SMALL
COMPUTER
SYSTEMS

File: Companies
C-906-609.1
Date: December 18, 1987

Title: **Tandem's Next Major Focus: DSM**

Summary: **With the announcement of DSM, Tandem has made a major commitment to system and network management.**

Key Issue: Can a midrange system vendor provide large network management capabilities?

Tandem Scenarios for Intersystem Network Management

Enabling Tandem networks to be managed from an IBM network (NetView interface)

Managing Tandem's own homogeneous distributed networks (home-grown solutions from DSM)

Managing heterogeneous networks from DSM (via third party solutions)

Distributed systems management (DSM) is one of those illusive targets to which vendors aspire, but few have achieved. Tandem Computers is engaged in an ambitious project of creating a DSM architecture and announced last September the first in a series of products (see accompanying note P-906-608) designed to position Tandem as a leader in distributed and departmental systems.

Tandem has much to gain from such a major investment: 1) current Tandem networks in typical large accounts average only five to seven systems, but have the potential to grow into thousands of terminals distributed among many dozens of remote system sites; 2) fault-tolerance has only limited applicability where applications and user operations are concerned and does not provide the facilities and tools for corrective operational procedures, configuration management and capacity planning; 3) as a major midrange systems aspirant, Tandem must battle Digital Equipment Corp.'s influence and image in distributed systems; and 4) systems and network management is strategically important in locking in user accounts with a single vendor. If it succeeds with DSM, Tandem's existing strong OLTP position could place DEC on the defensive (and perhaps slow DEC's progress in the financial sector).

Tandem and DEC both espouse similar philosophies of distributed systems -- the network as the system -- especially from the perspective of the user's need to access global resources. But we believe that Tandem is currently taking the concept farther and faster than DEC. DEC's network management capability has thus far failed to address wide-area fully instrumented systems, whereas Tandem is attempting to build a comprehensive distributed systems architecture, with local or remote control, peer or hierarchical, across wide-area networking.

The Tandem framework is based on three major components: 1) systems management; 2) network management; and 3) remote management. Within this model, Tandem is focusing on a number of key requirements,

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which, with the exception of IBM, have not been suitably addressed by most major vendors (see Figure I).

Figure I

Requirements of Distributed Systems Management

- all hardware and systems software instrumented
- passive and proactive network management
- applications instrumented
- central and local control
- peer or hierarchical
- automated operations
- distributed naming service
- relational database technology
- configuration management
- capacity management and planning
- security
- IBM NetView coexistence

In high-volume transaction processing environments, all components of the system must be instrumented (i.e., accept commands and report information). Tandem intends this to mean not only CPU and peripherals, but operating system, transaction monitor, network, modems and even the applications. An application, for example, would alert a console monitor if cash were low in an ATM (automatic teller machine). Both a status (passive) and proactive approach to network management has been adopted. In the former, the operator is forced into reacting to events while the latter is patterned closer to an early warning system. Programmatic control is vested in operations management and modeled along preventive measures as opposed to reactive ones.

Another important objective is to improve the productivity of the operators and place more recovery function into the network management system itself. The automated operations feature relieves the local operators of restart procedures in the event of downed connections. Programs automatically initiate new attempts and, if non-recoverable, can feed information to problem management. The Distributed Naming Service of DMS maps the physical components and connections into functional names and relationships and stores them in a database. Tandem will eventually utilize its relational technology in storing subsystem relationships independent of the applications so that changes are easily incorporated without affecting programs.

Tandem has also given careful thought to devising a coexistence strategy with IBM networks. With one of the best arrays of SNA connectivity products in the industry, Tandem will play in IBM SNA networks as an SNA NetView Management Services point (a la NetView/PC), or as the system manager for its own network which includes SNA devices.

With the architectural foundation in place, Tandem now should have its future development targets positioned well. It will still take Tandem several more years before all of the pieces are in place, including configuration management and capacity planning. But we believe Tandem has grasped the key issues and proceeded to erect a sound model. Systems management will be a major differentiator among midrange vendors in the distributed processing market and Tandem has now added another reason (beyond its system reliability) to be considered as a peer with DEC and IBM.

SMALL COMPUTER SYSTEMS

File: Products
P-906-608.1
Date: December 18, 1987

Title: **Tandem's Network Management Architecture**

Summary: **DSM provides a well-thought-out framework for large-system management and broadens Tandem's credentials as an upcoming major contender for distributed systems.**

Key Issue: How will midrange vendors differentiate themselves as hardware increasingly becomes a commodity?

Figure I

Architectural Building Blocks of DSM

EMS (Event Management Service): collects and distributes event information from instrumented subsystems throughout a network.

SPI (Subsystem Programmatic Interface): a Tandem developed standard for messages and protocols used in the exchange of event information among subsystems and applications.

Viewpoint: operations console facility with a window into the entire network for single point of control.

DNS (Distributed Name Service): database and cross-reference of the network's inventory of all components for use in automated operations.

Measure: collects system performance data.

NSS (Network Statistics System): collects and displays system and network statistics.

Tandem Advanced Command Language (TACL): provides high-level command language services

Viewsys: resource monitoring.

Tandem Computers has transformed and enhanced its current network management environment from a loose confederation of utilities into a full-scale network system architecture. The company decided that nothing short of a major development and foray into network management was required to outdistance its competition (primarily IBM) in transaction processing. One might question such an ambitious project worthy of a $50-billion giant like IBM but perhaps somewhat dubious for a vendor one-fiftieth in size. First, Tandem is in the very grown-up game of large transaction processing systems. Second, it wants to encourage expansion of its existing networks, in which it anticipates further growth. Third, the chief differentiation among midrange suppliers in the 1990s will be in added value, such as the network, not in commodity hardware.

However, Tandem was stuck with nearly 40 utilities (line-oriented command interpreters) which taxed the expertise and coordination of a large staff of operations, systems, maintenance and network managers in large accounts. The proliferation of tools was becoming an increasing burden to manage large networks and we believe users were pressuring Tandem for improved productivity. We also believe that Tandem may have become increasingly edgy about IBM's growing influence through Stratus and the enhanced NetView management package.

The basic building blocks (see Figure I) of Tandem's Distributed Systems Management (DSM) could serve as a requirements model for most distributed systems environments: 1) support of automated operations for unattended nodes and relief of repetitive tasks; 2) filtering large amounts of status/event information through subsets, aggregates and selective priorities; 3) operator or program access to subsystem and components without knowledge of locations, attributes and relationships; 4) expert system shells to unburden the operators; 5) painless start and restart of complex networks after reconfigurations or failed components;

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6) single point of control for multiple subsystems; 7) programmatic interface between applications and subsystems to provide users choices over which functions to automate; and 8) integration into heterogeneous network environments (e.g., Systems Network Architecture, DECnet, local-area networks).

Many of these functions are variously implemented under such DSM components as: Event Management Service, Viewpoint, Distributed Name Service, Measure, Network Statistics System and Subsystem Programmatic Interface. Interestingly, most of these capabilities are enhancements to the Guardian Operating System, which was previously enhanced for high-performance transaction processing for NonStop SQL. These net management capabilities push Guardian into the forefront as arguably the richest operating system in the middle tier.

Figure II

Packaging and Pricing

Operations Management Package

1. Viewpoint
2. DNS
3. Measure
4. NSS
5. Viewsys

VLX/ NSII/ TXP	Initial License Fee	Monthly License Paid Up
$3,200	$320	$17,920
EXT/CLX		
$1,600	$160	$ 7,360

We would not contend that Tandem has perfected the network and systems management problem. There is still plenty of development effort, which we believe Tandem recognizes, and intends to deliver over the next five years. For example, Tandem must address the presentation of network-wide information via graphics workstations and pull in data from heterogeneous networks as well as mixed data and voice environments. In all probability, advanced user interfaces using object-oriented, multiple-window displays will play a key role. Additional requirements will center on extensive use of relational database management with application interfaces to configuration, problem history and security profile data. And Tandem has yet to get its arms around such areas as configuration management, directory management, performance tuning and capacity planning.

Nevertheless, we recommend that users perceive Tandem's efforts as a significant forward step. The framework has been established, building blocks are in place, programmatic interfaces have been developed. Moreover, the user can experiment with several different organizational scenarios based on either a distributed or highly centralized management philosophy. Tandem will need to disseminate these products to large end users with an effective technical education program and rely on its key third-party applications developers in the Alliance program to build DSM-based applications. Short of dropping the ball, Tandem should be able to exploit DSM in solidifying its large account position and bringing the company further recognition as a top midrange vendor by the end of the decade.

Erasables Catch Japan's Optical Disk Mkt. Eye

By MINORU INABA

TOKYO (FNS)—A number of Japanese companies will soon enter the emerging market for optical storage devices, following the lead of Matsushita and International Business Machines Corp., but their emphasis appears to be primarily on erasable systems.

In fact, Sony Corp. has shelved a plan to sample a 5.25-inch write-once (W-O) optical system and, instead, will begin to supply a 5.25-inch magneto-optical (M-O) erasable system in sample quantities by the year's end.

Production quantities of Sony's erasable system, with a data capacity of 650 Mbytes, average access time of less than 100 milliseconds (ms) and data transfer rate of 400 kbps, is scheduled to begin shipping by next spring.

"You can't use a computer memory which isn't erasable," said Takao Ihashi, deputy general manager of Sony's optical disk drive division. He said 80 percent, or possibly 90 percent, of demands for optical storage devices would be for erasable systems.

All local sources contacted by MIS Week shared the Sony executive's view.

Matsushita, which supplies 5.25-inch write-once systems to IBM, also has a plan to market a 5.25-inch erasable system based on the same phase-change technology "sometime next year," according to Yasuhiro Sugihara, group manager of the company's central research laboratories.

ISO Lends a Hand

The technical specifications of Matsushita's and all local manufacturers' disks, for that matter, would be similar to Sony's because the Japanese are working closely with the International Standards Organization (ISO) on the standardization of write-once systems and on erasable systems next year.

Unlike Sony, however, Matsushita opted to use Stanford R. Ovshinsky's phase-change patents for its erasable system. Sugihara explained that it was planning to use the same technology for all of its write-once, erasable and read-only memory (ROM) optical disks to maintain some media compatibility.

Computer mainframe vendors, however, said it would take them a year or two more to introduce erasable optical storage.

Minoru Fujino, general manager of Fujitsu's file device division, said an erasable mainframe system was being researched, but the introduction "won't be (as early as) next year."

He said two to three years would be necessary because the optical devices would be too slow in data transfer and access time to be computer storage devices. "Probably more importantly," said the Fujitsu official, "computer folks are all so conservative that they don't trust anything without proven performance."

The 5.25-inch erasable systems under consideration were generally rated as having a corrected bit error rate that is less than 10 to the negative 12th power, and considered good enough to handle a computer's data code, said Yoshikazu Ichiyama, manager of NEC's peripherals engineering department.

However, he added, before optical storage devices could overtake faster magnetic storage devices, the heavy optical read-write head would have to be further miniaturized and made into a single large scale integrated chip.

High-Tech Paves the Way

He noted recent key technological advancements that bode well for the future of optical storage, including the increase in laser power from 15 to 30 milliwats (mw), from 0.83 micron to 0.68 micron in laser beam size, the development of a four-laser array for fast parallel read and, most importantly, a price decrease from $679 a laser unit to less than $135 a unit.

Matsushita's Sugihara said its erasable optical system would have 40 mw of laser output, 60 to 80 ms of seek time and 300 Mbytes of data capacity, based on possible ISO standards.

Erasable drives will not be much more expensive than write-once drives which, in Matsushita's case, list at $2,600 for a built-in model and $2,950 for a stand-alone model, Sugihara said. A W-O disk lists for $65 while an erasable disk was expected to be priced at $100.

Sony's erasable drive would have a list of about $3,000, targeted at such applications as desktop publishing, workstations and high-end microcomputers including IBM PCs, Ihashi said.

NEC's first 5.25-inch M-O erasable system would be sampled at about $6,792.

Low-end erasable systems, running a 3.5-inch M-O disk with 50 to 100 Mbytes per side of capacity, would sell for $1,358 for hookup with the PC 9800 family, Ichiyama said. No other companies had any plans to market 3.5-inch optical systems.

Potentials Are Unclear

Local industry sources contacted acknowledged that they did not have a clear vision about all of optical memory's applications and, therefore, about their ideal capacity. Nevertheless, all sources other than Matsushita said IBM's 200-Mbyte 5.25-inch disk was too small a capacity and that 230-ms access time was too slow.

Matsushita's Sugihara retorted by saying 200 Mbytes was as great as the size of an entire minicomputer software program and the 2.5-mbps data transfer rate was compatible with the transfer speed of 8086-based microcomputers.

He acknowledged that, as microcomputers were based on faster engines such as the 80286 and 80386, Matsushita's erasable drives would also be made faster.

However, the Matsushita official did not say that its write-once optical memory marketed since May was selling well. Software support still was needed for the write-once systems, he noted.

Neither does Fujitsu, which is planning to market by the year's end a $6,793 write-once system, including a controller, have an ambitious marketing plan.

Fujitsu's Fujino said the system, with its 300-Mbyte double-sided disks, would be targeted at users of the company's locally marketed 9450 microcomputer.

NEC at Head of Pack

NEC was said to be a leader in the existing market for 12-inch optical filing devices. NEC's Ichiyama said it had sold 2,500 spindles of its filing system, including 1,000 to U.S. law enforcement agencies for fingerprint filing systems, since November 1984.

Saying local competitors Fujitsu and Hitachi have sold probably only half as many 12-inch systems as NEC, Ichiyama said sales of optical filing systems had been unexpectedly poor.

"The market will have a fair size only in 1989," Sony's Ihashi said. He said optical storage was a "mass memory with removability" and would begin by taking over some of today's magnetic back-up memory functions.

Matsushita's Sugihara echoed the Sony executive's observation, saying optical disks would become attractive only when they are offered in write-once, erasable and ROM forms.

He said CD-ROM was having difficulty taking off because it was offered only in a read-only form.

Largest Decision36 Network Set Up In Trump's Castle, Atlantic City

By DIANE BERNARD

HORSHAM, Pa.—Decision Data Computer Corp. here announced that Trump's Castle Hotel and Casino in Atlantic City, N.J., has installed four Decision36 Systems, the largest installation of its new multi-processor computer system to date.

Jim Tennyson, Trump's director of management information services, said the new systems would be used in the MIS department for basic operations such as word processing, spreadsheets, coupled applications with microcomputer software and microlevel training.

In the accounting department, Tennyson said, the Decision36 will be used for standard multiuser bookkeeping operations. In the transportation department, they will be used to schedule maintenance for the casino's fleet of buses, limosines, helicopters and airplanes.

"We wanted a plug-and-play multi-user system that would not take a lot of time to set up," Tennyson said. "We looked into AT&T StarLAN and at the IBM Token Ring and found them to be too cumbersome—too much time involved in setup and detailing—and, in terms of total systems cost, too expensive."

"So far, it is working very, very well," Tennyson said. "But even if the operation grows much faster than we have planned for, the system is quickly expandable to meet the need. We could add five times the number of operators we now have and easily take care of it within the context of the system by just adding the required number of terminals."

Uniform Tracking

The most extensive application of the system at the Atlantic City facility will be in the wardrobe management department, which will use a dBase II application to keep track of uniforms for all employees, said Bob Entreken, the department's director, who wrote the application.

"It's a difficult chore to keep track of all the clothing assigned to all of the bellmen, desk personnel, dealers, maintenance, security, maids, showroom staff, cocktail servers, etc.," Entreken said. "It's a million-dollar inventory database function containing 120,000 individual garments and 4,000 people doing 180 different jobs at the casino, with three shift changes daily."

Entreken said that in the past, Trump's used a manual system for uniform inventory control,

Bob Entreken, director of wardrobe management, wrote the application to handle the "difficult chore" of managing the "million-dollar inventory database."

"but it didn't work. In the end, everything got filed in the corridors. Now we have multiple operators keeping track of the inventory and garment assignments on a real-time, 24-hour basis," he said.

The multi-user Decision36 system is source-code compatible with IBM System/36-developed RPGII applications and MS-DOS applications written for compatibility with the IBM PC.

"The Decision36 provides the opportunity to integrate powerful programs such as those written for IBM's System/34 and /36 minicomputers, while preserving the investments end-user companies have made in PC-level software procedures and training," said Allan Stanko, Decision Data's director of systems marketing and sales.

'Unique Solution'

Stanko said that the system was not a clone of either IBM's System/36 or the PC, rather a "unique solution which overcomes the limitations of the IBM S/36 and the confusion, disappointments and excessive lifecycle costs users discover when attempting to link existing PCs into businesslike systems."

The architecture of the Decision36 features parallel high-speed applications processors—one processor dedicated to each terminal in the system—linked to a high-speed control processor for access to all system resources such as disk storage, printers and tape backup.

Each dedicated terminal processor provides the user with up to 640 Kbytes of memory and internal disk storage options that will range up to 600 Mbytes. Terminals and printers are ASCII, IBM 5250-class or a combination.

The system is marketed in various configurations, with expansion options that permit uninterrupted migration from two to 16 users initially, and with a capability for futher expansion as additional components of the system are released.

Decision Data is the operating unit of Decision Industries Corp. It has a nationwide network of 120 service locations with more then 500 field engineers.

iNet Installs Tandem VLX

CUPERTINO, Calif.—Tandem Computers Inc. said iNet Company of America, Chantilly, Va., had installed a Tandem NonStop VLX system, valued at $1.4 million, to support its new INET service offering in the U.S. market.

A.L. Syberg, vice president, marketing, of iNet, said the new information management service, based on the Tandem VLX system, provided on-line information services, data conferencing, electronic mail, notice boards and an electronic workspace for editing, storing and sending files to geographically dispersed offices.

The INET service for the United States was developed jointly by Bell Canada and Bell Northern Research. The iNet 2000 Service has been commercially available in Canada since 1985 and has been operating on high-end Tandem systems since the product's inception. Envoy 100, one feature of iNet 2000, is Canada's largest public electronic mail system, with more than 70,000 users.

LEVEL 1 - 1 OF 4 STORIES

December 1, 1987, Tuesday

DISTRIBUTION: Business Editors

LENGTH: 458 words

HEADLINE: GOLDN-GATE-UNIVERSITY; Top executives come together to plot a course for America's high-tech future

DATELINE: SAN FRANCISCO

BODY:

Top-level executives from America's leading high technology firms will convene in Silicon Valley this March to tackle a question of growing importance to the future of the U.S. economy: how to combat the erosion of American market share for high-tech products in the face of intense international competition.

They will be the speakers at a one-day conference on March 18 entitled ''Silicon Valley in Global Competition: In Search of New Strategies for the 1990s.''

The conference, sponsored jointly by the American Electronics Association, the Semiconductor Industry Association, the Semiconductor Equipment and Materials Institute and Golden Gate University's High Technology MBA program, will explore industry-wide strategies to reverse the trends that have converted the United States from a net exporter to net importer of high technology in only a few years time.

Speakers and tentative topics include: Ray AbuZayyad, president, ROLM Corp., ''Strategic Planning -- A Practical Necessity''; Richard Alberding, executive vice president, Hewlett-Packard, ''Global Competition -- The New Reality''; Gary Anderson, director of business intelligence, SRI International, ''Surviving in the Global Market: Intelligence -- Don't Leave Home Without It''.

Other tentative topics and speakers are: Jack Chapman, vice president, international sales, Tandem Computers, ''Marketing in a Competitive and Culturally Diverse Environment''; Stephen Cohen, professor, University of California at Berkeley and co-director, Berkeley Roundtable on International Economy, ''Manufacturing Here or Overseas?''

They also include: Honorable Paul Freedenberg, under secretary, U.S. Department of Commerce, ''Is There a Future in U.S. High Technology Exports?''; Lewis Griggs, president, Copeland-Griggs Productions, ''Cultural Differences -- Fact or Fiction?''; Gerlof Homan, professor and director, high technology MBA program, Golden Gate University, ''The Global Manager: A New Frontier in Management?''

Other possible speakers and topics are: William Miller, chief executive officer, SRI International, ''Innovation and Competitiveness''; George Scalise, chief executive officer, Maxtor Corp., ''Business and Trade Negotiations in the 1990s''; and Ralph Thompson, senior vice president, American Electronics Association, ''New Approaches to the Global Challenge.''

The conference will be held at the Doubletree Hotel at the Santa Clara Trade and Convention Center, March 18, 1988. Further information is available from Golden Gate University's Center for Professional Development at 415/442-7248.

CONTACT: Golden Gate University, San Francisco
Jack Coyle, 415/442-7248

December 13, 1987, Sunday, Late City Final Edition

SECTION: Section 3; Page 1, Column 1; Financial Desk

LENGTH: 648 words

HEADLINE: PROSPECTS

BYLINE: By LAWRENCE M. FISHER

BODY:

Marketers on the Move

Some investors moved their savings from brokerage firms to banks in the wake of the market collapse. Now, with the layoffs on Wall Street, some marketing executives at investment firms may follow the money.

''Investment firms are trimming everywhere,'' said Colin A. Hanna, president of The Cheshire Group, a recruiter based in West Chester, Pa. ''Unless this is a blip, there will be reductions in marketing forces.''

At the same time, he says, most commercial banks have been adopting a more market-driven focus, ''so it's a safe assumption there will be some increase in banks' marketing staffs. Some of that talent will come from the brokerage companies.''

Why are investment firm marketers an especially good catch for banks? According to Mr. Hanna, they generally begin with marketing knowledge, then learn about investments. Bank marketers, on the other hand, often start with banking knowledge, then learn marketing. ''The best investment firms are involved in what is intrinsically a more marketing-oriented business,'' he said. ''At the average bank, marketing is not seen as the engine that pulls the train.''

Home Improvements

High home prices are pushing down housing starts and may cause sales of existing homes to dip next year. But the home improvement industry is expected to see strong growth.

The nation's homeowners spent $93.1 billion last year on improvements, compared with $80.3 billion in 1985, and are expected to spend $98 billion this year, says Stephen E. Grant, an analyst at Value Line Inc.

Rising home prices help the business in two ways, Mr. Grant said. Buyers priced out of the new home market tend to remodel their present houses, and the new houses tend to be larger and more luxurious, which means more fancy fixtures and cabinetry. Next year, he predicts, the home-improvement industry will take in about $104 billion.

A Broader Bonus Season

December is still bonus time at many companies. But increasingly, employers are deferring the check until Jan. 1 or offering compensation in the form of non-cash perquisites.

''From a tax point of view, it never made sense to pay bonuses in late December,'' said Thomas A. Alto, a tax partner in the Long Island offices of accounting firm Ernst & Whinney. ''It especially doesn't in 1987.'' The new tax code means that a bonus paid in December, 1987 will be taxed at a maximum 37.5 percent rate. The same bonus, paid on Jan. 1, 1988, will be taxed a maximum of 28 percent.

Non-cash bonuses, such as free memberships in health clubs, are getting popular, too, though employees must pay tax on what such perks are worth. The psychological impact may not be as great as a chunk of yearend cash, Mr. Alto said, but ''if presented in the right light, alternate compensation can be very popular.''

Clipping Paper Costs

Paperwork costs American businesses more than $100 billion a year, says Margaret Magnus, editor of Personnel Journal. A recent study conducted by the journal found that for every dollar that companies spend to print forms, they spend $20 to $80 to process, copy, distribute and destroy them.

The report gives some familiar prescriptions for reducing paperwork, such as eliminating unnecessary memos. But Ms. Magnus says the meaningful reductions will come from new technologies - electronic bulletin boards, voice mail and video conferencing. Communication via these paperless memos ''crops up without planning, because the technology is there,'' Ms. Magnus said. ''That's more of an evolution than for a CEO to say, 'Let's cut paperwork.''

Not by any coincidence, computer companies are leading the way in cutting paper costs. At Tandem Computers Inc.'s Watsonville, Calif., board-assembly plant, bar-code readers and computer terminals have reduced from 10 to 1 the number of paper transactions used to track and route the boards.

GRAPHIC: Drawing

SUBJECT: Terms not available

The New York Times

December 13, 1987, Sunday, Late City Final Edition

SECTION: Section 11WC; Page 6, Column 4; Westchester Weekly Desk

LENGTH: 921 words

HEADLINE: NEW LIBRARY SYSTEM FETED

BYLINE: By ROBERTA HERSHENSON

BODY:

CONGRATULATIONS were offered last weekend to the Westchester Library System, and in particular to its director, Maurice J. Freedman, for the completion of plans for a centralized, automated circulation-control system that is expected to upgrade services at public libraries countywide.

To fete the new system, which has been in planning for five-and-a-half years, a champagne reception was held at the Rye Free Reading Room. The hosts of the event were Utlas International of Overland, Kan., designers of the system, and Tandem Computers Inc. of Cupertino, Calif., suppliers of the hardware.

A special cause for celebration was the participation of 37 of the 38 member libraries in what some have called the biggest joint community effort ever undertaken in the county. The White Plains Public Library, the only member library not taking part in the project, belongs to a separate computerized system. Mr. Freedman promised to ''find ways to work with White Plains.''

A total of $2 million was raised by individual libraries in separate efforts to purchase their own terminals and shares in the new system's operations, at $11,000 a ''terminal share,'' according to the director. Contracts were signed for the purchase of 165 terminals in numbers varying from one for the Briarcliff Manor Public Library to 21 for the three branches of the Yonkers Public Library.

''No one believed this could be done,'' said Mr. Freedman, a specialist in library and information technology who was hired in 1982 specifically to bring about the automation of the county's public library circulation and cataloguing systems. In 1981, Mr. Freedman received the Library and Information Technology Association Award, given by a division of the American Library Association.

The director said that during the last five years he had gone ''from door to door'' to persuade each community of the importance of an automated countywide system and to encourage individual library and village boards to finance the project. ''There was contention over local funds - why should money go to the library?'' Mr. Freedman said. ''We had to convince everyone that mechanization was desperately needed.''

The resulting system, which Mr. Freedman called ''the biggest cooperative library automation project in New York State,'' will make obsolete equipment that he said in some libraries was ''literally falling apart.''

Thirty-two libraries will be connected to a central computer facility at the Library System headquarters in Elmsford by next April; the remaining five

libraries will be connected by April 1989. Eventually the system will give librarians immediate access to an on-line data base of updated information about every title held by each library - a total of more than four million books, pamphlets, magazines and records.

The system will show not only which libraries own which titles - information that Westcat, the microfiche catalogue, now provides for books only - but also how many copies of a book are owned and whether the volumes are on or off the shelves. If a requested title is not available, it can be reserved automatically and the borrower will be notified automatically when it has come in.

In most libraries, initially, only reference librarians will have direct access to the computerized information, but Mr. Freedman said he expected public terminals to be installed as more funds become available. The Scarsdale and Greenburgh libraries each will have a terminal for public use.

The new system ''is going to be wonderful,'' said Patricia Anderson, director of the New Rochelle Public Library, who added that the project represented ''a massive coming together of dollars, time and energies.'' Ms. Anderson emphasized that librarians in New Rochelle ''will have much greater control over our own inventory of 180,000 volumes.'' adding: ''Right now it is an intense and laborious process to find out who took a book out and when it is due.''

Ms. Anderson added that at any given time, 10 to 15 percent of New Rochelle's titles were overdue, usually because of ''simple forgetfulness.'' In the new system, overdue notices will be sent out automatically and up-to-the-minute information about delinquent borrowers will be provided to all public libraries in the county. This change, though welcome to librarians, may not be so popular with the public, Ms. Anderson conceded.

''In an automated system, you're an automatic delinquent,'' Mr. Freedman said. ''And once you settle up, you're automatically not a delinquent anymore.''

The Westchester Library System plans to rebuild its present offices, incorporating ''special environmental conditions'' to accommodate three full-time computer operators who will keep the service going seven days a week, the director said.

The Juhl Advertising Agency in Valhalla will conduct a pro-bono campaign on behalf of the Library System to teach the public about the changes in library service that will take place. One change will be a new library card for everyone, ''with a bar code on it like a can of juice in the supermarket,'' Mr. Freedman said.

Tandem computers are ''especially wonderful for their tremendous ability to deal with high-transaction processing,'' he pointed out. ''We don't want people lined up at terminals at 4 P.M. or other peak-load processing times because the computer has slowed down.''

''Libraries will be linking up to impressive state-of-the-art computers and the operators to run them,'' he added. ''They're getting a lot for their money.''

GRAPHIC: Photo of Maurice J. Freedman, director of the Westchester Library System (NYT/Roberta Hershenson)

LEVEL 1 - 1 OF 1 STORY

December 10, 1987, Thursday

DISTRIBUTION: Business Editors and Technical Writers

LENGTH: 408 words

HEADLINE: ULTIMATE/CPA-DATA; (ULT) The Ultimate Corp. acquires CPA Data Systems

DATELINE: EAST HANOVER, N.J.

BODY:

The Ultimate Corp. (NYSE:ULT) announced Thursday the acquisition of CPA Data Systems Inc., formerly a Canadian dealer for Ultimate.

CPA, which will be known as Ultimate Canada Inc., has a head office in Waterloo, and other offices in Toronto and London, Ontario, as well as Winnipeg, Manitoba. The purchase price of the acquisition was not disclosed.

CPA, founded in 1975, has been an Ultimate dealer since 1979. CPA has approximately 125 sales, support, and software development staff serving a customer base spanning from Nova Scotia to British Columbia. CPA concentrates its efforts on turnkey computer systems for manufacturing, distribution, agribusiness, automobile clubs, general insurance and trucking businesses.

CPA President Al Price and Vice President Grant Roberts will continue in such capacities with Ultimate Canada Inc.

Theodore M. Sabarese, president of Ultimate, commented, ''CPA's reach in Canada is important to our strategic efforts since having a stronger presence outside the United States is very important to us. The company has had a long history of success as an Ultimate dealer. Operating as a wholly owned subsidiary, we expect it to achieve even greater growth.''

The Ultimate Corp. provides information management solutions to businesses of all sizes by integrating the Ultimate Operating System, an enhanced version of the Pick operating system, with computer hardware from Honeywell Bull Inc., Digital Equipment Corp., IBM and Tandem Computers.

The Ultimate Operating System is characterized by a unique sustems architecture that integrates fourth generation language capabilities with a relational data base. Ultimate's products are distributed through a worldwide network of dealers who add applications software.

In addition to its domestic operations headquartered in East Hanover, Ultimate has subsidiary operations in the United Kingdom, France, Spain, Italy, Australia, New Zealand and Hong Kong.

The Ultimate Corp. was founded in 1978, and the company went public in 1981. Its stock is traded on the New York Stock Exchange under the ticker symbol ''ULT.''

For more information about CPA Data Systems, contact Al Price, president, at 519/885-4546, or write the company at 40 Bathurst Drive, Waterloo, Ontario, Canada N2V 1V6.

CONTACT: The Ultimate Corp., East Hanover
Michael Jorgensen, 201/887-9222, Ext. 262

LEVEL 1 - 4 OF 6 STORIES

December, 1987

SECTION: WORLDWATCH; Pg. 118

LENGTH: 942 words

HEADLINE: Is Government Singular or Plural? (Plural, If Export Is Your Game.)

BYLINE: By Laina Farhat

BODY:

In all the languages of man, the names for things both reflect how we see them and how they affect our perceptions of reality. Eskimos have many different words for snow, each describing a type and texture that in English would require a phrase. The Arab Bedouin has as many words for sand as the Eskimo has for snow; sand is his life-or-death environment. English, however, (both the British and American varieties) is the language of a culture that has long outgrown basic life-and-death matters; our language is expressive, rich, and . . . fuzzy. Which brings us to the point: American English makes singular nouns of institutions that are really very plural, very multiple, and not unified at all. As a result of the linguistic form, we tend to see very multiple entities as singular: THE government, THE people, THE military-industrial complex. Such language is deluding us. Anyone who believes that our government speaks with one voice is ready for some nice swampland I have for sale.

Let us take the issue of trade -- friendly trade -- and listen to the words of THE government. The government (Commerce Department) promotes trade: "Go forth and be fruitful, multiply, and trade -- and the light of Commerce shall smile upon thee." But then, the government (this time, DOD) says: "Thou shalt not trade with companies that smile upon thine enemy." The government (congressman from a district with trade-dependent industry) says: "Jobs, son -- we're talking about bread and butter here!" And the government (intelligence community) says: "Thine enemy is acquiring thy military technology by theft and by hoist! Trade not." Which of these Governments is your government?

Nor is Industry any longer a singular noun. We cannot even qualify it by saying American industry. Industry has become multinational, global, and of a size and complexity that makes monitoring or controlling close to impossible. Try tracing the connections of AT&T, for example, and you will find joint ventures with Toshiba, Olivetti, Phillips, Matsushita, Sharp, JVC and Sony. AT&T is involved with Japan's NTT, and NTT is involved with IBM, which has linkages to Nissan Motors and Mitsubishi. Somewhere hidden at the base of this network of bedfellows is C. Itoh, which apparently orchestrated the Toshiba-Kongsberg illicit transfer of submarine technology to the Soviets. How does THE government put the squeeze on a wrist this size -- while simultaneously fighting off THE government's other branches?

In an article called "Shoot-Out at Tech Gap" (Time, Oct. 12, 1987), an interesting struggle between Commerce and the Pentagon was charted. Commerce approved sale of a $ 3 million order for an IBM mainframme computer system to a West German company, Transnautic. The Pentagon had fought the sale on the

grounds that 51 percent of Transnautic is owned by the Soviet Union. The deadlock was resolved when the Soviet-controlled company bought a Hitachi-made IBM clone.

What do we learn from this? It seems that several conclusions can be drawn: 1) The Soviets will use any underhanded means possible to acquire technology, thereby shortening their development time and saving the expense of having to reinvent the wheel. 2) If the hardliners in the United States succeed in damming the flow of our technology to the Soviets, our friends and allies, who depend upon trade, will not be so nice. 3) If we read the economic forecasters correctly, our future lies in trade, joint venture, and internationalization; and that goes for the defense industry too (see Ten Year Forecast, page 97).

In bringing our plural government back to a single focus, a few lessons from history might be appropriate. Monopolies and cartels do not work for long. Anytime someone tries to bottle up an idea or a technology, it is like creating a vacuum. Someone will rush in with a monopoly-busting idea, product, or technique. We are the beneficiaries of 150 years of experiments in monopoly economics, and we have witnessed the failure of this tack. What has made America so inventive, productive, and fruitful over our history has been an environment of openness in competition, in literature, in conferences and symposia -- and little talent for keeping the cards close to the chest. There is a synergism in openness that has stimulated and served our technology well.

Although the Soviets steal our technology -- sometimes copying a chip down to its flaws, we really cannot hope to staunch the entire flow. Of course we must try to safeguard our most sensitive technology, but this should be very limited and should be continually purged as more important items are added.

The government is indeed a plural concept, being comprised of many people in many agencies serving the multiplicity of agendas required by we the people(s). We cannot help but agree with the economic forecasters that the continued success of the American economy lies in expanding trade, including the internationalization of the defense industry. Furthermore, we cannot help but agree with James Trybig, the chief executive officer of Tandem Computers (in a recent address to the Commonwealth Club in San Francisco) that our phenomenal creativity lies in our ability to be on the leading edge, not in worrying about keeping things shut up and unavailable. The reason that the Soviets have to steal is that their closed society makes access to ideas difficult. Can you imagine what it would be like if nearly every Soviet household had its own desktop computer? Can you imagine what would happen to the communications in that closed society? Hmmm . ...

POS NEWS

Vendor Spotlight

Atalla Looks To Tandem For Marketing Muscle

For years, observers of the EFT industry have expected Atalla Corp. to become a major player in point-of-sale terminals. It has an entree to the market with its system for securing personal identification numbers, both when they're issued and when they're used, and has a stellar reputation for turning out quality products. But Atalla has retained a low-profile image in POS, leading many of the same observers to wonder what Atalla's plan is.

Last month San Jose, Calif.-based Atalla sent a loud signal to those observers and to its competitors that it is serious about POS: It agreed to be acquired by Tandem Computers Inc., its $1 billion-a-year neighbor in Silicon Valley and the leading provider of EFT computer hardware to banks and networks. And Atalla is not shy about trumpeting its intentions with its new owner: "We no longer want to be a small-niche company," says William Atalla, Executive Vice President, Chief Operating Officer and son of founder Martin M. "John" Atalla.

Capturing More Business. The deal represents the third acquisition in the past year in the POS terminal industry and is evidence that the long-predicted trend toward consolidation is heating up. In the past year, Datatrol was acquired by Data Card Corp., and Lexicon was bought by ICOT Corp.

Until now, Atalla's size has prevented it from capitalizing on its strengths and early entry into the POS market. Atalla has sold fewer than 3,000 POS terminals in the U.S.: 2,000 to Vons Grocery Co. in California, and 800 to three other supermarket projects. There are about 35,000 direct-debit terminals and 150,000 credit-card draft-capture devices in the market today. "Atalla's sales are not big deals today," says an executive of a competing firm. "Big deals are 7,000 or 8,000 terminals at a clip. If you're not signing some of those once in a while, you have to question whether you should be in the market."

But with Tandem's resources and marketing muscle, Atalla could emerge as one of the most formidable competitors in the POS terminal industry. "Our size has limited the marketing we can do," Atalla says. "We should be able to capture a lot more business through (being associated with) Tandem."

Atalla Corp. has been a family affair. Besides son Bill, the company employs daughter Lori Abelman as Director of Marketing. Both will retain their jobs and titles after the acquisition. Martin Atalla will remain as Chairman of Atalla Corp., which will continue to operate under its own name, and will join Tandem's Board of Directors.

Atalla has been looking for a buyer for about 18 months, Bill Atalla says. It considered 16 candidates before narrowing it to Tandem. "We needed to find a strategic partner who served the financial and retail industries and one that had a critical mass that we could use in sales and marketing," he says. "We concluded early on that Tandem was the best partner for us. Their products seemed very complementary to ours. We run across them often on our sales calls."

While Atalla gets the marketing muscle and development resources of Tandem, its new parent hopes the acquisition will help it round out its EFT offering. One of the prime factors that Tandem was seeking was a security system to integrate into its network products. Tandem had sold security procedures as part of its software, but preferred the security to be in its hardware, where it is less subject to being tampered with. That is exactly what Tandem has been selling since 1974. "It was a natural fit for us," says John Kane, Tandem's Director of Marketing Communications. "We were looking for a security system and, rather than develop a whole new set of products, we bought Atalla. We are showing that we are interested in every aspect of transaction processing and have recognized the need for security."

Drop-In System. In addition to obtaining a ready-made security system, Tandem acquires a presence in the POS terminal market. While $1,000 terminals may seem like small potatoes to Tandem, which is used to dealing in machines that cost hundreds of thousands of dollars, Kane says terminals can become important to Tandem for two reasons: The potential market for the terminals is in the hundreds of thousands and being a terminal supplier rounds out Tandem's hardware line by allowing the company to sell a complete network, from the entry point for transactions at the retail location to the back-room processing horsepower for the banks. "We can see doing a complete Tandem drop-in system, all the way through from the terminals to the switches," Kane says.

Simply adding Tandem's sales force to Atalla's will suddenly give Atalla new presence in the POS market. Atalla joins Tandem with a single POS terminal salesman—Herb Williamson, Vice President of POS Payment Systems. Tandem plans to assign terminal marketing responsibilities to all 700 of its salesmen worldwide. "This gives us the foundation for growth that will be a degree of magnitude larger than the 30% growth we experienced last year," says Atalla. "The market has been growing at 45-50% a year and we are now positioned to grow along with it."

Opening Doors. Tandem believes it will not take much effort to attune its big-ticket salesmen to small-ticket terminals. "Our salespeople get involved in that end of the network already because potential buyers who talk to you about a high-ticket item eventually talk about the terminals that will be linked to that system," Kane says. He believes the integration of the Atalla line into the Tandem line will be complete within a matter of months.

Tandem and Atalla hope that their joint efforts will open doors for each other. Each company claims about 1,500 customers in the EFT arena and, while there is some overlap, there also are plenty of new opportunities for each company, they say. "There is no question that there will be substantial follow-on business for both sides," Atalla says. "We hope to see not just Atalla's customers going to Tandem and Tandem's customers coming to us, but all-new business opportunities that arise as a result of Tandem and Atalla going in to a new potential customer together." ■

POS NEWS

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POS News, Nov. 1987

Sun Forms 3 Companies For Marketing In Europe

BY ERIC NEE

MOUNTAIN VIEW, CALIF. — Sun Microsystems Inc. recently announced the formation of three European subsidiaries in Italy, Sweden and Switzerland.

With these additions, Sun now has seven European subsidiaries. The four existing subsidiaries are in France, West Germany, the United Kingdom and the Netherlands.

The distributors that had handled Sun's business in Switzerland and Italy will now become Sun VARs, selling to end users rather than to other resellers.

Ericsson Information Systems AB, which had distributed Sun products in Sweden to both resellers and end users, will continue as a Sun VAR selling only to users in that country.

Ericsson will sell to resellers and users in Norway, Finland and Denmark.

Each of Sun's subsidiaries has its own direct sales force along with a service and support organization. The European subsidiaries report to Darryl Barbe, vice president and general manager of Sun Microsystems Europe.

"The European market accounts for over 25 percent of Sun's revenue and we see that percentage increasing significantly this year," Barbe said in a prepared statement. Overall non-U.S. sales account for about 40 percent of Sun's revenue.

Heading the three subsidiaries are executives Sun recruited from the other computer companies' European operations. Sun went outside of its ranks in order to get people with experience in the specific countries, a Sun spokeswoman said.

Sun Microsystems Italia S.p.A., Milano, Italy, is headed by country manager John Baarns, who had been president of Computervision Italia.

Sun Microsystems AB, Stockholm, Sweden, is headed by country manager Elis Nemes, who had been Nordic manager for Gould Inc.

Sun Microsystems Schweiz AG, Zurich, Switzerland, is headed by country manager Roland Saner, who had been sales manager at Data General, Switzerland.

Intergraph Offers Workstation, Chips

HUNTSVILLE, ALA. — Intergraph Corp. has brought out a low-end engineering workstation incorporating the 32-bit Clipper chip set developed by Fairchild Semiconductor Corp.

Intergraph, which acquired Fairchild's Advanced Processor Division about a month ago, also brought out a second-generation version of the Clipper.

Intergraph is taking a shot at the low-end with the InterPro 120, a 4-MIPS workstation slated to ship in February. The unit, which runs Unix System V and is priced from $16,000 to $19,000, uses the standard 25-MHz C100 Clipper chip set. It can be upgraded to a 30-MHz microprocessor.

Other standard features of the system include a hardware floating-point processor, 6 Mbytes of main memory and an integral 80-Mbyte formatted hard disk.

The new C300 Clipper is, like its C100 predecessor, a three-chip set. The chip set uses the same instructions as the C100, but has an estimated performance of 13 MIPS. That's more than twice the C100, Intergraph said.

Faster Clock

Performance gains are attributed to the 50-MHz clock speed, compared to 33 MHz on the C100, an enhanced floating-point processor and a new pipeline design that has few clock cycles in several instructions, the company said.

Intergraph plans to eventually incorporate the chip set into future product lines, and sell the chips, Clipper-based modules and Clipper-powered circuit boards to OEMs. The new chip set will be available in sample quantities during the second quarter of next year, and volume deliveries will be available in the third quarter, the company said.

Tandem Stocks Safeway With Minis

CUPERTINO, CALIF. — Tandem Computers Inc. has reached an agreement to supply Safeway Stores Inc. with a network of Tandem NonStop computer systems for the company's U.S. retail operations.

The contract's dollar value was not revealed, but it could include up to 13 NonStop systems over the next two years.

In the first phase of the deal, Safeway has installed a NonStop EXT10 at its Salt Lake City data processing center, an EXT10/25 at its Oakland, Calif., headquarters, and a NonStop TXP at its Phoenix division. If the initial systems work as planned, Safeway will install additional computers at each of its nine other divisions, a Safeway spokeswoman said.

As part of the agreement, three independent software vendors that are members of Tandem's Alliance program will supply application software to Safeway. The three Alliance members are Systemhouse Inc., Immedia Telematics Inc. and Dallas Systems Corp. The three will supply store polling, electronic mail and warehouse management software, respectively.

HVE Engineering Names Ops VP

CAMPBELL, CALIF. — HVE Engineering Inc. named Holly Reed to the new post of vice president and general manager in charge of the company's day-to-day operations.

In her new post Reed takes over responsibilities that were held by HVE founder Howard Halverson, who remains president and chairman of the VMEbus and Multibus product company. Reed will report to Halverson.

"Holly has obtained a complete grasp of the on-going operations at HVE and is well qualified to assume total management responsibilities," said Halverson in a prepared statement. Halverson will now focus his efforts on new product development and marketing strategies.

Reed joined HVE in 1984 as production manager. Since then, she has served as vice president of sales and most recently as vice president of operations. Before joining HVE, Reed was employed at Kaiser Aluminum, and prior to that she spent six years at IBM in its customer support organization.

Thinking Machines Tries To Think Differently

Continued from page 36

a $1-million-to-$6-million price tag.

The Connection Machine is the brainchild of MIT scientist and Thinking Machines' co-founder Danny Hillis. Assigning dedicated processors to each bit of information permits large amounts of data to be processed simultaneously, according to the company. Suitable applications include object recognition, seismic interpretation and VLSI design simulation. Unlike other supercomputers that require elaborate liquid-cooling systems, the Connection Machine employs simple air-cooling methods.

Industry analysts have lauded Thinking Machines for its unique approach to solving compute-intensive problems. However, emerging competitors, a growing number of potential buyers who are skittish about the economy and changing application requirements could spell trouble for Thinking Machines, they said.

"Like most companies that have unique architectures of this sort, their chief problem is finding the niches of applications that execute particularly well on that architecture," said Omri Serlin, president of Itom International Co., Los Gatos, Calif. "The majority of applications today call for fewer, more powerful processors," he said.

In terms of competition, Thinking Machines over the next few months should become concerned with Active Memory Technology, Irvine, Calif. According to Serlin, that company this month is expected to introduce a machine similar to the Connection Machine but with improved price/performance ratios. Serlin estimated the machine will cost about $100,000.

Serlin and others are also somewhat skeptical about Thinking Machines' philosophy of finding the "right" customer before it sells its computers. The company must first answer to its venture capitalists before it can embrace that philosophy, Serlin said.

If you really want to be successful in an evolving marketplace, you have to find those who are going to be most successful in applying that technology.

The stock market crash may also force a change in the way Thinking Machines approaches its customers, said Jeff Canin of Hambrecht & Quist. Fearing further economic turmoil, many companies are delaying large equipment purchases and could be reluctant buy a supercomputer. "You can be selective at choosing customers until things get in a crunch," he said.

Tandem Computers Inc. - Company Report
FIRST BOSTON CORPORATION (THE) - Peterson, S.
10-27-87 (RN=720347)

Tandem Computers Inc. TDM

Reports Fourth Fiscal Quarter
Slightly Above Expectations
But Revenues Sizzled; Raising
Fiscal 1988 Estimate to $1.55
from $1.40; Opinion: BUY

Price (1) 10/26/87		Earnings (2) Per Share	P/E Ratios	Div'd Yield	52-Week Price Range
20 5/8	F1988E	$1.55	13.3X	-	37 5/8-16 5/8
	F1987A	1.08	19.1	-	
	F1986A	0.72			

Common Shares	99.6 mil.	L.T. Debt as % Total Capital	1.5%
Market Value	$2.05 bil.	Return on Average Equity	13.4%
Book Value/Share	$6.60	Est. Future EPS 5 Yr. Growth Rate	19%

(1) On 10/26/87 the DJIA closed at 1793.9 and the S&P 400 at 257.4.
(2) Fiscal year ends September 30. Previous estimate F1988: $1.40.

Tandem reported a strong fourth quarter: $0.31 versus $0.24, up 29%. This finishes the year at $1.08 versus $0.72, up 50%. We had looked for $0.30 per share and $31.0 million net income, so Tandem's $30.4 million net income is just in line. Here are the variances:

Positive Surprises

Equipment revenues $5 million higher, service revenues $7 million higher, equipment gross margin 74.6% versus our estimate of 71.9%, interest income $1 million higher, number of shares 99.6 million versus our estimate of 104 million.

Negative Surprises

Service gross margins 24.6% versus our estimate of 28.5%, R&D $2 million higher, SG&A $8 million higher, tax rate 42.6% versus our estimate of 41.3%.

Tandem released its quarterly results a week early (October 21) to help support the stock, because these are strong results. Total revenues grew 32% to $291 million versus last year's $220.5 million. This was helped by a 28% boost in U.S. shipments after several quarters

of growth in the low teens. International was up 38%, more of the same strength we've seen all year.

The spectacular 75% gross margin on equipment sales reflects a product mix shift that continues to favor large systems. The story we've told on Tandem for the last year is intact: distributed processing is stealing share from centralized mainframes. This creates a price umbrella for Tandem at the high end that PC and workstation companies envy.

Head count was up 5% over last quarter and 22% over last year, but revenues were up 10% and 35% for the same periods, so Tandem seems to have expenses under good control. The SG&A line, which caused concerns with its growth in the third quarter, is staying level as a percentage of sales.

We are raising our fiscal 1988 estimate to $1.55 from $1.40 to reflect better revenue growth, gross margins, tax rate, and share count than our previous estimates. We maintain our Buy recommendation and applaud Tandem for its performance at the New York Stock Exchange this week.

Table 1
Fiscal 1987 Results by Quarter
$ in millions, except per share data

[Part 1 of 3]

	Q1A F1986 ($)	Q2A F1986 ($)	Q3A F1986 ($)	Q4A F1986 ($)
Equipment Sales	140.3	146.2	163.3	182.6
Service Revenue	29.8	30.2	37.6	37.9
Net Sales	170.1	176.4	200.9	220.5
Less:				
Cost of equipment	43.3	41.5	43.4	47.0
Cost of service	22.8	24.8	26.9	30.2
Marketing, general & adminin.	64.8	68.8	77.5	83.8
Research & development	19.8	21.3	22.3	23.6
Interest income (net)	1.7	2.4	2.1	2.4
Pretax income	21.1	22.4	32.9	38.3
Income tax	-9.3	-10.0	-14.5	-16.9
Effective tax rate	44.5	44.5	44.5	44.5
Net income	11.6	12.4	18.1	21.6
Earnings per share	0.14	0.15	0.20	0.24
Average shares outstanding	83.2	85.6	90.6	91.8
Percent of Sales				
Equipment sales	82.5	82.9	81.3	82.8
Service revenues	17.5	17.1	18.7	17.2
Cost of equipment	30.9	28.4	26.6	25.7
Cost of service	76.5	82.1	71.5	79.7
Marketing, general & admin.	38.1	39.0	38.6	38.0
Research & development	11.6	12.1	11.1	10.7
Interest	1.0	1.4	1.0	1.1
Pretax income	12.4	12.7	16.4	17.4
After-tax income	6.8	7.0	9.0	5.8

[Part 2 of 3]

	Q1A F1987 ($)	Q2A F1987 ($)	Q3A F1987 ($)	Q4A F1987 ($)
Equipment Sales	198.7	202.4	218.5	241.5
Service Revenue	39.3	40.0	45.5	49.6
Net Sales	238.0	242.4	264.0	291.1
Less:				
Cost of equipment	53.6	54.9	57.0	61.3
Cost of service	27.8	30	36.3	37.4
Marketing, general & adminin.	86.8	96.3	102.3	112.8
Research & development	24.3	25.8	27.4	30.9
Interest income (net)	2.8	3.2	3.9	4.3
Pretax income	48.3	38.6	45.0	53.0
Income tax	21.3	16.1	19.3	22.6
Effective tax rate	44.0	41.6	43.0	42.6
Net income	27.0	22.5	25.7	30.4
Earnings per share	0.29	0.23	0.26	0.31
Average shares outstanding	93.6	98.0	99.7	99.6
Percent of Sales				
Equipment sales	83.5	83.5	82.8	83.0
Service revenues	16.5	16.5	17.2	17.0
Cost of equipment	27.0	27.1	26.1	25.4
Cost of service	70.7	75.0	79.8	75.4
Marketing, general & admin.	36.5	39.7	38.8	38.7
Research & development	10.2	10.6	10.4	10.6
Interest	1.2	1.3	1.5	1.5
Pretax income	20.3	15.9	17.0	18.2
After-tax income	11.3	9.3	9.7	10.4

Note: Fiscal Year Ends September 30.

Table 1
Fiscal 1987 Results by Quarter
$ in millions, except per share data
[Part 3 of 3]

	% Change			
	Q1 versus Q1 (%)	Q2 versus Q2 (%)	Q3 versus Q3 (%)	Q4 versus Q4 (%)
Equipment Sales	41.6	38.4	33.8	32.3
Service Revenue	31.9	32.5	21.0	30.9
Net Sales	39.9	37.4	31.4	32.0
Less:				
Cost of equipment	23.8	32.3	31.3	30.4
Cost of service	21.9	21.0	34.9	23.8
Marketing, general & adminin.	34.0	40.0	32.0	34.6
Research & development	22.7	21.1	22.9	30.9
Interest income (net)	64.7	33.3	85.7	79.2
Pretax income	128.9	72.3	36.8	38.4
Income tax	129.0	61.0	33.1	33.7
Effective tax rate				
Net income	132.8	81.5	42.0	40.7
Earnings per share	107.1	58.6	30.0	29.9
Average shares outstanding	12.5	14.5	10.0	8.5
Percent of Sales				
Equipment sales	1.2	0.7	1.8	0.2
Service revenues	-5.7	-3.6	-7.9	-0.9
Cost of equipment	-12.6	-4.4	-1.8	-1.4
Cost of service	-7.5	-8.7	11.5	-5.4
Marketing, general & admin.	-4.3	1.9	0.5	2.0
Research & development	-12.3	-11.9	-6.5	-0.8
Interest	17.7	-3.0	41.3	35.7
Pretax income	63.6	25.4	4.1	4.8
After-tax income	66.4	32.0	8.1	80.1

Note: Fiscal Year Ends September 30.

Table 2
Possible Fiscal 1988 Results
$ in millions, except per share data

[Part 1 of 2]

	Estimated	Actual		
	F1988	F1987	F1986	F1985
Equipment Sales	$1,125.0	$861.1	$632.3	$523.4
Service Revenues	225.0	174.4	135.5	100.7
Net Sales	1,350.0	1,035.5	767.8	624.1
Less:				
Cost of equipment	$295.0	$226.8	$175.2	$185.6
Cost of service	172.0	131.5	104.7	83.0
Marketing, general & adminin	520.0	398.2	294.9	231.6
Research & development	140.0	108.4	87.0	73.8
Interest income (net)	16.0	14.2	8.5	6.3
Pretax income	239.0	184.8	114.5	56.4
Income tax	$84.0	$79.3	$50.7	$22.0
Effective tax rate	35.1%	42.9%	44.3%	39.0%
Net income	$155.0	$105.5	$63.8	$34.4
Earnings per share	$1.55	$1.08	$0.72	$0.41
Average shares outstanding	100.0	97.7	88.4	83.6
Percent of Sales				
Equipment sales	83.3%	83.2%	82.4%	83.9%
Service revenues	16.7	16.8	17.6	16.1
Cost of equipment	26.2	26.3	27.7	35.5
Cost of service	76.4	75.4	77.3	82.4
Marketing, general & admin	38.5	38.5	38.4	37.1
Research & development	10.4	10.5	11.3	11.8
Interest	1.2	1.4	1.1	1.0
Pretax income	17.7	17.8	14.9	9.0
After-tax income	11.5	10.2	8.3	5.5

[Part 2 of 2]

	% Change		
	F1988 versus F1987	F1987 versus F1986	F1986 versus F1985
Equipment Sales	30.6%	36.2%	20.8%
Service Revenues	29.0	28.7	34.6
Net Sales	30.4	34.9	23.0
Less:			
Cost of equipment	30.1%	29.5%	-5.6%
Cost of service	30.8	25.6	26.1
Marketing, general & adminin	30.6	35.0	27.3
Research & development	29.2	24.6	17.9
Interest income (net)	12.7	67.1	34.9
Pretax income	29.3	61.4	103.0
Income tax	5.9%	56.4%	130.5%
Effective tax rate	(18.1)	(3.1)	13.5
Net income	46.9	65.4	85.5
Earnings per share	43.5	49.6	75.4
Average shares outstanding	2.4	10.5	5.7

Percent of Sales

Equipment sales
Service revenues
Cost of equipment
Cost of service
Marketing, general & admin
Research & development
Interest
Pretax income
After-tax income

Note: Fiscal Year Ends Sept. 30.

Tandem Computers - Company Report
DREXEL BURNHAM LAMBERT INCORPORATED - Orr, J.W.
10-28-87 (RN=720443)

Tandem Computers
(TDM - $19 7/8)

Watching for Value

Rating:	Neutral-1		Shares outstanding:	99,550,000	
52-Week Range:	37 5/8-16 5/8		Dividend: None	Yield:	None
	From	To			
EPS 1986A:	$0.72	---	P/E 1986A:	27.6x	
1987A:	$1.08	---	1987E:	18.4x	
1988E:	$1.50	1.40	1988E:	14.2x	
Projected 5-year growth rate:		17.0%	Operating return on tangible assets		28.6%
Market proxy ROR1:		12.0%	Total debt/equity:		1.5%
Company ROR1:		1.4%	Return on equity:		14.6%
Market cycle beta:		2.25%	Reinvestment rate:		14.6%

Fiscal year ends September.

POINT OF VIEW

Tandem's results for the fourth fiscal quarter ended September 30 and for the fiscal year were in line with our expectations. Needless to say, the market paid no attention in its slide last week. Tandem actually has been doing very well in the last couple of years despite slow demand growth for computers overall because it has a unique product, it has a modern product lineup and it has developed or acquired lots of software. Based on reduced expectations for general economic activity in 1988, however, we are reducing our fiscal 1988 estimate for Tandem to $1.40 per share, which has been the low end of our $1.40-$1.50 range, rather than the upper end $1.50 we had been carrying. Tandem stock has been rated Neutral-1 for some time almost entirely due to very high valuation in the marketplace. We now think investors should be alert to an opportunity to buy this high quality company during this period of market correction and adjustment.

Results for the Fourth Quarter and Fiscal 1987

In the fourth fiscal quarter, product revenues increased 32%; service and other revenues rose 31%, while total revenues increased 32% to $291.1 million compared with $220.6 million a year ago. Net income for the fourth quarter increased 41% from $21.6 million to $30.4 million, or $0.31 per share. For the year, revenues were greater than $1 billion for the first time in the company's history. Revenue for the year increased 35% from $767.8 million to $1.035 billion. Net income for the year increased 66%, from $63.8 million, or $0.72 a share to

$105.6 million, or $1.08 per share. Net income increased more than revenues due to higher gross margins and lower R&D expenses as a percentage of revenues. The tax rate also declined from 44.3% last year to 42.9% in fiscal 1987. These results were in line with our expectations for the year.

Revenues in the U.S. increased more than 28% in the quarter, while international revenues increased close to 37.5%. For the fiscal year, international revenues accounted for 42.8% of the total while they were 42.5% for the fourth quarter. Business overseas was good across the board; the United Kingdom and Switzerland were cited as being particularly strong.

The securities business continued to be particularly strong for Tandem as the company signed up new stock exchanges and new brokerage houses as customers. For the year the securities business grew at a rate of 79% for the company. Other financial markets grew 103% for the year. Sales to distribution, telecommunications, manufacturing and business services were also strong. Incidentally, the company received some favorable publicity with the huge and unprecedented trading volume on the New York Stock Exchange last week. The NYSE utilizes 200 non-stop Tandem processors to handle its trading.

Productwise, the high end VLX line continued to show very strong increases in sales. Sales of the TXP increased and sales of the EXT entry level machine were exceptionally good. The product house looks in good order.

Balance Sheet Strength

Tandem's balance sheet at year end continued to be very strong with cash of $317.5 million; long-term debt was only $9 million while stockholders' equity was $720.9 million, or about $7.25 per share. In the current market environment, these attributes are a plus.

Outlook

Barring a recession in 1988, we believe Tandem will continue to show revenue and earnings gains. Our range on earnings per share has been $1.40 to $1.50 per share. We have been using $1.50 as our single point. Given the uncertainties about the economy at this time, we prefer to use the low end of our range as a single point.

Tandem has been recording strong gains in revenues and earnings in 1985-6 while the industry has been in the doldrums. We believe the company is positioned to continue to grow faster than the overall computer industry. With the stock having come down during the market correction and now selling at about 14x our fiscal 1988 estimate, we view the valuation much more favorably. Our rating on this stock continues to be Neutral-1, but we think investors should be watching a high quality name like Tandem for an opportunity to buy.

Last Research Abstract on Tandem Computers: July 21, 1987.

LEVEL 1 - 1 OF 3 STORIES

December 4, 1987, Friday

DISTRIBUTION: Business Editors

LENGTH: 429 words

HEADLINE: ELEC/CANADIAN-TRADE; Electronics companies await U.S.-Canadian free trade

DATELINE: OTTAWA

BODY:

U.S. and Canadian high-technology companies have been discovering one another in increasing numbers of late.

Many U.S. electronics companies have established Canadian subsidiaries while others have formulated joint ventures and strategic alliances with Canadian technology companies.

Canada's electronics industry, valued at $23 billion in 1986, is made up of over 1,800 electronics firms and 2,000 software companies. Canadians have demonstrated particular expertise in the areas of telecommunications and satellite communication, CAD/CAM and CAE software development.

Canada is responsible for the world's first digital microwave transmission system, the first overseas teletext service and, much earlier, the telephone.

As free trade talks continue between the two countries, companies on both sides of the border are looking for ways to profit from the decrease in trade barriers. In fact, the American Electronics Association and its Canadian counterpart, the Canadian Advanced Technology Association, recently signed a cooperative pact.

The two organizations will swap policy development on everything from taxes to trade issues to public policy.

Meanwhile, several U.S. electronics companies have quietly been enjoying tremendous success with Canadian operations. According to Mike Moore, vice president of Tandem Computers' intercontinental division, ''Tandem Canada has the highest productivity within the corporation and is the fastest growing operating division.''

In addition, said Moore, ''Tandem Canada reports less than 4 percent employee turnover each year.''

Digital Canada, which reported revenues of $582 million for fiscal 1987, is one of Digital Equipment Corp.'s most profitable foreign-based arms. Revenues rose by 22 percent in fiscal 1987, following a 34 percent rise in revenues in 1986.

As the two electronics communities begin to work more closely together, and free trade talks progress, the hope is that greater cross-border technology

sharing will result. According to John Reid, senior adviser for CATA, ''Free trade will produce a synergistic effect and result in increased collaborative technological innovations between the U.S. and Canada.''

Ralph Thomson, senior vice president of public affairs for the AEA agrees, ''We look for free trade to increase the transfer of technology and ideas and allow both countries to capitalize on each others expertise.''

CONTACT: Franson & Associates, San Jose, Calif.
Janice S. Bandeen, 408/298-1221

LEVEL 1 - 2 OF 3 STORIES

Network World

December 7, 1987

SECTION: FEATURES; Open Systems: How open are they?; Pg. 41

LENGTH: 2816 words

HEADLINE: Who's most open of them all?

BODY:

The route to multivendor connectivity is liberally strewn with problems for users, primarily because computer system vendors' ideas of what constitutes openness vary so widely.

Network World's analyses of nine major vendors' systems over the past few months indicate that Hewlett-Packard Co. leads the pack in terms of current, overall support of Open Systems Interconnect (OSI) standards. Indeed, having been the first computer maker to abandon its proprietary architecture in favor of the emerging OSI protocol stack, HP is betting its future on standards.

The current leader in terms of IBM connectivity, however, is Data General Corp., a company that lags behind HP in fully embracing OSI. Apple Computer, Inc., in turn, excels in cooperating with third-party software vendors.

Nearly every computer vendor has staked out a connectivity niche, however narrow, in which it can claim superiority. Therefore, it's difficult -- and perhaps pointless -- to determine which vendor is the most open in a universal sense. It's up to users to find out which networking applications call for a particular vendor's unique brand of openness.

In the skeptical view of Dale Kutnick, an executive vice-president with Stamford, Conn.-based Gartner Group, Inc., "No one is good at multivendor connectivity today. If I had to pick, I would say that, in a year, HP would be the vendor to watch. HP, more than the others, is making moves toward openness and standards, and it's backing those moves with money."

In assessing the relative openness of a computer system environment, it's necessary to answer several key questions. To how many competing systems does the vendor offer connectivity, and at what level is that connectivity provided? Does the vendor also support third-party efforts to link its systems to those of competitors? Finally, does the vendor provide users with a smooth and relatively inexpensive migration path toward full support of OSI standards?

Interim solutions

While all major computer vendors profess to support the seven-layer OSI communications architecture, none can support it fully today. This is because key protocols at Layers 3, 6 and 7 are still one to two years away from becoming fully approved international standards.

In the meantime, vendors must either implement a "pseudo-OSI" architecture by making guesses as to the final form of the unfinished protocols or use an interim architecture, such as Transmission Control Protocol/Internet Protocol.

TCP/IP is, without doubt, the most popular interim architecture. It's the basis for many third-party connectivity products and is supported in one form or another by all major vendors except Tandem Computers, Inc. and Wang Laboratories, Inc., both of which intend to offer TCP/IP products in the future. Digital Equipment Corp. supports TCP/IP under Ultrix, the DEC version of Unix, but not under the VAX VMS operating system.

"In the next few years, OSI connectivity will be confined to the lower layers," says Dave Terrie, president of NewPort Consulting, a computer and communications consulting firm in Scituate, Mass. "What you really need today in the multivendor environment is TCP/IP. There's a lot of stuff to market with OSI, but users can't use it. If the vendor is using TCP/IP, the user can expect to be able to plug into about 100 different vendors with some degree of interoperability."

On the strength of its large installed base of proprietary Systems Network Architecture networks, IBM is the only vendor in a position to downplay TCP/IP, drag its feet on OSI and depend on other vendors to develop high-level links directly into its systems environment. All vendors discussed in Network World's Open Systems series have invested heavily in providing links to Big Blue's systems.

DEC's rapid growth may soon put it in a position similar to that of IBM. HP, with a product called Network Services for the DEC VAX Computer, has already moved to provide sophisticated DEC-specific connectivity. The burgeoning third-party DEC connectivity market will no doubt induce other systems vendors to follow HP's lead and develop their own high-level DEC links.

Beyond connections to IBM and DEC, however, computer vendors prefer not to provide high-level links to competitors' systems. Users with diverse multivendor environments wanting more than basic terminal emulation and protocol conversion must either develop such links themselves or seek out connectivity products offered by third-party vendors.

Assessing IBM connectivity

Industry experts differ in their assessments of vendors' IBM connectivity. Terrie calls the IBM connectivity game a two-horse race between DG and Wang. HP is nipping at their heels, and DEC lags behind HP, he says.

"Those four vendors all have upper level gateways connecting to IBM. DEC makes a lot of noise; but in key areas, it hasn't delivered. DEC lacks both [Professional Office Systems] and full-function [Systems Network Architecture Distribution Services] support," Terrie says.

Another important aspect of IBM connectivity, Terrie emphasizes, is the ability to piggyback on SNA, which he says DG does well. DG allows users to implement SNA transport protocols as a substitute for DG transport protocols. DG data is sent across the network as if it were SNA data and is then unwrapped and presented to the DG machine. Terrie explains that this method obviates the need for separate lines for DG and other traffic. "DEC is saying it doesn't need SNA, although I think it would help them strategically to support it," Terrie concludes.

Mike Braude, a corporate vice-president at Gartner Group, ranks Tandem No. 1 in IBM connectivity. "The only requirement they haven't met yet is for cooperative processing between their machines and IBM's," he says.

Tandem's SNA Access Services Software (SNAX) products support a wide variety of IBM protocols, including LU 0 through 4, as well as LU 6.2. Tandem also offers a direct, high-speed channel attachment between its systems and SNA hosts. However, the company does not yet support PU 2.1 or SNADS.

DEC again trails the competition in the eyes of John McCarthy, director of the Professional Automation Report with Forrester Research, Inc. in Cambridge, Mass. He gives DG, Wang, Tandem and HP high marks, noting that DG is the only vendor among them to support PU 2.1 today. "DEC is a layer below those four, because it has no PROFS for All-In-1, unless you go to a third party," he says.

"Wang is moving very aggressively with its Professional Application Creation Environment (PACE) connection products, which will hook up high-level IBM data bases. Ultimately, I think that product will be very important," McCarthy adds.

But while Terrie and McCarthy denigrate DEC's IBM connectivity, a third expert says he finds DEC superior to its competitors. Thomas J. Routt, president of Network Systems Consulting in Seattle, says, "Clearly, PROFS is important, but DISOSS is IBM's flagship office automation implementation product at this time. Out of these vendors [in Network World's Open Systems series], DEC is the most aligned to IBM's SNA through gateways. DEC has DEC-SNA gateways, which provide users with a number of advantages. The company supports LU 6.2 and [Document Interchange Architecture], SNA LU 1, 2 and 3 emulation to the IBM world, VAX application access into IBM DISOSS applications and IBM 3270 access to VAX applications."

Third-party vendor support

During the long journey down the open road, vendors can make multivendor connectivity easier by providing third parties with product specifications that facilitate the development of bridging products. This can be accomplished by licensing source code, publishing specifications or providing programming interfaces to third-party software vendors. However, while some vendors provide source code to customers under limited circumstances, they're loath to share it with third parties.

Application program interfaces may be more in evidence, but "there's a world of difference between publishing interfaces and licensing code," Terrie says. "IBM publishes a lot of interfaces, but it takes people quite a while to figure out how to use them. IBM will always make sure it hits the availability window first."

Routt defends IBM's cooperation with third-party vendors. "IBM has published application program interfaces for its SNA architecture, LU 6.2, Node Type 2.1, SNADS, DIA and Distributed Data Management and Management Services Architecture. Anyone with those specifications is in a position to develop products around them."

Apple outshines IBM and the rest of the field when it comes to cooperation with third-party vendors. This comes as no surprise, since any maker of non-IBM-compatible personal computers must nurture a thriving community of

third-party software developers.

John Neumann, a senior vice-president with Vienna, Va.-based Omnicom, Inc., says he thinks the most that can be expected from any vendor is that it publish its interfaces. Omnicom is a developer of OSI software, and Neumann says that, in his experience, all vendors are interested in participating in OSI development.

"We have tested our OSI software only with DEC and IBM in Europe, but my sense is that all the vendors are working closely with each other to achieve interoperability," he said.

Migration to OSI

What OSI compatibility means today, and what purpose it serves today, are highly debatable. While vendor OSI-based products will enable disparate systems to communicate, those communications will never take place in a manner as sophisticated as communications in a single vendor's systems environment. And vendors will still attempt to distinguish themselves by developing proprietary applications with greater functionality than can be obtained through the OSI architecture.

Therefore, users hoping to communicate at high levels between disparate systems without losing anything in the translation are doomed to disappointment.

"You want vendors to keep building proprietary applications," McCarthy observes. "Those are controlled by one vendor, which means they'll evolve a lot faster for general use than a standard that has to be thrashed out by 30 companies in a standards body."

Still, OSI-based connectivity products will be invaluable to users who must integrate multivendor networks. Despite DEC's advertisements to the contrary, no single vendor will ever have it all. OSI gateways look like the best solution for users whose applications dictate a multivendor networking approach.

The premier vendor in terms of OSI compatibility today, HP, has phased out its proprietary architecture in favor of a completely OSI-based solution. Where international standards are undefined, HP has implemented de facto standards, such as TCP/IP, as interim measures. Migrating to OSI was a matter of survival for HP, which lacks the resources to pursue proprietary connections to both IBM and DEC environments.

HP isn't the only vendor pushing OSI solutions, however. Network Systems Consulting's Routt puts DEC and, surprisingly, IBM at the top of his OSI-compatibility list. "DEC probably tops the list with its [Digital Network Architecture] Phase 5 implementations. It was the first company to state a strategic alignment in its future products to OSI. But IBM has done a lot in that area as well. Until two years ago, that wouldn't have been true, but since then IBM has introduced 21 separate OSI products that range in support from X.400 to [File Transfer and Access Method] to [Manufacturing Automation Protocol]."

While all nine vendors surveyed by Network World have stated their intent to support the X.400 electronic messaging standard, only three vendors have products available now. DEC is the only vendor with an X.400 product available

in the U.S.; HP's and IBM's similar products are offered in Europe only.

X.400 is actually a CCITT standard, but International Standards Organization technical committees have endorsed it, suggesting that it will become part of the OSI stack. Routt anticipates IBM's peer-to-peer communications protocol, LU 6.2, will meet the same fate. "IBM has been defeated a few times in attempts to make LU 6.2 a Layer 6 and 7 standard," Routt says, "but I think it'll be successful with the third attempt." LU 6.2, he says, is a superior general-purpose interprogram protocol.

But while IBM proclaims OSI support and is participating in the standards-making process, only in Europe has it introduced products that conform to all seven layers of the OSI reference model. Currently, it sells products that conform only to the model's lower three layers in the U.S. IBM says domestic demand for OSI is lacking; it has no plans to introduce its other products in the U.S. soon.

Current OSI problems

There are still other elements to be reckoned with in the OSI equation. Omnicom's Neumann points out that the industry still has to wrestle with interface specifications, which are nonexistent today, before interoperability can be achieved at the application level. "My interface at the top is different from [OSI software vendor] Retix's, DEC's, Tandem's and everyone else's. There won't be any communication among applications until we establish interface specifications," Neumann says; he does not expect that to happen soon.

Terrie sees another wrench in the OSI works. He says that consensus standards, which are generally agreed on outside of international standards bodies, factor heavily into future connectivity solutions. Examples include Sun Microsystems, Inc.'s Open Networking Environment, which includes the Network File System file-sharing protocol, Apollo Computer, Inc.'s Network Computing Forum and, of course, TCP/IP.

"The consensus standards movement says we agree we can address this need with this product, and we'll all implement it, and boom, it's done. To some degree, I think consensus standards will obviate some of the need for OSI protocols, because such standards will offer much better functionality," Terrie says.

"At the same time, consensus standards are being developed with an eye toward enabling migration to OSI when OSI becomes fully functional."

Who foots the bill?

There's still a gap between communications architectures today and OSI, and someone has to pay for the transition. Vendors, of course, are fronting the substantial research and development costs associated with the transition from a closed, proprietary architecture to one supporting OSI. So some vendors find it unreasonable, even absurd, to suggest they also shoulder the cost of providing upgrades to migrate their user bases to OSI.

As far as one Wang representative is concerned, "It is the user's decision to upgrade [to OSI], so the user pays for that." A Tandem spokesman says that whether or not it charges for OSI upgrades will vary on a case-by-case basis.

Joanne Womboldt, Prime Computer, Inc.'s senior manager of communications systems marketing, states that much of the same hardware will be usable as customers upgrade to OSI compatibility, but users will be charged for completely new software necessary to migrate to OSI. "Once customers have an OSI stack, they'll get upgrades to it free as part of their maintenance contract."

Steve Wendler, DEC's marketing manager for DECnet/OSI, says DEC's customer base won't be charged for most changes along the migration path. "DECnet Phase 5 customers will migrate without charge. That's at OSI Layers 1 through 4, which is what we're integrating into DECnet/OSI Phase 5," he says. "For OSI-based applications, users might have to pay an additional license fee for applications like FTAM, but it would be a fairly nominal charge. OSI Layers 5, 6 and 7 will probably be packaged as separate products. We may also bundle Layers 5, 6 and 7 into Phase 5 products, but we haven't made a final decision on that yet."

When one captures a glimpse of the real OSI world, it isn't quite the utopia it's been cracked up to be. But, in the end, Routt observes, the purpose of OSI is not "to define how native applications within each vendor's system should behave, but to evolve toward a position where there exists a common reference for multiple heterogeneous vendors to support communications between their real applications. The true objective behind OSI is to reduce the number of interconnection options to the smallest possible number."

As vendors continue to differentiate themselves, full interoperability at the highest layers of OSI will continue to be elusive. OSI can provide basic connectivity among diverse computing environments. And, while establishing these lowest common denominators is less than ideal, it should make life easier for users with multivendor nets.

This article concludes Network World's Open System series.

December 16, 1987, Wednesday

SECTION: BACKPAGE; Pg. 24

LENGTH: 787 words

HEADLINE: IBM and Software Alliance Tie for Top in Vendor Poll

BYLINE: By DAVID O. TYSON

DATELINE: NEW YORK

BODY:
For the second time this month, International Business Machines Corp. and Software Alliance Corp. get the top ratings in a survey of bank officers asked to name the best vendors of applications software for mainframes.

The two companies tie for the overall best rating among the senior bank data processing officers responding to a survey by Julia Donohue, marketing consultant for software companies.

In the American Banker's first technology survey, also just released, senior operations officers of banks with more than $250 million deposits gave the best marks to the software developed by M&I Marshall & Ilsley Bank, Milwaukee, which Software Alliance distributes. IBM ranked second.

Ms. Donohue does business as Donohue Associates, 17 Wellfleet Lane, Wayne, Pa. She conducted a mail survey in October among senior information processing executives of major industrial and service corporations, seeking their views on the products, support, and salespeople of software companies.

Questionnaires went to executives in 960 corporations, including 100 banks and 50 savings and loan holding companies. She said the response was 12% overall and 10% among the depository institutions - 10 banks and five S&Ls.

Among the 10 bank respondents, IBM and Software Alliance tied for first place on the question about the best overall mainframe software company. The summary released by Ms. Donohue did not state how many votes each got or what other vendors were cited.

IBM's banking applications software is chiefly for check-processing systems, but it also includes software for branch banking, teller, and administrative terminals. Some respondents in the Donohue survey may have had Hogan Systems Inc. in mind when they named IBM, since IBM is now exclusive distributor of Hogan's integrated systems.

Ms. Donohue is shipping the full report of her survey next week. It costs $595.

Application Packages Graded

Last week, the American Banker mailed the results of its technology survey. It was conducted in June and July by Trans Data Corp., Salisbury, Md., a

research subsidiary of the newspaper, in telephone interviews of senior operations executives at 344 banks and thrifts with at least $250 million deposits. Institutions of this size are most likely to do their own data processing.

In rating the software vendors, the bank executives were asked to assign grades of 1 to 5. On the overall quality of applications packages, M&I had a mean score of 4.20 and IBM 3.80, followed by Burroughs (now Unisys) with 3.76, Hogan Systems Inc. 3.65, and Shaw Systems Associates 3.59.

But because a relatively small number of M&I users responded - only 11 - Trans Data said its mean score is not necessarily statistically significant with respect to the other mean scores. IBM software users numbered 67.

Ms. Donohue said in a phone interview she is pleased that the results of her survey and the American Banker's seem to confirm each other. The Donohue Associates poll was not intended as a banking survey, since it covered all the Fortune 1000 corporations. But Ms. Donohue said she has had a number of requests to do a survey solely among banks.

The 10 banks that responded to her poll range in size from $3 billion plus deposits up to the largest of all, Citibank, with $114.7 billion. The five thrifts range from $2.9 billion to $16.9 billion deposits.

In the responses from bankers in the Donohue survey, IBM and Software Alliance were also tied for the best rating on the question of who has the best mainframe products. IBM was named best for support and for its sales people.

The Donohue and American Banker results differ on bankers' opinions of sales representatives. The American Banker survey shows the senior operations officers of midsize and large banks think less highly of IBM sales reps than of those from its two major competitors - Unisys Corp. and NCR Corp.

On questions about minicomputers, the banks and savings and loans combined in the Donohue survey gave Tandem Computers Inc. the best overall rating. Tandem and Digital Equipment Corp. tied on products. Hewlett Packard Co. and IBM tied for best-rated on support. And IBM was rated best for sales people.

In the field of microcomputers, Microsoft Corp., Bellevue, Wash., was rated tops overall and for products. It is developer of the MS-DOS operating system, the Multiplan spreadsheet program, and the word processing program named Word. IBM ranked first for support and salespeople.

Ms. Donohue asked the bank and thrift data processing officers to identify their top-priority need. Corporate networking software was cited by 47%, application development tools by 40%, and data base management systems by 13%.

LEVEL 1 - 2 OF 4 STORIES

Origin Universal News Services Limited, 1987

December 14, 1987

LENGTH: 305 words

HEADLINE: SIXTH FORMERS' LEADING ROLE IN RACAL'S JAPANESE DEAL

KEYWORD: RACAL

BODY:

Some forty sixth formers from Reading schools became Japanese grain traders for the day to help a local company show off its latest world-beating technology to a Japanese delegation.

The visitors - from the Tokyo Grain Exchange - had flown into Reading to witness the demonstration of electronic trading equipment which they have bought from Racal Microelectronic Systems to computerise their manual trading methods.

The contract, worth £1.8 million, is the first of its kind to be awarded by one of the Japanese trading exchanges to a British company. Racal worked in conjunction with sub-contractors, CAP Financial Services, which provided the system software, and Tandem Computers which supplied the mainframe.

In less than four months, Racal devised a dealing information and display system which can handle the unique Japanese dealing methods and even imitate centuries-old trading signals, such as the 'clapping of the woods' to denote the end of a trading period.

As a reward for their help in putting the new system through its paces, the pupils, from the Reading Boys School and Kendrick Girls School, earned £1,000 for each school.

The system supplied to the Grain Exchange includes 15 information boards which display market prices and movements and give the current status of trading. In addition to the 80 dealer terminals on the trading floor, there are a further 80 remote terminals all over Japan, fed through data communications equipment supplied by Racal-Milgo.

The system will be installed in the Tokyo Grain Exchange's prestigious new building which will be fully operational by the end of January. The Exchange is the oldest-established commodity market in Japan, trading spot and futures in three varieties of soya bean.

Contact: Racal Corporate Communications Centre, Wokingham (0734) 782158

LEVEL 1 - 1 OF 2 STORIES

December 16, 1987, Wednesday, BC cycle

SECTION: Financial Report.

LENGTH: 240 words

HEADLINE: WALL STREET STOCKS/ TANDEM COMPUTERS <TDM>

DATELINE: SAN FRANCISCO, DEC 16

BODY:

Tandem Computers stock gained in heavy trading following the company's prediction to analysts late last week of strong first quarter earnings. Good market conditions for technology stocks overall also accounted for the investor activity, analysts said.

The Cupertino, Calif-based company's stock rose 1-1/2 to 26-1/2 on volume of 744,400. At an analysts meeting Thursday, the company said it expects first quarter results to improve over fourth quarter per share earnings of 31 cts. The improvement surprised some analysts who said they had expected a per share profit for the current quarter of about 30 cts.

The strength of the computer industry also is bolstering the stock, analysts said.

"It is getting late in the quarter and orders continue to look strong, so the expectation is that earnings across the industry look good," said Kidder Peabody analyst Terence Carleton.

Analyst Jean Orr of Drexel Burnham said investors have realized that even if the economy slows next year, computer stocks will not suffer much. "If better demand does not develop, the companies are in a position to be profitable anyway," Orr said.

Analysts said the company should get increased orders for its equipment from the New York Stock Exchange as trading capability is expanded.

Also, the company told analysts at the meeting they are pursuing several 100-mln-dlr orders from single customers.

LEVEL 1 - 2 OF 3 STORIES

December 14, 1987

SECTION: INDUSTRY UPDATE; Network Survey; Pg. 7

LENGTH: 1027 words

HEADLINE: ATM net use increases; debit cards start to flower

BYLINE: By Jim Brown, New Products Editor

DATELINE: CHICAGO

BODY:

Although automated teller machine transaction volume grew faster than expected in 1987, ATM network operators are still waiting for a heralded influx of debit card transactions, according to a recently released report.

The annual ATM network survey conducted by the industry newsletter "Bank Network News" found the top ATM networks were prepared to handle 1987's 11% increase in ATM volume -- despite a sluggish 1986.

Network operators are utilizing excess capacity built into their networks to support point-of-sale transactions that are only now beginning to materialize, according to John Love, publisher of "Bank Network News" and companion newsletter "POS News." Love added that, increasingly, ATM net operators are charging consumers transaction fees, adding a new source of revenue.

"Bank Network News" surveyed 110 of the nation's approximately 125 regional ATM networks, asking for such information as the number of ATM and POS transactions processed in September and the number of ATMs and POS card-reader terminals deployed in the networks. The survey compared those figures with results from September 1986.

POS transaction volume grew by 64%, from 3.2 million transactions in September 1986 to 5 million in September 1987, Love said. The number of POS card-reader terminals deployed in retail outlets grew 37% from 25,148 in 1986 to 39,969 in 1987.

Despite the growth in POS transaction volume and terminals, Love said some merchants are still unwilling to accept debit cards as a payment method due to the number of different networks to which they would have to link and the number of different cards they would have to accept. But, as more regional ATM networks agree to provide links between area financial institutions, merchants will be able to accept larger numbers of ATM cards by linking to only one regional network, he added.

"POS, while it has great potential, has been disappointing in the last five years. But POS will take off soon and exceed ATM volume by the early 1990s," Love said.

POS debit cards let customers have the purchase price deducted from their bank accounts at the time of the sale. A customer passes the debit card

through a card-reader terminal at the merchant location and enters a personal identification number (PIN) on a keypad attached to the terminal.

Account information is gleaned from the magnetic strip on the card and sent with the PIN via a leased line to the merchant's bank, which, in turn, can be linked to a regional ATM network. The regional ATM net links to the financial institution with the customer's bank account and gives transaction authorization or denial to the merchant.

Love said most of the top 30 ATM networks have already upgraded their networks, including installation of new software, to support POS transactions. Some ATM networks have even replaced Tandem Computers, Inc.'s NonStop transaction-processing minicomputers with more powerful IBM mainframes in anticipation of increased POS volume.

The upgraded networks will support rapid response times required to minimize checkout lines at merchant locations. They will also support a broader range of transactions than ATMs, including the ability to credit a customer account for items returned to a merchant and increased security such as encryption of the customer's PIN, account number and transaction data sent via telephone lines.

Love said the growth of POS will be aided by the recent development of a set of POS network standards to support Entree, a national debit card program marketed jointly by Visa, U.S.A., Inc. and MasterCard International, Inc. Those standards are based on POS guidelines developed by the American Bankers Association.

The Interlink Network, owned by a group of 11 financial institutions in California and Arizona, now processes the most POS transactions, with 2.9 million transactions in September, compared with 1.8 million in September 1986. Interlink cards are accepted at more than 325 Lucky Stores, Inc. supermarkets in California.

On the ATM side, the number of transactions processed in September 1987 hit 335 million, up from the 301 million processed in September 1986. That growth of 11% is larger than the mere 2 1/2 % growth in transactions recorded in 1986. The survey found there were 4,000 more ATMs installed since September 1986, bringing the number of ATMs deployed across the country to 68,000.

Love said the increase in ATM volumes was partially due to increased advertising and marketing efforts on the part of the ATM networks. Also contributing to the increased traffic was the fact that the few financial institutions that had already started charging transaction fees decreased those fees from 75 cents to $1 per transaction to between 25 cents and 50 cents per transaction.

Networks charge member financial institutions a fee for processing a transaction. Some financial institutions have begun passing that fee along to customers who use their cards at ATMs owned by competing financial institutions belonging to the same network.

Customers felt the 75 cents-to-$1 fee was too high and curtailed some of their transaction activity, Love said. "But that 25 cents to 50 cents seems to be a fee consumers will pay for the convenience of using another bank's ATM."

The 2-year-old Fort Lee, N.J.-based New York Cash Exchange (NYCE) network is the leading network in the country in terms of ATM transaction volume, the survey shows. NYCE processed some 28.5 million transactions in September, up from 15 million in September 1986. The Pulse network of Texas, a onetime leader in volume, slipped to fourth, with 17.8 million transactions, up slightly from 16.3 million in September 1986.

The largest transaction-volume increase, percentage-wise, was recorded by the Connecticut-based Yankee 24 network, which went from 3.9 million transactions in September 1986 to 10 million in September 1987, a 159% increase. Most of that increase in volume came when the Boston-based Bank of Boston Corp., Bank of New England, N.A., Shawmut Corp. and State Street Bank and Trust Co. joined the network, along with Providence, R.I.-based Fleet National Bank.

LEVEL 1 - 1 OF 3 STORIES

December 14, 1987

SECTION: NETWORKING; Data Stream; Pg. 51

LENGTH: 853 words

HEADLINE: White papers, red faces

BYLINE: By Patricia Keefe; Keefe is a Computerworld senior editor, networking.

BODY:

It seems there's been a major run on white paper down on LAN Lane. No, it's not because of a white sale sponsored by the local stationery shops, but rather a version of the axiom, "Those who can't, teach." In this case, it might be better rephrased to read, "Those who haven't delivered generate a lot of hot air."

The mails are being flooded with white papers on OS/2 networking from LAN Manager proponents and co-developers 3Com and Microsoft. Rival unbeliever Novell was slated to deliver a white paper outlining its product strategy last Friday. And the last of the triumvirate of dominant local-area network operating system vendors, Banyan Systems, was also readying its own white paper, reportedly addressing IBM's Systems Application Architecture, of which OS/2 is the first piece.

To be fair, white papers -- at times a manifestation of all talk and no action -- can be beneficial, indeed eagerly received, if used to clear up confusion or provide technical information. On the other hand, if used to market grandiose claims or slyly create confusion beneficial to the author, then writers accomplish little more than muddying their names. And users should let them know about it.

The papers may be white, but in this instance they were triggered by Big Blue's unveiling of its OS/2 LAN Server at Comdex/Fall '87 last month.

Adding to the general state of confusion enveloping the PC LAN arena these days, IBM preannounced a product slated for delivery in November 1988 that requires OS/2 Extended Edition (scheduled to ship in July), adding it would use portions of LAN Manager, which is also scheduled to ship in mid-year or thereabouts.

However, IBM said it would not endorse LAN Manager and will not support LAN Manager applications programming interfaces. IBM encouraged software developers to write to the Advanced Program-to-Program Communications (APPC) interface.

Invisible support

3Com was the first to respond with a white paper promising support for APPC and guaranteeing compatibility with LAN Manager, OS/2 LAN Server and, last but not least, any applications written to OS/2. Pretty interesting, given that with the exception of OS/2 Standard Edition, none of the above mentioned products is supposed to ship for another eight months.

In addition, 3Com has a June delivery date for 3+Open, a new version of its 3+ network operating system. To its credit, 3Com demonstrated support for OS/2 on the workstation and server sides last week for the first time. That's a step in the right direction.

Rumor has it that Microsoft was less than thrilled by the cocky tone of 3Com's paper: So much so that two weeks ago, Microsoft released its own white paper, which essentially echoes technical information in 3Com's dissertation, albeit with a much more low-key approach.

The name game

There are two interesting twists to the Microsoft paper. First of all, Microsoft has renamed two portions of the LAN Manager, now called LAN Server (server software) and requestor (redirector). By coincidence, IBM uses the same names. Deliberately or not, Microsoft appears to be trying to confuse users, who already have enough trouble sorting out the differences between the Microsoft and IBM offerings.

And then there's Novell. Ever the busy bee, Novell is bursting at the seams with preannounced -- but unshipped -- products. Let's see, there's Systems Fault Tolerance Level III (file server mirroring); Netware for Apple's Macintosh, announced more than a year ago; Netware for VMS; and Advanced Netware 2.1.

The latter Novell ware was first unveiled in February, announced again in August, slated to ship in September and, last we heard, scheduled to ship last Friday. Netware 2.1 was delayed in order to add OS/2 support, Btrieve and Novell's Message Handling Service, a spokeswoman said.

Meanwhile, Novell, too, has been making promises, namely that it will support OS/2 at the server without licensing LAN Manager. (3Com vehemently insists Novell can't pull this off.) Again, it's hard to cut through the gale force here without even knowing how Novell plans to accomplish this, never mind without experiencing the look and feel of a real product.

In the dark

Banyan also has yet to detail its position on OS/2 networking beyond supporting OS/2 at the workstation. Banyan tends to wait for other players to go public with their plans before commenting themselves, a spokeswoman said. "The problem is that no one really knows what IBM is doing," she added. Nor does anyone know what Banyan is doing, at least as far as OS/2 is concerned.

The point here is that although the vendors may see white papers as a valid form of air freshener, all users end up with is yet another layer of obfuscation. Without actual products to compare all these explainers, claims and guarantees with, it's debatable how much comfort white papers really offer corporate planners and strategists.

So, passing on a tip from Col. North, let's shred those papers, zip those lips and start shipping some iron, or I should say in this case, software.

GRAPHIC: Picture, Patricia Keefe

LEVEL 1 - 3 OF 3 STORIES

December 14, 1987

SECTION: TOP NEWS; High-Speed Networks; Pg. 1

LENGTH: 1031 words

HEADLINE: Sun Trust Services puts faith in fiber

BYLINE: By Jim Brown, New Products Editor

DATELINE: ORLANDO, Fla.

BODY:

Sun Trust Services Corp. has sidestepped more costly leased T-1 service and ensured excess capacity for network growth by linking two buildings here with a private, 45M bit/sec fiber-optic link.

Sun Trust Services, which provides data processing support for Sun Banks, Inc. in Florida, SunTrust Banks, Inc. in Georgia and Third National Corp. in Tennessee, had the quarter-mile underground link installed between its data center and its new operations center here six months ago.

The $120,000, point-to-point fiber link can support 28 1.54M bit/sec T-1 channels, the same as a T-3 circuit, although the bank currently uses only four T-1 links. The fiber link cost nearly twice as much as a proposed 23-GHz microwave radio system supporting four T-1 channels, but it has six times greater capacity, according to Chris Cagle, who is a network planner for Sun Trust Services.

With 24 unused T-1s, the fiber system can easily support additional voice and data links. Those links would be needed if the bank moves ahead with a proposal to double the size of its operations center within the next three years, Cagle said.

The excess capacity will also enable the bank to place IBM check-sorting equipment in the operations center. This equipment would be linked via fiber-optic IBM 3044 channel extenders to an IBM mainframe in the data center.

The system also gives the bank the ability to install IBM 9370 minicomputers in its operations center and link them to the mainframe.

By going with the fiber link, the bank also avoided spending the $25,000 to $30,000 required to install a T-1 multiplexer and channel bank equipment needed to support four leased T-1 lines. Those leased lines would cost an additional $3,500 per month, or $42,000 a year.

"Even though our buildings are only a few thousand feet apart, leased T-1 service was fairly expensive," Cagle said. "The fiber system cost more than the microwave or leased T-1s, but in the long run we will, at the very worst, break even. We could even wind up saving money if the operations center is expanded or the need for additional T-1s between the buildings arises."

The link, installed by Martin Marietta Data Systems' Fiber Optic Systems Group, has operated as well as Sun Trust Services managers expected. Based on its experiences with the fiber system, the company may install additional private fiber links between Sun Bank or SunTrust buildings located close to each other, according to Cagle.

Two of the four T-1 lines currently operating over the fiber link carry voice traffic between an AT&T System 75 private branch exchange in the operations center and an AT&T System 85 PBX in the data center. Another links a mix of terminals and terminal controllers in the operations center to various hosts in the data center. That data link enables workmen in the data center to operate heating, air-conditioning and security control systems located in the operations center.

The fourth link transmits one-way video images from security cameras in the operations center to a security post in the data center.

The point-to-point link consists of a Telco Systems Fiber Optics Corp. 828F M-13 multiplexer and a D424 channel bank from ITT Telecom Network Systems Division that supports data channels operating at up to 56K bit/sec.

The fiber system also supports The Grass Valley Group, Inc.'s Wavelink one-way video system.

Cagle said the system's two T-1 voice links support a total of 48 digital, 64K bit/sec E&M trunk lines. The trunk lines enable users attached to the System 75 in the operations center to access outside telephone lines and Sun Trust's private electronic tandem network (ETN) via the System 85 in the data center.

That System 85 is linked via leased T-1 lines to a System 85 in a downtown Orlando Sun Bank. The downtown System 85 is one of three nodes in Sun Bank's private Sun Dial ETN network. The other two are located in Tampa and Fort Lauderdale.

The system's lone data link is split into nine channels, five of which connect IBM 3274 terminal controllers to an IBM 3725 front-end processor. Two of the controllers operate at 56K bit/sec, while the others operate at 9.6K bit/sec.

For the most part, IBM terminal users in the operations center require periodic access to customer files on the mainframe.

Another 9.6K bit/sec channel on that link is shared between NCR Corp. and IBM teller terminals needing connection to NCR or IBM hosts.

Those terminals are used for teller training or terminal troubleshooting, Cagle said.

Administrative personnel in the operations center using Tandem Computers, Inc. terminals are linked via another 9.6K bit/sec channel to a Tandem NonStop minicomputer in the data center. This minicomputer runs Sun Bank's Florida automated teller machine network. Users of Tandem terminals can retrieve ATM usage statistics from the minicomputer.

The last 9.6K bit/sec channel on the link enables an AT&T 3B2 microcomputer in the operations center to link to an AT&T 3B5 minicomputer in the data center.

The 3B5 collects station message detail recording files from the more than 50 System 75s located in Sun Bank branches in Florida. It also collects ETN network usage statistics from three System 85 ETN nodes in Florida. The 3B2 in the operations center is able to access those files to prepare reports.

While Sun Trust Services network operations personnel are able to monitor the status of the fiber-optic link, the bank has contracted with Martin Marietta to provide maintenance.

"With only a quarter-mile of cable, there is no need for us to build a fiber-optic maintenance staff," Cagle said. "It will be cheaper in the long run to just trust that maintenance to Martin Marietta."

Although it is using a system with the capacity of T-3, the bank does not currently have enough traffic to support leased 45M bit/ sec T-3 service between its branch sites. Nor does it plan to use leased T-3 service.

If ETN traffic increases, Cagle said he will likely propose the use of digital voice compression techniques -- such as adaptive differential pulse code modulation -- which would double the number of voice circuits a T-1 line can support.

LEVEL 1 - 1 OF 1 STORY

December 14, 1987

SECTION: AT DEADLINE; Pg. 1

LENGTH: 383 words

HEADLINE: Novell Plans Two-Part OS/2 Strategy

BYLINE: Sharon Fisher and Carole Patton

BODY:

Novell Inc.'s Netware network operating system will be available to run under both the Standard Edition and the Extended Edition of OS/2, the Provo, Utah, company announced Friday.

The Netware Requestor, scheduled for delivery in the first quarter of 1988, allows computers running the Standard Edition to coexist on a Netware LAN with PCs running DOS. Users, who will run the Requestor in their workstations, can run both DOS and OS/2 applications, Novell said. It will cost $ 50 and require Netware, Version 2.1, which is shipping this month.

The Netware Applications Coprocessor, to be released in the fourth quarter of 1988 after Extended Edition ships, is a server board with a coprocessor that runs both server-based OS/2 and Netware Value-Added Process applications. This allows users to run server-based applications without distracting the server from network operations. The board, which has not yet been priced, will come in both Micro Channel and At bus versions.

"Using a coprocessor takes OS/2 off the workstation," said Darrell Miller, vice president of corporate marketing for Novell. "This is not new technology. What's new is that now we're doing it on PCs."

Novell said it would support only the application programming interfaces supported by IBM and therefore would not support the named pipes interface present in the LAN Manager, developed by Microsoft and 3Com and incorporated in 3Com's 3+Open OS/2 LAN product.

Reaction from analysts seemed positive. "I don't think the added cost of a coprocessor to the file server will be a problem," said Douglas F. Whitman, an analyst with Alex Brown & Sons, in San Francisco. "Novell has a reputation for higher cost and higher performance."

However, Glenn Westin, support manager for Entre Computer Center, in New York, is taking a wait-and-see approach. "They tried this [coprocessor] approach before with TCP/IP," he said. "We'll see whether it will work."

Novell also announced it has begun shipping its System Fault-Tolerant Netware, Version 2.1. It includes network management and diagnostics software for Netware 2.1 LANs. As a special introductory offer, Novell said it would sell SFT for $ 3,895, which is $ 800 off the regular price. The discount will continue through April 23, 1988.

December 7, 1987

SECTION: RIDING THE CIRCUITS; 9th Circuit; Securities Law; Pg. 40

LENGTH: 83 words

BYLINE: "Riding the Circuits Part II" is prepared by The National Law Journal staff.

BODY:

Wool v. Tandem Computers Inc., NDCalif., 85-2674, 6-3. Reversed. District Court erred in finding that plaintiff suffered no injury as a matter of law by defendant's misrepresentations of its financial status in violation of Sec. 10(b) of the 1934 Securities and Exchange Act and Rule 10b-5, and summary judgment was improper. Plaintiff's allegations of fraud against the individual defendants was set forth with sufficient particularity to comply with Rule 9(b) requirement of particularity.

LEVEL 1 - 3 OF 8 STORIES

December 21, 1987

SECTION: NEWS; Trends; Pg. 78

LENGTH: 228 words

HEADLINE: Mainframe market

BYLINE: By Rosemary Hamilton

BODY:

In the mainframe market, IBM remains the undisputed king with a 92% share, leaving mere scraps for both Amdahl Corp. and National Advanced Systems (NAS), which each hold a 2% portion.

As Big Blue continues to gobble up business, a good chunk of it could come from the manufacturing sector, which shows the greatest amount of mainframe buying intentions from a survey including 11 industry segments that was conducted by Computer Intelligence Corp. (CI) in La Jolla, Calif.

But while CI cautions that the overall market shares look discouraging for the plug-compatible vendors, they are making headway in certain segments. Both NAS and Amdahl showed 7% gains in market share for IBM 3090-class machines this year, a CI spokeswoman said.

Those with mainframe buying intentions who opt for a non-IBM environment will have more options. Five major vendors are jockeying for position in the noncompatible market, although Unisys Corp. holds a clear advantage over the others with a 50% share.

Second to Unisys is Tandem Computers, Inc. with a 19% share; Hewlett-Packard Co. and Honeywell Bull, Inc. are close with 12% and 10% shares, respectively. Trailing the pack is NCR Corp. with a 7% share.

High demand for mainframes is also coming from medical and educational institutions, which account for 14% of the users who plan to buy hosts.

ROSEMARY HAMILTON

GRAPHIC: CW Charts, by Amy J. Swanson, information by Computer Intelligence, IBM still overhwelms mainframe competitors; Unisys leads the pack of alternatives; Manufacturers' buying plans biggest

LEVEL 1 - 1 OF 8 STORIES

December 21, 1987

SECTION: NEW PRODUCTS; Networking; Links; Pg. 43

LENGTH: 140 words

BODY:

A file transfer software package that runs on Tandem Computers, Inc.'s Nonstop systems has been announced by Phitech, Inc.

Called Dataexpress, the software supports batch transfer of files in any format, optionally reformatting to any other file format. It supports multiple media such as leased lines, dial-up, tape and disk as well as multiple communications protocols including 2780 and 3780 bisynchronous, Systems Network Architecture and asynchronous with error checking. Functions for monitoring communications lines and retransmission are also provided.

Other features include autodial, autoanswer and autocallback functions. Security, activity statements for customer billing and audit trails are also included.

Dataexpress costs from $30,000.

Phitech, Suite 710, 220 Montgomery St., San Francisco, Calif. 94104. 415-788-5455.

LEVEL 1 - 2 OF 8 STORIES

December 21, 1987

SECTION: NEWS; Pg. 1

LENGTH: 1192 words

HEADLINE: NBS admits Cobol test rules fuzzy

BYLINE: By Charles Babcock, CW Staff

BODY:

A National Bureau of Standards (NBS) procedure that few other vendors were aware of enabled IBM to have an unannounced, mainframe Cobol 85 compiler tested privately last month. But NBS officials say the procedures are "confusing" and will be speedily rewritten.

NBS officials declared last week that IBM was within established procedures when it asked that the test of what is anticipated to be the Cobol 85 version of IBM's VS Cobol II compiler be kept off the NBS published schedule [CW, Nov. 30].

Bureau officials said IBM has been the only vendor to invoke the out-of-sight testing process in the 18-month period during which the bureau has supervised the testing.

However, Micro Focus, Inc. acknowledged last week that earlier this year it had requested nondisclosure for testing of a PC Cobol 85 compiler they were developing for IBM.

Bureau officials said the written procedures that allowed IBM to avoid appearing on the Oct. 1 list of vendors slated to be tested are "confusing" and will be rewritten next month. The rewrite will make it clear that a vendor does not have to appear on any published list until certification is ready to be announced, if it chooses that alternative.

Other compiler producers contacted said they were surprised such an option existed.

The compiler issue surfaced when Computerworld asked NBS officials why IBM did not appear on an Oct. 1 list of vendors that had been certified as having Cobol 85 compilers or were scheduled to be tested during the next 12 months. The federal government has advised its agencies to require Cobol 85 in any software contracts, and IBM acknowledged at the time that it was continuing to bid on government business that included Cobol.

Cobol that meets the American National Standards Institute (ANSI)'s standard for Cobol 85 is not yet in widespread use, but it is believed to offer programming and maintenance gains of which the federal government wants to take advantage.

The NBS publishes a Certified Compiler List that advises federal agencies which vendors meet ANSI standards. NBS officials said in follow-up discussions about the private IBM compiler test that the published list should not be read

as all inclusive, although it appears to indicate that it is.

Section 8, page 102, of the Certified Compiler List states that it contains the schedule for language compiler tests. It continues, "All processors (compilers) are identified by name of vendor," compiler name, level of validation and scheduled test month.

"We feel that is misleading. It could lead to misunderstanding of our treatment of IBM. The list may not be a complete list," said Mabel V. Vickers, programming language adviser to the NBS staff.

Helen Wood, deputy director of the Institute of Computer Sciences and Technology within the NBS, which conducts the tests, said regulations governing the tests are "vaguely written" and "confusing." They appear to set up a public process but actually create a broad allowance to keep a test behind closed doors until it is completed and results are ready to be announced, she said.

When asked why other vendors had not discovered that option, Wood said, "Maybe they don't have so many lawyers."

The clarifying comments from the officials at the NBS were solicited after IBM officials charged that IBM had been unfairly singled out in the Nov. 30 Computerworld story on the undisclosed compiler test.

"I've got some people in the Information Systems Group that are pretty unhappy that it looks like we're getting special treatment. Other vendors have requested tests in private. It's a normal procedure," said IBM spokesman John H. Mihalec.

Wood said she agreed other vendors were given the option of keeping a scheduled test out of the public eye during the 1980-to-1985 period, when the testing was administered by the General Services Administration. She did not name any other vendors that had used such an approach and said that she knew of no records that indicated how frequently it was invoked.

Mihalec cited IBM's legal requirement to avoid preannouncing a product as the reason it wished to keep its compiler from appearing on the NBS test list.

Customers of IBM's MVS/XA operating system are believed to be waiting for IBM to get its VS Cobol II compiler certified as an ANSI-standard Cobol 85 compiler. The VS Cobol II compiler allows them to recompile a Cobol program for 31-bit operation under MVS/XA, or above the 16M-byte virtual memory line that restricts 24-bit programs under MVS/SP.

Cobol authorities said ANSI-standard Cobol 85 requires applications written in Cobol 74 or its predecessors to be converted and recompiled. Major IBM customers are reluctant to undertake the task until they know VS Cobol II meets the ANSI standard, said Jerome Garfunkle, a Cobol consultant in Litchfield, Conn.

One Cobol 85 compiler vendor, Prime Computer, Inc., questioned why appearing on a schedule to be tested would constitute a product announcement. Prime tested its Cobol 85 compiler in October in a publicly scheduled test. Test results are still awaited, and the product still has not been announced to customers, said Warren Jacob, a Prime product marketing manager. "A validation test says

nothing about when it will become a product," he said. The possibility of conducting the test in private "never came up."

NBS officials said the main reason they permit testing in private is to avoid embarrassing vendors. "We are trying not to penalize vendors that bring us a product that may not be ready. They're given a chance to clean it up [if it fails] without tarnishing their reputation," Wood said.

Tandem Computers, Inc., failed the validation test three times in public before getting its Cobol compiler certified, the first one certified at a high level, according to Tandem spokesman Don Nelson. When asked why Tandem repeatedly conducted its effort in public, Nelson said, "In the stuff I read, I didn't see anything about keeping it private."

The following passage in the Institute of Computer Sciences and Technology Test Procedures document given to compiler producers presents the option of keeping a test out of the public eye, according to institute officials:

"With the exception of information obtained through special Institute of Computer Sciences and Technology requests for advance information for scheduling purposes, all information provided about the specifics of a validation are public information available to the public upon request after the completion of the on-site data collection phase of the validation."

"We're a little confused about what that means," Vickers said. The paragraph is believed to indicate that a test becomes public information only after it is completed and results are available, she said. Vendor wishes may dominate the procedure until it reaches that stage, she added.

The compiler tested for IBM is believed to be a Cobol 85 version of its VS Cobol II compiler. While it is still unannounced, Mihalec said, the compiler has been listed since September in an internal data base for IBM branch offices "as being available to meet specific customer needs."

LEVEL 1 - 8 OF 8 STORIES

December, 1987

SECTION: BANKING APPLICATIONS; Pg. 69

LENGTH: 479 words

HEADLINE: POS Service Supports High Growth with On-Line Transaction Processing

BODY:

Problem: Supporting processing needs of high growth POS network.

Solution: Tandem Nonstop VLX System and LeRoux, Pitts & Associates Total Payment System software.

The Amherst Group Inc. (AGI) of Cambridge, Massachusetts, and North Hampton, New Hampshire, has grown to become a leading provider of point-of-sale (POS)) network services in the Northeast. Last year alone, the company increased sales by more than 80%, and currently provides retail POS services to 110 New England bank/merchant programs through a network of more than 7,000 on-line terminals. To support its rapidly expanding operations, the firm has installed a Tandem on-line transaction processing system with Total Payment System software from LeRoux, Pitts & Associates of Clearwater, Florida.

"AGI has developed the only fully supported authorization and draft capture network in the New England area," said Charles Shields, executive vice president and chief operating officer at AGI. "The firm was launched with a strong commitment to supply customers with the most advanced, cost-effective applications possible, and the computer system has been critical to our success by providing around-the-clock network availability and a ready pathway for continued growth."

AGI's network generates more than 1.5 million transactions monthly. It authorizes all major credit cards and supports electronic draft capture, as well as three of the nation's largest check guarantee services. Available anywhere in the U.S. 24-hours a day utilizing local nodes, packet switched networks, leased lines or WATS, AGI-Net also supports the most extensive local line telecommunications network of its kind in New England, processing all dial transactions directly through the computer system.

AGI ensures constant system availability by running its POS services on a two-processor NonStop VLX System from Tandem Computers Incorporated, Cupertino, California. According to Shields, AGI selected the Tandem equipment based on its fault tolerant architecture, modular expandability, flexibility, and availability of POS application software.

"We cannot afford any computer downtime in our business, and the NonStop System's fault tolerant capabilities eliminate this problem by providing 100% availability," he said. "The system also provides the flexibility to improve our billing and reporting procedures, and will allow us to expand capacity by simply adding processors and disk memory without any reprogramming.

"Another important consideration was the availability of the Total Payment system software package," Shields continued. "We approached four hardware vendors and asked them to suggest software houses who could meet our needs. The Tandem/LeRoux, Pitts & Associates combination was not ony the most cost-effective, it also offered the best overall solution for the future."

INVESTEXT/COMPUTERS AND OFFICE EQUIPMENT
December 28, 1987

Tandem Computers - Company Report
BEAR STEARNS & COMPANY - Fram, J., et al
11-20-87 (RN=722344)

Tandem Computers (TDM - 23)
Continuing Buy Recommendation

1986 EPS (9/30):	$0.72
1987 EPS:	$1.08
1988 EPS Est.:	$1.50
P/E 1987:	21.3x
P/E 1988 Est.:	15.3x
Dividend:	Nil
Yield:	Nil
1987 Price Range:	37-19
Common Shares Out.:	100 Mil.

[Graphical Material Omitted: TDM Price Chart]

Summary

On November 11, 1987 Bear Stearns hosted a meeting for Tandem management where our strong conviction about the company's prospects was affirmed. We continue to recommend purchase of Tandem shares.

Highlights of this meeting centered on:

Tandem's business is only beginning.

* Tandem is well positioned to address one of the biggest untapped opportunities in the computer industry, namely, distributed database systems. We believe that distributed database systems will drive much of the industry's growth over the next several years. Such systems are the natural outgrowth of Tandem's 10 years of experience in peer-to-peer networking and transaction processing technology. In short, the transaction processing business is rapidly becoming the commercial computing mainstream, which is no longer being restricted to niche markets such as automatic teller machines and electronic funds transfer.

Tandem has one of the finest financial controls in the industry.

* It is mystifying that Tandem still suffers from an image of loose financial controls, reflecting events of five years ago. However, since that time the new financial management created a rigorous planning and control process that has produced strong results and ratios. Fortunately, the company is appropriately calling attention to the fact that its financial ratios are the best in the industry in terms of asset management (inventory turns at 10), gross profitability (gross profit on sales of 75% last quarter) and financial condition (more than $300 million in cash, and no debt). As well, Tandem's conservative hiring posture caused the company to implement a

replacement hiring only policy in August 1987 after increasing headcount by 23% in fiscal 1987 in order to support revenue growth. The company's expense plan has been geared for 25% revenue growth, lower than the 35% order growth experienced over the past three quarters.

Business ramains strong.

* Many investors have assumed that Tandem's business would be particularly hard hit by the recent market crash. Yet, it appears that the demand for computers optimized for accurate, high-speed transaction processing has remained strong in the weeks immediately following the crash. Specifically, we know of one major brokerage firm and one major stock exchange that have made significant commitments to Tandem in the past week. The brokerage segment of Tandem's business is 80% higher than the levels of a year ago. Tandem's presence in retailing has also remained strong, with the company having recently won contracts with the #1 and #3 retailers in Japan.

Tandem's thrust into the low-end and in open systems environments

* The company recognizes that it is a heterogeneous world and it would be too narrow-minded to assume that the broad commercial market would make exclusive commitments to Tandem's processor architecture and operating system. Rather, Tandem recognizes the need to extend its contribution in transaction processing and distributed database technology to more generic processor platforms (i.e., systems running Unix). We would expect Tandem to allow such platforms to be seamlessly integrated into its own networks and distributed database systems during 1988.

This strategy comes hand-in-hand with Tandem's thrust into low-end, namely, the desk top and the branch site where transactions originate. Only by capturing the transaction at the source will the benefit of Tandem's distributed database technology be fully appreciated. We believe that product announcements to integrate PCs into the Tandem environment will also surface early next year.

Tandem Computers: Quarterly Financial Review and Projection
($ Millions)

[Part 1 of 2.]

	Fiscal 1987			
	I	II	III	IV
Product Revenue	199	202	219	241
Service & Other	39	40	45	50
Revenue	238	242	264	291
Cost of Product	54	55	57	61
Cost of Service	28	30	36	37
Product development	24	26	27	31
Mktg, Gen & Admin	87	96	102	113
Net interest	(3)	(3)	(4)	(4)
Total Costs	190	204	219	238
EBIT	46	35	41	49
Pretax Income	48	38	45	53
Income Tax	21	16	19	23
Net Income	27	22	26	30
Shares Out. (Mil.)	93	98	100	100
EPS ($)	0.29	0.23	0.26	0.31
Margins (%)				
Cost of Product	27	27	26	25
Cost of Service	71	74	80	75
Product development	10	11	10	11
Mktg, Gen & Admin	36	40	39	39
EBIT	19	15	16	17
Pretax Income	20	16	17	18
Income Tax	44	42	43	43
Net Income	11	9	10	10
Growth (%)				
Product	42	38	34	25
Service	32	34	20	20
Revenue	40	37	31	32
Pretax income	131	72	37	38
Net Income	134	81	41	41
EPS	111	60	28	31

Note: For additional information, please refer to the Highlights dated May 29, 1987 and Recommendation Follow-up dated July 24, 1987.

Tandem Computers: Quarterly Financial Review and Projection
($ Millions)

[Part 2 of 2.]

	Fiscal 1988			
	I Est.	II Est.	III Est.	IV Est.
Product Revenue	248	253	276	307
Service & Other	47	48	54	63
Revenue	296	301	330	370
Cost of Product	70	71	74	81
Cost of Service	34	35	39	45
Product development	33	33	35	39
Mktg, Gen & Admin	114	113	124	139
Net interest	(4)	(4)	(4)	(4)
Total Costs	246	248	268	300
EBIT	46	49	58	66
Pretax Income	50	53	62	70
Income Tax	18	19	22	25
Net Income	32	34	40	45
Shares Out. (Mil.)	100	101	101	102
EPS ($)	0.32	0.34	0.40	0.44
Margins (%)				
Cost of Product	28	28	27	27
Cost of Service	72	72	72	72
Product development	11	11	11	11
Mktg, Gen & Admin	39	38	38	38
EBIT	15	16	18	18
Pretax Income	17	18	19	19
Income Tax	36	36	36	36
Net Income	11	11	12	12
Growth (%)				
Product	25	25	26	27
Service	20	20	20	27
Revenue	24	24	25	27
Pretax income	3	39	38	31
Net Income	18	54	56	47
EPS	10	50	53	44

Note: For additional information, please refer to the Highlights dated May 29, 1987 and Recommendation Follow-up dated July 24, 1987.

	Fiscal year ending			
	9/30/88 Est.	9/30/87	9/30/86	9/30/85
Product Revenue	1,083	861	632	515
Service & Other	213	174	135	109
Revenue	1,296	1,035	768	624
Cost of Product	296	227	175	186
Cost of Service	153	131	105	83
Product development	139	108	87	72
Mktg, Gen & Admin	489	398	295	262
Net interest	(16)	(14)	(9)	(6)
Total Costs	1,061	851	653	596
EBIT	219	171	106	22
Pretax Income	235	185	114	28
Income Tax	83	79	51	22
Net Income	151	106	64	6
Shares Out. (Mil.)	101	98	88	84
EPS ($)	1.50	1.08	0.72	0.07
Margins (%)				
Cost of Product	27	26	28	36
Cost of Service	72	75	77	76
Product development	11	10	11	11
Mktg, Gen & Admin	38	38	38	42
EBIT	17	16	14	3

Pretax Income	18	18	15	4
Income Tax	36	43	44	79
Net Income	12	10	8	1
Growth (%)				
Product	26	36	23	15
Service	22	29	24	30
Revenue	25	35	23	17
Pretax income	27	62	310	(50)
Net Income	43	66	972	(86)
EPS	35	50	950	(87)
Product Revenue ($ M)				
NS-II	30	50	50	77
TXP	440	480	460	386
EXT	56	68	68	52
VLX	360	200	55	0
CLX	120	26		
LXN	63	14		
Unit Shipments				
NS-II	120	200	200	300
TXP	1100	1200	1150	1000
EXT	375	450	450	350
VLX	360	200	50	0
CLX	2400	400		
LXN	1800	300		

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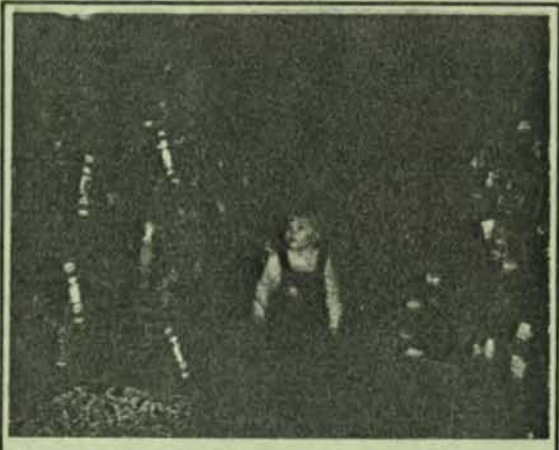


Thanks to some 1,500 volunteers at a Texas Instruments plant in Austin, about 70 community service groups—including nursing homes, children's hospitals and schools for the mentally retarded—have decorated Christmas trees with presents such as toys and games. Above, the child of one volunteer admires part of their work before the trees are delivered. Page 6.

Don't Throw That Modem On Yule Fire

By ROBERT FELDMAN

NEW YORK—Infinet Inc.'s Christmas card suggests a timely new verse to add to a familiar carol. It reads: "Modems roasting on an open fire, Jack Frost nipping at your nodes . . ."

Whether such integrated network propaganda will actually lead to a modem bonfire is still in doubt, however. At a recent ISDN (integrated services digital network) conference here, despite predictable hoopla, the old-fashioned devices seemed not ready for burning just yet.

But one trial customer did seem prepared to torch a roomful of NT-1 devices he had accumulated at his plant. They were all junked prototypes that Northern Telecom had experimentally installed, pulled out and forgotten to haul away, said the user. (The NT-1 is a basic rate interface to integrate voice and data terminals onto an ISDN line.)

As for nodal frostbite, three other early trial customers showed up with intact proboscises despite the cold weather, voicing generally warm thoughts on ISDN. The panelist-users were Michael Shelton of Suntrust Service Corp. of Georgia; Jim Mathieu of Lockheed Missiles, San Francisco; John Amidon, Arizona Department of Transportation; and Billy King, Shell Oil, Houston.

In all, about 125 people attended the seminar, sponsored by the Eastern Management Group (EMG), Parsippany, N.J.

As for the most publicized

SEE ISDN, PAGE 19

Second of three articles on ISDN developments. The first appeared in Dec. 14 MIS Week, page 23.

Harris 'Protects' Silverlake Buyer

By MIKE EGAN

MILWAUKEE—In what could be an industry trend-setting software pricing action aimed at "protecting" System/3X users delaying major software purchases until International Business Machines Corp. unveils its S/3X "Silverlake" replacement line early next year, Harris Data Service Inc. has announced a "Silverlake price-protection plan."

Effective immediately and applying to purchases now through June 30, 1988, Harris Data is guaranteeing upgrades of its S/36 and S/38 applications software products to the native Silverlake language—whatever it turns out to be—for a fixed price of $1,000 per software module.

Simultaneously, Harris is offering a repurchase guarantee (at market prices) for all IBM S/3X hardware sold by Harris.

Harris Data has seen a growing sales slowdown among S/3X users who are undecided about whether to upgrade their S/3X systems or wait for Silverlake. Harris's price-protection program is aimed at removing the fear of buying what could turn out to be soon-to-be-obsolete software.

"There's a lot of anticipation in the S/3X marketplace right now. Users are holding off on purchasing normal System/36 and System/38 systems and software," said Bob Grant, marketing coordinator for Harris Data Service, an IBM VAR (value-added reseller).

SEE HARRIS, PAGE 31

Tandem Plotting 3-D Investment Strategy

By LESLIE GOFF

CUPERTINO, Calif.—Gerald Held, Tandem Computers Inc. vice president of new ventures, is saying, "You have to think about the cube," as he walks to a chalkboard and proceeds to diagram his master plan for the myriad investmegts Tandem has made in new technology and markets since he started the new ventures program in 1985.

When Held completes the drawing of his "strategic cube" he says, "Now, you can look at the (cube) and you see what should be driving investments and acquisitions." A more objective look at the cube, however, reveals that this vice president, with a Ph.D. in database technology, has just constructed a relational database model to support his plan.

"You have to understand the focus of our strategy," Held said. "Strategy is really competition; it's a war. So you have to conceptualize that you're not fighting on every front. You look at the market, at where you are, at your strengths and where you can win."

Held drew the first plane of the cube, which he said was "everything in the world." He then refined that plane, drawing col-

SEE TANDEM, PAGE 11

Tandem's Gerald Held

IBM: OS/2 Ext. Tool Kit Will Ship This Winter

By PATRICIA ZENGERLE

ARMONK, N.Y.—The developers' tool kit for OS/2 Extended Edition from International Business Machines Corp. will be in the hands of software developers this winter—part of IBM's continuing effort to position the OS/2-Personal System/2 combination as a central component of its integrated computing solution.

Ned Lautenbach, IBM vice president and president of its National Distribution Division (NDD), said that IBM would be having technical seminars on the extended operating system in February and March, and added, "Our goal will be to have it (the tool kit) in people's hands by then."

Additionally, there is more to IBM's microcomputer plan than just its emphasis on integrating its OS/2-based machines with its larger systems, according to Lautenbach and Richard J. Gough, manager of product line evaluation, PC product management, IBM Information Systems Group.

The two executives told MIS Week that IBM's plans for PC-DOS-based machines included the development of a user interface product for its low-end PS/2 Models 25 and 30.

In an interview last week, the two executives discussed the theories behind the PS/2 and its direction over both the next several

SEE IBM, PAGE 6

No Issue Dec. 28

Because of the holidays, MIS Week will not publish a newspaper Dec. 28. We launch the New Year the following week with the issue dated Jan. 4, 1988.

MIS Lends Helping Hand to Homeless

By SUSAN ROMAN

NEW YORK—As the winter nights lengthen and grow colder, the reality that not everyone has a home to retreat into becomes more awful and, while some homeless will spend their nights on sidewalks or inside cheerless train stations, others depend heavily on shelters provided by the city.

The technology of computer terminals spread throughout shelters in New York City linked to a central minicomputer might appear to be of little help in assisting the completely human problem of providing shelter, protection and care for fellow persons.

On the contrary, as the homeless numbers have expanded, officials say a computer system was helpful in the provision of services to homeless persons, including warm beds, showers and benefits due them.

Kathryn Ruby, spokeswoman for the Human Resources Administration (HRA), said that in 1978, there were three shelters with about 46 women and

SEE HOMELESS, PAGE 7

George Everhart, Apple Computer Inc. executive, says the business market outstripped even education and consumer sales in 1987. Page 24. Apple is expected to unveil LU 6.2 software for peer-to-peer nets at IBM SNA sites. Page 17.

Tandem Gazes to 3-D Venture Strategy Future

CONTINUED FROM PAGE 1

umns to represent Tandem's target vertical on-line transaction processing (OLTP) markets—financial services, manufacturing, telecommunications, retail, government and transportation—which he called the first dimension of the cube.

"Then you look within the vertical columns and you further refine them," Held said. "For instance, within financial services you have banks. Within that, you have the Fortune 200 and within that you need delivery systems.

"You look at the segments and sub-segments you can be the most successful in," he added. "And you keep an eye on the happenings in those segments because anything can change the way they (the customers within those segments) do business and that's an opportunity for Tandem."

The second dimension of Held's cube defines the company's product strategies—large systems, small systems, databases, communications, security systems and software and hardware services.

The third dimension singles out the geographic areas in which Tandem sells—the United States, Great Britain, Germany, Holland, Australia and Japan.

"If you look across the industries and the product areas in the (geographic) markets we're in, you see really unique opportunities," he said, adding, "For instance, Tandem is strong in the manufacturing sector in Germany but not in banking. In the U.K., it's the opposite.

"As you look at the cube in this way," Held continued, "you see particular needs that Tandem will try to address. Then we ask, 'Can we do this ourselves or should we team up with someone else who has what we need in terms of customer base, distribution channels, technology, whatever?'"

Tandem's first investment, in 1985, was a joint venture in Tokyo with Computer Engineering and Consulting Ltd. to develop, market and support custom application software for Tandem's NonStop on-line transaction processing (OLTP) systems in Japan.

The resulting company, Vartecs Inc., works with regional customers on a case-by-case basis to help support large projects, particularly with regard to value-added networks and financial, retail and point-of-sale applications.

Prior to that initial foray, however, Held said Tandem was notorious for its technological and manufacturing independence.

"If you follow us back to the early days," Held said, "we were very focused on the OLTP market. We basically invented the first products for that market. We were very successful and we did everything ourselves.

"We were accused of being xenophobic," he added. "Everyone said we were too inward-looking because we did everything on our own. We reached $100 million in five years, which was very rare at that time.

"When you're faced with that kind of success," Held said, "you tend to get overconfident. A company believes it can do anything, because if you extrapolate that growth rate up you think you'll catch IBM in a few years. But you can't do everything yourself."

As a result of the soaring revenue in those early days, Tandem had a substantial cash reserve, Held said, which it decided to apply toward growing the company through a "reinforcement strategy."

"There are three tactics companies apply their cash to," Held said. "They can diversify, they can establish a venture capital fund with the main goal being a financial return on investment, or they can use the cash to reinforce the basic strategic thrusts of the company. That's what we're doing."

The company still looks for a return on investment, Held said, but not necessarily a financial return.

"We try to look at the effect of the investment across the company," he said. "We look at how the company has grown and how the partnership has benefitted business."

Largely as a result of the Vartecs venture, Held said, Tandem recently has gained a substantial new account, the Bank of Tokyo, in addition to providing other Japanese users with increased software support.

With Vartecs, Held said, the company started with "one underlying need," which was to help support large projects for Japanese customers. While the company could have hired new personnel, he said, "That's not really the way we do business.

"We started with a seasoned, large software services company that has the advantage of a methodology," Held said. "We had the customers so they get a source of business and we get the support for our customers."

Netherlands Proves Fruitful

The company last year established a similar partnership in the Netherlands with the Volmac Group. Together they formed Twinac, which provides project management and consulting services for Tandem customers. Held said this venture also had garnered new business for Tandem.

Twinac also assists members of Tandem's Alliance program in the distribution and support of their software packages for applications in the financial, production, transportation and travel sectors in the Netherlands. Again, the venture hearkens back to Held's cube.

Key to the strategic cube, Held said, is matching the size and type of investment to the recipient. Of the nine alliances Tandem has established, only one has been an outright acquisition and in that instance the acquired company, Atalla Corp., was seeking a merger (see Oct. 19 MIS Week, page 4).

"Minority investments are intentional," Held said. "We're a big company now, but we started small and we try to think like a start-up. We are entrepreneurs.

"What is the incentive for a small company if it's eaten up by a large company?" he continued. "Small companies win because they have a contribution to make that they are dedicated to and work for so we work hard to create an environment where people with ideas can see them through."

Held added, "We don't want to impose the way we operate on a little company. If you try to operate them like a big company, they die."

An Investment Listing

In addition to the October acquisition of Atalla and the joint ventures in Japan in December 1985, and the Netherlands in November 1986, Tandem has (in chronological order):

- Purchased a 19.5 percent stake in Integrated Technology Inc. (ITI), a telecommunications firm, to jointly develop and provide integrated services digital network (ISDN) capabilities for Tandem NonStop customers (February 1986);
- Made an equity investment in Triplex, a manufacturer of fault-tolerant programmable logic controllers to be marketed with Tandem's NonStop computers for comprehensive computer-integrated manufacturing (CIM) solutions via Tandem's manufacturing automation protocol (MAP) implementation (March 1986);
- Entered a memorandum of understanding with Pacific Bell and ITI under which PacBell acquired a 24.5 percent stake in ITI and Tandem increased its holdings to equal PacBell's for the three companies to develop advanced telecommunications network systems for use in PacBell's network (October 1986);
- Bought a minority interest in Netlink Inc. to jointly develop and market products integrating Tandem's NonStop systems with IBM systems through the use of Systems Network Architecture (SNA) solutions (July 1987);
- Joined SEL Canada and Union Pacific Railroad as stockholders in Automated Monitoring and Control International Inc. (AMCI) to jointly develop an electronic Advanced Train Control System (ATCS) for the railroad industry for which Union Pacific will be the first customer (September 1987); and
- Made an equity investment in Anamartic Ltd., a Cambridge, England-based research and development firm specializing in advanced, high-performance computer storage products through the use of a new method in wafer-scale integration called Soft Wafer Interconnect (November 1987).

100 Percent Wish Fulfillment

Held said all of the strategic alliances have met Tandem's expectations and produced results, though "some have taken longer to come along."

ITI and Tandem are deploying the ISDN Switching Signal No. 8 through incremental shipments of Tandem equipment, Held said. Triplex has shipped its product and is now preparing to ramp up production to volume capacities.

Held also said the company shortly would announce SNA products resulting from the minority investment in Netlink and added, "Our IBM integration is one of the best around—in some cases better than IBM's."

He called Tandem's SNAX, its application of SNA, one of the most comprehensive in the industry, but said the company needed the alliance because "SNA is a high architecture and Netlink is strictly dedicated to SNA.

"We had a leadership position in SNA and now we have extended that position through a new company with strength in that area," Held said, pointing again to the strategic cube.

The investment, with SEL Canada and Union Pacific, in AMCI has built-in incremental revenue, Held said, with Union Pacific as both a partner and customer with

SEE TANDEM, PAGE 33

High-End Spruce Up Opens Act II of Memorex DASD Play

By LESLIE GOFF

MILPITAS, Calif.—As the second phase in a three-tiered response to International Business Machines Corp.'s recently announced triple-density 3380-class disk drives, Memorex Corp. has added new products and features to its line of plug-compatible high-end drives.

Bob Bodnar, Memorex director of storage equipment marketing, said the company would implement the third phase of its plan, the actual introduction of triple-density plug-compatible drives, in the first calendar quarter of 1988.

In October, following IBM's September announcement (see Sept. 7 MIS Week, page 1), Memorex lowered prices and extended warranties on its existing storage products (see Oct. 19 MIS Week, page 10).

The new products include a new disk storage subsystem, a direct-attach string controller and a string controller buffer.

Memorex also boosted the data transfer rate of its 3888-23 cache controller from 3 Mbytes to 4.5 Mbytes per second to match that of IBM's 3090 processor and new Models J and K disk drives. It also increased the cache memory from 64 Mbytes to 192 Mbytes, which is available in 16-Mbyte increments for installed units.

Bodnar said the new products and enhancements were fully compatible with Memorex's existing disk product line. IBM has not yet provided upward compatibility in its disk drive upgrades.

The new 3680-HP disk storage subsystem has an average access time of 12 milliseconds (ms). It consists of a string controller, the 3683-HP, which is the equivalent of an "A" box in IBM terminology, and up to three disk drive modules, or "B" boxes.

Each disk drive module has two 1.25-Gbyte head disk assemblies (HDAs) for a capacity of 2.5 Gbytes per module or a total string capacity of 10 Gbytes.

Additionally, Bodnar said, each Memorex 3680-HP single-density drive in a storage module can be upgraded to a Memorex 3682 double-density drive.

Direct-Attach to Memorex

Whereas IBM's new drives will not attach to its older storage control unit, the 3880-3, Bodnar said the new Memorex subsystem would attach to any Memorex storage controller, including the 3888 (equivalent to IBM's 3880-3), the 3888-23 cache controller and the new 3686 direct-attach controller.

The 3686 controller, Memorex's answer to IBM's 3380 CJ2 unit, attaches directly to the host channel and combines a 3683-HP head of string unit and a 3888 storage control unit into one box. The Memorex model features two single- or double-density HDAs, compared with only one single-density HDA in IBM's CJ2.

The new string controller buffer is supported on all Memorex string controllers.

The buffer is designed to eliminate missed disk rotations and is said to provide a 15 percent improvement in input/output (I/O) performance.

"Missed disk rotations are a major cause of input/output delays, especially in DP shops that have many on-line users," Bodnar said. "Even though the requested track is located almost instantly, the disk is busy spinning non-productively until a data path to the CPU is available."

When a track is located, it is transferred to the string controller buffer on the first revolution so that it is available to the CPU immediately. The buffer retains the track until all sequential accesses are completed whereas, ordinarily, multiple accesses would be required to read the entire track, Bodnar said.

The 3680-HP subsystem is scheduled to be available in the first quarter and will list at between $70,000 and $235,000, depending on configuration. The 3686 direct-attach controller will not arrive until the third quarter of 1988 and will list at between $87,000 and $252,000.

The string controller buffer feature will be available for single-capacity units in the first quarter but will not be available for double-capacity units or the expected triple-density units until the fourth quarter. It will be priced at $25,000 across the board.

Finally, to upgrade the 3883-23 cache controller, users will pay $3,000 for the 4.5-Mbyte channel speed, available in the first quarter, and $3,000 per Mbyte for the memory upgrade.

Financial

Tandem Enters 3rd Dimension for Venture Strategy

CONTINUED FROM PAGE 11

plans to implement the system nationwide.

A pilot ATCS project is already underway on 200 miles of the Union Pacific line in western Nebraska and AMCI could take Tandem into other industries requiring monitoring and control systems.

Additionally, AMCI could benefit from Tandem's relationship with Triplex, representing an integration between investments that further supports Held's database model. Held said integration among the various relationships was not a requirement, but "there are side benefits when that happens."

Atalla, which Held said would continue to operate under its own name, will solidify Tandem's position in banking with its on-line security systems. Those systems, in fact, are already tied to numerous installed Tandem computers at customer sites like Wells Fargo Bank, San Francisco; Bank of Nova Scotia, Canada; and Barclays Plc., England. The Atalla customer base also offers Tandem vast opportunity for its OLTP systems.

More importantly, however, Atalla will provide the company a new strategic advantage in the point-of-sale (POS) niche. "We're already in the POS market on the networking side, but Atalla is in it at the terminal end," Held said. "If you look forward, that's a bigger potential. We will grow Atalla to meet that opportunity."

Atalla is developing point-of-sale terminals with built-in security for full credit-oriented OLTP applications that could eventually extend beyond the retail marketplace to government agencies and health care providers concerned with the security of business records.

Targeting Chain Stores

Initially, Vaughn's, a Southern California chain of grocery stores, will install the Atalla terminals and Held said, "You will see Tandem more and more in those markets.

"As networks get larger and we have more access to data," Held said, "security becomes an even greater key to a sale. Tandem has a couple of products in this area but Atalla gives us a real opportunity for growth."

The investment in Anamartic, Held said, is the one most oriented toward product development, though at this point Anamartic is still in the technology phase.

Anamartic's breakthroughs in wafer-scale integration will lead to high-speed memory products that use less power, are more reliable and cost less than solid-state storage devices available today, he added. Actual product is still about 18 months down the line.

"The key goal," Held said, "is to be the OLTP leader in both hardware and software. We see this (high-speed storage) as a key component to that strategy."

With $300 million in cash, Tandem plans to keep a close eye on Held's strategic cube in the coming year, looking to fill in those remaining empty columns and rows.

"We will continue a strong investment program in 1988," Held said. "The number of deals probably won't increase, but the size and impact will."

3Com Corp.'s Profit Falls Due to Merger with Bridge

SANTA CLARA, Calif.—3Com Corp. last week reported a decline in net income even though sales more than doubled for the second quarter ended Nov. 30, jumping to $58.2 million from $38.3 million for the same period in fiscal 1987.

The local-area networking systems company said second-quarter net income was down to $3.1 million, or 11 cents per share, from $6.3 million, or 22 cents per share.

3Com attributed the drop in net income to a one-time charge for expenses related to its merger with Bridge Communications Inc. in September.

Sales and earnings figures reflect reported quarterly results for the period ending June 28, 1986, for Bridge Communications Inc., and for the period ending Nov. 30, 1986, for 3Com, a spokesman said.

"We are successfully integrating the Bridge and 3Com product lines, distribution strategies and management teams," said William Carrico, 3Com president and chief operating officer, in a prepared statement.

Market Declines Slightly; New Chip Boosts Motorola

NEW YORK—As reflected by the MIS Week Communications Stock Index and the Dow Jones Industrial Average (DJIA), investors continued their somewhat bearish stance towards stocks during the monthly trading period that ended Dec. 14.

The MIS Week portfolio dropped 6.31 points to close at 1,305.63 for this trading period, compared with the DJIA, which fell 16.24 points to close at 1,932.86.

Two statistics emphasized the selling pressure applied to communications stocks over the last 30 days. Once again, declining issues outpaced advancing issues by a 10 to 8 count. Additionally, three stocks—Ungermann-Bass, ITT and Paradyne—fell to new 52-week lows. Meanwhile, no stocks reached new highs.

Motorola—the largest dollar gainer for the period, up $5.25—was actively traded last month as investors aggressively added shares of the semiconductor maker to their portfolios.

Wall Street boosted the stock price higher when Motorola announced the development of a new microprocessor chip employing Reduced Instruction Set Computing (RISC) technology that it said would enable the chip to power future high-performance technical workstations and minicomputers.

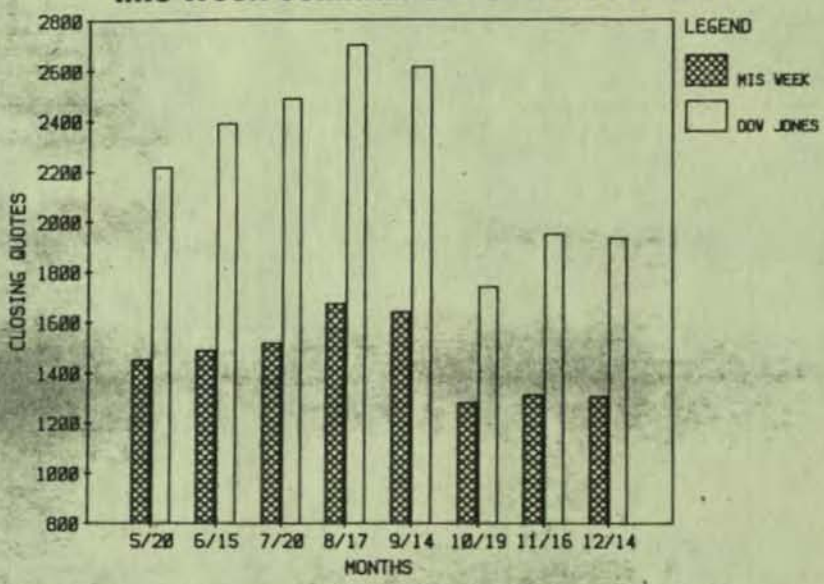
Motorola was also the highest percentage gainer for the period, up 12.28 percent.

Bell Atlantic was the largest dollar loser, down $2.88 last month, while Ungermann-Bass was the largest percentage loser, down 16.97 percent, to close at $6.75 for the same period.

Recently, Digital Communications Associates decided to terminate its unsolicited merger offer of $9.75 per share, or $175.5 million, to Ungermann-Bass, after Ungermann-Bass rejected its takeover bid. However, Digital still holds a 5.7 percent stake in the data communications-equipment maker.

Separately, Digital Communications Associates now trades on the New York Stock Exchange under the ticker symbol DCA. Previously, DCA was listed on NASDAQ.

MIS Week Communications Stock Index



COMPANY	CLOSING PRICE 11/16/87	CLOSING PRICE 12/14/87	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
AT&T	29.50	28.38	—1.12	—3.80	21	1.20	4.23	35.88	22.25
BELL ATLANTIC	69.38	66.50	—2.88	—4.15	11	3.84	5.77	79.75	60.50
BELLSOUTH	38.50	37.88	—.62	—1.61	11	2.20	5.81	44.25	29.13
COMSAT	26.50	25.00	—1.50	—5.66	—	1.20	4.80	34.63	22.00
CONTEL	28.00	28.00	0.00	0.00	11	2.00	7.14	39.63	25.00
DIGITAL COMM.	24.50	25.50	1.00	4.08	12	—	—	49.00	14.50
GTE	35.63	37.25	1.62	4.55	12	2.52	6.77	44.75	29.38
ITT	49.00	46.38	—2.62	—5.35	9	1.25	2.70	66.38	41.75
M/A-COM	9.88	8.63	—1.25	—12.65	6	.24	2.78	16.38	7.25
MCI	10.00	9.63	—.37	—3.70	—	—	—	12.13	5.00
MOTOROLA	42.75	48.00	5.25	12.28	23	.64	1.33	74.00	35.00
NETWORK SYS	8.38	8.50	.12	1.43	13	—	—	18.75	6.75
NORTHERN TEL.	16.75	18.13	1.38	8.24	13	.24	1.32	24.25	14.00
PARADYNE	4.13	3.88	—.25	—6.05	—	—	—	8.75	3.50
TPI ENT.	4.50	4.63	.13	2.89	—	—	—	9.88	3.88
TIE COMM.	2.75	2.75	0.00	0.00	d	—	—	5.88	1.75
TIMEPLEX	31.25	31.50	.25	.80	18	—	—	41.00	16.50
UNGERMANN-BASS	8.13	6.75	—1.38	—16.97	28	—	—	16.25	5.13
UNITED TELECOM	24.50	24.88	.38	1.55	—	1.92	7.72	33.38	23.50
US WEST	50.88	49.25	—1.63	—3.20	10	3.28	6.66	60.25	42.50

THE COMPETITIVE OFFENSIVE

Intense worldwide competition drives push for excellence

By LORRAINE GENGO

Despite a decade of talk about competitiveness in world markets, American high-tech businessmen are leading lives of quiet desperation when their thoughts turn eastward.

Scott McNealy, president and chief executive officer of Sun Microsystems Inc. in Mountain View, admits losing sleep because of the Japanese.

"We're working very hard and pushing very hard to work with American silicon companies, American computer makers and software developers," McNealy told a group of high-tech businessmen at a recent conference on personal computing.

"But there's a huge battle we have to fight in terms of work ethics," he added.

Sun has 22 competitors in Japan for its high performance technical workstations. From a revenue standpoint, Sun is the leading supplier in Japan. "But we will see continued aggressive competition from them," McNealy predicted.

Sun had net revenues of $537.5 million on worldwide sales during its fiscal year ended June 30. Seven percent of those revenues were generated from the Pacific Rim, according to Sun's annual report.

McNealy grew up in Detroit where his father worked in the automobile industry. "That's where I spent my formative years and where I learned business over the dinner table," he said.

The parochial attitude evinced by American automobile makers is not limited to that industry alone. "I just don't think we care as much," McNealy said. "When you hang out in the UAW shops and you hear the attitudes of the lifers: they're happy, they're comfortable and they're not going to lift an incremental finger; then it doesn't seem possible to make a difference."

Ed Zschau, former congressman and now chairman of a task force on competitiveness, cited three general strategies that American high-tech companies should take when focusing on the Japanese market.

American companies have to make a commitment to provide foreign customers with products and services that are superior to indigenous products, Zschau said.

American high-tech companies also need to emphasize manufacturing prowess. "We took our eye off the manufacturing ball in the '70s. U.S. business school enrollment in manufacturing has been very poor," he added.

Thirdly, American companies have to become much more investment-oriented with a focus on long-term research and development, training and education, Zschau said.

In short, most competitiveness experts said America needs to become more export-oriented in general. "American businesses are too intimidated to export even though they may have the capability," said Tom Uhlman, Hewlett-Packard Co.'s director of corporate development. "The number one reason for this is fear of the unknown," he added.

Uhlman and HP president and chief executive officer John Young served on a presidential committee in 1983 that was charged with the task of finding ways American business could become more competitive. The commission made 32 recommendations which have been largely ignored by the political leadership.

"There was not much responsiveness in the White House. Their economic agenda was set by the time and they were not open to new ideas," Uhlman said.

CHUCK GATHARD

White House unresponsive
HP's Tom Uhlman

CHUCK GATHARD

Support and service essential
Tandem's David Peatrowsky

CHUCK GATHARD

Losing sleep
Sun's Scott McNealy

Since then, HP has taken a leadership role in continuing the discourse on American competitiveness with the formation of a separate task force.

The group, headed by Young, recently polled the presidential candidates on the issue of competitiveness to determine their stances on key issues.

Hewlett-Packard is frequently cited as an example of competitiveness. The technical equipment and computer maker has seen rapid growth in the Pacific Basin with the possible exception of Japan, according to the company's annual report.

The company's technical computers do very well in Japan's market but consumer computing systems have done less well, according to Uhlman.

Hewlett-Packard has been in the Japanese market for 25 years and has a joint venture operation with Yokogawa Electric Corp., an electronics company.

Tandem Computers Inc. of Cupertino has been winning accolades from the Japanese government for its on-line transaction processing systems.

Tandem has only been competing in Japan for seven years, and only in the past five years has it been very active in the market, according to David Peatrowsky, regional director at Tandem Asia Pacific.

"We've managed over the past five years to have a compound growth rate of 55 percent," Peatrowsky stated.

Tandem recently won the G-Mark award for outstanding design on its VLX mainframe processor and its SL-8 mass storage system from the Ministry of International Trade and Industry. The G-Mark emblem will be stamped on all the equipment Tandem sells.

"You have to have a fetish about support and service to do well in Japan," Peatrowsky commented.

Two other companies that have done well competing in Japan are Harmon International, which has plants in California and Ohio, and Fujitsu America in Santa Clara, according to Zschau.

Harmon, which makes audio speakers that go into automobiles, is in a business the Japanese should own, Zschau said. Even so, Harmon has been very successful selling car speakers in the Japanese market. Their products are made by California workers to boot, Zschau added.

Fujitsu America, which was established to make disk drives, has been turning out a product from its plant in Oregon that is far superior and less expensive to produce than the same product made by Fujitsu in Japan. The Japanese firm is now thinking of buying the product made in Oregon instead of making its own, Zschau said.

The outlook, at least from the perspective of the Computer and Business Equipment Manufacturers Association in Washington, D.C., is not nearly as gloomy as American businessmen tend to think, according to Charlotte LeGates, director of communications for the trade organization.

LeGates said the United States is not losing market share in Japan but gained seven-tenths of a percent from 1982 to the present. "It's not enough to send earthquakes through Tokyo, but it's an improvement."

Here's how Hewlett-Packard, others found avenues to better productivity

There are almost as many ways for businesses to improve profits as there are different businesses.

But most fall into several broad categories: better defining a niche, developing new products and services, increasing production efficiency and cutting costs, improving product quality and offering incentives to employees and customers.

The trick is to find the idea or ideas that are right for a particular business and situation. Here are a few of the more innovative approaches being used by firms around the country.

Offering incentives Dave Child, production manager of Scientific Research Inc., a longtime Portland, Ore.-based machine shop and high-tech subcontractor, started an employee incentive program to develop new products and improve old ones.

So far, employees have created a new precision welding tool and modified existing products. The result: greater production efficiency.

Efficiency Hewlett-Packard Co. of Palo Alto was looking for ways to make its mobile sales force more productive.

The electronics giant found in surveys that its field representatives were unhappy with administrative aspects of their jobs, which cut into selling time.

Enter the portable computer, a battery-powered unit which, paired with a printer, is the size of a large briefcase. The company bought 2,000 of the $4,000 machines.

Employees in the Rochester, N.Y., area and elsewhere report they love the new machines. Hewlett-Packard expects to recoup its multimillion-dollar investment in a year because of the efficiency the computers afforded the sales staff.

Finding a niche By targeting very specific niches, Duquesne Systems, a Pittsburgh-based developer of software for IBM mainframes and minicomputers, has produced record results in virtually every quarter since its initial public offering in 1984.

The company's strategy is to sell software packages that require little training or on-site consulting.

Revenues for the fiscal year that ended Sept. 30 were $37.7 million, up 55 percent from $24.2 million a year earlier. Net income rose from $5 million to $8.1 million while earnings per share were up 42 percent, from 53 cents to 75 cents.

New products A Louisville, Ky.-based company, Soltech Co. Inc., added a whole series of new products when sales leveled off for its thermal and acoustical insulation.

Its team of engineers — chemical, electrical, metallurgical and mechanical — developed new product lines of surgical kits and medical equipment. The company acquired eight patents in the past year for products centering on the water heater industry.

"We have a little mini-think tank here," said Thomas Nelson, president. Soltech's sales have doubled every year since 1983.

LEVEL 1 - 1 OF 1 STORY

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HEADLINE: First Data Establishes Communications Link With Deluxe Data to Handle Cash Advances

BYLINE: By Jeffrey Kutler

DATELINE: NEW YORK

BODY:

The companies that process the greatest numbers of credit card and debit card transactions have installed a communications link.

First Data Resources Inc., the leading bank credit card processor and a subsidiary of American Express Co., announced the agreement this month to link with Deluxe Data Systems, Brown Deer, Wis. Deluxe is an electronic funds transfer system supplier owned by Deluxe Check Printers Inc., St. Paul.

Under terms of what they call a "gateway" agreement, credit card cash advances at automated teller machines served by Deluxe can be routed to First Data Resources for authorization.

The link gives First Data Resources' clients a low-cost way of obtaining credit card authorizations and provides Deluxe Data Systems' users an additional service option at their ATMs.

"The link provides our banks with economical access to ATM transactions without adding to fixed costs," said Eugene E. Kathol, director of product development, First Data Resources, Omaha.

"The synergies of bringing together a large credit card processor and a large debit card services provider will bring more business to both our customers," Mr. Kathol added. "Also, the system has the potential to provide other services in the future, including debit card access at the point of sale."

Kenneth Byrne, senior vice president of marketing, Deluxe Data Systems, said First Data Resources maintains a data base of 25 million Visa and MasterCard accounts, which ensures a vast potential transaction volume for the gateway link.

He characterized credit card authorizations as the first phase of a continuing relationship between the two service companies.

Deluxe Data Systems, formerly A.O. Smith Data Systems, counts among its clients the six largest shared electronic funds transfer networks in the U.S.

As the result of an agreement announced Dec. 1, Deluxe's principal ATM/POS software product, Connex, is being marketed jointly with International Business Machines Corp.'s sales force. It makes Deluxe the latest of several systems

firms to participate in IBM's cooperative software program.

As a mainframe-based system, Connex runs on IBM 4831 or larger computers.

Deluxe also released two pieces of customer news:

* Nebraska Electronic Transfer System, Lincoln, licensed Connex software for ATM and POS switching on a Tandem computer. It drives one of the oldest statewide networks in the country, with 406 ATMs and 32 POS terminals serving 364 financial institutions. NETS said it would also take advantage of Deluxe's gateway service for access to other networks and card systems.

* Provident Bank of Maryland, Baltimore, contracted with Deluxe for automated teller machine processing, authorization, and settlement services. Deluxe is replacing an in-house software system as Provident Bank replaces its 21 ATMs with machines from the Diebold 1000 series. The bank is a member of Most, a regional ATM network that is also a Deluxe client.

Tandem buys five buildings it had leased in Cupertino

By MICHAEL KREY

In a dramatic indication of its growth and commitment, Tandem Computers Inc. has purchased five Cupertino office buildings that it had been leasing.

The move also will provide a hedge against future rent increases.

The purchases encompass five buildings with 510,000 square feet and approximately 30 acres off Vallco Parkway and Tantau Avenue, near the intersection of Interstate 280 and Wolfe Road.

In a related move, Tandem is in escrow to purchase a vacant 5.4 acres between Vallco Parkway and Stevens Creek Boulevard, near Tantau, as a future site for an eight-story, 300,000-square-foot sales and marketing office.

The seller for all Tandem's recent transactions is Vallco Park Ltd.

Frank Robinson, Tandem's director of corporate real estate and construction, citing company policy, declined to release financial details of the transactions. Vallco Park Ltd. officials could not be reached for comment.

> *"In the early years we weren't in the financial position to purchase any buildings. Now we're in a position to take advantage of a good market. We're very happy in Cupertino and obviously we plan to stay."*

But some other recent purchases indicate area property costs.

Last December, Tandem bought two office buildings on about nine acres of land from a trust administered by Bank of America. The buildings on Tantau Avenue, comprising about 200,000 square feet, sold for a reported $15.5 million.

That same month the Crow-Spieker-French No. 133 Ltd. Partnership bought two office buildings of 105,000 square feet each nearby, at 19310 and 19320 Pruneridge Ave., leased by Hewlett-Packard Co. That price was approximately $13 million.

Within that same area, Tandem occupies 13 buildings and approximately 1 million square feet. The firm now owns seven of those buildings, plus the site for the future marketing tower. All the buildings are in Cupertino except for a leased building on Stevens Creek Boulevard that is just within the San Jose border.

"We've been negotiating for these five buildings since we bought those other two last December," Robinson said. "We're a maturing company that needs the space. We are looking at all options at this point. To tell you the truth, its been a challenge to come up with the facilities to house these employees."

Tandem, in fact, has grown from 5,223 employees at the end of its fiscal year 1984 to 7,007 employees as of Sept. 30. More than a third of its employees are based in its growing Cupertino complex.

Formed in 1974, the company passed the $1 billion sales mark in fiscal 1987, compared with $767.8 million in sales for fiscal 1986. Its income grew from $63.7 million in fiscal 1986 to $105.6 million in fiscal 1987.

"In the early years we weren't in the financial position to purchase any buildings," Robinson said. "Now we're in a position to take advantage of a good market. We're very happy in Cupertino and obviously we plan to stay.

"From a facility standpoint, ownership gives us better control. Sometimes we have to move quickly. Aside from that, we've concluded that these buildings offer pretty good investments."

Real estate executives also point out that Cupertino is one of the county's strongest markets, prone to rent increases. The strength stems primarily from the formidable and expanding presence of Tandem, Hewlett-Packard and Apple Computer Inc.

On a space binge of its own, Apple earlier this year bought its first building ever, in Cupertino, and has signed leases for more than 500,000 square feet of space in that city.

"Tandem and Apple are the players in Cupertino, and they have been in expansion modes for some time," said Steve Weatherholt, sales manager for the San Jose office of Grubb & Ellis. "It makes sense for Tandem to buy because it gives them more control. With rents increasing its nice to lock in the cost at today's rates. Rental rates are increasing faster in Cupertino than probably any other market in the valley.

"But if Tandem were based in north San Jose, where rents are low and are expected to remain low for some time, Tandem probably wouldn't be so interested in buying."

"Tandem has been doing some good things in Cupertino," said Glenn Barber, Apple's director of real estate and facilities. "They've been buying and we've been leasing, so our approach has been much more modest. But in the long term Apple hopes to consolidate its facilities here in Cupertino."

Tandem could soon be doing more. The 5.4-acre site still in escrow is just east of the site of the proposed 700-room Marriott Hotel. Robinson said Tandem's preliminary plans for construction of an eight-story, 300,000-square-foot marketing complex should be brought before the city of Cupertino this spring, although an actual construction date has not been determined.

Tandem also recently remodeled most of the buildings it has just purchased. The buildings are:

- a 140,000-square-foot manufacturing building at 19333 Vallco Parkway—the first building Tandem occupied in Cupertino, dating to 1977;
- a 140,000-square-foot research and development building, also 19333 Vallco Parkway;
- a 25,000-square-foot conference center, also 19333 Vallco Parkway;
- a 140,000-square-foot sales and marketing building, 19191 Vallco Parkway;
- a 65,000-square-foot accounting building, 10300 N. Tantau Ave.

Tandem also has nearly completed major renovations of the two buildings it bought last year. The firm had not previously occupied these buildings, at 10435 N. Tantau Ave., but the administration staff has moved into one building, while more research and development departments are moving into the second building.

Robinson said Tandem is in the midst of a landscaping and signage program in an effort to tie all the buildings into a campus concept.

"Tandem's culture is communications," Robinson said. "That's why we feel it's important to create this tight-knit complex."