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Inside...

Carriers Release Semiannual Business Results: Mobile and Data Business Up, While Fixed-Line Results Down

Major Japanese carriers have released their half-year business results ended September 1999. These results clearly demonstrated that the demand has been shifting from conventional voice to mobile and data communications. Carriers are required to have a strong data and mobile communications business strategy in order to win in the competitive market. Revenues from conventional fixed-line voice services have been shrinking because of a series of market price down resulting from a harsh competition and the rapid expansion of cellular phone users. On the other hand, data communications services have been expanding due to an explosion in the number of Internet users. Market watchers estimate that the subscribers for mobile phone services will totally reach 577 million by the end of FY 1999. Subscriber telephone users of Nippon Telegraph and Telephone Corp. (NTT) are estimated to reach 560 million during the same period. Cellular business is now the main profit earner for communications carriers. Roughly speaking, 66% of NTT's consolidated profit comes from NTT Mobile Communications Network, Inc. (NTT DoCoMo). But each carrier is taking different strategies and tactics: for Japan Telecom Co., Ltd. (JT) taking a balanced management strategy by emphasizing data, international, mobile as well as conventional businesses equally; for NTT and DDI Corp., revitalizing the deficit-ridden PHS business is the most urgent job; and, for KDD Corp., which does not have any mobile business, the need to make a breakthrough.

Mobile carriers

Thanks to the rapidly expanding number of users, most cellular phone carriers reported a two-digit expansion in their revenues and expect a good business results for the entire year. Among these mobile carriers, the J-Phone Group achieved a remarkable 41.1 % increase in its revenues from a year ago. On the other hand, the DDI Cellular Group and the IDO Group are expected to see significant drops in their profits for the fiscal year, partly due to an increase in their incentive payments to launch new cdmaOne services.

NTT DoCoMo posted a 332 billion yen interim pretax profit for the first-half ended September, soaring by 42.7% from a year ago, boosted by a rapid expansion in its subscriptions base. Since the number of cellular phone subscribers reached 26 million, up 27% from a year ago, the revenues shot up to 1.76 trillion yen, a 20.5% up from a year ago. Although the costs have also increased, the increase was surpassed by the significant increase in its revenues.

In the September term, revenues from voice transmission services for cellular was 1.36 trillion yen, a 20% up from a year ago. Although the average monthly revenues per subscriber fell down by 7% to 8,860 yen, the carrier's total revenues have expanded rapidly due to the explosion in the number of subscribers. Revenues from PHS business which NTT DoCoMo took over from NTT Personal Group last year amounted to 41.5 billion yen. Data transmission services registered 5.7 billion yen in revenues because of increased subscriptions to the new iMode services. Revenues from pager business totaled 19.3 billion yen, a 52% drop from a year ago. Revenues from sales of cellular terminals reached 30 billion yen, a 20% increase from a year ago.

The operational cost was 1.41 trillion yen, up 22% from a year ago. It is partly because the payment to retailers for registration arrangement increased because of an increase in the number of subscribers and partly cause of an increase in depreciation concerning the infrastructure for PHS system (resulting from the takeover of the PHS business from NTT Personal). As a result, the operating revenues increased by a mere 15%.

However, the current profit grew by 43% from last year because the carrier did not need to register the special loss registered by NTT DoCoMo for the rescue of NTT Personal last term. NTT DoCoMo expects its pretax profits for the entire year ending March 2000 will be 3.665 trillion yen, a 17.5% increase from a year ago. NTT DoCoMo's annual payments to the NTT holding company for R&D activities was decided to be 7.2 billion yen.

DDI Cellular Group and IDO Group have expanded their revenues partly as a result of successful launch of nationwide cdmaOne services. By the end of September 1999, DDI Cellular won 1.95 million subscribers while IDO won other 440,000 subscribers. Thanks to the good sales, IDO expanded both its revenues

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Entry of 2 New Venture Capital Markets Triggers Competition

NASDAQ Japan vs. Mothers vs. OTC

by Yaeko Mitsumori

Just after Masayoshi Son, President of Softbank Corp., revealed his bold plan to establish NASDAQ Japan, the Tokyo Stock Exchange (TSE) revealed its plan to found a new market targeting venture businesses called "Mothers." The emerging-companies market which has long been a calm, peaceful and dull suddenly turned into a battlefield with three combatants. Both NASDAQ Japan and Mothers are trying to attract promising venture businesses to their markets as part of their efforts to turn themselves into an established exchange market for emerging companies. The Securities Dealers Association of Japan is also struggling to join the battle.

On October 13, NASDAQ Japan Club, a membership organization for companies which intend to be listed on the new market, held an inaugural ceremony at a Tokyo hotel. Some 2,700 venture businesses attended the get-together along with 35 venture capitals looking for promising venture businesses.

According to NASDAQ Japan Planning (NJP), the company formed last June in order to establish NASDAQ Japan, 3,137 companies had joined the NASDAQ Japan Club as of the end of September (1999). In cooperation with the National Association of Securities Dealers (NASD) in the U.S., NJP is planning to establish NASDAQ Japan in December 2000.

At the inaugural ceremony, Masayoshi Son, who concurrently holds the position of President of NJP, said since he launched the concept of NASDAQ Japan in June 1999, he has received good repercussions from the market, and NJP has been promoting preparation jobs on the time schedule. He also referred to a recent survey that

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NTT to Cut its Investment by 30% and Reduce Workforce by 21,000

Nippon Telegraph and Telephone Corp. (NTT), the Japanese flag carrier, on November 17 announced a drastic restructuring plan.

According to the firm, NTT East and NTT West are going to reduce the number of their regional offices *in toto* to 200, around one-third of the current number; reduce their annual investments in plant and equipment by 30 billion yen to around 1 trillion yen; and reduce the number of employees by 21,000, around 16% of the current employees.

The business environment surrounding NTT has become increasingly sever since the number of NTT's subscribers line contractors have fallen in part due to an explosive expansion of cellular phone use, and in part due to the increasing pressure to push down NTT's interconnection charges.

By imposing these series of measures, NTT is gong to shift the resources to promising business areas such as the Internet.

Junichiro Miyazu, president of NTT, said at the press conference on November 17 that NTT itself should change because the market demand has been changing from conventional telephony to the Internet.

The November 17 restructuring plan is for both NTT East and NTT West. By imposing the series of restructuring plans, NTT East and NTT West are expecting to be able to reduce their costs by 160 billion yen and 190 billion yen respectively. Based on the plan, the

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Carrier:
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and profits. The carrier registered 227 billion yen in its revenues, a 10.8% increase from a year ago, and 22.4 billion yen in profits, a 98% jump from a year ago. For the entire year ending March 2000, IDO estimates that its revenues will be 500 billion yen, and the recurring profits will reach 22 billion yen.

DDI Cellular saw a huge groundswell in its revenues of 407 billion yen, up 23.6% from a year ago; however, the company posted 8.6 billion yen loss. It is partly because incentives for retailers have expanded for launching its new cdmaOne services and the number of subscribers for the PDC system have dropped significantly. PDC system subscriptions base for DDI Cellular Phone dropped by 550,000 during the first half year, which accounts for about one-third of the new cdmaOne subscribers.

J-Phone Group significantly expanded its revenues in the September term partly because the carrier used Miss Norika Fujiwara, the popular screen personality, as its P.R. spokesperson. The carrier registered 430 billion yen in its revenues, a 41.1% rise from a year ago, and 57.3 billion yen in its recurring profits.

Among the Group's nine companies, J-Phone Tokyo Co., Ltd., the core carrier of the J-Phone Group headquartered in Tokyo, reported 129 billion yen in its revenues, a 69.9% jump from a year ago, and 25.3 billion yen in its recurring profits. The carrier had reported 2 billion yen in loss during the same term last year. The carrier had been suffering from a high churn rate since it launched its services in April 1994. As part of its effort to improve service quality, the carrier has constructed 300 new base stations a year since 1997. Due to such an effort, the number of subscribers increased by 480,000 during the first half of this year (1999).

Fixed-line carriers

Business results of fixed-line carriers were mixed.

NTT announced its consolidated business results for the September term on November 24. It was the first financial statement since it was reorganized last July (1999). According to the carrier, the revenues of the NTT Group was 5.092 trillion yen, a 6.3% growth from a year ago, and the recurring profits was 492 billion yen, increasing by 21.7% or 87.6 billion yen from a year ago. NTT DoCoMo's significant expansion in its profits pushed up NTT's consolidated revenues. When limited to the three operating carriers and the holding company, both revenues and profits during the term decreased by 1%. The number of contractors for the NTT's subscriber lines which is the core revenue resource for the two regional carriers was 57.28 million as of the end of September 1999. Even if ISDN subscribers are added, the NTT's fixed-line subscribers have been leveled off at 63 million from a year ago. Since the investment cost for ISDN is heavy, it seems to take a couple of more years for the ISDN business to turn into black.

In the September term, revenues from the Internet business and mobile communications, increased by 440 billion yen from a year ago, while the revenues from fixed-line business decreased by 210 billion yen.

Furthermore, since NCCs have shifted their interconnection points from the conventional zone center (ZC) switches to group center (GC) switches, NTT's interconnection-charge incomes have dropped. Regarding interconnection charges, not only NCCs but also foreign governments have been posing pressure to push them down. So the revenues from the interconnection charges seem to drop further in the future.

Both Nippon Telegraph and Telephone East Corp. (NTT East) and Nippon Telegraph and Telephone West Corp. (NTT West) revised their estimated profits for the entire year. On November 24, 1999, NTT East revised downward its estimated recurring profit by 14 billion yen to 2.9 billion yen, while NTT West's deficit ballooned by 28 billion yen to 70 billion yen. Junichiro Miyazu, president of NTT, stressed at the press conference on November 24 that the firm's most urgent job is restructuring both NTT East and NTT West because their revenues from fixed-line business are expected to decline further.

NTT released its restructuring plan in mid-November. According to its plan, 4,000 employees of NTT East and NTT West will be reassigned to another firm within NTT Group including NTT DoCoMo. NTT will also reduce its investment by a total of 900 billion yen for the coming three years.

DDI Corp. on November 15 posted 10.9 billion yen in consolidated net profit in the September term, almost 30% less than a year ago. Although the group's revenues was 672 billion yen, up by 8.7 %, due to an expansion of good business result of DDI parent firm and the DDI Cellular Group, bloated depreciation for launching its cdmaOne services and deficit-ridden PHS business worsened the consolidated results.

For the entire year, the carrier predicts 1.59 trillion yen in group revenues, a 28% growth from a year ago and 17 billion yen recurring profit, down 66% from a year ago. This is partly because the DDI Cellular Group is expecting to see its recurring profit shrink by 74%. But the net profit is believed to be 21 billion yen, a 23% rise from a year ago.

JT on November 18 announced that its mid-term consolidated business achievement, the first time that it has released its consolidated interim earning results. JT Group's net profit was 9.8 billion yen, booted partly due to expansion of J-Phone Group sales and lower interconnection charges paid for NTT. Revenues for JT itself was 190 billion yen. While revenues from voice services decreased by 4 billion yen, that from data services expanded by 5.4 billion yen. The JT Group is expecting its net profit for the entire year to be about 3 billion yen. Although the J-Phone Group is expected to post a good result for the entire year, JT is seen its revenues being cut and the depreciation becoming swollen due to the takeover of British Telecommunications plc (BT) and AT&T Corp. subsidiaries.

International communications

KDD Corp. on November 12 announced its interim business result. Accordingly, the recurring profit (consolidated) of the carrier was 11.7 billion. The good result was achieved partly because the carrier sold out part of the Japan Information Highway (JIH), a newly constructed under-the-sea optical fiber network surrounding the Japanese archipelago. A decrease in revenues from international telephony services was covered by an increase in its revenues from domestic telephony services and data communications services. Since the international telephone market has become more competitive, partly due to the entry of NTT Communications Corp. (NTT Com, the international and long-distance carrier of the NTT Group), KDD is expecting to see its revenues from international business shrink further. On the other hand, domestic telephony and data transmission are expecting to expand further; however, both businesses require huge initial investments. KDD is expecting revenues for the entire year to reach 616 billion yen, up 51.8% from a year ago and the recurring profit will be 11 billion yen, taking off by a whopping 189%.

R&D

MPT/MOE

R&D on Network to Connect Schools to the Internet with Multi-Type of Access Lines

MPT and the Ministry of Education are promoting collaborative R&D on schools' access to the Internet. Approximately 1,000 elementary schools, junior-high schools and high schools in thirty areas in Japan will be connected to the Internet via multiple access lines such as optical fiber, Digital Subscriber Line (DSL), satellite communications, cable TV line, Wireless Local Loop (WLL), etc.

For R&D, a network is being utilized which consists of the central network center opened on September 20, 1999 and 30 local area network centers.

A working group, led by Dr. Takemochi Ishii, Professor Emeritus of the University of Tokyo, was established to promote research on educational methods utilizing the new network technology from FYs 1999 to 2001. The results of R&D will be applied to the future high-speed Internet access network to be connected with 40,000 schools nationwide.

Industry News

Oki/CASIO

Joint Venture on Wafer-Level CSP Established

Oki Electric Industry Co., Ltd. and CASIO Computer Co., Ltd. will set up a joint venture to develop next-generation chip-sized packaging (CSP). The joint venture, Integrated Electronics and Packaging Technologies, Inc. (IEP Technologies), was established on November 15, 1999 based in Tokyo. The joint venture is to develop wafer-level CSP, its surface mount technology. The company will explore opportunities for licensing business with these technologies.

IEP Technologies will work together with LSI makers, packaging subcontractors and consumer product manufactures to develop CSP technology to meet market needs. Furthermore, IEP Technologies plans to form an alliance with materials suppliers, as well as with process and test equipment manufacturers for standardization of the wafer level CSP.

CSP is becoming popular in the microelectronics industry to meet the need for product miniaturization. In particular, wafer-level CSP is a very promising technology. Often called "redistribution," it is assembled in a wafer form that makes available copper redistribution, terminal finish and encapsulation within the size of a chip. The technology enables the development of smaller, lighter and more powerful LSIs at lower costs.

The parent companies, Oki and CASIO, have been carrying out joint development of wafer-level CSP since January 1998. As an LSI maker, Oki has developed advanced LSIs, especially for personal and mobile electronic devices. CASIO has long developed unique products employing advanced LSIs. IEP Technologies will comprise a vital part of their joint strategies for more efficient and comprehensive development of business opportunities in the CSP area.

Toshiba

World's Smallest Low-Temperature Polysilicon TFT LCD with XGA Resolution

Toshiba Corp. reinforced its leadership in low-temperature polysilicon TFT LCDs with the announcement of the world's first 6.3-inch display with XGA resolution. The new LCD's 1,024 x 768 pixel image is supported by a 0.126-millimeter dot pitch that achieves a density of 202 pixels per inch (ppi).

Toshiba has positioned itself at the cutting edge in low-temperature polysilicon LCDs through such innovations as the industry's first 4-inch display offering VGA resolution. With its latest breakthrough, the company brings a resolution matching that of high caliber printed color materials, such as found in magazines, to a compact LCD panel, the size of typical photograph and smaller than a trade paperback.

Toshiba's new 6.3-inch display is expected to support further developments in such areas as electronic books (e-books) and personal digital-picture viewers. Low-temperature polysilicon TFT LCDs offer the most promising solution for mobile personal equipment of any commercialized display. Their use of crystallized silicon allows electrons to pass transistors with much greater mobility than in amorphous silicon TFT, producing a higher resolution and brighter display. They are also significantly smaller, as the display drive circuits can be formed directly on the display's glass substrate, reducing pin connections by 95%. LTM06C310 will be commercialized in April 2000 with samples priced at 100,000 yen.

SEI/TEPCO

Collaborative Research Begun on High-Temperature Superconducting Cable Systems

Sumitomo Electric Industries, Ltd. (SEI) has begun collaborative research on a long-term loading test of a high-temperature superconducting cable system with Tokyo Electric Power Co., Inc. (TEPCO).

TEPCO is planning a long-term loading test of a high-temperature superconducting cable system at Yokosuka Laboratories of the Central Research Institute of Electric Power Industry. Usefulness and practicability of the high-temperature superconducting cable system will be evaluated. This cable is expected to reduce system construction costs greatly. SEI has been nominated as a partner in the collaborative research on high-temperature superconducting cable systems by TEPCO since SEI has made invaluable contribution to the development in this field such as development of high-temperature superconducting wires, cable conductors and cable systems.

EMD

Sony vs. Matsushita Vying over Next-generation Memory Card

Major consumer electronics manufacturers including Sony Corp. and Matsushita Electric Industrial Co., Ltd. are struggling against each other to win the de facto standard for small memory cards. It is because they believe such small storage devices will become the key device for connecting digital consumer electronics with one another. Once their memory card wins the *de facto* standard and is widely used, then they will be able to allure more consumers to their products. Many electronic manufacturers are going to gear up their sales drive for portable music players equipped with a small memory card targeting the upcoming (1999) Christmas sales season.

by Yaeko Mitsumori

NTT Mobile Communications Network, Inc. (NTT DoCoMo) is scheduled to launch an experiment for electronic-music distribution (EMD) in April 2000 in cooperation with Sony Corp., Matsushita Communication Industrial Co., Ltd., and IBM Japan, Ltd. The carrier is going to launch their commercial based services in July 2000 at the earliest following the experiment.

Prior to the experiment, several venders are going to put EMD terminals which carry a small memory card. At present there are a variety of small memory cards with different specifications in the market. As the number of circulated memory cards seem to be pushed up even by one digit, every player is now struggling against each other to win the de facto standard.

Since memory cards do not have much differences in their function rather than their size and storage capacity, it seems only a few cards may be able to survive. Like the war between VHS and beta, a key media may decide the standard for the next generation digital machines and devices.

At present two kinds of memory cards are widely used: Compact Flash (CF) and Smart Media (SM). More than 80% of these cards are being used for digital still camera. At the moment, SM retains a larger share than CF. However, market watchers believe that the market allocation may change as the required storage capacity increases.

Even today, the maximum memory capacity of CF is larger than that of SM. Due to differences in their design, gaps in the maximum storage capability between these two cards will become much bigger. Partly for this reason, Olympus Optical Co., Ltd., a major digital camera manufacturer, switched from SM to CF earlier this year. Market watchers said that it is a matter of time before Fuji Photo Film Co., Ltd., another major manufacturer, follow suit.

CF can be used not only for digital camera, but also for PC-related devices. The present PC cards seem to be replaced with such small cards.

There are some other memory cards in the market. IBM is marketing Micro Drive, which has the maximum storage capacity of 320 MB. Although its market price is around 50,000 yen, much higher than other memory cards, unit price per MB is not extremely high. If IBM successfully reduces the power consumption for the card, then the card may have more applications.

Sony developed a chewing-gum-shaped Memory Stick. At the moment, the stick is being used by only Sony products. But Sony has been expanding the line-up and other makers are planning to release their products with MS slots.

Meanwhile, SanDisk Corp. earlier this year (1999) introduced Multi Media Card (MMC). The card is being used by digital video cameras manufactured by Matsushita as well as some MP3 players. Some other MP3 players are using SM and CF.

However, as large scale EMD is about to take off, now memory cards are required to provide a high level of copy protection.

In August 1999, Matsushita Electric Industrial Co., Ltd., Toshiba Corp. and SanDisk Corp., announced that they will cooperatively develop a next generation secure memory card called Secure Digital Memory Card (SD Memory Card). Toshiba is the largest producer of SM and SanDisk is a major producer of CF and MMC.

The SD Memory Card, which was developed based on MMC, looks like MMC. The SD Memory Card has the same size (24 mm x 32 mm) as MMC, but is thicker than MMC (2.1 mm vs. 1.4 mm) in order to keep larger data. In addition the SD Memory Card has nine pins in order to have higher data transmission speed. The SD Memory Card also has a write protect switch which prevents consumers from accidentally overwriting or erasing data. They will launch sample shipment in Q1 in 2000 and large scale shipment in Q2 in 2000.

The maximum storage capacity of SD card is initially 32 MB. They are scheduled to release an advanced card with 64 MB in 2000 and another with 256 MB in 2001.

The trio seems to be a strong business alliance from any aspects from chip production, software supply, strategy for the U.S. market and copyright protection technology.

However, each firm has its Achilles' heel: Matsushita has not been able to produce any strong memory card. Toshiba is the leading manufacturer of SM; however, in the digital camera market, SM has been defeated by CF. To enter the EMD business, Toshiba is planning to put an ID on each card in order to protect copyright. However, such an arrangement is not strong enough. SanDisk is producing NOR-typed flash memory chips. This type of chips take longer to record data than the NAND chips that Toshiba and other manufacturers are producing. By tying up with each other, the trio can mutually cover their weaknesses.

Just after the trio disclosed their plan to develop SD Memory Card, Sony announced Magic Gate Memory Stick (MGMS) which provides a high level of copy protection. The MGMS incorporates Magic Gate copyright protection technology.

Sony is scheduled to market Memory Stick Walkman in December 1999 which carries either a 32-MB or a 64-MB MGMS. The Walkman also has copy protection schemes called OpenMG. Sony said that it is the world's first music players which comply with the Secure Digital Music Initiative (SDMI) guidelines. The SDMI, a forum where technology companies work together to create an open architecture and specifications for digital music, in July 1999 released the phase I specifications for portable media.

Sony in November 1999 announced 26 companies worldwide will be licensing the MGMS technology. Under the licensing contract, Fujitsu is going to produce the stick while electronic appliance manufacturers such as Aiwa and Sharp are going to produce MGMS based appliances.

Sakon Nagasaki, Director of DVD Business Development Office of Matsushita, said that Sony's MGMS may be the only rival for Matsushita in the future. Market watchers are now carefully watching which will eventually win the de facto standard in the market. From the media point of view, the SD Memory Card trio may have advantages. Both Toshiba and SanDisk have long experience in manufacturing chips, so they have technology and infrastructure. On October 7, 1999, Toshiba and SanDisk announced that they will establish a joint venture at the beginning of 2001 for manufacture of the next generation flash memories.

On the other hand, in case of the memory stick group, Sony is reportedly going to obtain the NAND-chip for its MGMS from Fujitsu under an OEM arrangement. Then the production environment for chips such as production cost, stable supply and availability for mass production of the chips seems to hold the key for success.

However, it must be the end products that attract consumers. Sony may have advantage in this field. On Nov. 16, 1999, Sony released several more memory stick-based products. Rather than Memory Stick Walkman, Sony are going to market Memory Stick Voice Recorder, Digital Video Handycam, Cyber Frame, a digital photo frame, and Cyber Shot, a digital camera.

On the other hand, among SD Memory Card team, the only Matsushita is manufacturing audio visual products. Matsushita is scheduled to start marketing SD Memory Card-based music player in the spring of 2000.

Can Matsushita catch up with Sony and eventually defeat it just like it happened in the VHS vs. beta war? Matsushita's Nagasaki firmly said that the VHS manufacturer still has much opportunities available to win in this market as well.

According to the EIAJ, the shipment of small memory cards in the first half of fiscal 1999 in Japan was 5.24 million units and 17.8 billion yen, up 155% and 113% respectively, from a year ago. It is believed that the worldwide market will reach $10 billion in 2005.

Y2K

Major Carriers Are Ready to Cope with the Year 2000 Problem (Y2K)

Prior to the year 2000, Japanese major carriers have all been busily preparing for Y2K problems, widely believed to occur between December 31, 1999 and January 1, 2000. All major carriers have said that they have already checked all of their systems and applied all necessary measures. But even through they have done everything it still could not be said that they are "perfectly immune to Y2K problems."

A number of small carriers are not well prepared. International carriers have done interconnection tests with some foreign carriers but not with all of their counterparts. At least some confusion may occur on New Year's Day.

The Y2K problems in the communications area may occur in a form communications lines being cut off suddenly due to some troubles on date-based functionality of computer systems. But NTT Corp., Japan's flag carrier, said there is no Y2K problems on their systems because all of their systems are run by recognizing the year as 4 digits, not 2 digits.

Yasuki Hayashi, Senior Manager of Information Strategy Planning Section of NTT Corp., said that since NTT systems are different from typical Western systems being operated on 2 digits, theirs (NTT's) are basically free of Y2K problems.

According to him, all NTT switches ordered since mid-1980s were designed to recognize the year as 4 digits, almost all of their systems ordered since 1992 were designed to recognize the year as 4 digits, and all of the NTT's 500 systems have been checked and applied some modifications when necessary by the end of June 1999.

Some customer support systems were actually found in need of some modifications. For instance, since communications charges are calculated by subtracting the termination time from the start time, if the date recognition system has some troubles, then the bill may carry some mistakes.

However, Hayashi said they have already applied all necessary measures — either rewriting software or changing devices — on them.

In addition, under the leadership of Telecommunications Carriers Associations (TCA), NTT (comprising NTT East, NTT West, NTT Communications Corp.) conducted interconnections tests with 62 major carriers for both telephony and leased lines. Between June and September 1999, 65 TCA member carriers participated in the interconnection tests. The TCA said no trouble was found in the series of tests.

Following the model Contingency Plan worked out by the TCA, NTT also produced its own Contingency Plan and is now busily preparing for D-Day. On December 31, 1999, four NTT companies including the holding company are planing to mobilize a total of 3,200 staff on site — network controlling centers, switches and offices. Besides them, many other staff from related firms such as NTT Communicationware Corp. and NTT-ME Corp. will also stay on site overnight.

According to an estimate made by NTT Corp. in 1997, NTT's cost for Y2K countermeasures was 4 billion yen. Hayashi said that the budget is comparatively smaller than Western nations, partly because NTT has constructed its systems which recognize the year as 4 digits. But the figure does not include costs for their measures on D-Day, nor payments for mobilizing NTT-related companies staff.

As an Asian carrier, NTT is going to enter for the ITU's Early Warning System.

Details of the system have not been worked out yet. However, Hayashi said NTT will probably report the status of its network systems to the international body a couple of times on D-Day. Hayashi believes that NTT's trouble records on their switches may not be very useful for foreign carriers because their switches were fully customized, known as "NTT spec. ones." "However, our reports on supporting systems such as workstations or servers will be absolutely useful for western carriers," he said.

Other carriers have also worked very hard for Y2K problems.

Japan Telecom Co., Ltd. (JT) will mobilize several hundred of JT staff on December 31 at their offices to cope with unexpected problems. JT's major branches will be opened over night between December 31 and January 1. JT said the firm has spent 1 to 1.5 billion yen for checking and repairing its hundreds of systems.

DDI Corp. will mobile 300 staff between December 31 and January 1, 2000. Its customer center will be opened around the clock on that day. DDI spent 1.1 billion yen for Y2K problems. Computer venders have been working hard to tackle with Y2K problems. A total of 100,000 staff within the industry are scheduled to be mobilized between the end of year 1999 and at the beginning of 2000, and all venders will be ready to cope with the problems around the clock.

All of these venders have been providing machines and devices free of Y2K problems, checked all of their systems, and worked out their own contingency plans.

For their users, the venders are providing all necessary information regarding Y2K through their web sites and have carried out running tests on their users systems. Fujitsu Ltd., a leading vender, has completed these running tests on users systems in all of the industries including financial industry, distribution industry, governmental offices and facilities, and public facilities such as hospitals. They said no problem was found in the series of tests.

The Japan Electronic Industry Development Association (JEIDA), the industry association, has taken the leadership in industry's such effort against Y2K problems and has been providing much information to both members and users through its website.

In September 1999, JEIDA released "Y2K Support Declaration" in which it said all of its member companies will do their utmost to provide the necessary support for users, although they do not expect serious Y2K problems to impact people's lives greatly.

The Japanese government also has been taking many measures for letting the Japanese people have the year 2000 without any problem.

The government in September 1998 worked out the Action Plan for Y2K problems and established the Y2K countermeasure division within the Cabinet.

As part of its effort, the government in September 1999 conducted a large-scale drill inviting both governmental officials and private companies for confirming the information flow on D-Day. On D-Day, the Risk Management Center will be established under Prime Minister Keizo Obuchi at the Prime Minister's Official Residence and all relevant information will be concentrated at the center, then fed back to each region. Two more similar drills are scheduled before the end of this year (1999).

Prime Minister Obuchi on October 29, 1999 appealed to the Japanese public, asking that people stock foods and other daily necessity at least for a couple of days to cope with "unexpected happenings" on New Year's day.

TV commercials stressing these points are also to be aired through year-end.

Carrier News

NTT Communications Corp. (NTT Com)/ NTT Mobile Communications Network, Inc. (NTT DoCoMo)

Enter into MoU on Possible Strategic Investment in Telekom Malaysia

Khazana National Berhad ("Khazanah") and NTT Communications Corp. and NTT Mobile Communications Network, Inc. (together as "NTT") have entered into Memorandum of Understanding (MoU) regarding the possible strategic investment in Telekom Malaysia Berhad ("Telekom"). Pursuant to the MoU, evaluation on Telekom and discussions on the terms and conditions of this acquisition by NTT will commence soon.

NTTPC Communications Co., Ltd.

Release of the Super OBN (Open Business Network) Service

NTTPC Communications Co., Ltd. starts the Super OBN (Open Business Network) service as an IP based closed-area network service with guaranteed security.

The OBN service is a network service based on the specification of the "Open Business Network (OBN)," which was developed by the incorporated foundation, Distribution Systems Research Institute.

With the recent spread of the Internet technology, the demand from business users for the service that enables LAN communication with guaranteed security and high-reliability under the existing LAN environment that is based on TCP/IP is increasing. To respond to such demand, NTTPC provides this service as an IP based closed-area network service with guaranteed security.

This service achieves business dedicated Intranet (intra-enterprise data exchange service) and Extranet (inter-enterprise data exchange service) with high security in a Plug & Play mode. This service has the following features:

- Network design is not required and the service can be built with a router of a reasonable price, maintaining the overall installation within a reasonable cost.
- Network management is not required and connection destinations can be added in Plug & Play mode, maintaining the ongoing operation within a reasonable cost.
- Extension from Intranet to Extranet can be made easily.
- Internet can be connected easily at a reasonable price.
- The EDI (Electronic Data Interchange) service corresponding to the distribution industry standard procedure (H procedure) is available from at a low rate of 3,000 yen per month.

3. Service Type

Leased line connection type (Items: 64kbps to 1.5Mbps)

Dial-up connection type (can be connected from subscriber's telephone, ISDN, and mobile terminal)

Technical Information Disclosure

Super Network U Inc.

Super Network U Inc. has disclosed interface specifications for its SNU Internet Connection Service, scheduled for launch on April 1, 2000. Granted a Type I telecommunications license on November 5, 1999, the company will offer cable-LAN-based, high-speed data transmission service.

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Tsukuba Technology to Electrify the World in New Millennium

by C. A. Pomeroy (ARN)

Tsukuba Science City, Ibaraki Prefecture, which just gained a new conference center, started operations in November 1999 by hosting an international gathering of scientists involved in frontline research. Orchestrated by Leo Esaki, the Nobel Laureate who has been active in electronics as well as the educational field, brought together researchers in areas such as info-communications, materials and brain sciences. The main themes revolved around the goals for, features on and processes concerning frontline research for the new century. Of particular interest were the inter-relationships between the various research activities and the "ripple effect" of the results of such works.

Tsukuba, which is located to the northeast of Tokyo, now holds within its limits, in addition to various national research institutes, numerous private-sector R&D institutions, for example NEC, Daikin, Omron, L'Oreal, Sanyo and other world-famous corporations, as well as industrywide endeavors like the Real World Computing Partnership and the Angstrom Technology Partnership. Such entities have garnered rave reviews through such breakthroughs as those involving blue lasers and carbon nanotubes in recent years, and are seen spawning many new technologies with applications limited not only to the info-communications and electronics areas.

Other renowned names such as Susumu Tonegawa, the 1987 Nobel Laureate, currently concentrating on brain science at MIT., Steven Chu, the 1997 Nobel Laureate now working on laser and materials science at Stanford and Harmut Michel, a Director of the Max-Planck-Institut who was the 1988 Nobel Laureate, spoke on a variety of topics ranging from computers and crystals to memory and nanostructures. According to Takahiko Soejima, a university professor who is presently researching the work of such educators as Itaru Watanabe (the great biologist and a mentor to Dr. Tonegawa) a thorough interdisciplinary outlook as provided by such talks would further the effort to educate the world on the leading-edge scientific endeavors.

However, most stimulating were the theme sessions focusing upon germane work ongoing in the science city and more specifically the discussion following these sessions organized by Dr. Esaki on epoch-making research. Such prominent panelists as Gen Matsumoto, an expert on brain algorithm at the Japan Institute of Physical and Chemical Research; Shinichi Kurokawa, of the Japan High Energy Accelerator Reseach Organization; and Koji Kajimura, of the Agency of Industry Science and Technology (AIST) Electrotechnical Laboratory of the Japanese Ministry of International Trade and Industry, spoke on the latest trends in computing and the Internet, not to mention computational physics and related subjects.

The highlights of this discussion, presented as the "Tsukuba session for producing epoch-making research," were provided by Toshiaki Ikoma of Texas Instruments (TI) Japan and Reiko Kuroda of the University of Tokyo (UT). Dr. Ikoma is a former UT professor who moved to Tsukuba to head up the TI research efforts nearby; he subsequently assumed the post of president of TI Japan, which he still holds. The good doctor drew upon his experience in both the public academic and private research arenas, and provided a comprehensive overview of how research activities could be intertwined and lead to synergistic advances. His former colleague at UT, Dr. Kuroda, ably supported this thesis with an analysis of such activities.

On the downside was the addition of a "journalist" named Takashi Tachibana. A reporter who gained fame for bringing down former Prime Minister Kakuei Tanaka, he has of late interviewed Dr. Tonegawa on behalf of the state-run broadcasting company (resulting in the illusion that the questioner gains instant expertise concerning brain science if he interviews on behalf of such an entity). Also billed "an expert commentator" on the Internet, to quote Prof. Soejima, "this man talks too much nonsense based upon faulty scientific knowledge." Tachibana's input seemed to back this up, for making such negligible statements as "research must be made fun" did little in adding substance to the discussion.

However, in spite of a few glitches such as has been noted, the "Tsukuba 999" seems to have put things on the right track and set the pace for research activities in the 21st century. Further news may be expected and a close eye on the region northeast of Tokyo, where other breaking stories may be expected in the near future, is highly recommended.

IT Industry

KDD/Singapore Telecom

Establishment of Strategic Partnership Announced

KDD Corp. and Singapore Telecom (SingTel) today announced that the two companies will form a strategic partnership to serve their corporate customers in Asia and around the world. Reflecting their strong commitment to the partnership, KDD and SingTel have agreed to undertake a share swap.

Under the agreement, KDD will issue 4,011,800 new shares, or approximately 5% of its enlarged share capital, to SingTel. At the same time, SingTel will issue to KDD 221,310,898 new shares, representing 1.43% of the enlarged SingTel share capital. The pricing of the share swap was arrived at following negotiations on a willing buyer and a willing seller basis.

In conjunction with the partnership, KDD and SingTel have signed an Agreement-In-Principle with the intent to form an equally-owned joint venture (JV) that will provide premium seamless and managed end-to-end telecommunications services to multinational corporations and business customers. These services include Asynchronous Transfer Mode (ATM), frame relay, international leased circuits and services based on Internet Protocol.

Although KDD and SingTel presently have their own networks in the Asia Pacific, the two companies intend for the JV to provide services on a common platform. To meet this objective, the JV will develop an integrated ATM backbone in the Asia Pacific region with connectivity to North America and Europe. The backbone's initial nodes will be located in Singapore, Tokyo and Hong Kong.

KDD and SingTel will contribute assets such as submarine cables and equipment as well as second personnel to the JV. Ownership of the ATM backbone will provide the JV with operational flexibility and enable it to better manage its cost structure so that it can offer services that are competitively priced. Total amount of investment of the JV over the five years will be in the region of US$350 million.

Presently, KDD and SingTel work with other carriers to provide global service to their customers. Where necessary, the JV will do likewise to distribute its services. It will provide comprehensive back office support including consolidated billing, clearing house, product development and network management functions. Customers will have a single point of contact and a single contract with the JV. The services provided by the JV will be useful to other carriers who are keen to serve their customers with managed end-to-end services.

KDD and SingTel expect to sign a definitive agreement on the JV by end of February 2000 with the incorporation of the JV scheduled for April 2000.

KDD President Tadashi Nishimoto said, "The new equity relationship between SingTel and KDD is definitely a new step in our long-standing and tested partnership that will enable solid expansion of our business especially in the Asian region. The two standing shoulder-to-shoulder will remodel the Asian telecommunications market. The true purpose of our alliance and our agreement to establish a joint venture," said Mr. Nishimoto, "is for the customers to benefit from abundant opportunities to enjoy premium quality, seamless end-to-end managed products and services based on an integrated ATM backbone. It is my strong belief that SingTel and KDD will continue to be the leaders in the Asian region in the new millennium."

SingTel President and CEO, Brigadier-General Lee Hsien Yang, said, "SingTel is pleased to welcome KDD, an established and well-regarded telecommunications company, as a strategic partner. The share swap reflects the strong and significant commitment of KDD and SingTel to the partnership and cements the already close relationship of our two companies. KDD and SingTel have had a long history of working together. We were founder members of the WorldPartners alliance and we have also collaborated closely in the planning of many submarine cable systems in the region. This strengthening of our partnership will ensure that both companies continue to play leading roles in the region even as the telecommunications industry continues to consolidate."

Fujitsu/Compaq

Cooperative Marketing Agreement for Science and Technology Applications

Compaq Computer Corp. and Fujitsu Ltd. recently have agreed to cooperate in providing solutions for scientific High Performance Computing. Based on this agreement, the two companies will port Fujitsu's MOPAC 2000 calculation system -- used for obtaining molecular orbitals from macromolecular structures -- on Compaq's high-performance Tru64 UNIX-based AlphaServers. A joint marketing campaign will commence in the U.S., Europe and Japan starting at the end of November. Both companies then plan to port and optimize Fujitsu's molecular dynamics software, MASPHYC, its network visualization tool, VisLink, and other science and technology applications on Compaq AlphaServers.

Through this agreement, Compaq will expand its portfolio of solutions for AlphaServers, while Fujitsu will further develop its science and technology applications globally. The companies will also set up an AlphaServer Application porting Development Center at Fujitsu's Makuhari Systems Laboratory in Chiba Prefecture, where Fujitsu will work on porting and optimization of MOPAC 2000 for the AlphaServer line. Compaq will provide all necessary technical support and will also promote the product to its customers.

NEC/Hitachi

DRAM Joint Venture Company Established

NEC Corp. and Hitachi, Ltd. (Hitachi) have signed an agreement to form a joint venture DRAM company at the end of December 1999 to be called "NEC-Hitachi Memory, Inc. (NEC-Hitachi Memory)." Operations are slated to begin from April 2000.

The new firm will bring together the best technology from both NEC and Hitachi that will not only result in more technically advanced products, but also in more rapid development. Through the anticipated synergies between the companies, more rapid introduction of shrink versions and circuit innovations are expected to reduce chip area size resulting in greater product competitiveness. Moreover, with joint branding, DRAM products are also expected to achieve greater presence in the marketplace to ensure the firm takes the leading DRAM market share.

Heading the new company as representative directors will be Kenji Tokuyama as President (currently Vice President and Executive General Manager of NEC's LSI Memory Operations Unit), and Tokumasa Yasui as Executive Vice President (currently General Manager for Memory Operations at Hitachi's Semiconductor and Integrated Circuits group).

Hitachi

Installing Europe's most powerful supercomputer in Germany

Hitachi Europe Ltd. has won the contract to supply Europe's most powerful supercomputer, which can perform more than 1 trillion calculations per second.

This state-of-the-art computer, a top of the range SR8000, which will have a peak performance of over 2 TFLOPS by 2002, is to be installed in the Leibniz Computer Centre (LRZ) in Munich. The LRZ is a department within the Bavarian Academy of Sciences, the largest of the seven science academies in Germany. Scientists from across Germany will be able to use the SR8000 to process jobs several times larger and more complicated than were previously possible. The SR8000 will be used by scientists to conduct research in: physics and geophysics; chemistry; astronomy; meteorology; engineering sciences; and, software engineering.

Internet Business in Japan

Major Japanese Firms Entering Internet Business

The Internet business is "in." Until a couple of years ago, major players of the Internet business were either venture firms or IT-related companies. But now, not only IT-related companies but also non-IT companies are entering the Internet market. An overview of the Internet business in Japan follows.

• Securities industry

The securities industry is one of the industries which have changed most drastically due to introduction of the Internet.

Prior to complete liberalization of transaction fees on October 1, 1999, a number of new online securities businesses were established. Most of these newcomers are owned by major Japanese companies. Monex Inc. is a subsidiary of Sony Corp. Japan Online Securities Inc. was established by Itochu Corp., Daiichi-Kangyo Bank, Ltd. and Asahi Life Insurance Co. E*Trade Japan was founded by Softbank Corp. in a tie-up with E* Trade Securities Inc. of the U.S.

Incumbent securities companies are not taking a wait-and-see attitude.

Nikko Securities, a major securities company in Japan, is aggressively entering the online security business. The firm established Nikko Beans Inc. in October 1, 1999.

Norio Suda, President of Nikko Beans, said "We will not take care of the existing customers of Nikko Securities unless the customers want to do so. We will own and manage our own customer database, separate from Nikko Securities."

• Stock exchange market

A new securities market based on the Internet is scheduled to be established in December 2000. Softbank and NASD, the operator of NASDAQ in the U.S., last June (1999) jointly established NASDAQ Japan Planning (NJP). The joint firm is now working hard to work out the design for the new platform, clearing legal issues, and building a new system targeting December 2000. NJP is also organizing matchmaking meetings between venture businesses and venture capitals.

The Internet is employed in a variety of business fields such as book sales, travel agency business car sales and ticket sales businesses.

• Bookseller

Almost all of major booksellers have their own websites and are selling books over the Internet.

Bunkyodo Co., Ltd., a major bookseller with 206 outlets, in August 1999 established J-Book, an online bookstore. The virtual mall is one of the world's largest bookstores dealing with more than four million books and other related goods.

Tohan Corp., a book wholesaler, is planning to enter the retail market in cooperation with Softbank Corp., Yahoo! Japan Corp. and Seven-Eleven Japan Co., Ltd., next spring (2000). Unlike other virtual bookstore, users will be able to pick up their purchased books over the Internet at a nearby Seven-Eleven outlet.

• Travel

All of the major travel agencies are gearing up their Internet-based sales.

Japan Travel Bureau, Inc. (JTB), in April 1998 opened "JTB INFO CREW," a website which provides reservation and settlement services. Since then the firm has collected more than 60,000 members. In FY 1998, the virtual shop gained 1 billion yen in sales and is expecting to get 3 billion yen in FY 1999. JTB is expecting to earn 10% of the total sales through the Internet in 10 years.

Kinki Nippon Tourist Co., Ltd., a major travel agency in Japan, is providing "E Coupon," for domestic hotel reservation service, and "Holiday," for overseas packaged tour reservation services. Since June (1999), customers for "Holiday" have been able to settle their purchases over the Internet.

Nippon Travel Agency Co., Ltd., another major travel agency, is providing information on 2,000 overseas packaged tours and 1,600 domestic tours via the Internet. Users can settle their purchase over the Internet.

Recruit Co., Ltd., the human resources placement business, entered the travel agency business last December (1998) through its subsidiary, Recruit ISIZE Travel. The firm put 50,000 packaged tours on its Recruit's popular website called ISIZE, selling them to Internet users directly. The firm does not have any shops. Since the firm launched its business last June (1999), the website received 100 inquiries a day and sold products to 1,000 customers per month on the average.

• Ticket sales

In the ticket sales business, the Saison Group and Sony Corp. are going to establish a joint venture which will sell a variety of tickets over the Internet. Based the agreement, the Saison Group is scheduled to close all of its outlets as of the end of October (1999). Entertainment Plus Inc., the joint venture, will launch services in the spring of 2000.

Pia Corp., the leading ticket sales outlet, tied up with NTT Mobile Communications Network, Inc. (NTT DoCoMo), Japan Satellite Systems Inc. (JSAT) and others in April 1999 for establishing Pia Digital Communications. The firm is going to sell tickets over the Internet as well as providing comprehensive daily-life information services through a variety of digital media.

• Automobile sales

The Internet is entering automobile sales, too. Since 1998, non-automobile sales business such as Recruit and Network Information Center launched quoting and commercial negotiation appointment services.

Recently major automobile companies such as Nissan Motor Co., Ltd. and Mitsubishi Motors Corp. entered the business. But the market seems set to become more competitive soon. In November 1999, two major automobile dealers — Autobytel.com and CarPoint — will enter Japanese market. Autobytel Japan K.K., the local firm for Autobytel.com, is owned by Itochu Corp., Recruit and others, while CarPoint Japan K.K. was established by Microsoft Co., Ltd., Yahoo! and others.

• Settlement

A variety of settlement methods are being used for e-business today. Each has its strong and weak points. Some market watchers said cash on delivery system by post office or a door-to-door delivery services or settlement at a counter at convenience store is the most efficient settlement way in the Japanese net market.

Seven-Eleven Japan Co., Ltd., the leading convenience store chain in Japan, will in November 1999 start a new service which Seven-Eleven's 8,000 outlets collect charges for Internet shopping. Using the services, a virtual mall shopper will be able to pay the charges at a Seven-Eleven outlet.

Lawson, another major convenient store chain, will also start similar settlement services using their outlets in November 1999. Tying up with Digital Garage, an Internet venture business, Lawson will also provide purchased commodity delivery services. Using the services, a shopper will be able to pick up their purchased goods over the Internet at a nearby Lawson outlet.

• Distribution

All of the major distribution business are trying to expand their business using the Internet. It is because most of net sales require physical distribution services for delivering their purchased merchandises to users. Nippon Express Co., Ltd., the leading distribution business in Japan, has recently constructed a new distribution system that is suitable for net business. Fully utilizing the new system, the firm is delivering merchandises for the "JBOOK," and "e-sekai," an the Internet shopping site run by ASCII Corp. Nippon Express is the leading firm in the industry; however, the firm is behind Yamato Transport Co., Ltd., in the consumer market. By putting an emphasis on the Internet business, the firm is trying to obtain a large consumer market.

Yamato Transport also has been aggressively entering e-business. Yamato last July (1999) established "eS-Books," an online book seller with Softbank and others for which Yamato works as the physical distributor. Yamato also won a distribution job for the new joint business by Lawson and Digital Garage.

Separately Yamato is operating its own virtual mall called "Kuroneko Tankentai." Using the status as the platform operator, Yamato works as the distribution agency for the 2,100 virtual shops on the mall.

• Infrastructure

The highest hurdle for Japanese e-business is high communications fees.

NTT is scheduled to introduce a flat-rate on an experimental basis in Tokyo and Osaka in November (1999) at 8,000 yen a month. New companies are now entering even the infrastructure business.

Softbank, Tokyo Electric Power Co., Inc. (TEPCO) and Microsoft established a joint venture for providing fixed rate communications services. The new venture will start providing flat-rate services at around 5,000 yen from the summer of 2000 using wireless technology. In October (1999), 15 Japanese carriers and vendors established a forum for providing flat-rate communication services using ADSL. All of the major NCCs and venders became the members of the forum. They are reportedly going to provide flat-rate services at around 5,000 yen by the end of 2000 at the earliest.

Crosswave Communications Inc. (CWC) and some major cable TV operators are also planning to provide fixed rate services in the near future.

• Government

Japanese government has been promoting informatization of the administration sector.

As part of its effort, the government is going to realize "Super-Electronic Government" in 2003. Many ministries included some request for the project in their FY2000 budget. When Super-Electronic Government is implemented, all of the administrative jobs will be processed electronically; businesses will be able to file applications with the government via the Internet; and citizens will browse real estate and commercial registrations via the Internet.

The government is preparing to submit laws related to electronic signature and electronic authentication. Once these systems are implemented, then the security level of Internet transactions will improve.

• Economic organization

The Japan Federation of Economic Organizations (Keidanren) at the end of July proposed the "Digital New Deal Project" plan to Prime Minister Keizo Obuchi.

In the project plan, the organization recommended that Japan should increase the number of the Internet users to 70 million yen and e-commerce transaction to 72 trillion yen in five years. As for tactics, the plan recommends that the government establish a world-class super-electronic government, adopt an Information Literacy Charter and promote use of computer in education as well as develop basic technologies in priority sectors.

According to a study by the Ministry of International Trade and Industry (MITI), business-to-consumer (B-to-C) e-business in Japan will be 3.6 trillion yen in 2003.

Today Japanese e-business is said to be four to five years behind the U.S. However, the study pointed out that Japanese e-business will develop so rapidly for the coming five years to narrow the gaps between the two nations partly because the Internet usage will expand drastically and the content on the Internet will be diversified greatly.

Then access to the Internet will not be limited to PCs. People may get connected with a cellular phone, a video game machine or a TV set. These diversification in access way may trigger further expansion of the Internet usage and IT business.

NTT Investment:

Continued from Page 1

NTT Group is scheduled to work out the restructure strategy as the group in the spring of 2000.

The restructuring plan was not a big surprise for the market, partly because digitalization of switches which had occupied the largest portion of NTT's investment for the past decade has completed, and partly because the lay-offs will be done by either reassignment of the staff among NTT Group companies or "natural" decrease in workforce.

However, the reduction in investment will impact on so-called NTT Family companies and communications facilities construction companies.

The expected revenues of the four so-called "NTT family" companies -- NEC Corp., Fujitsu Ltd., Hitachi, Ltd., and Oki Electric Industry Co., Ltd. -- in fiscal 1999 (ends at the end of March 2000) will total 1.8 trillion yen. Among the figure, slightly less than 900 billion yen is said to come from business with NTT Group. The announced cut of 300 billion yen in investment should have a significant impact.

All of these four firms reported a loss in fiscal 1998. They are going to turn into black in fiscal 1999 by revising ailing semiconductor business as well as by further expanding the buoyant information communications business. Since all of these firms have been promoting their restructuring strategies, the announcement will impact on them.

According to NTT, both NTT East and NTT West are scheduled to invest 650 billion yen each (totally 1.3 trillion yen) in fiscal 1999. But for three years from next fiscal year (fiscal 2000) both firms will suppress their investments to 500 billion yen each (a total of 1 trillion yen).

Junichiro Miyazu, President of NTT, said that the firm will continue to invest for the vital projects such as optical fiber deployment project even under the restructuring strategy. On the other hand, Shuichi Inoue, President of NTT East, at the same conference, said that the carrier will carefully examine the demand and pour its recourses only into really necessary projects.

The telecommunications industry's total investment in fiscal 1998 was 3.8 trillion yen. It appropriates around 10% of the total investment by the private industry of 42 trillion yen. Among the 3.8 trillion yen, NTT Group spent roughly a half.

NTT at the same time announced that NTT East and NTT West will reduce their workforce by 16% (21,000 employees) in three years. According to the firm, NTT will reassign 4,000 its employees to related companies including NTT Mobile Communications Network, Inc. (NTT DoCoMo) and NTT Data Corp., where the remaining 17,000 employees are expected to be reduced "naturally" by adopting a freeze on the hiring of new recruits. NTT will not employ new staff for two years from fiscal 2001.

Since NTT was privatized in 1985, NTT has made great effort to reduce the number of employees. Still NTT Group maintains a total of 220,000 employees today (NTT had 310,000 employees in 1985). In April 1999 NTT employed 800 new graduates.

Some pessimistic market watchers said that the planned freeze in the hiring of new employees over the next two years may pour cold water on the now-slowing recovery of the Japanese economy. NTT also announced it will promote consolidation and mergers of its business and offices.

While both NTT East and NTT West will reduce their local offices to 200, they will shift their employees from sparsely populated rural areas to densely populated metropolitan areas to concentrate their sales effort on urban areas.

Why did NTT decide to impose such a drastic restructuring plan? There are some reasons. First, partly due to an expansion of cellular phone users, fixed line phone subscribers which used to be the major revenue resource for NTT has been shrinking. NTT is now putting an emphasis on sales for ISDN; however, the ISDN market is still too tiny to cover the loss from shrinking fixed line business.

Secondly, the Price Cap system is going to be imposed on both NTT East and NTT West in 2000. Then carriers will not be able to earn at all unless they reduce their costs more than the a certain percentage (this percentage is to be decided later by the government). Thirdly, the Long-Run Incremental Cost (LRIC) model-based interconnection charges will be introduced by March 2001. Since the new interconnection charges are expected to be much lower than current charges, NTT will reduce its revenues from interconnection business. Fourth, the network structure has been changing. Now IP-based network using less expensive routers are winning popularity rather than conventional expensive switch-based network. In this new era, conventional network that incumbent carriers such as NTT maintain will become a burden rather than their peculiar resources.

NTT has been occupying almost all subscriber networks in Japan, and has not made much effort to rationalize its structure and systems. However, since competition in the market has been more severe partly due to the great expansion of cellular phone and partly due to the entrance of new carriers, NTT has no choice but to execute drastic restructuring.

Kazuo Asada, President of NTT West, at a separate press conference in Osaka, said that the firm decided to execute the restructuring plan because they thought NTT had better make an early decision rather than putting off its decision while losing money. "By beating the competition in the market, we would like to resume our recruitment of newly graduates in the future," he reportedly said. However, the November 17 restructuring plan does not include an impact from lowering interconnection charges.

NASDAQ Japan:

Continued from Page 1

70% of venture businesses responded said they would like to be listed on either NASDAQ in the U.S. or on NASDAQ Japan. "We've already won a large share psychologically," he said.

On the same day, NJP released the tentative criteria for NASDAQ Japan listing.

According to them, the standard market criteria, which is comparable for the National Market criteria, require the firm to have at least 400 shareholders, and more than 1,100 shares being floated that total at market values between 800 million to 2 billion yen.

In order to allow a variety of companies become listed to the market, three different criteria are offered: 100-million yen profit before taxes for the "standard" companies, more than 1.8-billion yen net assets for "companies with abundant assets," more than 7.5-billion yen total company values (or 7.5-billion yen total capital and total revenues) for "large-scale" companies.

The venture market criteria, which is comparable for the Small Cap criteria, require either more than 400-million yen net assets, or more than 5-billion yen total company value or more than 75-million yen profit before taxes.

NJP is going to hold a weekly "matchmaking" meeting between venture businesses and investors where venture businesses will explain their business plan and strategies in front of representatives from venture capitals, banks, securities companies and accounting firms.

NJP is planning to invite 500 venture businesses to such matchmaking meetings over the coming year. "We will help venture businesses even before they apply for a listing on NASDAQ Japan," Son said. "No exchange market in Japan has provided such a service before."

Meanwhile, TSE has been gearing up to establish a new stock exchange market targeting emerging companies called Mothers in November. "Mothers" stands for Market for the High-growth and Emerging Stocks.

TSE recently released the criteria for Mothers listing which market watchers said are somewhat less strict than that of NASDAQ Japan.

According to this criteria, companies that are going to be listed on the new market will be required to provide a clear business plan instead of a history of financial results and a minimum number of year since incorporation; to submit quarterly business achievement reports; and conduct investors relations (IR) activities. The criteria for TSE listing puts an emphasis on the history of financial results. Also, most Japanese companies release their business achievement reports twice a year and do not do much IR activities.

To meet demands from emerging companies that wish to be listed as soon as possible, TSE will shorten its examination period from the current three months to one month.

Hiroyasu Shiraishi, Head of Planning, Listing Policy Group of TSE, said that due to the relaxed criteria, even a firm incorporated within a couple of years may be listed on Mothers.

Once TSE's executive board, scheduled to be held at the end of October, approves the new system, Mothers will be launched in November as scheduled.

Although the Mothers plan was disclosed after Son revealed his plan to establish NASDAQ Japan in June 1999, TSE insisted the market recognized the need for a new market for emerging companies, especially for high technology and multimedia companies, for a long time and launched preparations for establishment of Mothers last year (1998).

Shiraishi said that many venture businesses, especially IT-related companies, have shown their interests in Mothers. But he said they are carefully selecting a first dozen of companies to be listed on Mothers "because they hold the key to the success of the new market." Shiraishi said he expects a couple of dozen firms may be listed on Mothers during the coming year.

The National Securities Dealers Association of Japan, which is running Japanese over-the-counter (OTC) market, has not been taking a wait-and-see attitude in the drastically changing market. The association has set up a JASDAQ listing promotion section and officials of the section have been visiting promising venture businesses one by one to encourage them to be listed on JASDAQ. The association conducted a survey on about 2,100 venture businesses which clear the criteria for JASDAQ listing aimed at getting some ideas for improvement of the market. Although JASDAQ has a long history, it has been inactive.

Separately, as part of its effort to revitalize the Green Sheet market, the association is going to release the asked and bid prices at the Green Sheet market on a weekly basis and release financial data on the companies dealt through the market over the Internet. The Green Sheet market, comparable to the U.S. Pink Sheet market, is a market for non-listed companies. It was established in July 1997.

SpecC Technology Open Consortium

Consortium Inaugurated at Embedded Technology Conference and MST '99

Industry leaders in embedded software, EDA, IP and systems announced establishment of the SpecC Technology Open Consortium, an international forum for promoting the SpecC language and methodology. The new consortium will seek to enhance the development and design process for electronic products through promotion SpecC language, a new specification description language. It will establish a SpecC-based system-design methodology that enables smooth, accelerated specifications exchanges during the product development process, from the specification phase to final design phase. The new methodology is expected to achieve significant productivity gains in development of electronics products, including communications equipment, portable products, multimedia equipment and set-top boxes.

Originally developed at the University of California, Irvine, SpecC language -- specification description language based on C -- represents the fruits of many years of research and sponsorship and collaboration by numerous Fortune 100 companies, industry consortiums and universities. Key sponsors include Toshiba Corp. and Hitachi, Ltd. The language is designed to support smooth overall integration of product development, from determining specifications to design implementation. SpecC language allows the same semantics and syntax to be used to represent specifications in a conceptual system, in hardware and software and, most importantly, in intermediate specifications and information during hardware and software co-design stages.

Statistics

Records of Telecom Equipment (As of May 1999)

Production

Type	May '99 ¥1 Mil.	May '99 Sets	Compared with May '98 (%)
Telecom Equipment	**254,385**		1.1
Terminal Equip.	**153,258**		15.9
Wire Telecommunications Equip.	33,334		-20.3
Telephones Sets	5,536	675,209	-39.9
Standard Type	571	60,075	7.9
Functional Type	380	125,742	-58.5
Wireless Phone	4,306	486,059	-39.9
Others	279	3,333	-53.7
Telephone Application Equip.	11,543		11.8
Key Telephone Systems	5,144	223,573	-9.5
Small Capacity	479	32,012	7.4
Medium/Large Capacity	4,665	191,561	-11.0
Telephone Auxiliary Equip.	154	45,041	-17.6
Interphones	3,166	305,633	-12.1
Others	747		-12.0
Telegraph & Picture Transmission Equip.	16,255		-27.1
Facsimile	15,467	364,134	-28.7
Super High-Speed Facsimile	166	1,471	-1.8
High-Speed Facsimile	14,831	360,402	-28.2
Other Facsimiles	470	2,261	-44.9
Others	788		27.9
Mobile Terminal Equip.	119,924	4,894,779	32.7
Land	118,152	4,866,710	34.1
•Automobile	80	4,787	-94.2
• Portable	109,689	4,227,798	54.5
• Pager	580	61,983	-45.0
• MCA	98	1,195	-50.5
• Public PHS Terminal	5,160	394,036	-13.6
•Others	2,545	176,911	-70.0
Maritime and Airplane	1,772	28,069	-21.7
Personal Radios (900 MHz)	-	-	-
Network-Related Equip.	98,316		-14.7
Wire Network-Related Equip.	80,206		-12.7
Switching Equip.	33,134		-33.1
Electronic Switches	24,329		-27.6
For Telephone Offices	18,447		-21.3
For PBX	5,882		-42.1
Other Switching Equip.	8,805		-44.8
Carrier Equip.	47,072		11.2
Code Transmission Equip.	34,302	10,317	49.9
MODEMs	3,262	9,302	-17.8
Others	9,508		-38.6
Mobile-Related Network Equip.	16,339	18,774	-30.2
Fixed Station Communications Equip.	9,767	2,276	-36.3
Terrestrial	9,090	1,734	-16.2
Satellite	677	542	-84.9
Base Stations	6,572	16,498	-18.8
Wire Telecommunications Parts	2,811		-30.0
Relays (1,000 units)	2,641	39,870	-30.7
Other Components	170		-18.3
<For Reference>			
Broadcast Equip.	**2,155**	**2,119**	-14.5
Radio Application Equip.	**12,258**		57.4
Radar Equip.	3,278	3,852	25.3
Radio Measuring Equip.	1,609	3,025	122.2
Others	7,371		65.8
Telemetry/Telecontrol Equip.	1,191	412	-34.2
Others	6,180		134.6

Remarks: 1) Data are based on the Statistics of Actual Production by the Ministry of International Trade and Industry (MITI).
2) Radio Communications excludes the citizen band transceivers and the amateur telecom equipment.
Source: Communications Industry Association of Japan

Export

Type	May '99 ¥1 Mil.	May '99 Sets	Compared with May '98(%)
Telecom Equipment	**46,765**		-2.2
Wire Telecommunications Equip.	**41,525**		1.3
Telephones	1,790	246	-48.8
Cordless Telephones	1,112	146	-54.1
Other Types	678	100	-36.8
Telephne Application Equip.	769	40	-18.4
Key Telephone Systems	121	5	-55.7
Automatic Answering Telephone Sets	128	3	-8.3
Intercoms	139	28	-43.2
Others	380	3	33.8
Telegraph and Picture Transmission Equip.	6,967	177	-30.9
Facsimile Equip.	6,967	177	-30.9
Teleprinters	0	0	0.0
Others	0	0	0.0
Switching Equip.	1,424	16	-39.2
Carrier Equip.	6,150	42	326.4
Components	24,425		7.6
Radio Communications Equip.	**5,241**	**204**	-22.9
Transmitter and Transmission/Receiving Equip.	4,629	112	-14.7
For Long/Medium/Short Waves	591	4	-21.8
For Ultra Short Waves	1,224	67	-24.8
For Other Waves	2,814	40	-7.5
Receivers	612	92	-55.3
<For Reference>			
Broadcasting Equip.	**628**	**0**	190.2
TV Camera	**10,974**	**235**	-43.4
Radio Application Equip.	**2,670**	**948**	-2.4
Radars	771	2	-14.2
For Navigation	917	23	-16.6
Direction Finders	81	1	253.4
Others	836	22	-22.4
Radio Remote Control Equip.	982	923	33.4

Import

Type	May '99 ¥1 Mil	May '99 Sets	Compared with May '98(%)
Telecom Equipment	**34,280**		-2.6
Wire Telecommunications Equip.	**30,092**		-3.5
Telephones	1,139	219	-53.8
Cordless Telephones	421	67	-73.3
Other Types Telephone Sets.	718	152	-19.4
Telephone Application Equip.	1,582	104	448.8
Automatic Answering Telephone Sets.	27	4	-62.5
Others	1,555	100	618.3
Telegraph and Picture Transmission Equip.	1,691	108	-31.4
Facsimile	1,575	102	-35.3
Teleprinter	1	0	0.0
Others	115	6	270.5
Switching Equip.	6,882	39	5.4
Carrier Equip.	4,285	193	2.0
Components	14,512	0	-4.6
For Wire Telecom Only	11,875	0	-19.0
Parts for Common Use in Wired/Radio Communication Equip.	2,638	0	374.9
Radio Communications Equip.	**4,188**	**174**	4.1
Transmitter and Transmission Receiving Equip.	3,755	145	10.7
Transmitting Equip.	249	21	171.9
Transmitting and Receiving Equip.	3,352	88	5.0
For Aviation	294	0	1,632.3
For Mobile Telephone	1,456	63	19.1
For Long/Medium/Short Waves	120	32	364.9
For Ultra Short Waves	33	4	-60.0
For Other Waves	1,602	25	-17.9
Receivers	433	29	-31.6
<For Reference>			
Broadcasting Equip.			
TV Camera	**262**	**4**	-51.5
Radio Application Equip.	**1,617**	**2,966**	-10.1
Radars	79	1	-80.0
For Navigation	202	1	-4.1
Radio Remote Control Equip.	1,335	2,965	12.1

Remarks: 1) Data are based on the Statistics of Custom Clearance by the Ministry of Finance.
2) Radio Communications excludes the citizen-band transceivers and cordless microphones.
3) There are cases in which the total value will not equal the components because the figures have been rounded one decimal place. Also, the comparative ratios are calculated in ¥1,000 units.
Source: Communications Industry Association of Japan

Current Electric & Electronic Machinery Statistics (As of May l999)

Products	Unit	Production Apr. '99	Production May '99	Production May '99/ May '98 (%)	Sales Apr. '99	Sales May '99	Sales May '99/ May '98 (%)	Stock Apr. '99	Stock May '99	Stock May '99/ May '98 (%)
Video Tape Recorder	Sets	572,677	599,928	84.7	1,060,562	1,108,320	96.8	1,083,213	1,257,161	119.8
Video Disk Player	Sets	3,431	4,832	57.2	6,976	7,137	69.6	19,250	20,374	44.1
Video Camera	Sets	936,195	827,755	101.0	926,635	822,043	103.2	475,880	476,935	86.1
Car Navigation System	Sets	118,716	139,378	112.7	101,500	107,829	108.6	74,536	82,286	84.8
Digital Audio Disk Player	Sets	1,543,526	1,477,068	105.0	1,493,469	1,237,163	87.2	1,537,003	1,756,522	137.4
Active Liquid Crystal Device	1,000 units	4,178	4,082	204.9	3,364	3,079	232.2	1,183	1,261	131.5
Passive Liquid Crystal Device	1,000 units	33,848	37,458	110.8	32,690	34,401	104.1	16,278	16,963	74.9
Photoelectric Converter	1,000 units	840,380	877,667	112.1	927,488	953,252	117.7	389,402	368,342	94.3
Bipolar Semiconductor IC	Mil. yen	6,362	5,876	88.7	5,768	5,359	108.8	-	-	-
MOS Semiconductor IC *(logical element)*	Mil. yen	132,992	134,422	105.0	115,249	119,540	109.3	-	-	-
MOS Semiconductor IC *(memory element)*	Mil. yen	68,599	65,041	109.6	68,722	63,563	120.3	-	-	-
Hybrid IC	Mil. yen	22,703	21,872	96.5	19,298	19,930	108.8	-	-	-
General Purpose Computer	Mil. yen	20,226	10,788	28.8	-	-	-	-	-	-
Mid-range Computer	Mil. yen	18,358	17,882	81.4	-	-	-	-	-	-
Personal Computer	Sets	760,494	713,415	137.2	-	-	-	-	-	-
Electrical measuring instrument *(Except for semiconductors and IC measuring instruments)*	Mil. yen	13,472	10,901	79.5	-	-	-	-	-	-
Semiconductor and IC Measuring Instrument	Mil. yen	12,382	10,889	84.3	-	-	-	-	-	-
Industry-use Measurement Control Unit	Mil. yen	17,482	11,115	79.3	-	-	-	-	-	-

Source: Machinery Statistics and Research Office, MITI

Cable Supply & Demand Classified by Type (As of May 1999)

(Unit: ton)

Type of Cables	Orders Received May '99		Orders Received May '99/ Apr. '99 (%)	Orders Received May '99/ May '98 (%)	Shipment May '99		Shipment May '99/ Apr. '99 (%)	Shipment May '99/ May '98 (%)
Open Wire (OW)	7,745		96.8	85.5	7,099		84.0	80.7
Winding Wire	15,155		96.2	106.0	14,626		89.1	97.4
Cable for Machinery	4,809		93.7	95.4	4,729		92.1	91.0
Communications Cable	2,870		71.8	75.9	3,938		88.8	95.2
Power Cable	19,420		82.0	90.6	21,148		91.0	90.2
Covered Wire	12,648		89.1	94.0	12,998		90.9	91.3
Cable for Transportation	3,710		92.6	103.8	3,633		92.1	99.5
Total	66,357	(75,150)	88.7 (93.4)	93.9 (91.4)	68,171	(75,911)	89.8 (92.6)	91.5 (83.1)
Aluminum Power Cable	4,785	(2,541)	169.6 (153.0)	123.3 (84.7)	3,735	(2,174)	115.6 (108.6)	50.0 (43.8)
Optical Cable					652,916	(18,032)	87.6 (90.4)	143.6 (106.1)

Remarks: 1) Figures of optical cable show "km Core."
2) Figures in parenthesis represent the amount in yen.
Source: The Japanese Electric Wire and Cable Makers' Association

Cable Supply & Demand Classified by Major Consumption Fields (As of May 1999)

(Unit: ton)

Fields	Orders Received May '99 (Actual)	Orders Received May '99/ Apr. '99 (%)	Orders Received May '99/ May '98 (%)	Orders Received Jun.'99 (Estimated)	Shipment May '99 (Actual)	Shipment May '99/ Apr. '99 (%)	Shipment May '99/ May '98 (%)	Shipment Jun.'99 (Estimated)
Telecommunications	1,978	55.7	70.5	2,300	3,050	77.3	100.5	1,800
Electric Power	8,295 (3,339)	103.6 (196.0)	87.2 (103.2)	8,800 (3,700)	10,102 (2,534)	112.4 (111.5)	85.0 (40.3)	9,400 (2,800)
Electric Machinery	18,360 (325)	96.3 (133.2)	102.7 (165.8)	18,000	17,492 (255)	91.2 (97.0)	93.6 (123.2)	19,900
Automobile	5,132	92.6	109.0	6,300	4,928	87.7	103.7	6,300
Construction/Cable Shops	23,519 (19)	83.9 (67.9)	94.6 (38.0)	28,500	23,967 (30)	86.3 (103.4)	93.6 (66.7)	28,400
Others	5,707 (96)	89.4 (141.2)	93.9 (87.3)	6,200 (400)	5,388 (74)	82.5 (61.2)	87.7 (60.2)	6,400 (500)
Domestic Demand Total	62,991 (3,779)	89.3 (184.9)	95.7(105.3)	70,100 (4,100)	64,927 (2,893)	90.1 (107.7)	92.6 (43.4)	72,200 (3,300)
Export	3,366 (1,006)	79.8 (129.5)	69.9(345.7)	6,600 (1,000)	3,244 (842)	83.1 (153.9)	74.3 (105.3)	3,900 (1,000)
Total	66,357 (4,785)	88.7 (169.6)	93.9(123.3)	76,700 (5,100)	68,171 (3,735)	89.8 (115.6)	91.5 (50.0)	76,100 (4,300)
Core Cable Sales	26,670 (91)	89.0 (95.8)	91.0 (32.2)	33,700 (100)	28,519 (49)	95.3 (40.8)	98.4 (32.0)	30,000 (100)

Remarks: 1) Figures of optical cable show "km Core."
2) Figures in parenthesis represent the amount in yen.
Source: The Japanese Electric Wire and Cable Makers' Association

NTT's Mid-term Restructuring Plan

To develop into a "Global Information-Sharing Corporate Group," while continuing to respond to customer demand for fee reductions, the NTT Group aims to achieve further growth in the rapidly changing telecommunications market by restructuring, including the reallocation of human resources.

NTT's two regional companies, NTT East and NTT West, have drafted the three-year Mid-term Restructuring Plan to go into effect from FY 2000. The details are outlined below.

1. Reduction in the number of employees

	Number of employees (Jul. 1, 1999)	Number of employees (Mar. 31, 1999)	reduction
NTT East	60,000	About 50,000	About 10,000
NTT West	68,000	About 57,000	About 11,000
Total	128,000	About 107,000	About 21,000

NTT East and NTT West will reduce the number of employees by about 21,000 by the end of FY 2002.

[Measures]

- Raise operating efficiency
- NTT East and NTT West intend to merge or close a considerable number of offices (see attachment), reduce the number of administrative staff members, and transfer employees to urban areas where the market is more attractive.
- Reallocate human resources

NTT East and NTT West intend to transfer about 4,000 personnel to affiliated companies which need greater human resources to expand their business.

NTT Group companies also intend to restrain hiring NTT East and NTT West do not intend to hire new employees for 2 years of FY 2001 and 2002).

2. Reduction in capital investment

NTT East and NTT West intend to cut their aggregate capital investment by about 900 billion yen for a period of three years (FY 2000 - 2002).

[Measures]

- Reduce procurement and construction costs
- Make demand-based and efficiency-enhancing capital investment

3. Others

1) Cost reduction

NTT East and NTT West intend to cut other expenses by approximately 100 billion yen (NTT East: 30 billion yen and NTT West: 65 billion yen) by FY 2002.

[Measures]

- Cut overall expenses
- Reduce transaction fee within the NTT Group

All NTT Group companies intend to improve efficiency and find new markets outside the NTT Group.

2) Expansion of the merit system

NTT is discussing expanding its merit-based system for promotion and pay to place more emphasis on employee performance and contribution and to enable NTT group companies to respond more flexibly to changes in the business environment.

4. Financial benefits

These programs are expected to save NTT about 350 billion yen in total (160 billion yen at NTT East and 190 billion yen at NTT East). As a result of these measures, recurring profits for FY2002, not including the effect of any governmental policy changes in charges (Long-Run Incremental Cost methodology, price caps), are estimated, on a preliminary basis, at about 100 billion yen for NTT East and about 30 billion yen for NTT West.

This forecast is based on management's assumptions in light of the information currently available. The assumptions involve risks and uncertainties which may cause actual results to be materially different from the forecast. Potential risks and uncertainties include the increased competition, price reductions, and change of regulations.

Efficiency-Raising Measures (NTT East and NTT West)

	NTT East		NTT West	
	Number of Offices (May 31,1999)	Number of Offices (Projected)	Number of Offices (May 31,1999)	Number of Offices (Projected)
Sales	230	about 100	279	about 100
Customer service	335		308	
Number 116 (Installation and telephone service)	77	about 40	74	about 35
Fee collection	73	about 30	80	about 30
Number 113 (Telephone repairs)	23 (24 hours) (34 daytime only)	about 10 (24 hours) (about 20 daytime only)	34 (24 hours) (7 daytime only)	about 5 (24 hours) (about 25 daytime only)