraph network, while not becoming very enthusiastic about telephony. Still, by the time of the decision a number of government agencies—including the police and military—and private companies—including railroads—had established systems for their own use. However, there was no interconnection among them until 1890 when an exchange service was established. It started with 344 subscribers. This had expanded to 2,672 in 1893.

Due to the Sino–Japanese War, which erupted in 1894, government investment in telephony shrank, shutting down expansion. As a result, in 1896, one year after the end of the war, the number of unmet service requests had reached 6,500 more than double the 3,200 total subscribers served at the time. The size of the backlog increased yearly—and the problem continued into the late 1970s. In other words, it took eighty years for supply to catch up with demand.

The demand for telephone service was so strong that the business was highly profitable from its introduction. In contrast, the telegraph ran cash flow deficits every year but three from its inception until 1895. That year MOC changed its bookkeeping system in such a way that it was impossible to tell. The deficits were primarily the result of capital expenditures for network expansion—on an operating basis the system was profitable. In any case, profits in telephony covered the telegraph deficit and became an important source of revenue for the government.

Because of the backlog problem, individuals and companies whose needs remained unmet began to buy telephone service from existing subscribers. MOC could not ignore the high black market prices and so in 1901 established a priority system based on willingness to pay. The basic idea was similar to an auction. Those in a hurry could leap the queue by bearing a higher proportion of installation costs. This differentiated cost-burden, which was unique to Japan, meant the network could be expanded more quickly than might otherwise have been the case.

The Great Kanto Earthquake in 1923 resulted in serious damage to the system. In spite of this, the number of subscribers steadily increased, reaching 1 million in 1938.

22.2 The Early Postwar Period

As a result of bombing raids during World War II about half the telecommunications facilities in Japan were destroyed. The peak number of subscribers was 1,080,000 in 1943, but this had dropped to only 470,000 by war's end. For the urgent need to rebuild facilities, it was decided to create a ministry specific to the task. In June 1949 the MOC was divided into the Ministry of Postal Services and the Ministry of Telecommunications.

At the same time, the government established the Advisory Council for the

Reconstruction of Telegraph and Telephone to consider postwar policies. It published its final report on March 31, 1950. The Council considered direct government operation, private management, operation by a public corporation, and a dual system of direct government operation and private management. It insisted independence and flexibility were critical to quick recovery from war damage. The report concluded that although private management provides the greatest independence and flexibility, the public nature of telecom service, the need for technical standardization, and a natural monopoly structure meant a public corporation acting as much as possible as though it had private management was most appropriate. In addition, to provide funds for reconstruction, the government was waiving taxes on the telecom provider, which was easier to do if it was a public corporation rather than a private venture.

After the government-monopoly recommendation was sent to the prime minister, trading companies in Japan adamantly advocated that international service be separated and operated by private management. Government leaders were willing to consider this. The argument in favor was that trade was of vital importance, and international telecommunications are critical to international trade. To the trading companies, recovery of the overseas system was quite simply more urgent than rebuilding the domestic system. It was feared that if both services were operated by the same organization, recovery of international services would be delayed due to difficulties providing domestic services. It was expected that the recovery of international telecommunications would be more quickly realized if managers could concentrate on international services alone.

Separation prevailed. The NTT Law for domestic service, and the KDD Law covering international service, were drafted at the same time; both passed the National Diet on July 31, 1952. Although NTT started operations August 1, KDD did not begin until the start of the next fiscal year on April 1 1953. From August 1 through March 31 NTT operated international services. (NTT's formal Japanese name is Nippon Denshin Denwa—telegraph and telephone—and the company is referred to as Denden. The English acronym is used in this chapter. KDD is Kokusai [international] Denshin Denwa. The company is referred to as KDD even in Japan.)

Large parts of the Ministry of Telecommunications were transferred to the newly created NTT and KDD, and the remaining regulatory sections were combined with the Ministry of Postal Services as the Ministry of Posts and Telecommunications (MPT).

NTT was a public corporation (*kosha*), one of three (with the railways and the salt and tobacco monopoly). As recommended, it was intended to act like a private corporation in most ways, but it was entirely owned by the government. In contrast, KDD was quickly turned into a private company. In May 1953 about half the shares in KDD were sold to private parties by the Ministry of Finance. Further shares over to NTT. A few months later NTT sold half of those. NTT still owns about 10 percent of KDD. Other large holders include MPT's Mutual Aid Assoc. (11 percent), NTT's Mutual Aid Assoc. (2 percent),

and, as one would expect of a large utility, insurance companies. In September 1991 MPT announced it would end its opposition to any foreign ownership of KDD and NTT shares. Non-Japanese would be collectively limited to 20 percent of each company.

22.2.1 *Funding*

One other argument in favor of government ownership had been that profits from the telephone business would be a good revenue for the government. Restoring and expanding basic services was a major mission of NTT, a task that required considerable capital investment. Thus, the Diet decided profits should be retained and reinvested in the construction of network facilities and the improvement of telephone quality. NTT was allowed to charge high rates and thus earn substantial profits in the early years, but rates moved up very slowly.

As an additional source of funds, in 1953 NTT began requiring subscribers to pay an installation charge and to purchase telephone bonds. From 1960 until 1982, when the requirement was dropped, the stipulated amount was 150,000 yen (a bit more than two weeks cash earnings for regular employees in 1982). These bonds provided over 25 percent of funds available to NTT each year between 1960 and 1974; their contribution had declined to about 10 percent in 1982. (As a fringe benefit to the whole economy, these bonds could be traded, and a market developed for them that provided some indication of a "free market" interest rate during a period when other deposit and borrowing rates were tightly controlled.)

NTT used a series of five-year projects, beginning in 1953, to achieve its goals. As an example of how financing was obtained, during the third project period (1963–1967) internal funds provided 52 percent, subscriber bonds 32 percent, installation charges 4 percent, and government investment and loan programs 12 percent.

Rate increases came slowly after 1953. The unit call charge remained 7 yen from 1953 (when it had been increased from 5 yen) until 1976, when a 10 yen rate was implemented. Exchange line charges went nine years with no increases in major cities, sixteen years in the rest of the country. Increased usage, however, meant revenue growth, and NTT was profitable. Then, in the wake of the inflation induced by the 1973 oil crisis, the company incurred a deficit. In 1976–1977 it was allowed two increases that together doubled monthly rates.

Itemized bills were not introduced until 1986, and then as an extra-cost option—100 yen per page—although a customer can inspect the detailed billing at an NTT office. In 1991 some areas still could not provide the information. Most Japanese have forgone itemization. However, in 1990 NTT announced it had found 4.8 billion yen in accidental overcharges during the previous five years. International call billings have always been itemized.

22.3 International Service

When Japan initiated domestic telegraphy as a direct governmental enterprise it did not have either the financial or technological resources to initiate international telegraphy. Therefore, the government licensed a Danish company, Great Northern Telegraph (GNTC, called Taihoku Denshin Kaisha in Japan) on August 25, 1870, to install and operate submarine telegraph cable between Japan and other countries. A cable between Nagasaki and Shanghai began service in June 1871, reaching Europe through connecting lines. GNTC also installed cable between Nagasaki and Vladivostok, which was put in service in November 1871. Japan signed the International Telegraph Treaty in 1879.

In 1906 the Japanese government and an American private company jointly installed a submarine telegraph cable between Tokyo and Guam (some 2500 km south of Tokyo) and connected it to the telegraph cable between Guam and the U.S. mainland, ending GNTC's monopoly. The facilities were leased to the government, which operated the service. The cable itself, however, was mainly controlled by the American partner. Japan still had to rely on foreign companies for know-how and equipment.

22.3.1 *Wireless and Telephone*

Radio telephone communication using long waves became commercially viable at the beginning of this century, and Japan opened its first wireless radio communication circuits to Petropavlovsk from Ochi Ishi, near Nemuro City in Hokkaido, in June 1915. In the same year, a Wireless Telegraph Law was enacted. Although long wave is suited to international telecommunications, much electricity was needed for transmission, making it quite costly. Moreover, the number of available frequencies was limited to about 120, resulting in severe competition among governments to secure them. Japan thus sought to construct transmission stations as quickly as possible.

However, as the government had inadequate financial resources for this venture, it was decided facilities for international telecommunications should be owned by private businesses. As a result, a new company, Japan Radio Telegraph (Nihon Musen Denshin KK), was established in 1925. It owned facilities for international communications and leased them to the government. Because of various government subsidies, it was essentially a semi-government operation.

In the late 1920s short-wave radio technology developed. Because short wave requires less energy, and is thus less costly, intensive effort was made to use it for international communications. Short-wave service to the United States started in 1928.

The first international telephone service was between the United Kingdom and the United States in 1927. Japan had experienced a major crisis in its banking and financial system that year and the government had insufficient funds to finance international service. In December 1932 a new private company, International Telephone (Kokusai Denwa Kaisha), was established. It

constructed and owned radio transmission facilities for international telephone service and leased its facilities to the government.

Thus, International Telephone and Japan Radio Telegraph owned the international facilities for telephone and telegraph, respectively, leasing them to the government, which operated the services. The companies merged in 1938 as International Telecommunications (Kokusai Denki Tsushin).

As Japan expanded militarily into Manchuria and China, international telecommunications facilities also expanded. Just before the outbreak of the Pacific War in 1941, Japan operated thirty-three international telegraph circuits, thirteen international telephone circuits, and four international telephoto circuits, more than any country except Great Britain and the United States. GNTC's license expired in 1943. Almost all the international telecommunications facilities installed before the war were completely destroyed during the war.

22.3.2 After the War

International Telecommunications was dissolved by GHQ order soon after the war, and its facilities were absorbed by MOC. Thus, in 1947 MOC owned and operated both domestic and international telecom services as a monopoly for the first time. However, GHQ renewed Great Northern's license in September 1947 and the company resumed service on November 15 using its Nagasaki–Vladivostok cable. In 1954 GNTC and KDD agreed to jointly own and operate the two cables installed by GNTC before the war. By 1957 they had deteriorated to the point the two companies agreed to construct a new broad-band cable. The new company was half-owned by each firm. It was completed in July 1969 and called JASC.

22.3.3 KDD Monopoly

KDD was established as a monopolistic, regulated joint stock company to give it freedom in management and in the adoption of new technologies, while at the same time having it serve the public interest. It was rather strictly regulated, but less so than NTT. KDD was controlled mainly by the MPT, while in many situations NTT had to obtain approval from the Diet.

In the early 1980s a scandal involving top executives of KDD and high-ranking bureaucrats at MPT made headlines. The origins go back to the mid-1960s when continued very high calling charges began producing substantial profits for KDD. Rather than reduce rates, KDD hid part of its profits by spending lavishly on entertaining “business partners”—a valid expense up to a point, except that many of the guests were politicians and MPT officials. This incident was a factor in the opening of international calling to competition.

The trend in the 1950s, particularly in Europe, was socialization. The shift from private to public management was often seen in public utilities like telecommunications. The reverse shift in Japan—from government operation to private management—was a surprise to many. Viewed from Japanese business tradition, however, it was a natural shift. There is only one instance in modern

Japanese history where existing private companies were nationalized—the major railroads in 1906–1909—and that was for military reasons in the wake of the Russo–Japanese War (1904–1905). Japan National Railway was split up into six regional companies and privatized in 1987.

KDD grew steadily as the Japanese economy recovered. International telecommunication before the 1960s depended on submarine cables and short wave. KDD initiated telex service in 1956 and started to provide leased telegraph circuits to trading companies in 1962. The number of frequencies allocated to KDD increased from 95 in 1953 to 360 in 1963, while the number of international circuits increased from 58 to 292. KDD's sales increased from 4.5 billion yen in 1953 to 10.8 billion in 1963.

Short wave has serious defects due to its susceptibility to natural conditions such as change in the ionosphere. Also, scarcity of spectrum means it is difficult to secure a large number of circuits. KDD followed installation of a newly developed submarine coaxial cable between Europe and North America in 1956 (TAT-1) with interest. The success of TAT-1 stimulated KDD to plan installation of the same type of cable between Japan and North America. The cable, TPC-1 with 138 circuits, was completed in 1964.

Production and installation of TPC-1 were totally dependent on U.S. technology. However, KDD learned enough to develop its own know-how in cooperation with NTT. In 1972 the two firms together developed a submarine cable technology—dubbed CS-12M—that provided a tremendous increase in circuits per cable. KDD then installed submarine coaxial cables on seven routes, five using technologies developed in Japan. In 1989 KDD installed a trans-Pacific coaxial cable (TPC-3) using optical fiber.

The first communications satellite was launched by the United States in 1962. KDD constructed its first earth station shortly thereafter. In 1964 the first international relay broadcasting was conducted by the Japan Broadcasting Corporation (Nippon Hoso Kyokai/NHK) using the U.S. satellite and KDD's earth station. In 1964 Intelsat was provisionally established. It launched its first satellite in 1965 and began commercial operation. In 1967 KDD started using Intelsat satellites for communication between Japan and the United States, and in 1969 constructed another earth station to establish circuits to Europe and the Middle East.

The dramatic growth of Japan's international telecommunications, as shown in Table 22.1, paralleled Japan's rapid economic expansion since the Korean War. This has produced a strong demand for international telecom services, and this in turn has facilitated further expansion of trade. The number of international circuits operated by KDD increased from 71 in 1953 to 1,240 in 1970 to 8,279 in 1985 (two-thirds by satellite and one-third by submarine cables). There were more than 20,000 circuits in 1990.

22.3.4 International Public Services

Before telex service started in 1956, telegraph accounted for 80 percent of KDD's annual income and 94 percent of all international traffic through public

Table 22.1. Expansion of International Telecommunications^a

Year	Circuits	Telegrams ^b (thousand times)	Telex ^b (thousand times)	Telephone ^b (thousand times)	Public Data	
					Transmission (no. of Contract)	TV Transmission (frequency)
1953	71	3,430	—	1,900	—	—
1955	92	3,670	—	1,600	—	—
1960	217	4,140	400	1,900	—	—
1965	463	5,020	1,100	5,200	—	—
1970	1,240	5,820	4,360	2,180	—	—
1975	2,425	5,820	16,230	8,570	—	—
1980	4,553	3,340	37,980	23,430	406	2,559
1985	8,279	1,530	50,170	95,630	5,890	4,832
1990	20,397	600	17,530	322,750 ^c	17,489	16,355

^aThis table was made based on data in *Tsushin Hakusho* (White Paper on Communications), 1973, 1978, 1983, 1988, and 1991 editions (Ministry of Posts and Telecommunications, 1973, 1978, 1983, 1988, 1991) and *Denki Tsushin Tohkei, 1991* (Ministry of Posts and Telecommunications, Telecommunications Policy Bureau, 1991).

^bThe figures for international telegraph, telex, and telephone calls include those of transmission, reception, and relay.

^cThe figure for international telephone calls in 1990 covers only calls made through KDD and does not cover calls by other new international carriers, ITJ and IDC.

circuits. The number of international telegrams peaked in 1969 at over 6 million; by 1990, the number had fallen to 600,000. The use of telex, in turn, reached its peak in 1984 with over 52 million messages and had fallen to around 17 million in 1990. International telephone volume has been increasing remarkably as users shift to fax. Another reason for this growth is the expansion of computer communication via phone circuits. Since 1970 the number of international telephone calls has increased even more rapidly than the number of circuits, exceeding 320,000 in 1990.

NTT started a data communication service called MARK I in November 1971 for domestic users. KDD began providing International Computer Access Service (ICAS) in 1980. (In Japan, there were several "ten-year gaps" between domestic and international services. This is a typical example.) The service was upgraded using a packet exchange called Valuable and Efficient Network Utility Service-Packet (VENUS-P) in 1982. The two were integrated in 1983 under VENUS-P. Another rapidly expanding area of KDD's services has been international television transmission.

22.3.5 International Private Leased Circuits

KDD leases two types of international circuits. The first is a telegraph class and the second is voice (telephone) class. These were originally to be used for telex and telephone, respectively. Voice class usage has increased dramatically due to facsimile transmission and development of modems that allow computerized data transmission. Telegraph class circuits peaked in 1981 at 625. In

1987 there were 458 telegraph class and 851 voice class leased international circuits.

There are several regulations restricting use of international leased circuits. Under the Telecommunications Business Law and the ITU Convention, use of international leased circuits is limited to three cases. These are (1) intracompany communication (inhouse use), (2) communication within the same group of companies (subscriber holds more than 50 percent of the stock of the partner company), and (3) communication between companies having close business relations (20 percent of subscriber's sales must be to the other company).

A major purpose of these rules is to prohibit the use of international leased circuits in the same way as international public circuits, including resale. Therefore, use is permitted for simple data processing, including data base service and financial market information, even if the communicators do not fit in any of the three categories.

22.4 Early Deregulation and Introduction of Competition

Using microwave systems, electric power companies and the Self Defence Forces (military) established their own communication networks. In rural areas where construction of facilities for NTT's telephone system was delayed, wired radio and telephone systems expanded rapidly.

The Wire Telecommunication Law and Public Telecommunication Law were enacted in 1953. Before then, those who wished to install private lines had to get permission from MOC. Under the new law anyone could install private lines provided that the system was reported to MPT and did not affect public circuits. This was the first instance in Japan of telecommunications "deregulation" caused by technological development.

During the 1950s and 1960s, policy goals for telegraph and telephone were very simple. They were the reconstruction of facilities destroyed during the war, technical standardization, expansion of telephone networks, and completion of automatic switching on a nationwide scale. Because these were technical problems, they were left to NTT and KDD.

In the late 1960s various new media such as data and facsimile communications began to emerge and, together with the growth of the computer industry, rapid expansion of various forms of telecommunication and information services was projected. The development of cable television in the United States and new ideas like "wired cities" caught the attention of Japanese, and the first CATV expansion occurred in the early 1970s as a part of the *johoka shakai* (information society) boom.

To cope with such a rapidly changing situation, MPT created a special section named the Telecommunications Policy Division in 1972 to plan and execute nonbroadcast telecommunications policies. During the 1970s the division completed a number of well-known projects, such as the Information Flow Census (see Ito 1981, pp. 671-98), the Tama Community Cable Information Service (CCIS) experiment, and the Character And Pattern Telephone Access

Information Network System (CAPTAIN) videotext experiment (on these last two, see Araki 1984, Ito and Oishi 1987, and Ikeda 1985). The division was later expanded and strengthened; it became the Telecommunications Policy Bureau in 1980.

Though restrictions on privately installed circuits were eliminated by the Public Telecommunication Law in 1953, many other restrictions continued, such as those regarding what equipment could be connected to NTT lines, sharing of private leased lines, message exchange using private leased lines or cable tv circuits, sublease of private leased lines, and interconnection with NTT lines. These restrictions were justified on the basis of the security of public networks, technical standardization, protection of communication secrecy, and protection of NTT's monopoly. Complaints about restrictions were rare when services were limited to the telegraph, telephone, and telex. They became loud, particularly among business circles, when data communication rapidly spread and various information and communication services became viable in the late 1960s.

Users and information service providers began to feel the restrictions were a serious hindrance to free and efficient information flow. MPT understood the problem and announced a "Basic Policies for the Liberalization of Telecommunication Circuits for Data Communications" in September 1969. The Public Telecommunication Law was amended in May 1971 based on these basic policies. This amendment is called the "First Liberalization of Telecommunication Circuits." Connection of computers, information receiving equipment (terminals), and fax equipment to NTT public telephone lines became legal. At the same time, NTT and KDD were allowed to engage in the data communication business using their computers.

Thus, after 1971 many private information service companies emerged. They provided stock market quotations to brokerage firms, data processing and storage services for small companies, literature information for researchers, and so on. Sharing private leased lines was permitted on condition that the parties involved have business transactions on a regular basis. Message exchange through private leased lines also became permissible on the condition that the messages have something to do with the data being exchanged.

NTT's two major goals for the postwar telephone system had been immediate installation and immediate connection. After eighty years, the backlog of requests for phone service disappeared in the late 1970s, and with it went the chief justifications for NTT's monopoly. Furthermore, because of developments in transmission system technology, the economies of scale that had justified monopoly were also lost. Thus, by the late 1970s and early 1980s, most experts in this area came to agree that fundamental rethinking and possibly drastic changes in the traditional public telecommunications order were needed. Nagai continues this discussion in the next chapter.

22.5 From Monopoly to Competition

Under the "Second Liberation of Telecommunications Circuits" in 1982, usage restrictions on private leased circuits were relaxed and more private companies

entered this area. For example, Dentsu Kokusai Jobo Sabisu (Dentsu International Information Service) started a calculation service and a sales and inventory management service in 1982 using General Electric Information Service Co. (GEISCO) computers in Cleveland, Ohio. As a result of a major reform in 1984 it became possible for private companies to enter all areas of telecommunications, international or domestic. This allowed Shikyo Joho Senta (Market Information Center) to use private lines leased from KDD to provide stock market quotations from Reuters in London starting in 1987.

As deregulation in the domestic system proceeded, it became clear that international agreements and ITU's policies were not as progressive as those for the domestic system. Japanese government and business leaders perceived existing international rules and regulations as obstacles to free entry by private enterprise. However, those who supported the existing international framework argued that Japanese firms, together with U.S. interests, were trying to skim the cream and pursue selfish interests. These issues will be discussed with regard to common carriers and international VANs.

22.5.1 International Common Carriers

According to the Telecommunications Business Law enacted in 1984, common (Type 1) carriers are companies owning transmission facilities such as cables, microwave networks, satellites, earth stations, antennas, and the like. In July 1986 five trading companies, an electronics manufacturer, and a bank formed International Telecom Japan (ITJ) (Nihon Kokusai Tsushin) to study the feasibility of entering the international telecommunications business. (The companies were Mitsubishi, Mitsui, Sumitomo, Marubeni, and Nissho Iwai, plus Matsushita and Bank of Tokyo.)

Intelsat initially leased transponders exclusively to recognized private operating agencies (RPOA). However, that policy has changed to permit private businesses to lease international circuits. Government approval is required to hold Intelsat harmless if the private company causes any international trouble.

ITJ began regular service on April 1, 1989, by leasing transponders on Intelsat satellites (ITJ owns ground stations), part of a submarine cable between Japan and Hawaii (TPC-3) from KDD, and part of a submarine cable between Hawaii and U.S. mainland (HAW-4) from AT&T. The resulting network connects the major countries in Asia, North America, and Western Europe.

Kokusai Dejitaru Tsushin (International Digital Communications, IDC) was established on November 7, 1986. Major investors are C. Itoh & Co., (20 percent), Cable & Wireless (C&W) (20 percent), Pacific Telesis Intl. (10 percent), Toyota Motor Ltd. (3 percent), Merrill Lynch (3 percent), two electronics companies, and three banks. A notable feature of this company is that it is 33 percent owned by Japanese firms. IDC was the first case in an advanced country in which so much of an international carrier—albeit a fringe one—is held by a large foreign international carrier.

Under the 1984 Telecommunications Business Law, foreigners and foreign firms were not allowed to hold shares of NTT or KDD, and ownership of new Type 1 carriers is restricted to 33 percent. Other areas, including Special Type

2 (large-scale VANs), are open to foreign entry. Therefore, from a regulatory viewpoint, there should have been no problem with IDC's ownership. Nonetheless, on the grounds foreign companies are not permitted to control major carriers in any advanced country, MPT expressed dislike for IDC's plan.

MPT strongly suggested IDC and ITJ be unified and shares of each foreign company in the combined company be kept at less than 5%. On a more positive note, MPT also argued a combined company could better compete against the much larger, well-established KDD. Both C&W and Pacific Telesis International, a subsidiary of a Baby Bell company, strongly protested. Their protests were backed by the US Trade Representative, the US Secretary of Commerce, and British Prime Minister Thatcher, and became an international issue.

C&W planned to make IDC one of the cornerstones, and possibly the center, of its business activities outside England. Approximately 60 percent of C&W's revenue are from the East Asian market. C&W's main Asian office is in Hong Kong, but management, uneasy about 1997, has expressed interest in moving it to Tokyo. Japanese liberalization would appear to provide a perfect opportunity for this. Furthermore, C&W has an ambitious plan called the "Global Digital Highway"—the connection of all the major industrial and financial centers in the world. It is now constructing optical fiber and digital cable networks across the Atlantic and North America, and between Hong Kong, South Korea, Japan, and the United States.

Negotiations were held between ITJ and IDC decided to embark on business separately, and Prime Minister Nakasone announced at the Venice Economic Summit that both ITJ and IDC would be given licenses as international Type 1 carriers. IDC began private leased line service in May 1989, covering the United States, Singapore, Hong Kong, Canada, the United Kingdom, West Germany and South Korea.

IDC is using Intelsat (IDC owns ground stations) and participates in joint ownership of trans-Pacific Ocean cables, like KDD and ITJ. However, it is now constructing the Northern Pacific Submarine Cable (NPC) for its own exclusive use. This is an optical fiber cable with an equivalent capacity of 17,000 telephone circuits, directly connecting the United States and Japan. Many experts worry that this cable will create excess capacity on the route. Those who support the traditional international framework argue that price reduction, caused by the oversupply or severe competition may benefit Japanese and U.S. industries, but be harmful to a world system like Intelsat.

In 1985 KDD started lowering its tariffs for direct-dial and private leased circuits. Still, ITJ and IDC entered the market on October 1, 1989, offering rates some 20 percent below KDD's for international calls. By November they reportedly had 28 percent of the traffic to the United States and Hong Kong—even as KDD's absolute volume increased from a year earlier. KDD quickly reduced the rate differential to less than 7 percent and by 1990 it was less than 2 percent. Similar narrowing took place for leased lines. By 1990 KDD rates were less than half what they had been five years earlier. The result was flat revenue and plunging profits for KDD from 1989 to 1990.

KDD has done more than cut prices to meet competition. It has established

“telehouses” in the United States and United Kingdom that enable companies (mostly Japanese multinationals) to locate computer and communications systems at shared, KDD-managed facilities.

22.5.2 *International Type 2*

Under the Telecommunications Business Law, Type 2 business refers to companies providing service by leasing transmission facilities from Type 1 carriers.

Early providers offered administrative or data-base services. This involved no information exchange among customers, so it did not contradict international system regulations. A problem arose, however, in the information exchange between customers using electronic mail systems and interconnection between computers. This international VAN service has become a controversial issue. Such service is permitted, in a narrow sense, if it is provided through public data communication networks such as KDD’s VENUS-P. However, public circuits are costly and inflexible for large users. Therefore, VAN service providers want to use private leased lines.

CCITT’s recommendation D 1 prohibits leasing international private circuits to anyone who plans resale. On the other hand, CCITT D 6 permits exceptions to D 1. Worldwide telecom service organizations such as the Societe Internationale de Telecommunications Aeronautiques (SITA) and SWIFT were made possible by D 6. D 6 also permits exceptions for organizations designed as a RPOA.

Measures considered to bridge the gap between the Japanese domestic system and international systems were:

1. Revisions to CCITT D 1 so that resale of international private leased circuits is permitted.
2. Revisions to CCITT D 6 so that international VAN companies are regarded as exceptions like SITA and SWIFT.
3. Bilateral or multilateral agreements, independent of ITU rules, so that the concerned countries can permit operation of international VAN services using private leased circuits.
4. Granting international VAN companies RPOA status.

Instead of adopting any of these measures, MPT revised the Telecommunications Business Law in 1987. Type 1 carriers were permitted to lease circuits to Type 2s under conditions different from those available to other users. The Japanese term for them translates as a “non-tariff-based circuit.” They are not as flexible as private circuits, but they are billed at a monthly fixed price. The idea is to treat international VANs as carriers in order to avoid D 1 problems. (Because the United States, in particular, continued to campaign against D 1 restrictions in various international forums, in it was reduced by CCITT to applying to “simple resale,” in March 1991.)

By the early 1990s fax accounted for half the communications flow between the United States and Japan. In March 1990 the United States and Japan ne-

gotiated an agreement covering value added resale. Among other things, this allowed the delivery of a fax at a designated time and to multiple receivers beginning in May 1990. A similar arrangement was made with the UK that became effective in August 1991. By May 1991 there were five firms offering value added fax service. Because they used non-tariff lines their rates were about 20% below those of the common carriers.

There were 16 other providers of international VAN service operating in Japan in May 1991. Many are joint ventures of major multinationals (AT&T, NTT, IBM, General Electric, Fujitsu and so on). Among the more specialized VANs are Intech (of Japan), GTE Telenet, and Tymnet (both US firms). In addition to the United States and the United Kingdom, international VANs connect Japan to Hong Kong, Singapore, Canada, France, Germany, the Netherlands, and Switzerland.

22.6 Factors in Policy Change

Telecommunications policy is the mass of administrative, judicial, and legislative measures taken to achieve social goals through the electronic media. Therefore, policy is basically determined by two questions: "What are the social goals to be achieved?" and "What are the means to achieve these goals?" Because of political considerations, shifts in social values, and technological innovations, the answers change; therefore, policy must also change. Change in what means are best occurs mainly through technological innovation. In Japan, changes in social goals due to value changes or political reasons have not been important, except to the extent technological change has expanded the range of achievable social and political goals.

22.6.1 Goal Changes

Until after World War II military secrecy was an important reason for keeping common carriers under strict government control. Today, however, the military has developed separate networks. Similarly, expansion in terms of range and availability had long been a major goal, to bring Japan up to the level of advanced countries. This has been largely achieved. Without these arguments, support for a strictly controlled government monopoly is weakened.

Another long-time major goal has been to provide facilities to meet social needs for communication. These needs traditionally have been defined simply in terms of quantity—the ratio of telephones to population, and so on. In the 1980s, however, this took on other meanings—an expansion of "needs" that includes fax, videotext, data telephones, data communications, and information services. Quality—diversity—has become an element.

Generally speaking, monopoly is suited for large-scale, simple, and fixed services; it is less well-suited for diversified, flexible services. Laws and regulations governing monopolistic corporations are one of the major reasons for this; however, mere size can also be a serious obstacle to providing diversified,

flexible services. This was an argument of those promoting privatization of NTT.

The idea of fostering information-related industries as a strategic industry was not common before the mid-1960s. It has since been included in the policies of most industrialized countries.

In Japan in the mid-1960s, faced with serious industrial pollution inside Japan and tough competition from newly industrialized countries such as Korea, Taiwan, and Singapore, Japanese economic policymakers began to feel that the industrial structure as a whole should become specialized in more pollution-free, knowledge- and technology-intensive industries. Foremost among these were MITI and its advisory groups, such as the Sangyo Kozo Shingikai (Industrial Structure Council). In the late 1960s and early 1970s policies were implemented to strengthen Japanese information and communication industries.

The Japanese information and communications industries along with MITI had long insisted on deregulation of communication circuits and enhanced services as a way of fostering industrial expansion. Sometimes MPT and NTT were cautious about deregulation, professing concern about maintenance of safe, stable public service. However, MPT could not deny the importance of strengthening the Japanese information and communications industries. By the mid-1980s science and technology policies such as national development plans for rockets were seen by many as related to telecommunications policies, particularly concerning satellite communication.

22.6.2 *Changed Means*

Because telecommunications laws and regulations have historically tended to be very specific to the available technology, and thus very narrow and restrictive, new laws or amendments to old laws ultimately have resulted each time a new service has appeared. In Japan, the Telegraph Law of 1900, Wireless Telegraph Law of 1915, Radio Law and Broadcast Law of 1950, Wire Telecommunications Law and Public Telecommunications Law of 1953, and Cable Television Broadcast Law of 1972 were all enacted to regulate new services.

Further, these laws have been amended to cope with changes caused by technological innovations. For example, the Public Telecommunications Law was amended in 1971 to enable connection of computers, terminal equipment, and fax to public networks. It was amended in 1982 to permit private leased circuits for information and communication services ("value-added" or "enhanced" services). Home shopping and home banking are examples of services that require new legislation or amendments of existing laws.

Cable television started as a supplementary broadcasting system and has become a two-way telecommunications system. According to Baughcum (1986, p. 91), development of computer and microelectronics technologies has blurred both the distinction between telecommunications and data processing as well as the lines between the traditional basic grouping in telecom equipment: central office switching, transmission, and customer premises equipment. Legal adjustments are needed to cope with these changes.

Many regulations were developed on the assumption resources for telecommunications are scarce. Networks have been limited in most countries by the enormous amount of money required for construction. However, ways have been found to expand the usable radio spectrum and bring down the per circuit cost of other types of networks (see, e.g., Gilder 1991).

As the scarcity is reduced, groups wishing to take advantage of these circumstances work for legislation to allow them to do so. In Japan strong pressure emerged from three sources. First, private business circles demanded changes to permit use of telecommunication resources for profit making. Second, consumers demanded better, cheaper, more varied, and flexible services. Third, there has been mounting public criticisms of the bureaucratic inefficiency and red tape of mammoth, monopolistic government organizations. These factors combined to bring about the drastic legal reform of 1984.

22.6.3 *Cost Changes*

Costs and, therefore, prices usually drop as a result of technological innovation. Demand increases for products and services with falling prices. Telecommunications is a typical example. Long distance used to be expensive, but prices have fallen so much that more people telephone than write letters. Many business transactions are done on the telephone, which has required legal adjustments to validate verbal commitments. Basic technologies for facsimile have been known since the 1930s, but the cost was so high that manufacturers did not develop equipment for the general public. Fax machines can now be found in many homes. In Japan, citizens can receive most documents published by public offices via fax.

Telecommunication has long been considered subject to economies of scale. This has provided one of the strongest arguments against permitting competition in basic services. Network expansion, however, has almost reached a saturation point in advanced countries, and the means of providing telecom services have become diversified. In this environment economies of scale are not as great. Moreover, the value of competition has increased because diversified—differentiated—services are more effectively provided by independent companies competing with each other than by a monopolistic public corporation. These are major reasons Japan decided to introduce competition.

Technological innovation affects policies through its impact on social goals and through development of better means to achieve given social goals. Despite cultural and situational differences, countries face similar (if not exactly the same) socioeconomic problems from technological innovation. Therefore, by exchanging information on how to cope with these problems, every country can learn how to make the best use of technology to achieve its social goals.

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