

Ringling Up Profits with Cellular Phones

Open market, rapid growth realize ten-year-old vision of MOSS Talks

By Hayden Stewart

The Japanese market for cellular telephones is poised to continue its record-setting pace of growth throughout the remainder of this year, probably bringing the total number of phones in service to more than 7 million. In 1993, by contrast, there were only 2.13 million cellular telephones in Japan.

Foreign companies are at the center of this growth. Firms from the United States and Europe are not only taking part in the sales boom, but also share the responsibility for making this growth possible.

Only one-and-a-half years ago, the picture was quite different. Leading American telephone manufacturer Motorola was arguing that it did not enjoy fair access to the Japanese market, and United States Trade Representative Mickey Kantor was threatening to impose retaliatory sanctions.

Now the atmosphere in Japan is anything but hostile. Says Bill Schaupp, services distribution manager for Nippon Motorola, "Every player in this market—domestic and foreign—is benefiting from the competition which our company has injected into the Japanese market."

Motorola has worked with Nippon Ido Tsushin (IDO) and carriers who are affiliated with Daini-denden (DDI) to supply a network for users of mobile telephones in Japan. This network was the first nationwide alternative to a similar system which is operated by Nippon Telephone and Telegraph Mobile Communications (NTT DoCoMo), a subsidiary of NTT.

The installation of a North American-supplied service network in Japan not only allows Motorola to sell in Japan its telephones, which do not work on NTT DoCoMo's analog system, but is also fostering price competition between service providers. This competition is responsible for bringing the price of mobile telephone services down to a reasonable level and thereby sparking a sales boom.

Bad connections

Companies from Japan and Scandinavia pioneered the early development of cellular technology.

NTT and Japanese electronics manufacturers unveiled their first commercial product, a car telephone, in 1979. These same companies later participated in the global development of other products for people who wanted to communicate while walking, travelling by train, or doing a variety of other activities.

As cellular telephones assume a wider variety of applications beyond the automobile alone, the basis of this technology remains more or less unchanged: mobile telephones transmit radio signals, which are received by a local base station and then sent to a mobile services switching center. After reaching this center, the signal may then follow a few different paths. For instance, if the other party is using a cellular telephone by the same carrier, the mobile switching center will next transfer the signal to a base station near the recipient. In most cases, however, the recipient is using a land-line phone or another carrier's cellular phone, and the signal is sent to a NTT telecommunications center.

In order to make (or receive) a call, users of cellular telephones must be near a base station. Antennae are commonly attached to the roofs of buildings, but their radius is generally less than 10 kilometers, making a circular "cell" whose area measures approximately 300 kilometers.

Although NTT built a nationwide network of base stations, sales of mobile telephones in Japan grew more slowly than sales in other advanced countries. As of April 1994, the percentage of people in Japan who used cellular telephones hovered around 2 percent. By contrast, the penetration rate was already 8 to 9 percent in the U.S., and more than 10 percent in Scandinavia.

Pundits blame Japan's reversal of fortune on government regulations as well



One of Motorola's latest cellular phone models, for use on NTT DoCoMo's digital network.

as a lack of competition which combined to keep prices unnecessarily high. According to a report by NTT, it was 6.6 times more expensive in 1991 to operate a cellular phone in Japan than in the United States.

Firstly, government regulations prohibited people from purchasing cellular telephones. Instead, customers were required to rent their phones from NTT.

Secondly, NTT was a state-owned monopoly until 1985. As such, it faced no price competition until the same year, when newcomers were allowed to enter the domestic market for telecommunications services.

Knocking on the door

Companies in the U.S. introduced cellular telephones in 1984, but low prices and a large market soon made them world leaders. Chief among these companies is Schaumburg, Illinois-based Motorola. The company is not only the world's largest maker of cellular telephones but a major manufacturer of the equipment necessary for constructing cellular telephone networks.

Motorola has long been working with the U.S. government to gain access to Japan's telecommunications market. In 1985, Japanese Prime Minister Nakasone and American President Ronald Reagan launched the Market Oriented Sector Selective (MOSS) discussions. These negotiations identified telecommunications as one of four priority sectors in which foreign companies would be guaranteed "free and unimpeded access" to the Japanese market.

As a result of the MOSS discussions, Motorola and regional members of the DDI family were allowed to launch a Motorola-supply service network for cellular telephones: TACS.

Aside from offering domestic long-distance telephone services, DDI is a leader in wireless telecommunications. The company was founded in 1984.

Nippon Ido Tsushin (IDO) was also moving to introduce cellular telephone services after NTT's privatization. However, it decided to construct a network around the NTT-format system.

DDI and IDO do not supply cellular services nationwide; they operate in mutually exclusive areas. In the late 1980s, IDO was the only company competing with NTT in Tokyo and Nagoya (the "Tokaido" corridor), and DDI was present in all other parts of Japan.

A shortage of radio spectrum and government guidelines was responsible for this geographical division of labor. In order to foster methodical competition, Japan's government instituted a policy of "Two Operators in One Region."

This geographical division of labor was problematic for both Motorola and DDI. A Motorola spokesperson explains that it "barred" DDI's foreign suppliers from entering the Tokaido corridor. And "DDI was at a disadvantage to IDO in terms of service area." Because their phones were compatible with NTT's established network, IDO's customers could easily "roam"—make (or receive) calls while travelling long-distances by car or train. DDI customers, by contrast, needed to purchase an adapter in order for their telephones to interface with NTT-format base stations.

In 1989, the Japanese and U.S. governments sought to rectify Motorola's lack of market access. As a part of their accord, IDO pledged to build its own TACS system in the Tokaido Corridor, thus making it easier for U.S. suppliers to enter this area and for DDI customers to enjoy hassle-free roaming.

By October of 1992, IDO had installed 66 Motorola-format base stations, and planned to operate a total of 189 by June 1994. Motorola appreciated IDO's investments in TACS equipment,

but the pace was too slow. In order to cover 95 percent of the population in Tokyo and Nagoya, Motorola estimated that 350 base stations were required. Any investment below this figure was not productive, argues the company, because roaming would have been difficult and customers would have been drawn to the NTT-format system whose population coverage measures slightly higher than 95 percent.

U.S. suppliers did not want their competitive disadvantage to increase over time, especially since the cellular telephone market was expected to boom with upcoming plans by the Japanese government to liberalize the market. The Ministry of Posts and Telecommunications had made clear that it would allow people to purchase, not rent, cellular telephones from April 1994.

As tensions mounted, the United States Trade Representative (USTR) announced that Japan had not complied with the terms of the 1989 agreement. Representative Mickey Kantor threatened to impose sanctions against Japanese companies.

An eleventh-hour deal was finally reached when IDO agreed to install 159 new cell base stations as well as 9,900 channels.

Open market

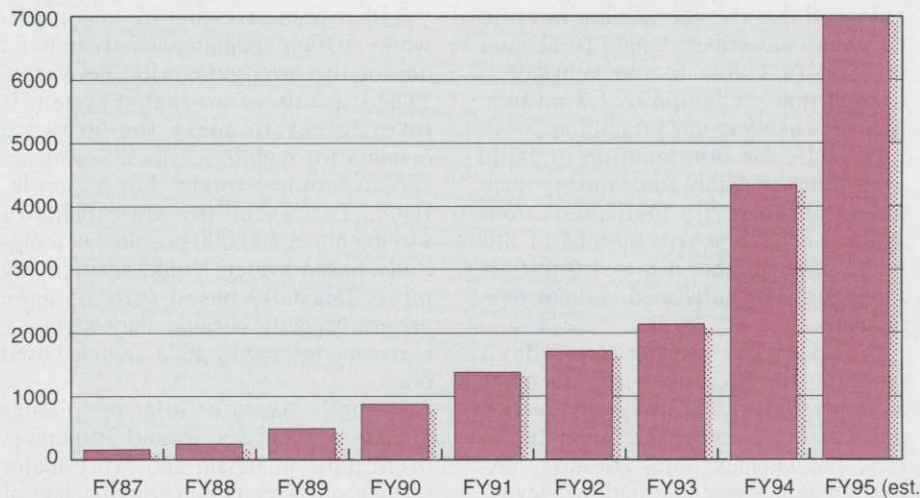
One-and-a-half years after the amicable end to the trade dispute between Japan and the United States, Japan is not only a "fair" place for international companies to do business but it is once again a major international market for mobile telecommunications.

The proof is in the numbers. More IDO customers now subscribe to the company's TACS system than to its older NTT-format system. As of March, IDO had 635,400 subscribers, of whom 363,000 used its TACS infrastructure.

Given the positive reaction of customers to its TACS systems, IDO is happy to have accelerated the company's investment in the system. "We always adjust our investment schedule to reflect changes in the market," says a spokesman. "Since the market has been growing quicker than we expected, it is possible that IDO would have accelerated this investment on our own initiative." "Motorola is a good business partner," adds the spokesman: "We are friendly."

Due to investments by DDI-affiliated companies and IDO, almost all of the population of Japan is now covered by the TACS systems. For instance, IDO's TACS system covers 96 percent of the

Transition in the Number of Cellular Phones



Unit: 1,000 terminals. Statistics are courtesy of the Ministry of Posts and Telecommunications, except for the figure of estimated sales this year which is based on an extrapolation of current growth rates.

population in Nagoya and Tokyo.

IDO is planning to invest a little more in the company's TACS infrastructure, but it will not expand into the remote countryside. According to spokespeople, one base station costs around ¥100 million to construct; however, rural services would attract only a handful of people.

Nagao Kiyoshi, manager of Motorola's IDO Sales Department, is prepared to accept current trends. "Customers can freely use our phones in any city around Japan, and enjoy talking while driving a car or travelling on a train," he says. Nagao concedes that telephone services can be disrupted if users pass through a tunnel. However, carriers are cooperating to solve this problem. From this year, they began to install devices to carry cellular signals inside tunnels.

Market growth

Consumers can now buy cellular telephones and competition is hot between carriers IDO, DDI, NTT DoCoMo, and newer firms. As a result, the Japanese market is growing at a phenomenal pace as prices fall to record-setting lows.

The current rate of growth has caught even Motorola by surprise. Kuru Isamu, president of Nippon Motorola, acknowledged last winter in an interview with the *Nikkei Weekly*, "I had estimated that the net increase in cellular phone subscribers would be about 1 million in 1994. In the summer, I revised that prediction to 1.2 million. Now it is likely to top 1.4 million."

In 1995, the continuation of rapid growth has probably forced many manufacturers to revise their predictions again. In the first five months of this fiscal year, another 1.8 to 1.9 million Japanese have purchased cellular telephones.

Cheaper rates are fuelling today's rapid growth. Five years ago, operating a cellular telephone in Japan was 600 percent more expensive than in the U.S., but Japanese rates are now moving towards lower international levels. Although rate schedules vary widely from carrier-to-carrier, Nippon Motorola's Schaupp points out that the

subscription fee alone has fallen from around ¥38,000 to only ¥10,800 in some cases. And the basic monthly fee has similarly fallen from ¥9,000 to just ¥4,500.

Because it deregulated the sale of cellular telephones, Japan's government is partly responsible for nurturing low-prices and market expansion. But the bulk of credit goes to the emerging openness of Japan's telecommunications marketplace. Says Motorola's Kuru, "Service rates have become affordable because of fierce competition among service providers."

A competitive future

As prices are expected to continue falling, it is likely that the market penetration rate for cellular telephones in Japan will soon equal (or even exceed) American figures. But staying on top of the competition as well as technological changes will not be easy for any company—foreign or domestic.

Only one-and-a-half years after IDO, DDI, and Motorola realized a ten-year-old vision of opening Japan's telecommunications market to foreign companies, carriers are already moving to install next-generation digitally-based systems which will ultimately supplant the existing TACS and NTT-format networks, systems which utilize analog technologies.

Rather than investing in analog networks, IDO is spending heavily to build one of the next-generation networks. "The capacity of an analog system is insufficient to meet the growing demand for mobile services," company spokespeople explain. For example, IDO's TACS facilities are capable of serving about 600,000 people, but a digitally-based system could serve many more. Digitally-based systems have greater capacity because they require a narrower frequency than analog-based ones.

Digitally-based cellular telephones already account for around 30 percent of all units in Japan, and every major service provider is constructing one of the new networks, including NTT DoCoMo, IDO, and DDI.

Some new service providers have

recently started operations in Japan as well, and they are constructing only digitally-based networks. Amongst these firms, TSU-KA is the largest. There are also many regionally-based carriers such as Tokyo Digital Phone and Kansai Digital Phone. NTT DoCoMo estimates that digitally-based systems will replace existing analog systems in 10 to 15 years.

Similar to the case of service providers, makers of cellular telephones also face stiff competition and rapid technological change. The number of telephone makers is growing rapidly and firms with analog-based terminals must replace their best-selling products with new digitally-based phones.

Although the company will not release its market share, outside reports suggest that Nippon Motorola commands around 10 percent of the market for mobile telephones. Says Schuapp, who is confident that his firm can survive the heightening of competition and technological change, "Motorola phones are sturdy and they have a good reputation amongst salespeople."

Nippon Motorola has already introduced cellular telephones to operate with the digital formats of NTT DoCoMo and TSU-KA, and will soon unveil a terminal for operation with IDO's emerging digital network.

Motorola is no longer the only foreign vendor of mobile telephones in Japan, however. Nokia Mobile Phone of Finland recently entered the Japanese market to sell its own units. According to company spokespeople, Japanese consumers are reacting positively to the company's European design, and Nokia should be able to capture a sizeable piece of the Japanese market itself in the near future.

Ten years after the MOSS talks, foreign companies are not only free to sell their mobile phones here, but they may sell more than they ever expected. ■

Hayden Stewart, an American economist with a master's degree, is a freelance writer/researcher on business and economics.