

## **COMPAQ COMPUTER CORPORATION:<sup>1</sup>** **Entering the Japanese Market**

The success of Compaq's aggressive pricing strategy in the U.S. had given Compaq's new president, Eckhard Pfeiffer, confidence in taking his strategy worldwide in 1992. Having established a foothold in 13 European countries, New Zealand, Australia, and Singapore, Compaq was the largest PC vendor in the United Kingdom. It was now time to enter Japan. The question was whether or not Compaq's low price strategy would work in Japan. Japanese competitors were pessimistic about Compaq's chances of success. NEC, with over 50 percent of Japan's PC market, resisted price competition and had little concern that foreign competition could overcome its market dominance.

In July of 1991, Compaq established its 19th international sales and marketing subsidiary in Tokyo. As shown in Exhibit 1, Compaq had significant experience in entering new countries. According to Pfeiffer, this entry had been well planned:

For three and a half years, we extensively investigated the Japanese market's product needs, channels of distribution and service requirements. In March 1992, we introduced notebook, desktop and systems products targeted for this market -- the world's second largest. Though designed to use the Japanese language, these computers truly will be "global" products. By simply switching keyboards and the version of DOS, they can be used with 17 other languages as well. No other PC manufacturer, we believe, offers this feature. Our computers for Japan will be distributed through a variety of distribution channels that cater to specific markets within the country.

### **EXHIBIT 1: COMPAQ'S OVERSEAS SUBSIDIARIES**

<b>Country</b>	<b>Opened</b>	<b>Country</b>	<b>Opened</b>
Australia	1985	Mexico	1991
Austria	1990	The Netherlands	1987
Belgium	1988	New Zealand	1990
Canada	1985	Norway	1989
Denmark	1989	Singapore	1988
Finland	1990	Spain	1987
France	1984	Sweden	1987
West Germany	1984	Switzerland	1988
Italy	1986	United Kingdom	1984
Japan	1991		

Source: Company records.

### **THE JAPANESE COMPUTER MARKET**

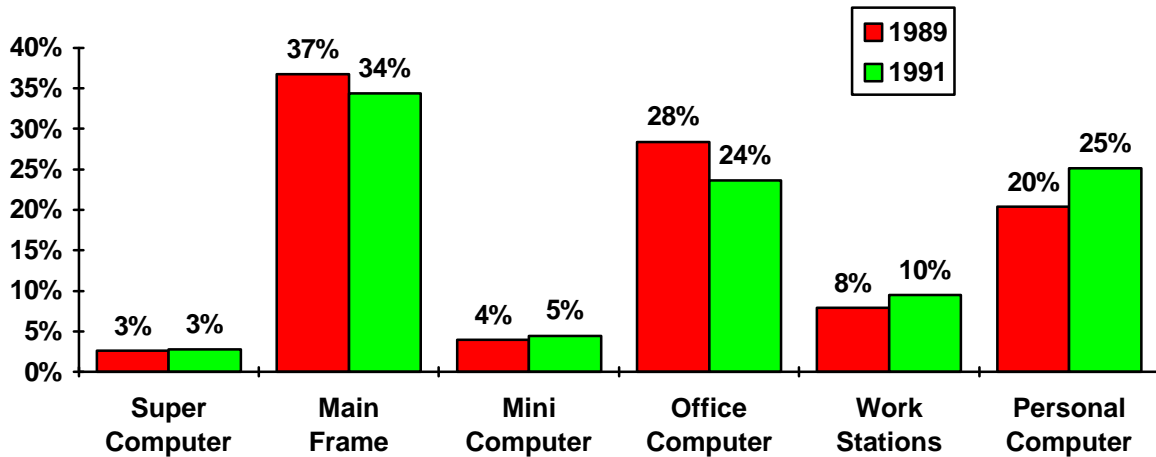
The Japanese computer market had revenues valued at 2,440 billion yen (\$18.8 billion) in 1991, up from 2,300 billion yen (\$17.7 billion) in 1989. As shown in Exhibits 2 and 3, the major market segments were main frames, office computers and personal computers. With the increasing capabilities of desktop computers and work stations, personal computers were increasing market share as main frames and office computers

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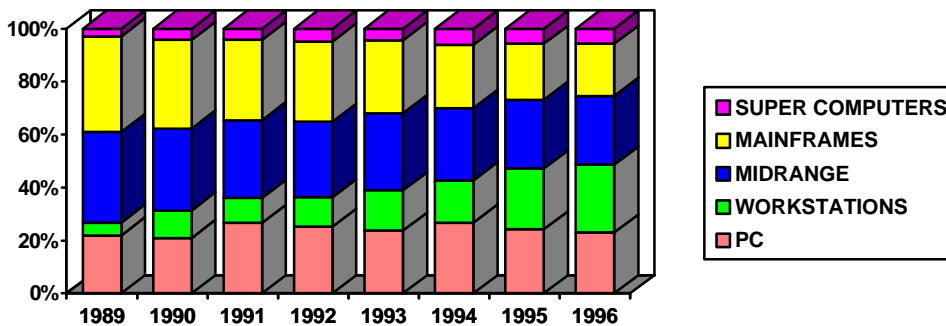
declined. For the first time in 17 years, Japan's five largest computer manufacturers -- Fujitsu, NEC, Hitachi, Toshiba and Mitsubishi Electric -- saw their combined computer revenues fall by more than a third and pre-tax profits fall by half in 1992 (Exhibit 4). As Japanese banks and securities companies found themselves in financial trouble (having to write off nearly \$500 billion in bad debts), capital spending for computers was postponed for the next several years. This combined with the shift in purchases from mainframe computers to PCs. The share of mainframes was forecast to fall from 50 percent in 1990 to 39 percent by 1996 while the share for PCs was expected to grow from 23 percent to 33 percent during that period.

**EXHIBIT 2: JAPAN'S MARKET SHARES BY COMPUTER SEGMENTS**



Source: Dataquest, Information System Industry Analysis, April, 1992.

**EXHIBIT 3: FORECAST OF COMPUTER SEGMENTS IN JAPANESE MARKET**



Source: Dataquest, Information System Industry Analysis, September, 1992.

Hitachi, with its weakness in workstations and PCs, was expected to be hit the hardest. The company was working to reduce costs and develop relations with foreign firms. It signed a deal with Hewlett-Packard for workstations, IBM for PCs, and Texas Instruments and Gold Star of South Korea for semiconductors. Fujitsu, the world's second-largest computer maker, depended on data-processing products for three-quarters of its sales, but had only eight percent of the PC market. Hitachi, Toshiba and NEC derived half their

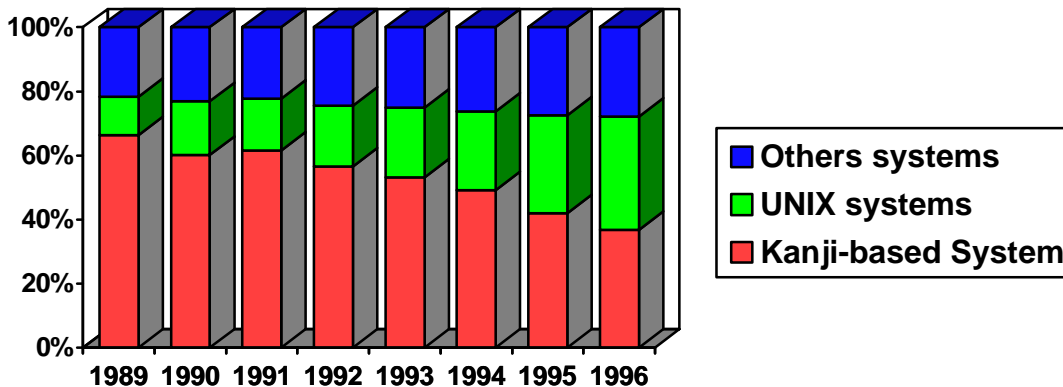
revenues from computer products. Mitsubishi Electric depended on computers for only a third of their revenues.

**EXHIBIT 4: PERFORMANCE OF JAPANESE COMPUTER MAKERS (billion yen)**

Company	March 1990		March 1991		March 1992	
	Revenues	Operating Income	Revenues	Operating Income	Revenues	Operating Income
NEC	2760.7	139.9	2961.1	137.7	3049.4	86.4
Fujitsu	2,125.7	121.8	2337.8	147.3	2434.1	66.0
Hitachi Ltd.	3525.3	200.0	3788.8	171.0	3925.3	102.6
Toshiba	3060.9	244.8	3227.7	164.6	3185.1	65.8
Mitsubishi Electric	2387.8	159.8	2588.8	135.6	2611.1	59.6

Single user markets, including workstations and PCs, occupied only 35 percent of the Japanese market compared to 50 percent for the world market. Shipments in the PC market for 1992 were projected at 2.4 million units, growth of nearly 8 percent over 1991. The Japanese market for main frame computers was expected to decline at a rate of 4.2 percent annually over the next five years. Office computers were also expected to decline at a rate of about 7 percent. However, over the next five years, super computers were expected to grow at 11.4 percent per year, mid range computers at 15 percent annually, and work stations at 29 percent per year. Along with the shift in computer sales was a similar shift in operating systems. As shown in Exhibit 5, UNIX based systems were expected to grow from 20 percent to 40 percent of the market over the next five years as workstations and more powerful PCs became dominant. Japanese proprietary kanji-based operating systems were expected to rapidly decline. Other systems, like Macintosh and DOS/V were expected to grow with the market.

**EXHIBIT 5: FORECASTED SHIFT IN OPERATING SYSTEMS**



Source: Dataquest, Information System Industry Analysis, September, 1992.

### Japan's Personal Computer Market

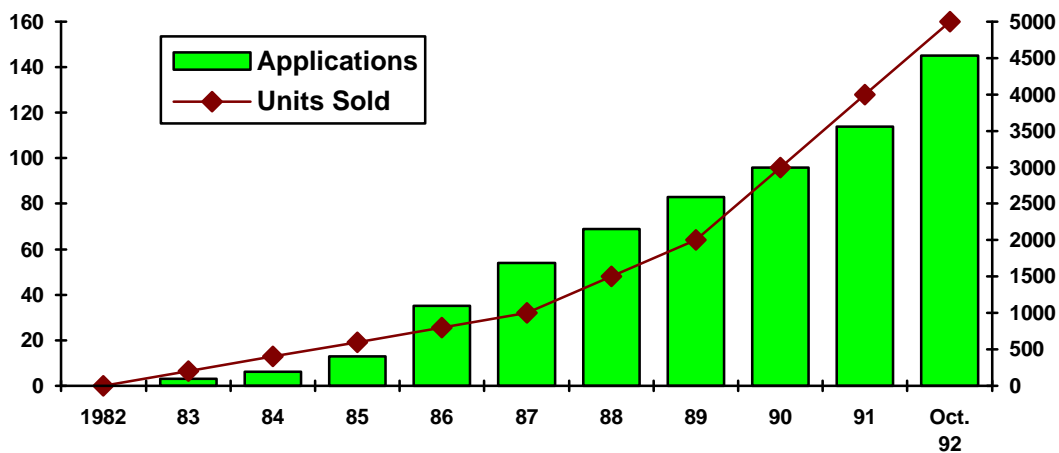
The personal computer market in Japan was estimated at over 6,000 billion yen (\$45.2 billion) in 1991. The Japanese PC boom started in 1981 when Fujitsu entered the

market, along with Sharp and NEC, with 8-bit microprocessor-based machines. With the introduction of the 16-bit microprocessors, Fujitsu and Sharp dropped out of the market due to their lack of word processing software. NEC was left with a monopoly of the word processing market as it upgraded its computers with its own 8-bit, 16-bit, and 32-bit microprocessors. Two NEC compatible word processing packages, named "Matsu" and "Ichitaro", became the standards for Japanese word processing, and NEC's sales had continued its grow as shown in Exhibit 6.

**EXHIBIT 6: TEN YEAR HISTORY OF NEC PC 9800 SERIES**  
(Thousands of units sold)

**Software Applications**

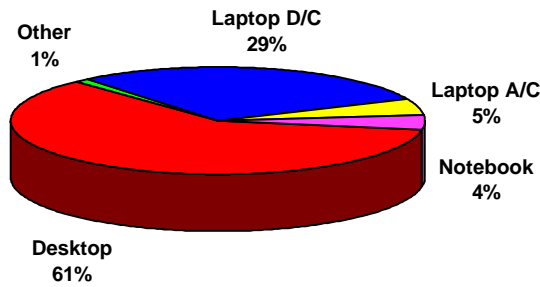
**PC Unit Sales**



The Japanese personal computer market bought 2,363,000 units in 1991, a 5.3 percent increase in units over the previous year. Home use of PC computers in Japan, however, represented only ten percent of the PC market. To encourage the development of the home-use market, nineteen computer makers, including six foreign makers, established an educational PC leasing company in June of 1992. Japanese participants included Toshiba, NEC, Hitachi, Fujitsu, Matsushita Communication Industrial, Matsushita Electric, and Mitsubishi Electric. Foreign firms included IBM Japan, Apple Computer (Japan), AST Research Japan, Compaq (Japan), Nihon DEC, and Nihon Unisys. Educational Computer Systems (ECS), capitalized at 860 million yen (\$6.8 million), planned to purchase PCs from computer makers and rent them to elementary, junior and senior high schools. ECS forecast tens of thousands of rentals over the next four to five years to help Japan improve computer literacy in its schools, and to stimulate the home PC market.

As shown in Exhibit 7, the largest product segment of the market was the traditional desktop computer with over 60 percent of unit sales. Laptops and notebooks accounted for the remainder of units sold in the market. Handheld and pen-type computers were only beginning to enter the market. The entry by U.S. and Taiwanese computer companies into the Japanese market was putting pressure on product development. While Japanese firms had been introducing new models every three or four years, foreign competitors were changing designs every six to nine months.

**EXHIBIT 7: JAPAN'S PERSONAL COMPUTER MARKET SEGMENTS IN 1991**



Source: Dataquest, Information System Industry Analysis, April, 1992.

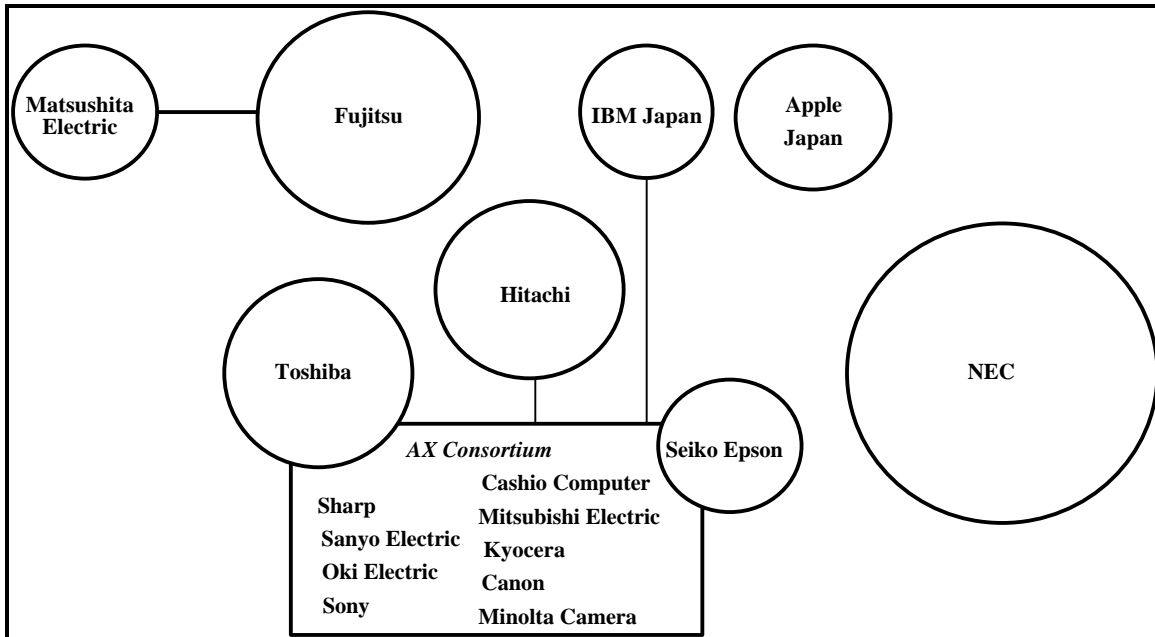
The changing mix in microprocessor sales demonstrated the shift in technology and computer speed and power. For example, the older 80286 microprocessor lost market share, down from 33.9 percent in 1990 to 18.1 percent in 1991. During that time, the 80386SX microprocessor increased its share from 17.5 percent to 37.7 percent. The faster 80386DX chip held 26.1 percent and the newer 80486SX and DX microprocessors, still four to five times the price of the 80386 chip, held only .4 and .9 percent share in 1991. The old 8086/88 chips continued to hold 8.9 percent of the market in 1991. Motorola's 68000 series microprocessors accounted for 6.8% of the total microprocessor market. Of the more advanced 32-bit 386 microprocessors, Intel still dominated with 66 percent market share in 1992, followed by Motorola with 13 percent, Advanced Micro Devices with six percent, National Semiconductor with three percent, and LSI Logic with two percent. All other suppliers accounted for only ten percent of the market.

NEC continued its domination of Japan's PC market in 1991 with nearly a 53 percent share. In fact, NEC had increased its share by half a percent over 1990. NEC introduced its new desktop and notebook models using the 386DX microprocessors in 1991. NEC's machines, like Toshiba, Fujitsu, Epson and other PC makers in Japan, depended on a proprietary operating system incompatible with any industry standard. In the past, application vendors had to develop different versions of their products for machines made by NEC, Fujitsu, Hitachi, Toshiba, IBM and a consortium called AX as shown in Exhibit 8. There was wasteful duplication of work not only in writing the code but also in testing, translation of user manuals, packaging, advertising, distribution and support. By using proprietary systems, NEC had hoped to lock customers into their own products. Instead they had fragmented the software market, killing any chance for an independent software industry to emerge in Japan to supply programs for a common operating system such as Microsoft's MS-DOS. Software companies had to develop their applications for each company, making it difficult to generate economies of scale. These proprietary systems were also unable to run on Microsoft's latest version of Windows.

The most significant long term competitive threat to NEC was IBM's cooperation with Microsoft in developing DOS/V for the Japanese market, a modified DOS operating system that incorporated 2000 kanji (Japanese characters) within its operating system. Ninety percent of the computers in the world were IBM compatible, meaning that they were

standardized around IBM's PC/XT open architecture which introduced the AT-bus in 1981. The DOS/V operating system ran on standard AT-bus machines and therefore allowed IBM-clone makers to enter the Japanese market. Software applications were still a problem. While the vast majority of software in the world had been written for DOS based systems, under 1000 DOS/V software packages were yet available, compared to over 14,500 packages for NEC's PC 98 machines.

**EXHIBIT 8: DOMINANT JAPANESE OPERATING SYSTEMS**

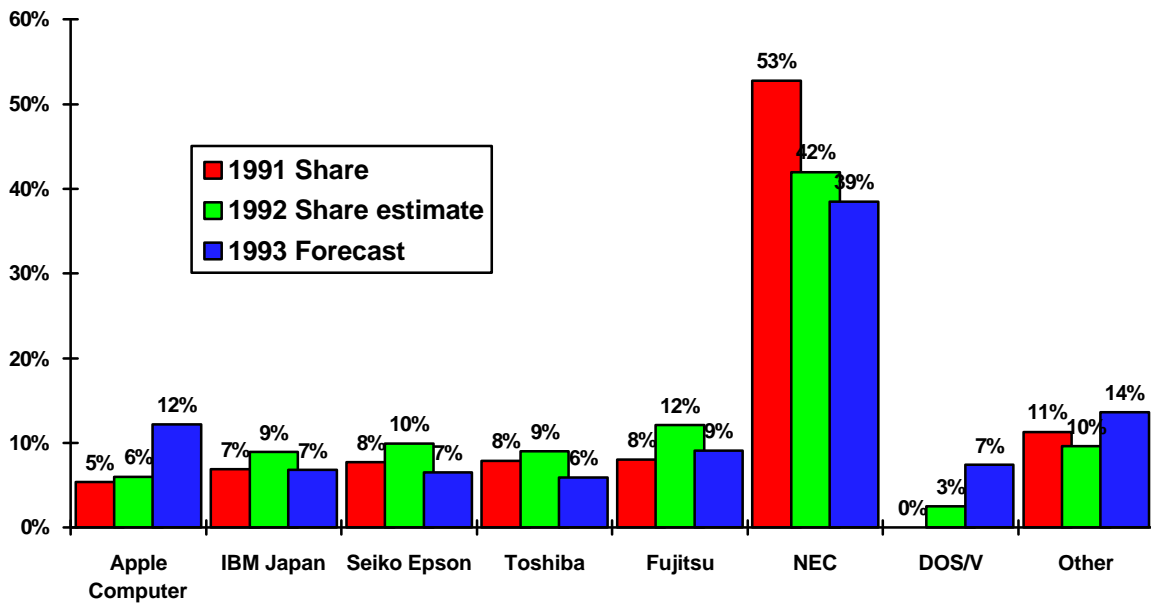


The number of DOS/V applications were slowly increasing with introductions of compatible versions of "Ichitaro," "Lotus 1-2-3," "dBASE IV," "Paradox," and "Hanako," mostly adapted from NEC 98 versions and not original developments. NEC and Fujitsu refused to introduce DOS/V compatible machines while foreign PC makers scrambled to enter the Japanese market now that DOS/V and Windows had opened it up. At least half-a-dozen foreign clone-makers (Compaq, Dell, AST, Mitac, Acer and Unisys) already had a foothold. IBM, the Taiwanese clone makers, and most other Japanese producers were rapidly introducing DOS/V compatible products.

The growth in DOS/V machines was also expected to stimulate Windows sales. The penetration of Microsoft's Windows was only 15 to 20 percent in Japan, compared to over 60 percent in the U.S. and Europe. So far, "Word," "PageMaker," "Lotus 1-2-3," "Excel," "Ichitaro," and "Designer" software were available for Windows. With the increase in application packages, the fall in hardware prices, the increase in PC power, and Microsoft's planned introduction of Windows 3.1 in 1993, Windows shipments were expected to surge in 1993. This was all riding on the coattails of Macintosh's success in Japan. Over 80 percent of Mac applications consisted of Claris' MacWrite, FileMaker, and Aldus's PageMaker. While NEC felt that DOS/V use was only a temporary phenomena, analysts were predicting some major shifts in market position for 1993 as shown in Exhibit 9. The screen resolution of NEC's industry-leading PC 98 computer was too low to run Windows properly.

In fact, the management of LAOX, Japan's largest retailer of PC computers (holding a fifty percent market share), projected that within two to three years the market would primarily be divided between NEC with 45 percent, DOS/V machines with 30 percent, and Apple with 20 percent. Changing technology was also putting DOS/V on a more equal footing with NEC. For example, an analysis of software applications for the new 486 PCs revealed that DOS/V had a 29.2 percent share of the applications. NEC 9801-based PCs still held a dominant 65.6 percent of the new applications. Other systems accounted for only 5.3 percent.

**EXHIBIT 9: FORECASTED IMPACT OF DOS/V ON PC MARKET SHARES**



Source: Dataquest, Information System Industry Analysis, October, 1992.

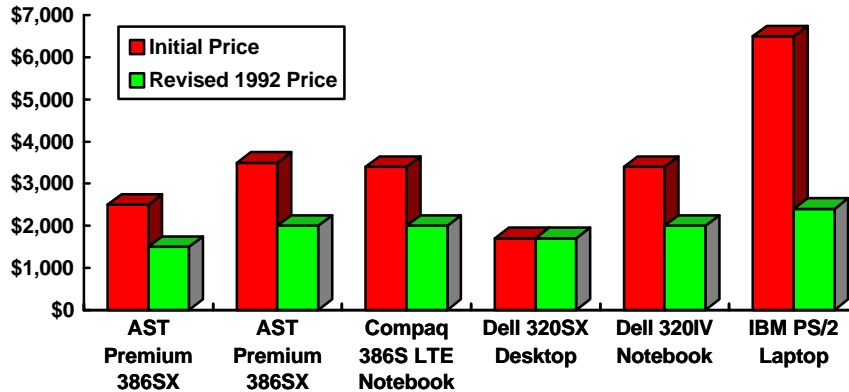
U.S. software houses saw DOS/V and Windows introductions into Japan as a strategic opportunity. In the future, single versions of applications could be written to run on Window's graphic user interface, letting Windows take care of the discrepancies among Japan's different hardware architectures. The market potential was considered enormous, since PC sales per capita were less than half that of the U.S. and packaged software sales were less than one fifth that of the U.S. U.S. packaged software firms, experienced in developing Windows applications, were expected to control about 50 percent of Japan's \$1 billion (wholesale) software market.

With the introduction of DOS/V and Windows in 1991, it was expected that imported computers would have a better chance at gaining market share in Japan. 1992 saw the beginning of a rapid decline in PC prices as Compaq, AST Research, and Dell Computer introduced lower priced units into the Japanese market as shown in Exhibit 10. As a result, most PC prices had fallen 50 percent from the previous year.

## The Office Computer Market

Office computers represented a 5,770 billion yen (\$44.4 billion) market in 1991. In the office computer market, NEC and Fujitsu were the leaders with 31 percent market share. IBM, in third position, had been more successful in the corporate market than in PCs with a 13.6 percent share. Mitsubishi Electric and Toshiba lagged with 6.6 percent and 5.1 percent shares, respectively, as shown in Exhibit 11.

**EXHIBIT 10: RAPID PRICE CUTS IN PERSONAL COMPUTERS**



Source: Dataquest, February 1992.

Like the open-systems movement in PCs, the networking trend was finally coming to Japan. The fraction of business desktop machines that were networked was between 5 and 10 percent in Japan, compared to 40 percent in the U.S. As with software, U.S. vendors had vastly more experience than Japanese competitors in writing applications for NetWare or LAN Manager and possessed many off-the-shelf packages they could easily localize for the Japanese market.

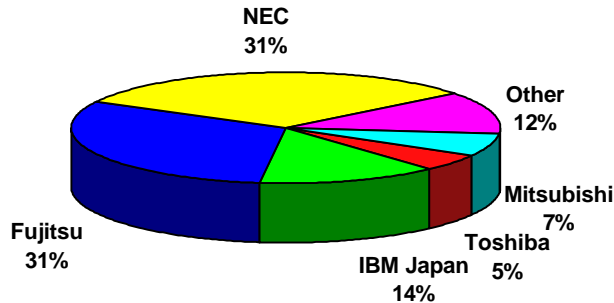
To facilitate the development of the network market, software also was being introduced. ASR International planned to market two types of network software developed by General Software of the U.S. Both "EtherProbe" and "Snooper," which ran on IBM and its compatible PCs, such as Compaq PCs, analyzed network conditions and data flows. The software met the growing demand for LAN network development among users. ASR was aiming for annual sales of 500 packages. EtherProbe retailed for 360,000 yen (\$2,927), and Snooper was priced at 178,000 yen (\$1,447).<sup>2</sup>

Autodesk (Japan) was porting its world leading desktop CAD/CAM program, "Autocad", to Toshiba and other PCs. The company introduced "Autocad Release 12J" for Toshiba and Compaq PCs on November 1. Three-dimensional solid modeler "AME2.1 for Release 12J" was on the market. A floppy version of Release 12J was priced at 1,150,000 yen (\$9,426), and AME2.1 listed at 200,000 yen (\$1,639). Autodesk planned within six

<sup>2</sup>11/5/92: Nikkei Sangyo [p.6]

months to port the CAD software to all the PCs which had more than 5% of the domestic market.<sup>3</sup>

**EXHIBIT 11: JAPAN'S OFFICE COMPUTER MARKET SHARES**



Source: Dataquest, Information System Industry Analysis, April, 1992.

**The Workstation Market**

The workstation market accounted for 2,336 billion yen (\$18 billion) in 1991. In workstations, two U.S. firms, Sun Microsystems and Hewlett-Packard, lead the market with shares of 25 percent and 16.5 percent, respectively as shown in Exhibit 12. NEC held 11.1 percent, followed by Sony with 7.4 percent and Hitachi with 6.4 percent of the workstation market. Digital Equipment Corp. was strong in engineering workstations and held about 5.8 percent of the overall market. All other competitors had a total of 28.9 percent of the market.

**The Mainframe Market**

The traditional mainframe producers were having trouble adjusting to the changing nature of the market as more powerful desktops and servers shifted the demand to networks and more distributed computing activities. The Japanese market was split rather evenly between Fujitsu with 25.4 percent, Hitachi with 20.3 percent, IBM with 19.4 percent, and NEC with 18.1 percent. Unisys held an additional 10 percent of the market, leaving only 6.8 percent for other competitors. NCR targeted the on-line transaction market of financial institutions.

**COMPAQ'S ENTRY STRATEGY FOR JAPAN**

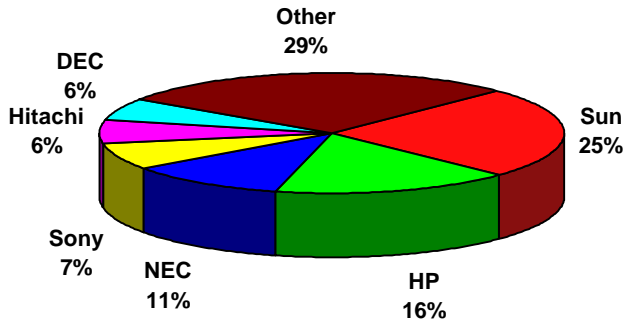
Compaq's management had been looking seriously at the Japanese market for over four years. After nearly three years of market studies, Compaq, the U.S.'s largest manufacturer of IBM-compatible PCs, entered the Japanese market in September, 1990, with a 100 million yen (\$719,424) capitalization of its subsidiary. Engineers were recruited and a former IBM executive was selected as president. The company started actual operations in

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<sup>3</sup>10/29/92: Nihon Kogyo [p.11]

July, 1991, using Katena and Marubeni companies as distributors while it developed its own sales channels. Compaq's Japan expanded its staff from 40 to 80 by the end of 1991.

**EXHIBIT 12: JAPAN'S WORKSTATION MARKET SHARES**



Source: Dataquest, Information System Industry Analysis, April, 1992.

While Compaq's entry signaled increased competition in the IBM-compatible PC market, seven foreign firms also launched a new consortium on October 15, 1991, called the "Information Industry Council of Foreign Affiliate Corporations," to study possibilities for mutual cooperation in solving common problems relating to market entry and the expansion of operations in Japan. The group, membership in which was limited to mid-sized firms in computer-related industries, was started with Compaq, Oracle, Microsoft, Sun Microsystems Japan, Silicon Graphics Japan, Memorex, Telex, and The Santa Cruz Organization. A total of about 30 firms were to join the consortium.<sup>4</sup> Compaq also joined the PC Open Architecture Development Group (OADG), an organization of IBM-compatible manufacturers supporting development of the Japanese compatible operating system.

Compaq began cutting its PC prices in September, 1991. Katena, one of Compaq's sales company, slashed prices on 20 Compaq PCs in October, 1991. The new price of an IBM-compatible Compaq PC was then almost equal to that of the IBM Japanese-made model "PS/55." Its desktop "Deskpro486/33L" was priced at 2,289,000 yen (\$17,608), down 6% from 2,429,900 yen (\$18,692). The price of the notebook "LTE286" was reduced by 32% to 431,200 yen (\$3,317), down from 630,000 yen (\$4,846).

Compaq (Japan) continued to build its foundation as it expanded its sales operations<sup>5</sup> and developed machines for the Japanese market. It announced the introduction of five series of IBM-compatible PCs designed for the Japanese corporate market to be sold through 28 distributors starting on March 3, 1992. All new Compaq PCs ran on the "MS-DOS 5.0J/V" Japanese/English bilingual operating system which had been designed to use IBM Japan products and ran other software developed in Japan. The "LTE Light/25" notebook PC was introduced featuring an "80386SX" microprocessor, 4 to 10 Megabytes of main memory, and a 60 to 120 Megabyte hard disk drive. It ran for four hours on a single

<sup>4</sup>(10/14/91: Nihon Kogyo [p.1])

<sup>5</sup>(10/5/91: Nikkei Sangyo [p.5]; 10/6/91: Dempa [p.3])

battery recharge, and was priced starting at 498,000 yen (\$3,831). The "Portable 486C" was equipped with an "80486DX" microprocessor (33MHz) and a color LCD, and was priced at 1,398,000 yen (\$10,754). The "SystemPro/LT Series" was a network server PC; the "DeskPro/M Series" was a desktop PC; and the "DeskPro386S/20N" was a network client PC.

In preparation for its introduction of a new, high performance, low priced PC line, Compaq (Japan) increased its capital fourfold in late June, 1992. The Japanese subsidiary, initially capitalized in September of 1990 at 100 million yen (\$787,402), increased its capitalization to 400 million yen (\$3.1 mil) in June, 1992. The funding increase was used to expand sales channels, develop additional Japanese-language products, and otherwise strengthen the company's operations. The company also planned to increase its 80 employees to 100 by April of 1993.<sup>6</sup>

### **New Product Introductions**

In August, 1992, Compaq announced five new series of IBM-compatible PC lines to begin sales in October. Compaq released the first of its high-performance PC lines, priced below 130,000 yen (\$1,048), in late September. The price was roughly half that of a Japan-made machine with comparable performance. Compaq's release of such an inexpensive PC raised the specter of increased price competition in Japan.<sup>7</sup> By using the new DOS/V operating system, these new machines ran programs in English or Japanese.

As announced, Compaq released 24 models within its new DOS/V PC lines in early October. The "Prolinea Series" included 12 entry-level models; the "DeskPro/i Series" included nine mid-range models; and the "DeskPro/M Series" featured three high-end models. The lowest-priced 32-bit PC, the "Prolinea3/25zs," featured a 25MHz version of the "80386SX" microprocessor, 2 Megabytes of main memory, and a 3.5-inch floppy disk drive. It listed at 128,000 yen (\$1,067), almost half as much the comparable NEC "PC-9801US." Compaq's top-of-the-line desktop model, the "DeskPro66M" included a 66MHz version of the "80486DX2", a coprocessor with 256 Kilobytes of cache memory, 8 Megabytes of main memory expandable to 64 Megabytes, a "Q Vision" graphic controller, a 510 Megabyte hard disk and four 32bit "EISA" bus slots, and priced at 938,000 yen (\$7,817). The "SystemPro Series" included a top-of-the-line server based on the "80486DX2" microprocessor (66MHz).

Compaq planned the release of its "ProSenior Series" in 11 models of low-priced LAN servers within the year. The low-end "ProSenior 486/33-1/EL" was based on a 33MHz version of the Intel "80486" microprocessor with 4 Megabytes of main memory, and priced at a little over 350,000 yen (\$2,893). Other models were intended to be priced 1/3 to 1/2 the price of Japanese competitors' servers. Compaq was posing a serious threat to domestic makers who had a hard time meeting the U.S. maker's challenge in the server market where

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<sup>6</sup>(6/3/92: Nikkei Sangyo [p.5])

<sup>7</sup>(9/22/92: Nihon Keizai [p.1])

volume sales were difficult to achieve.<sup>8</sup> With the releases of its low-priced PCs, the company projected a 5-7% share of the domestic PC market.<sup>9</sup> It projected first-year sales of its new product line of 3 to 5 billion yen (\$22.1 to \$36.8 million).

Compaq announced plans to introduce laser printers in Japan by the end of 1992. The company expected to ship 4,000 printers to corporate users for in-house networks within three and a half years. Compaq developed Japanese versions of its printers to capture a larger slice of the growing corporate network market.<sup>10</sup>

### **Expanded Distribution**

To sell its broader product line, the company pushed to develop its distribution and service capabilities. While Compaq started its distribution through three companies, by October it had a distribution network of 28 sales firms having a total of over 500 outlets. The sales companies were asked to become value-added retailers and systems integrators for the corporate market. The company planned to increase the number of dealers by another 10 by year's end. On November 14, *Nikkei* reported Pfeiffer's comment about this strategy:

In marketing, Compaq will expand its distribution channels. We plan to sell through discount houses and mail-order houses in Japan. Some people say that the Japanese market is unique. However, basically, we are planning to take the same approach as we have taken in the U.S. and Europe.

By November 23, Compaq had in fact established 48 dealers and 78 support offices in Japan.

### **Dropping Personal Computer Prices**

As in the U.S., trade press and magazines were keeping users informed about the rapidly changing nature of the personal computer market. As prices for personal computers began to fall, surveys showed competitive price levels for the Japanese market. *Trendy* magazine, for example, had done an extensive survey of Tokyo's electronics district and found the prices shown in Exhibit 13 by October, 1992.

Components for personal computers were readily available in the market, and magazines provided "build-your-own" instructions. IBM compatible computers could be assembled by an amateur within two hours with no tools other than a screw driver. *Nikkei's Trendy* magazine described a young lady who purchased her own components in the Tokyo electronics district and assembled her own computer. The cost of her machine was 280,000 yen as shown in Exhibit 14. Other publication pointed out that personal computers could be purchased in Taiwan or Hong Kong for even less money. For example, Hong Kong dealers sold assembled computers, including monitors, for less than what computer parts would cost in Japan. Examples of Hong Kong's shop prices are shown in Exhibit 15.

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<sup>8</sup> (10/9/92: Nihon Kogyo [p.5])

<sup>9</sup> (10/2/92: Dempa [p.5], Nikkan Kogyo [p.10], Nihon Kogyo [p.5], Nikkei Sangyo [p.7])

<sup>10</sup>(9/7/92: Nihon Kogyo [p.1])

**EXHIBIT 13: HIGH EFFICIENCY PERSONAL COMPUTER PRICES IN TOKYO**

<b>Special Operating Systems</b>	<b>CPU/clock speed</b>	<b>Memory</b>	<b>HDD</b>	<b>Market Price (yen)</b>	<b>Retailer</b>
NEC H98 system U90	486SX/25MHz	3.5 MB	100MB	860,000	Laox
NEC PC-9801 FA	486SX/16MHz	1.6 MB	--	275,000	Softmap
Epson PC-486GR2	486SX/25MHz	1.6 MB	--	350,000	Tsukumo
Fujitsu FM TownsII CX1	386DX/16MHz	2 MB	100MB	378,000	Softmap
Macintosh II Ci	68030/25MHz	5 MB	200MB	543,000	Harro
<b>IBM Compatible Systems</b>					
IBM-PPS/55Z 30U SLC	386SLC/20MHz	6	120	530,000	T-zone
Compaq Pro/LT	486DX/33MHz	8	120	1,068,000	Laox
AST PCvision4/33	486DX/33MHz	10	210	418,000	T-zone
Dell DL486PP/33-120	486DX/33MHz	8	120	486,000	Laox
Mitac TM4033	486DX/33MHz	8	200	368,000	T-zone
Dynastar ET-486DX33	486DX/33MHz	8	200	374,000	Builtin
Robin RT486DX-33LC	486DX/33MHz	8	200	328,000	Robin
EpochScience Create486	486DX/33MHz	8	200	318,000	Elect.
Direct PCD486dxe-33D	486DX/33MHz	8	200	312,000	Softmap
Xanax DX/33A	486DX/33MHz	8	200	378,000	Step
Quartz Jr. 486/33	486DX/33MHz	8	200	354,000	Oak
Laptune 33	486DX/33MHz	8	200	438,000	Village Quarest Spanky's

Source: Nikkei Trendy, November 1992

**EXHIBIT 14: COST OF BUILDING YOUR OWN COMPUTER IN TOKYO**

<b>Basic Components</b>	<b>Purchase Price (yen)</b>
CPU (Intel 386DX/33MHz)	33,000
SIMM memory (70ns, 1MBx8)	44,800
Motherboard (BABY386-332)	26,000
Graphics board (Diamond VRAM 1MB)	39,000
Controller-I/O card (LCS-6624G)	7,000
3.5 in. FDD (Teac)	12,500
5.25 in. FDD (Chinzo)	12,000
100 meg. HDD (Alps)	65,000
Box (200 watts of power)	30,000
Japanese keyboard (Costar)	10,000
<b>Total Cost</b>	<b>280,100</b>

Nikkei Trendy, November 1992.

Compaq appeared to be successful in its effort to broaden its distribution channels in Japan. Uchida Yoko, an office automation dealer, announced on October 18, 1992 that it would now market NEC, Apple, and Compaq computers. Until now, Yoko had been the major, exclusive dealer for Fujitsu and had not been willing to sell non-Fujitsu brand equipment or machines. The company decided to market hardware from other makers in response to the recent move toward multivendor networks. Uchida Yoko was also considering marketing Sun Microsystems workstations, targeting surveying and construction companies. Plans called for sales of NEC and Compaq PCs bundled with specialized software. Computer sales companies, like Yoko, expected that they would have to meet diversified user hardware needs in building networks if a PC price war like that in the U.S.

broke out in Japan.<sup>11</sup> Users were then building their systems from components available from low price competitors. Kao Corporation's subsidiary, Kao Media Sales, became an agent of Compaq and ordered 500 ProLinea PCs. Koa was one of Japan's most successful companies. For comparison, Compaq's PC prices as of October are shown in Exhibit 16.

**EXHIBIT 15: COMPUTER PRICES IN HONG KONG**

Company Name	CPU/Clock Speed	Memory	HDD	Price (yen)
NEON Computers (Hong Kong)	486DX/50 MHz	4MB	170MB	213,000
	486DX/33 MHz	4MB	130MB	174,000
Able Computer (Hong Kong)	486DX/33MHz	4	170	220,000
	386DX/33MHz	4	80	128,000
PROMAG Computer (Hong Kong)	486SX/20MHz	4	170	132,000
	286/16MHz	1	40	83,000

Nikkei Trendy, November 1992.

**EXHIBIT 16: PRICES FOR COMPAQ COMPUTERS.**

Model	CPU/Clock speed	Memory	Price	Price with HDD
<b>ProLinea</b>				
3/25 zs	i386SX/25MHz	4	128,000	168,000 (40 MB)
4/25 s	i486SX/25MHz	4	198,000	258,000 (120 MB)
4/33	i486DX/33MHz	4	278,000	338,000 (120 MB)
4/50	i486DX2/50MHz	4	338,000	398,000 (120 MB)
<b>Deskpro</b>				
4/25 is	i486SX/25MHz	4	288,000	348,000 (120 MB)
4/33 i	i486DX/33MHz	4	368,000	428,000 (120 MB)
4/66 i	i486DX2/66MHz	4	438,000	498,000 (120 MB)
				558,000 (240 MB)

Sources: Company records

On December 8, *Nikkei Sangyo* newspaper announced that Compaq had signed a distribution agreement with C. Itoh Corporation, one of Japan's largest trading companies. With imports of low-priced IBM-compatible PCs from Southeast Asia growing, the trading company decided to enter the market with the hope that the domestic PC market would be restructured. C. Itoh signed a distribution contract with Compaq Japan to market IBM-compatible PCs through its data communications equipment sales subsidiary, C. Itoh Techno-Science (CTC). The trading firm, which set up a PC sales team in its industrial electronics division, planned to market Compaq PCs on its own as well. CTC, which distributed Sun workstations, intended to market Compaq PCs mainly as network terminals.<sup>12</sup>

On December 1, 1992, *Nikkei* further reported that Nihon Office Systems (NOS) and Japan Business Computer Co. (JBC), two of IBM's major PC dealers, had decided to begin selling both NEC and Compaq PCs. JBC announced that it would also begin selling Apple

<sup>11</sup>10/18/92: Nihon Keizai [p.7]

<sup>12</sup>11/9/92: Nihon Kogyo [p.5]

computers. IBM had 45 percent ownership in NOS and 36 percent ownership in JBC. NOS sold about 800 IBM PCs per month and JBC sold 1300 IBM PCs per month. The change in policy caught the attention of IBM's top executives. Tsukumo Denki, another Akihabara computer store, announced its plan to sell between 1000 and 2000 Compaq products in the coming year. Compaq had been running at full production since it introduced low-priced models in the U.S. and Europe in June.<sup>13</sup>

### Competitive Responses

By mid November, NEC, Fujitsu, and Toshiba, the leading Japanese computer makers, had yet to announce new low-priced machines. NEC had taken a very defensive position and had expected to see a ten percent increase in sales for 1992. Its notebook computers were still selling at 498,000 yen, too expensive to expect to generate sales in the general consumer market. NEC's only new computer was over 980,000 yen, signaling the company's lack of interest in participating in the low price market. NEC's president, Tadahiro Sekimoto, told *Nikkei*, "We are not going to announce low price PCs by sacrificing necessary functions." He argued that NEC had continued to improve the cost-performance effectiveness of their computers over the past ten years. NEC's strategy, however, was to make the PC98 more attractive for software companies.<sup>14</sup> *ComputerWorld* noted that initial Compaq purchasers had to purchase monitors (70,000 to 80,000 yen), software, an outside hard disk drive, and a printer, making the total purchase bigger than the cost of upgrading an NEC PC 9801.

On November 9, 1992, NEC finally responded to Compaq's low priced computer with a full page add in the *Nihon Keizae Shimbun*, Japan's primary business newspaper. The advertisement told the readers that Japanese should respond to this new competition by using the NEC 98 personal computer. The advertisement pointed out that the NEC 98 had 14,500 software programs available and that 3,000 companies supported its applications. In contrast, the ad noted that DOS/V had only 800 applications listed in IBM's software catalogue. The ad said that NEC had 339 repair shops and 422 service centers at a total of 379 separate locations. Over 40,000 people had been trained per year in NEC PC schools. It pointed out that the NEC 98 series was built for Japanese word processing and had the fastest translating function. It had a special keyboard and was especially developed for right handed people, thereby being right for Japanese users. Finally, it pointed out that NEC had the largest market share with 53.1 percent of the Japanese PC market. NEC had sold over 5,760,000 computers.

On November 10, 1992, Compaq responded to NEC's advertisement with a full page advertisement in the *Nikkei Sangyo* newspaper. The advertisement pictured a computer model and pointed out features of Compaq machines. The ad noted that Compaq computers included Japanese by using DOS/V, had advanced technology chips that could handle high temperatures, were durable, and were easy to use. Compaq also provided a maintenance

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<sup>13</sup>10/3/92: Sankei [p.11]

<sup>14</sup>11/6/92: Nikkei Sangyo p. [7]

book and provided on-site service for one year. It also had capacity to expand memory to 16 megabytes. The advertisement went on to detail seven different models. On November 16, the *Asahi Shimbun* discussed the PC advertising wars between NEC and Compaq. It noted that NEC had stressed that they provided "right handed PCs" and were attacking all IBM compatible (DOS/V) machines, not just Compaq.

On October 16, 1992, IBM announced the introduction of its new line of low priced, DOS/V-based personal computers, called PS/V, that were 30 to 50 percent cheaper than Japanese PCs. IBM Japan's move was seen as likely to lead to a price war in the Japanese PC market. IBM Japan planned to begin selling its low-cost PC in November. They were to sell for between 200,000 and 300,000 yen (\$1,639 to 2,459), or 30-50% cheaper than domestic-made PCs. Aimed at smaller companies, the PCs used the Intel "80486" microprocessor in the CPU. They were expected to have greater price-performance than the low-cost PCs that Compaq announced. After IBM Japan restructured on January 1, the new entity in charge of sales to second-tier corporations will market the machines through retailers of office automation equipment and electric appliances. The move by IBM put the Japanese PC market into a period marked by low-price PC competition.<sup>15</sup> On November 14, Hitachi announced that IBM would also be supplying it with PS/V personal computers on an OEM basis.

Acer Japan, the Japanese subsidiary of Taiwan-based PC maker, Acer, introduced its low-priced DOS/V PCs. In response to the industry-wide price war spurred by Compaq and IBM Japan, the entry-level model of the "AcerMate 486SX/25D Series" used a 25MHz "i486SX" microprocessor, had no built-in hard disk drive, and was priced at 148,000 yen (\$1,194). Models with 120 and 200 Megabyte hard disks were priced at 208,000 yen (\$1,677) and 268,000 yen (\$2,161), respectively, about 50,000 yen (\$403) cheaper than comparable Compaq models.<sup>16</sup> Acer had been responsible for initiating the price war in the United States several years earlier. Acer Japan planned sales levels of 20,000 units in Japan by 1995, 30% of which it hoped to sell to individual users.<sup>17</sup>

Fourteen makers had introduced DOS/V compatible computers at prices under 450,000 yen, and as low as 98,000 yen. There were also 26 makers that had models in the high priced end of the market, beginning at 328,000 and as expensive as 998,000 yen. Eight of these makers also had DOS/V compatible notebook PCs. Japanese PCs using the same microprocessors were priced over 480,000 yen (\$3,871). Tokyo-based data equipment seller Cluster announced intentions to release a 98,000 yen (\$817) 32-bit desktop PC imported from Taiwan in December. The new PC, made by EFA of Taipei, featured a 25 MHz version of the INTEL "i386SX" microprocessor and a built-in display. The PC ran the DOS/V operating system. Cluster, which had annual sales of 2.3 billion yen (\$19.2 million), planned to sell 4,000 of the new PCs and increase sales to 4.0 billion yen (\$33.3 million) in

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<sup>15</sup>10/14/92: Nihon Keizai [p.1]

<sup>16</sup>11/14/92: Nihon Keizai [p.9]

<sup>17</sup>11/10/92: Nihon Kogyo [p.7]

1993. The company also planned to release in December a "LANputer" PC with a built-in dedicated LAN chip board.<sup>18</sup>

OTC of Tokyo had introduced an IBM-compatible PC priced at 149,980 yen (\$1,209). The "DLC-25/40" incorporated a 25MHz CYRIX "Cx486DLC" microprocessor and came with a display and a 40 Megabyte hard disk drive. The performance of the CYRIX clone chip was positioned between the 20- and 25MHz versions of the INTEL "i486SX" microprocessor. The PC's 4 Megabytes of main memory were expandable to 32 Megabytes, and the hard disk was removable for upgrades. OTC, which had designed the PC, had a Taiwanese maker assemble the PC using components procured in Japan, Singapore, and Taiwan. The new PC was over 30% less expensive than Compaq's comparable model.<sup>19</sup>

Mitsui & Co. moved into the low-end desktop PC market, releasing five DOS/V models under its own "PCiN" brand. The lowest-priced model, produced on consignment by a Taiwan manufacturer, featured an Intel 25MHz "i486SX" microprocessor and was priced at 138,000 yen (\$1,122), 60,000 yen (\$488) less than a comparable Compaq model which used the same processor. Sales were being handled through its wholly-owned subsidiary, Mitsui Bussan Digital. Mitsui was aiming for first-year sales of 1 billion yen (\$8.1 mil). Mitsui's aggressive pricing was likely to push Japan's PC industry closer to a price war comparable to that being waged in the U.S.<sup>20</sup>

The rapid introduction of new low priced PCs was putting additional pressure on suppliers of components. Negotiations on microprocessors were expected to see price cut by early 1993. U.S. chip makers and Japanese PC manufacturers were about to reach an agreement to lower prices of microprocessors to be shipped during the first quarter of 1993 by about 20%. Competition between U.S. chip makers was intensifying, and with the introduction of low-priced PC models into the Japanese market by Compaq and IBM Japan, Japanese PC makers felt they were unable to avoid a price war, so they had been seeking lower microprocessor prices. The price of a 32bit 20MHz "80386" chip in large lots was likely to settle around 5,000 yen (\$40.32), 1,800 yen (\$14.51) lower than the previous period.<sup>21</sup> In response to the new price levels in Japan, Dell Computer cut the prices on all of its computers. The new prices announced for December are shown in Exhibit 17.

### **The Market's Response**

Pfeiffer believed that IBM compatible computers were going to become the standard in Japan. He didn't believe that even NEC could stop the trend. Meiji Seimei, a large Japanese life insurance company, announced its standardization on DOS/V and purchased 80 Compaq computers. The company planned to convert its operations to DOS/V based

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<sup>18</sup>10/20/92: Nihon Kogyo [p.5]

<sup>19</sup>11/11/92: Nihon Kogyo [p.5].

<sup>20</sup>11/7/92: Nihon Keizai [p.1]

<sup>21</sup>11/11/92: Nihon Keizai [p.25]

machines, requiring 5,000 PCs over the next two years. Asahi Beer Company was also studying DOS/V as a standard for the company. He felt that there was a large potential market for IBM compatible computers, and was planning to sell them on an OEM basis to Japanese makers.

**EXHIBIT 17: DELL COMPUTER PRICE REDUCTIONS**

<b>Model (6/92)</b>	<b>CPU/Clock Speed</b>	<b>Memory/HDD</b>	<b>Monitor</b>	<b>Price</b>
DELL 486P/25	i486SX/25MHz	4/120	SVGA 14"	\$1999
DELL 486P/33	i486DX/33MHz	4/170	SVGA 14"	\$2299
DELL 486D/50	i486DX2/50MHz	8/230	UltraScan 15"	\$3249
<b>Model (12/92)</b>	<b>CPU/Clock Speed</b>	<b>Memory/HDD</b>	<b>Monitor</b>	<b>Price</b>
DELL 425s/L	i486SX/25MHz	4/120	VGA 14"	\$1,599
DELL 433s/L	i486SX/33MHz	4/170	SVGA 14"	\$1,999
DELL 450/L	i486DX2/50MHz	8/170	UltraScan 14"	\$2,449
DELL 466/L	i486DX2/66MHz	4/230	UltraScan 14"	\$2,949

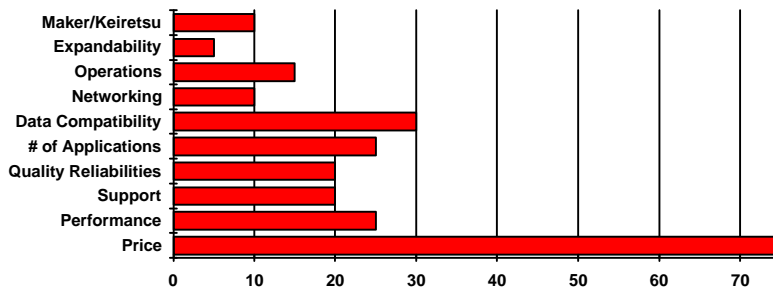
On November 18, *Nikkei* announced its results of a survey of several computer shops to see the impact of the growing price competition. IBM "PS/V Series" PCs were being sold 10-15% under their manufacturers' suggested retail prices at some Akihabara stores in Tokyo (Tokyo electronics district), while Compaq units were hardly discounted. But retail stores in other areas of Tokyo had cut Compaq PC prices by 10% or so. Although hardware makers claimed that they could not keep up with orders, retailers in Tokyo were saying sales of low-priced PCs were not as great as they originally expected. The Camera Discount Shop in Tokyo's Shinjuku shopping district had not sold a single Compaq PC yet. Laox, the largest computer shop in Akihabara, said, "Users are now becoming very conservative and spending more time on product selection," but sales had been slow. But according to IBM Japan, "We are making good progress on shipments and it looks like we will have a shortage of inventory." According to Compaq, "Orders are coming in beyond our expectations."

The November 23 issue of *ComputerWorld* raised question as to whether or not the low priced IBM compatible computers would be accepted in the Japanese market. It pointed out a number of problems that these computers had to overcome. It was believed that the quality and after service of these computers were not sufficient to meet the needs of the market. As NEC had pointed out, DOS/V computers did not have sufficient software applications. Japanese were also concerned that foreign suppliers could withdraw from the Japanese market and abandon their customers if the market did not develop. Finally, it was argued that Japanese firms required high product reliability and perfect product support for success to occur. It also reported the results of a survey taken during the end of October of 100 major Japanese corporations. Of the 32 firms that responded, 75 percent noted that price would be the primary determinant when installing large numbers of computers. There were also a majority, 72 percent, that were willing to consider the purchase of Compaq computers. The survey results are shown below in Exhibit 18.

In assessing the potential for client-server and LAN (local area network) growth in Japan, Dataquest reported its survey of 453 Japanese companies' level of interest in LAN installations (Exhibit 19). While only seven percent had established networks and three

percent had trial applications, 16 percent reported LAN applications under development. Another 33 percent were studying LAN possibilities, 22 percent were beginning to conduct some research about LAN applications, and seven percent expressed an interest in developing LAN installations. Only 12 percent of the respondents said that they had no interest in LAN applications to their business. Of course, LAN applications would require a client/server computer at the center of the applications with a large number of low-cost computers linked into the network. This was a market that Compaq felt had the greatest potential for growth in Japan. The question was whether or not Japanese firms would consider Compaq when making such decisions. A survey of 32 large corporations suggested that Compaq had a chance to make the sale as shown below:

**EXHIBIT 18: MAJOR DETERMINANTS FOR MASS PC SALES**



**EXHIBIT 19: INTENTIONS TO PURCHASE COMPAQ Pcs?**

