3090 upgrade push is on again

BY ROSEMARY HAMILTON

With few signs of a customer feeding frenzy for the VM/SP operating environment and the 3090 S models, IBM has shifted into high gear in an attempt to push its high-end package. Last week, the computer giant dangled another batch of incentives in front of customers, including a new 3090 Model 380S, a midrange model that features an asymmetrical processing capability that will also be made available on other S models.

The asymmetrical capability lifts the constraint that required users to configure equal amounts of expanded storage and channels on both sides of a multiprocessing 3090 complex.

With the asymmetrical feature, users can install only the amounts they require on either side, saving money on expanded storage.

IBM also offered a promotional deal that gives users a 20% price break on central and expanded storage. The company said it will make available in June the system-managed storage function for MVS/DFS 3.1, another piece of the Enterprise Systems Architecture pie.

Software drought slows up workstation growth spurt

BY DOUGLAS BARNEY

The hardware price/performance battle between personal computers and workstations will get hotter this week, but the continuing lack of business-oriented software may hold back the workstation charge.

At Comdex/Spring '89 in Chicago, Intel Corp. is expected to show off its 80486 processor, whose performance begins where the 80386 leaves off. Also on tap for the show are systems built around the 33-MHz 80386 chip that challenge low-end workstations for millions of instructions per second ratings.

System woes taxing IRS to the limit

BY AMY CORTISEN

The Internal Revenue Service expects to process nearly 200 million tax returns and generate a record-breaking $1 trillion in tax revenue this year. But with each year, its outdated tax processing system is a step closer to complete overload, which a government watchdog agency predicts could occur as early as 1992.

Although parts of the system have been upgraded over the years, its structure is still essentially the same design approved by Congress in 1959 and put into place in the 1960s.

While the current tax season is proceeding smoothly, the IRS' track record of false starts, poor financial accounting and technological mishaps raises questions about the General Accounting Office — the organization charged with evaluating the agency's information systems — questions the IRS' ability to continue patching together the aging pieces of its computer operations and move forward with more aggressive plans.

In an age when on-line access to information is commonplace, it can still take the IRS several weeks to answer a routine question on a return. The magnetic tape or paper document with taxpayer account data must be at the central storage facility.
UPDATE

Future shock. In Japan, a typical 10th-or 11th-grade student logs nearly 40 hours of homework per week, compared with 15 for an average U.S. student, with the accent in Japanese high school studies increasingly on technical subjects. While U.S. students spend weekday afternoons on the ballfield, their Japanese counterparts get additional college prep training at juku, or cram schools. Only one Japanese teen in 20 fails to make it through the testing. Page 71.

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QUIOTABLE

"The IRS' telecommunications network is basically airplanes and trucks." -- JAMES WATTS, U.S. GENERAL ACCOUNTING OFFICE

On the state of the computer network at the Internal Revenue Service. See story page 1.

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EXECUTIVE BRIEFING

It was a busy week for IBM as it announced mainframes, electronic data interchange (EDI) and disaster recovery products and services. New incentives make moving to S models and the ESA operating system more attractive, page 1. Software translates a variety of business documents into standardized EDI formats, page 137. A disaster recovery service is now available on a limited basis with fees ranging up to $45,000 per month per machine, page 136. By the way, there are also new 9370s, page 136.

Thrift shuts down IS operation and farms the work out to EDS. Most employees take new jobs with the service bureau. The reasons are purely financial, page 8; Burger King's MIS director resigns after 18 months on the job, continuing the company's high turnover rate in that position, page 8.

What to do with those old personal computers? Companies are taking different routes: passing them to clerical employees, offering them for home use or donating them to charity. The risk is separating employees into haves and have-nots as PCs are distributed and redistributed through organizations. Page 71.

Faster chips will be the news at Comdex/Spring '89 this week, with the announcement of the 80486 chip along with a half-dozen systems based on the 33-MHz 80386. But don't bother looking for software to exploit it, page 71. Planning pays off when buying PCs for high-end functions such as CASE, CAD and LAN server jobs. It's better to get what you need up front than to add on later, page 71.

Break down organizational walls to get the most from information systems, say Nolan Norton consultants. They cite such successful examples as Federal Express' package-tracking system, which shares information among operations, customer service and accounting. Other examples are on page 61.

Information systems are the key business success in the 1990s, an Arthur Young study says. But investments in technology have to be accompanied by organizational changes and training. Page 62.

Hotel rooms are the next battleground for strategy, IS. Concorde, the United Airlines affiliate, has joined American Airlines in extending its airline system to compass hotel reservations. A consortium of hotels is also working on its own network. Page 16.

Users in the news: Fighter jet maker Northrop converts 16,000 pages of documentation into a sixounce packet of microfiche, page 27. The Baltimore Sun shakes dependence on a single vendor and adopts industry-standard products for a high-speed page layout and graphics network, page 49. A rural Utah county government proves that leading-edge technology doesn't mean big city. The MIS manager uses 386s, fiber optics and multitasking PCs as part of a downsizing effort, page 44.

IBM will now help handle troublesome projects like designing or moving a data center, and some IS managers say the arrangement works well as long as the firm is treated as a hired hand rather than a friend, page 27. Users can now buy directly from IBM, and that may be an opportunity for IS. By leading the charge toward corporate standards and new technologies, IBM is creating an effective network. IS departments can expand their influence, page 19.

Oracle goes on LANs with the release of the database manager for Banyan's TS. Covi, the TS. Covi, the Untol = Sates Ging gr tay Metaphor rather than getting embroiled in the Apple-Microsoft PC wars. Page 14.

The interface wars escalate as Xerox finally files a lawsuit against Apple over the Metaphor rather than getting embroiled in the Apple-Microsoft PC wars. Page 14.
The speed of our software shouldn't come as a bolt out of the blue.

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We'll be there in a flash.
ISDN unit taps OS/2 features

BY ELISABETH HURWITZ

STAMFORD, Conn. — Interna-
tional Computers Ltd. North
America introduced last week
what it claims is the first Inte-
grated Services Digital Network
(ISDN) workstation to take ad-
vantage of the multtasking pow-
er of OS/2.

“A multitasking machine will be
very useful with ISDN, particu-
larly if you have a full-featured
ISDN phone” that allows a
workstation to communicate si-
multaneously over 64K bit/sec.
and 16K bit/sec. ISDN channels,
said Jeffrey Fritz, a data commu-
nications analyst at West Vir-
ginia University. The university
currently sends voice and data
traffic over 660 ISDN connec-
tions.

ICL’s previously announced
ISDN workstation provided some
degree of multitasking through a
proprietary extension to MS-DOS
4.0, which allows the operating
system to assign
up to 64K bit/sec. per task, said
Ronald Aitchison, director of
ISDN sales and marketing for
Tandem Computers Ltd. North
America; the other 93%
went to technical users, said
Vince Brandel, a workstation ana-
lyst at International Data Corp.,
a Framingham, Mass.-based
market research firm.

The strength of PCs has al-
ways been a huge common base
of applications that make them
ideal for spreadsheets, word pro-
cessing and database use. The
still faster, more powerful Unix-
oriented workstations lack solid
software for everyday use. Com-
commercial application software
will not appear overnight, said Don-
ald Lambe, manager of technical
sector marketing at Data Gener-
al Corp.

PCs itself is developing main-
stream workstation applications
for use on workstations such as
PC-17 million, Arvin, with
4M bytes of random-access
memory, sells for $7,450, a price
very similar to a high-end Intel
80386-based system.

Apollo Computer, Inc. has
made similar promises. Users
can soon expect software prod-
ucts from major PC vendors that
allow them to work within the
OSF/Motif environment potentially addresses Fritz’s
reservations, Altchison said.
The high-end Model 30 uses an
Intel Corp. 80386 processor that
incorporates an accelerator that
boosts performance in move-
ing data and graphics between
screens and can cut response
time by as much as two-thirds,
Altchison said.

Tandem’s OS/2 multitasking
allows the machine to sup-
port up to 16 active sessions,
including active screen- and
application-sharing with as many
as eight users, he continued.

The Information Integrator
supports MS-OS/2 Standard
Edition 1.1 with Presentation
Manager, ICL said. The compa-
ye chose not to support IBM’s
OS/2 Extended Edition because
did not want to be forced to
choose between protocols that
are supported by the
Communications Manager,
Altchison said.

The high-end Model 30 is
priced at $50,100; Models 10 and
20, which use 80286 processors,
ranges from $6,000 to $7,000. The
software alone is at $1,695. Gen-
eral release is scheduled for July 1.

KCL’s OS/2-based ISDN In-
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Tandem show of support

BY JEAN S. BOZMAN

CUPERTINO, Calif. — Hoping to
expand its role in large MIS
shops, Tandem Computers, Inc.
will announce this week that it is
enhancing support for IBM
mainframe and mixed-vendor-
cal-area network environments.

Tandem’s three new prod-
ucts address three environ-
ments: IBM’s Systems Network
Architecture (SNA), the interna-
tional Open Systems Intercon-
nect (OSI) communications stan-
dard and the Transmission Control Protocol/Internet
Protocol (TCP/IP) standard.

SnaX/CDF (Cross-Domain
Facility), a new product for SNA
connectivity, is designed to
work with all mainframe
architectures, which could bring a
whole new breed of high-end
workstations to market.

SnaX/CDF, which imple-
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OS/2 Presentation Manager and
the application programming in-
terface Decwindows, may at-
tract PC applications written for
OS/2 to the workstation envi-
ronment. Again, though, the
timeline is unclear.

Like many others, PC soft-
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Inc. will develop for the Presentation
Manager first and then consider a
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Senior writer William
Brandel contributed to this re-
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The IRS is experiencing a steady increase in tax return processing volume and in revenues collected for the government.

**We all contribute**

The IRS is experiencing a steady increase in tax return processing volume and in revenues collected for the government.

**Glossy-free future?**

The IRS is taking a fully integrated tax processing system in place late in the next decade.

**On-line returns**

The IRS envisions a day when all tax returns are filed electronically from homes and businesses. But while its electronic filing program has made headway, poor quality software, procurement troubles and contractors have brought the project to a standstill.

**Bank taps expert tool for payroll**

NEW YORK — Citibank NA has discovered that expert systems can trim time and increase productivity in the otherwise taxing process of issuing approximately 250,000 pension payroll checks per pay day.

Citibank built its Pension Disbursement On-Line System using IBM's KnowledgeTool, a mainframe-based knowledge-based tool. The 103-rule expert system adjusts tax withholdings based on the tax codes in different jurisdictions across the country, said Abhik Dasgupta, vice-president, at the bank's human resources department.

**At Citibank, we can now also issue specially requested checks in one day.**

Dasgupta said the Cobol application runs under IBM's EDMS because the bank did not want a radical change in applications. Dasgupta cautioned that each application should go through an in-depth analysis before being considered for expert systems technology.

**An expert system must be managed carefully,** Dasgupta warned, "or it will take your CPU.

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9:00 a.m. Seminar Begins
12:30 p.m. Complimentary Lunch

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April 18

Chicago, IL
April 30

Cincinnati, OH
May 4

Dallas, TX
April 5

Denver, CO
April 18

Detroit, MI
April 21

Edmonton, AB
May 9

Los Angeles, CA
April 25

Milwaukee, WI
May 18

New Brunswick, NJ
April 19

New York, NY
April 11

Oakland, CA
May 11

Orlando, FL
April 8

Philadelphia, PA
May 2

Phoenix, AZ
April 27

Richmond, VA
May 5

St. Louis, MO
May 17

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April 17

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April 12

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**NEWS SHORTS**

**FCC's Patrick steps down**
Dennis R. Patrick resigned last week as chairman of the Federal Communications Commission after five years with the FCC. Patrick, who will remain until a successor is sworn in, played a key role in FCC approval of pricing caps for AT&T long-distance rates and Open Network Architecture plans for regional holding companies. In other news, the FCC postponed until Wednesday a vote on AT&T's Tariff 12, which provides for custom voice and data networks within large organizations.

**Wang confirms cutbacks**
Word of departures from Wang Laboratories, Inc. approached flood level last week as the minicomputer vendor confirmed that close to 900 names have been deleted from the payroll over the past 90 days or so. Among the missing are 180 hardware field service employees laid off last month. However, most of the reduction has come from attrition, not layoffs, a company spokesman said. Meanwhile, Wang may have figured out the most alluring price of all for disaster protection: free.

**HP extends service plan**
Hewlett-Packard Co. last week expanded to worldwide availability a 24-hour, seven-day remote-diagnostics call-in service that it has been putting in place at selected response centers in the U.S. The key role in FCC approval of price caps for AT&T long-distance rates and Open Network Architecture plans for regional holding companies. In other news, the FCC postponed until Wednesday a vote on AT&T's Tariff 12, which provides for custom voice and data networks within large organizations.

**DG sets network plans**
Seeking to position its minicomputers as network servers for personal computers, Data General Corp. plans to release several connectivity products today. The offerings include a micro-to-mainframe package featuring menus like those of Lotus Development Corp.'s 1-2-3 and a data dictionary. DG also plans a statement of direction promising Token-Ring products.

**3Com targets Japanese market**
3Com Corp. — calling Japan one of the largest networking markets outside the U.S. — and its Tokyo distributor, Soltron Systems K.K., have formed a jointly owned operation to address that market. The venture, called 3Com/Soltron, plans to supply products called 3+Open Kanji. The first product, 3+Open Kanji LAN Manager, will ship this summer.

**DEC adds net management options**
Digital Equipment Corp. has unwrapped two additional network services. The Local Area Interconnect Service is said to improve support for customers' local configurations of cable plant and interconnect hardware. An on-line database provides real-time access to that equipment inventory for 24-hour status of network elements and support for fault isolation. DEC's Wide Area Interconnect Service now sports an alarm feature designed to monitor various circuit characteristics and a hot-spare option for remote switching of a customer's spare modem.

**EDS supplants Meritor Financial Group's IS**
**BY ALAN J. RYAN CW STAFF**
MIAMI — The revolving door to the top job at Burger King Corp. is spinning again. Bob Forte, who held the position of vice-president of MIS for 11 years, decided to form relationships with the market leaders. HP also announced support for three major T1 switch vendors, two of them to improve support for customers' local configurations of cable plant and interconnect hardware. An on-line database provides real-time access to that equipment inventory for 24-hour status of network elements and support for fault isolation. DEC’s Wide Area Interconnect Service now sports an alarm feature designed to monitor various circuit characteristics and a hot-spare option for remote switching of a customer’s spare modem.

**Burger King MIS VP resigns**
**BY JOHN FOLEY CW STAFF**
FOLEY was replaced by John Foley, a six-year Burger King veteran, who most recently held the position of vice-president of finance and administration at A&W Restaurants, Inc. in Detroit.

**Burger King's Forte**
Forte's resignation was not related to last week's reorganization announcement, which eliminated 100 positions at the Burger King headquarters and cut out another 450 jobs at corporate headquarters and the operations of the company's former management team.

**EDE extends service plan**
EDE also announced support for three major T1 switch vendors, two of them to improve support for customers' local configurations of cable plant and interconnect hardware. An on-line database provides real-time access to that equipment inventory for 24-hour status of network elements and support for fault isolation. DEC’s Wide Area Interconnect Service now sports an alarm feature designed to monitor various circuit characteristics and a hot-spare option for remote switching of a customer’s spare modem.

**Meritor's IS VP resigns**
Meritor's decision to farm out its IS function was purely financial, said Liss, an 18-year veteran of the thrift. "We're not afraid to move things around, though we try to eliminate the need for them to relocate geographically.

**Mercer's IS VP resigns**
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**EDE's general policy in major processing contracts is to keep employees in their previous jobs..."**
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John McKee, manager of applications, US West Advanced Technologies' MIS Division

When regional Bell operating company US West decided to standardize on a relational database, they chose ORACLE. Developing their applications on inexpensive PCs in a Local Area Network allows them to run tested and debugged applications on any computer—from PC to workstation to mini to mainframe.

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Motorola’s 68030 clocked at 50-MHz clip

BY JULIE PITTA

AUSTIN, Texas — Motorola, Inc. said last week that it has boosted the speed on its 68030 chip to 50 MHz, making it the fastest complex instruction set computing (CISC) processor currently on the market.

According to Motorola, the chip offers 12 million instructions per second of performance. The introduction of a faster 68030 is the second microprocessor announcement from Motorola recently. Two weeks ago, Motorola unveiled its 68040, a microprocessor that combines floating-point and memory management functions on a single chip.

The performance race is slated to intensify at Comdex/Spring '89, when Motorola rival Intel Corp. is expected to launch its 80486 microprocessor. Sources have said the 486 will run at 30 MHz; Intel has declined to offer any details on the long-awaited chip.

System vendors are rushing to keep pace with the new chip introductions. So far, only Hewlett-Packard Co., Sony Corp. and Apollo Computer, Inc. have adopted the 33-MHz version of the 68030, which was introduced several months ago.

Jeff Nutt, Motorola technical marketing manager, said he anticipates the 50-MHz 68030 will be adopted by systems manufacturers that are more performance-conscious. "Some, like Apple, build in volume, and they’re looking for the optimum performance point rather than raw performance," he explained.

Xerox Star

FROM PAGE 1

copyrights because Star formed the basis of its Macintosh graphical user interface. It has been widely anticipated that Microsoft will challenge the copyrights on that basis.

In late 1988, Xerox told Metaphor, which utilizes a proprietary operating system using icons (see story page 37), that it would need a license from Xerox. In February and March, that threat was backed up with two letters. As a result, Metaphor last month sought a judicial ruling that it has not infringed on any Xerox copyrights. Xerox does not even want to confirm that the Star interface is the crux of its complaints with Metaphor. Nevertheless, "this raises some questions about who owns that interface," said Peter Rogers, an industry analyst at Robertson, Colman and Stephens. The whole thing is starting to look like range warfare.

Rogers said the conflict between Metaphor and Xerox could add further confusion to Apple’s lawsuit against Microsoft. "It plays into Microsoft’s hands, since it may be that the technology belongs to someone other than Apple," he said.

Founders’ tale

Two of Metaphor’s founders, Don Massaro and Dave Liddle, were Xerox employees when they formed Metaphor in 1982. Liddle was responsible for Xerox’s Star development team.

According to court documents, the two men tried to interest Xerox in backing their start-up, informed Xerox of Metaphor’s products and provided the company with a business plan. Xerox declined to invest in 1986. Then, late last year, it informed Metaphor of its interest. "They didn’t say, ‘Stop this or we’ll kill you,’" Liddle said. "Their [communication] was not specific on what is being infringed upon."

Xerox patent attorney Ronald Zibelli would not confirm that it is the Star interface that is in dispute, only that Star is an acronym for an early Xerox computer. "It is that type of software," he said.

Despite the legal filing, Liddle said that both sides are engaged in settlement negotiations.

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Banyan, Oracle team up on server option

BY PATRICIA KEEFE CW STAFF

Banyan Systems, Inc. and Oracle Corp. unveiled Oracle Server for the Vines network last week, much to the relief of Banyan users struggling to control mounting traffic volumes attributed to cumbersome personal computer databases.

Available in May, Oracle's SQL port to the Virtual Networking Software, or Vines, runs on Intel Corp. 80386-based PCs. The server software costs $4,999 and will support client applications running under MS-DOS, Unix and Apple Computer, Inc.'s Finder.

The announcement raised some pricing issues. Many users are pressing for server licensing of network software and do not want to pay separately for each network client.

Rack 'em up
A large network with several users could quickly rack up costs, complained Richard Henry, a user on a 300-node Banyan network operated by a West Coast-based electronics organization. According to Henry, linking PCs to database servers could cost him as much as $1,200 per node.

"I could buy a mainframe at that price," he concluded.

"We certainly won't pay mainframe prices for the technology," added Larry Stouder, manager of technical development at New York-based Continental Grain Co., which has a domestic Vines network with about 400 nodes and 18 servers.

Oracle said it does offer volume discounts but did not say when those would kick in. Bruce Mitchell, Oracle's director of marketing, added, "We are going to see some fundamental changes in regard to pricing due to client/server architecture." He did not elaborate further.

Pricing issues aside, some Banyan users were particularly interested in the enterprise-wide networking implications of Oracle's port to Vines.

"We've never been able to do a thing in terms of wide-area networking with PC database applications such as Paradox, Dbase and R:Base," said Jonathan Oski, a technical engineer at Bank of New England in Boston.

Currently, Bank of New England's multistate Banyan network has 52 servers and more than 1,000 nodes. "There's no way today that we can have users from two states share a database. A traditional PC database, even on a network, is really just a shared hard disk," Oski said.

The advantage of an SQL-based database server, according to John Cornell, a network specialist at Pacific Gas & Electric Co. in Diablo Canyon, Calif., is that it cuts down on network traffic by confining most of the processing and storing activity to the server vs. downloading everything to the PC.

This is key in an enterprise-wide network, because many WAN connections tend to have a smaller bandwidth than the local networks.

"You can't use Rbase or Dbase over a WAN," Cornell said. He said that his network has several thousand users and 120 servers, 75 of which are attached to a WAN.

While Oski has yet to evaluate the Oracle server, he noted that the fact that Oracle runs native on Vines, uses Streettalk and runs on a variety of platforms "is a real big plus."

In addition, Oski's IBM shop uses DB2, with which Oracle Server for Vines will be able to communicate, according to Banyan.

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USAA’s CEO cited for systems role

BY MICHAEL SULLIVAN-TRAINOR
CW STAFF

On his first day as chief executive officer at the United Services Automobile Association (USAA), Robert F. McDermott, a retired brigadier general, ordered the burning of some of the company’s paper and microfiche files to prove a point. “I wanted to get rid of paper,” he said. “All our files were lying in folders everywhere, and access to any particular piece of paper was only possible after a month of searching. So I started burning the files to demonstrate my commitment and to show there would be no turning back.” That was 20 years ago, and USAA has never turned back. McDermott’s determination to use technology — particularly image processing — to drive USAA’s growth earned him Gartner Group, Inc.’s 1989 Excellence in Technology award.

The purpose of the award is to recognize executive leadership in technology use for sustained strategic advantage. A panel of 10 chief information officers selected the winner. Previous winners were AMR Corp. CEO Robert L. Crandall, Federal Express Corp. CEO Frederick W. Smith, Aetna Life & Casualty Vice-Chairman William O. Bailey and American President Companies Ltd. CEO Bruce Seaton.

McDermott received this year’s award Tuesday in New York at a Conference Board, Inc. seminar on information management in the 1990s. The CEO’s key role in advocating strategic use of information systems was a central theme of the seminar. “With technology becoming the key factor in achieving strategic competitive advantage, the responsibility for meeting the pervasive demand for technological support cannot fall solely to the information services executive,” said John H. Panabaker, chairman of the board of Mutual Life of Canada, one of the keynote speakers.

Buddy-buddy

Panabaker described the need for a partnership between MIS and senior executives. But the partnership will not happen without leadership from the top and an understanding of its necessity, he added.

McDermott demonstrated such leadership by making USAA the first insurance company to pioneer IBM’s image-processing technology, the Image-plus system [CW, May 30, 1988]. Part of a $100 million automation project that began in 1981, the image-processing system allowed the company to get rid of 99% of its original paper documents. An estimated 160 employees once involved in file handling are being retrained for other positions, according to Donald R. Lasher, president of USAA Information Services.

McDermott credited the use of image processing, expert systems and networks with reducing the cost of policy processing. USAA’s underwriting expense ratio (the cost of underwriting policies divided by the value of premiums written) is 9%. The nearest ratio for competitors in the same industry is 13%.

While most of the large insurance companies are considering major image-processing projects, USAA is the first to fully implement imaging to process all the company’s files. Other companies are stymied by an inability to cost-justify image systems because the short-term payback does not match the up-front investment costs.

APRIL 10, 1989
COMPUTERWORLD
Covia tosses its hat into hotel reservation service arena

BY ELLIS BOOKER

ROSEMONT, Ill. — Airlines are jostling to extend their reservation systems beyond the tarmac and to the front door of the traveler's hotel room.

Covia, the United Airlines affiliate that operates the Apollo network, launched its hotel reservations product last week, jumping into an arena already staked out by American Airlines.

Covia Reserve will be available immediately; that may give Covia a jump on AMR Confirm, a reservation product in 1990 that will "improve the efficiency of the hotel reservation industry would be welcome: "From our standpoint, anything that can make us more efficient is a plus for our clients and a plus for hotels."

Covia's Mercurio announced plans for AMR Confirm, a reservation system for hotel and car rental businesses. Mercurio said Covia Reserve will be targeted at the 20% of the market that consists of chains with between eight and 50 hotels.

"We can give them an interface to all the travel agents using the Apollo network or other reservation networks," Mercurio said. He noted that about 30% of all hotel bookings are made through airline computer reservation systems (CRS) such as Apollo but that many smaller chains lack centralized reservation systems or on-line connections to the approximately 30,000 travel agencies worldwide.

Covia Reserve will work but will be an independent product marketed directly to hotel chains, said Paul J. Mercurio, managing director at Covia Reserve. In March 1988, American affiliate AMR Information Services announced plans for AMR Confirm, a reservation system for hotel and car rental businesses. Mercurio said Covia Reserve will use the Apollo network—but will be an independent product marketed directly to hotel chains, said Paul J. Mercurio, managing director at Covia Reserve.

Covia Reserve will be available immediately; that may give Covia a jump on AMR Confirm, which is developing its hotel reservation network with Budget Rent-A-Car Corp., Hilton Hotels Corp. and Marriott Corp., has a 1991 target date to bring AMR Confirm on line.

If Covia can make its network operational immediately as planned, "it would be a major competitive advantage," said International Data Corp. President Thomas E. Switchenbank. "The real question is whether they can make it attractive for smaller chains and then put pressure on the larger chains to interface to it and pay a transit charge."

John Heilner, vice-president of industry sales at New York's The Thomas Cook Group, the third-largest U.S. travel agency, said any service that promises to improve the efficiency of the hotel reservation industry would be welcome: "From our standpoint, anything that can make us more efficient is a plus for our clients and a plus for hotels."

Meanwhile, a group of 15 major chains is developing its own communications network. The Hotel Industry Switch Co., formed last October in a joint project with Murdock Electronic Publishing, Inc., is developing Ultraswitch for simplifying communications links between hotel and airline CRSs (CW, Nov. 28). Each hotel will have a single interface to Ultraswitch, which would establish multiple links to the various airline CRSs.

Final technical details of Ultraswitch are being set, and the 15- to 18-month development of the $8.5 million project is on track, said Jerry Petit, executive vice-president and chief operating officer of Thino member Quality Inn International, Inc. in Silver Spring, Md.
HP pact may shield 3Com from takeover

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Speak softly and carry a big stick. It worked for Teddy Roosevelt, and it may work for 3Com Corp.

There's more to the recently trumpeted alliance between 3Com and Hewlett-Packard Co. than meets the eye. Buried in fine print under the backslapping technology, marketing and service agreements is wording that could erect an imposing barrier to any attempt to take over 3Com.

In late February, the two vendors strengthened their longtime relationship with a series of joint development and OEM pacts cemented by an agreement that allows HP to purchase up to 10% of 3Com's stock, based on certain sales factors.

In the aftermath of that announcement, analysts wondered whether the deal was a prelude to an HP buyout or merely insurance for 3Com. What the two vendors did not reveal is spelled out in 3Com's 8K Report, filed with the Securities and Exchange Commission Feb. 27. The language appears to ensure that HP has right of first refusal should 3Com feel inclined to entertain any buyout or merger offers.

3Com Chairman William Krause confirmed that the measure is a poison pill of sorts. However, he insisted that 3Com has no plans to forfeit its independence, which he said adds to the company's value. "It's obvious that 3Com is worried about someone taking them over. Every week, one of those [LAN] guys is up for sale," said one industry observer.

According to the 8K Report, in the event that 3Com decides to accept a tender offer for more than 25% of its outstanding voting stock or a similar proposal for a merger or acquisition that would transfer control of 3Com, it must give HP a chance to counteroffer.

Further, if HP offers a higher price per share, 3Com must accept or recommend to shareholders that they agree to HP's offer.

Other terms of the agreement mandate that once HP's holdings reach 8% of 3Com voting stock, 3Com's board of directors will expand to make room for an HP representative. In return, 3Com gains the right of first refusal on sales by HP of 3Com stock.

The agreement expires after seven years or can be terminated by either party after three years upon six months' notice. "This is going to sound egotistical, but computer network companies represent a balance of power. If 3Com were to become part of another computer company through an unplanned or undesirable mechanism, that balance would be upset," said Krause, a former HP executive.

Krause claimed that HP and Digital Equipment Corp. have made it clear to 3Com, both in words and through their actions, that they would like the network supplier to remain an independent company.

Although Krause was quick to quash any talk of merger, he said more minority investments in 3Com can be expected.

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Stellar launches low-cost minisuper performance rival

BY JAMES DALY
CW STAFF

NEWTON, Mass. — Graphics supercomputer maker Stellar Computer, Inc. began circling the struggling minisupercomputer market last week with introductions that included a machine reportedly capable of offering a minisuper's performance at less than one-third the price.

It also announced 12% to 15% price cuts on its GS1000 Graphics Supercomputer as a result of memory component price reductions, among other factors.

Although the graphics supercomputer market has not taken off as quickly as Stellar had hoped (CW, Feb. 6), the new products and price cuts could draw much-needed dollars into the coffers of the company, which is reportedly investigating another round of investor financing.

The company also unveiled the Stellar X Terminal, which supports the X Window System as well as Transmission Control Protocol/Internet Protocol. The machine is capable of providing simultaneous access to multiple applications from multiple hosts to providing windowed text and graphics, Stellar officials said.

Stellar also announced support for a variety of Digital Equipment Corp. VAX/VMS compatibility features, including Decnet Phase IV and VMS DCL emulation, which allows users to enter DCL commands in place of Unix commands.

Complementing the VMS DCL emulation is a version of EDT Editor.

Pricing for the Departmental Supercomputer starts at $59,000 and the X Terminal costs $3,100. Both are currently available. Decnet support is priced at $3,500, and VMS DCL emulation and EDT Editor support are $1,300 each. All have second-quarter availability slated.

OSI chosen in Tymnet net management

BY ELISABETH HORWITT
CW STAFF

SAN JOSE, Calif. — McDonnell Douglas Network Systems Co. subsidiary Tymnet plans this summer to release the initial version of an integrated, multivendor network management system based on Open Systems Interconnect protocols, a company spokesman told Computerworld last week.

The product, which still has no official name, will run on a Sun Microsystems, Inc. workstation and bring several network management applications — including traffic monitoring, troubleshooting and diagnostics, work management applications — under the same graphical-based user interface and Sybase, Inc. database management system, said Tymnet marketing manager Curt Bauer.

The initial release will manage Tymnet's public packet-switching network and private customer networks based on the vendor's CCITT X.25 packet-switching product line, Bauer said. A second release, scheduled to be out by the first quarter of next year, will support other vendors' equipment through the OSI Common Management Information Protocol (CMIP), he added.

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IBM redefines MIS alliance

SAM HARVEY

After three decades of seeing IBM as a staunch ally, some MIS managers are wondering whether the company is still 100% behind them. The reason: IBM's new effort to sell directly to end users.

The rationale behind the new sales pitch was expressed by George Conrades, head of IBM's U.S. Marketing and Service group, in last November's Computerworld Extra.

The buying decision, Conrades said, now sometimes includes end users, people who are acquiring and implementing technology across the firm, be they department heads or individual users themselves.

To an MIS director who has been struggling for years to build the discipline and capability required to implement large transaction systems successfully, this change can be hard to take.

The new sales approach is led by a national account team assigned to offer products at different levels of the company. Some team members focus on selling large systems to MIS, while others present small systems to end users. While there is an effort to coordinate the approach with MIS, users often make their own buying decisions.

Great expectations

"When users buy a PC, they have high expectations," says Joe Petty, vice-president of MIS at Conagra, a large IBM account. "They want access to the company's databases. MIS is responsible for providing that, and there are problems, but IBM works closely with us to provide coordination across our network."

Ever since the early 1950s, MIS has worked with an IBM that has acted as a partner in selling systems benefits to top management and then worked closely with MIS on implementation. Strong loyalties were established between IBM and MIS.

The bond is still strong, but technological advances have changed the environment. Computer power that far exceeds the early large mainframes comes now in personal computers. High-level "English language" programs and packaged systems make it possible for users to install their own applications.

New technologies enable new capabilities, such as graphics, computer-aided design and manufacturing, image processing and expert systems. In many cases, these systems reside outside the MIS area. Faced with competitors' marketing products to support these applications, IBM has no choice but to sell directly to users as well. In doing so, the company appears to be contributing to the "Tower of Babel" that is caused when separate user departments acquire technology without regard for corporate standards or connectivity.

It will only be a matter of time before users recognize that systems integration is required. The ability to communicate between the related functions of an organization is the key to increased productivity. A complex computer and communications infrastructure is required to accomplish this goal. Such an infrastructure does not happen by chance. The question is, who will be in charge of constructing and maintaining it?

In a few cases, business executives have already decided that a third party, such as a systems integrator, can handle the job. General Motors Corp.'s use of electronic data systems is the most prominent example. IBM and other companies are competing in the systems integration market to meet the needs of such firms. MIS managers must recognize that IBM's pitch to departmental end users can be turned into an opportunity. Action must be taken to do the following:

- Facilitate the development of plans with end users. Enterprise systems—which cross traditional business lines, transcend different levels of systems and integrate functions that were previously separate—cannot be successfully implemented without tracking against a well-developed plan.
- Provide leadership in focusing information systems technology to increase the productivity of the business.
- Provide leadership in evaluating new technology. The task requires expert knowledge of the technology and a clear understanding of the business.
- MIS should have management responsibility for the operation of the computer and communications network and the custody of all data on the network.

Putting it all together is not easy. The challenge is in the systems integration of the parts. Partnerships are to be encouraged, individual initiative is great, cooperation is essential, but, in the final analysis, somebody has to be in charge.

In IBM's view, that person is still the MIS executive. "MIS has an important role to play because most business solutions, once identified, drive across functional applications," Conrades said. "The MIS director is responsible for the network and more and more for the management of the data within the firm."

Harvey is president of Business Research, Inc., which provides technical and management services to Fortune 100 firms and is based in Stowe, Vt.

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**EDITORIAL**

Say no to LBO

 HAVE YOU EVER wondered why corporations in other countries seem immune from the agony of today’s hostile takeover mania? Recently, a West German executive answered this $64 billion question this way: “We have laws against them. They aren’t good.”

In the name of free enterprise in the U.S., however, the highly leveraged hostile buyout is business as usual.

Until recently, the computer industry had largely escaped the LBO chaos. Then last fall IMAI Basic Four, with the backing of junk-bond king Drexel Burnham, launched what first appeared to be an absurd effort to take over Prime Business as usual.

From ethical, economic and “what’s just plain right?” points of view, there’s plenty wrong with these kinds of buyouts. They are also inexcusably legal, and that’s what’s must be changed, or at least closely examined.

This is not to say there aren’t compelling arguments in their favor. Typically, a company is bought out by offering shareholders some premium for their shares. The purchase price is funded with so-called junk bonds, which are financed a number of ways, such as selling off certain parts of the company. But in the end, the shareholders make a profit. And that’s what free markets are all about, right? You take a risk on an equity investment and the reward is your return.

It can also be argued that there are efficiency gains realized when the company is chopped up and sold off, that the sum of the parts is more viable and productive than the whole.

But as is becoming so clear in the case of junk-bond traders from Drexel and elsewhere, the invitation to fraud and abuse in LBO schemes is enormous. The greatest economic benefits often end up in the hands of a very small group of speculators, not in the pockets of the average investors, whom our securities laws are really designed to protect.

For the companies under hostile assault, millions of dollars could be earmarked for product development, customer support and the like to high-powered lawyers. Thousands of jobs are lost—not all in the name of efficiency—to trim expenses for the buyout defense. And for the people who have been selected as project managers and team leaders by business-oriented managers will certainly expeditiously execute major projects. At the same time, it fosters creativity by providing ample time to apply that “other” side of the brain to the system’s design.

Paul Reiter
Senior Systems Consultant
Computer Task Group, Inc.
Kirkland, Wash.

No more nerds

Regarding the editorial “Fund education” [CW, March 20], do not blame the schools or the government for lack of students: Blame the industry. Companies treat new, inexperienced people like dirt: no experience, no job. You can blame the schools and the government for students’ lack of knowledge but until children perceive science and math as being “non-nerdy,” no amount of money will change these scores.

Richard Shook
S&R Associates, Inc.
Winchester, Mass.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Lohris, Editor, Computerworld, P.O. Box 9171, 375 Co-chute Road, Framingham, Mass. 01701.
If you would rather be right

JOHN BARNES

Every MIS manager sooner or later hires someone who looks great on paper and interviews well—a nice guy who seems to understand everything after just one explanation—only to find that six months or a year later, the person has never actually done anything.

He's a professional interviewee. You've paid all that salary for a big smile and a good attitude. When you get rid of him, he'll climb aboard someone else's organization and do the same thing.

Sure, the problem starts early. In some college classes I've taught, students have showed up looking sharp and neat, leaning forward bright-eyed to catch what I was saying and nodding at all the right points—but then did virtually nothing with the assignments and no studies at all.

A lot of them seemed to be really started when they got the F. After all, they're making a positive attitude. People have always been here when we need it.
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For more information, including seminar specifics, call 1-800-328-8383. Because when it comes to joining Macintoshes, Businessland can't be beat.
Newquist

FROM PAGE 21

amounts of information that pile up day after day, week after week, year after year.

For instance, The Wall Street Journal reported last year that less than 50% of all the information received from satellites in the last 10 years has been processed. That’s right, less than half of the last decade’s worth of satellite transmissions has even been looked at. The point of the article was that information on the hole in the ozone layer — “discovered” a year ago — has actually been buried in databases that are 10 years old.

Day-old info

A large part of the problem is that we have not developed computer systems — primarily in the area of visual simulation — that can adequately handle such an incredible amount of digital signal transmission. Because of technology’s current inability to deal with all this information, it is already out of date by the time we can interpret it.

So, imagine this scenario: Ten years from now, we have resolved many of the networking and interface problems that are currently front-page news every week in this industry. We’re now prepared to move on to some really intelligent data handling and information filtering. As we look toward the research community from whence such offerings have flowed in the past, we see people shrugging their shoulders and sadly shaking their heads.

The researchers have been grappling with the same issues that computer users deal with every day. The researchers haven’t had much time for researching new technology. The computer industry is faced with a case of “Sorry boys, no Christmas this year, unless you want to buy it from Japan or West Germany.”

Idea shortage

With the primary wellspring of ideas drying up in favor of rehashing old technology, we’ll be stuck with operating environments such as OS/2, created without regard for the necessary software applications.

There has to be a division between what computer science wants to pursue and what it wants to play with. Pursuing new technology is a risky business, but that is what ultimately provides us with a continued path of computer evolution as well as a competitive edge.

Playing with technologies that are already deployed is safe and sound. But safe and sound doesn’t produce breakthroughs in machine learning, or new materials for microprocessors, or mainframes the size of a Cheerios box.

APRIL 10, 1989

BOOKS IN BRIEF

Data Architecture: The Information Paradigm
By W. H. Inmon
Toward an information architecture — the evolution of a paradigm explained, along with advice for installing new systems.

Implementing Software Engineering Practices
By Fletcher Buckley
A software engineer at General Electric Co.’s Government Electronic Systems Division details the practical steps that can lead to successful software development in a commercial facility.

CASE is Software Automation
By Carma McClure
An introduction to computer-aided software engineering (CASE) that explores user implementations, productivity claims and CASE’s relationship to other software technologies.

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—George P. DiNardo, Executive VP, Mellon Bank

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To find out more about why Mellon banks on FOCUS, call or write Information Builders, Inc.
IBM as the hired help?

Late last month, IBM made a slick marketing pitch on its automated service options that portrayed the company as a friend to customers who want to take care of troublesome data center projects.

According to the pitch, a customer need only hire IBM, and big projects like data center redesigns and relocations will be taken care of. Gone are the headaches and extra hours that would have been the MIS manager’s constant companions had he handled the job himself.

Usually, there’s a catch when something sounds so good. I couldn’t help but wonder what else the MIS manager might be losing. Something about allowing IBM to do so much for a customer was unsettling. A situation could develop in which IBM designed the customer’s data center, installed the IBM equipment, hooked up the cable to connect the equipment and managed the network.

Couldn’t this situation develop to the point where the customer was relying too much on IBM and, as a result, was giving up some control of decisions?

By Stanley Gibson

Benchmarks gains following

BY STANLEY GIBSON

While the computing community has been clamoring for a single, clearly defined Debit/Credit benchmark standard, it appears probable that TP1, a subset of Debit/Credit, will gain widespread acceptance as well.

According to Omri Serlin, chairman of the Transaction Processing Performance Council (TPC), database vendors favor the establishment of a second standard that tends to isolate the database function in processing transactions. The full Debit/Credit implementation, on the other hand, brings in variables such as terminal network configurations that blur the significance of the database software used, the data vendors believe.

The TPC has been meeting regularly to define the Debit/Credit standard but has not published specifications. Serlin said the TPC has not yet started dealing with TP1.

Despite the ill-defined state of TP1, several vendors, including Software AG of North America, Inc. and Informix Software, Inc., recently released results of TP1 tests. Software AG also released Debit/Credit results, claiming a world record of 167 Debit/Credit transaction/sec. Its TP1 maximum was 388 transaction/sec.

Unlike database management system vendors, Software AG favors Debit/Credit over TP1 because it sells a teleprocessing monitor that it claims can improve its results over those of competitors that do not offer teleprocessing monitors.

Software AG calculated a transaction per second cost of approximately $38,600. Its tests were performed on a National Advanced Systems AS/EX 100, which offers power comparable to that of an IBM 3080 5000 running IBM’s MVS/XA.

In Software AG’s Debit/Credit run, no controller was actually used, although one was simulated. Whether to require a controller is one of the points the TPC is debating.

Cost of configuring a zero mainframe with a communications controller deters many database vendors from undertaking full Debit/Credit implementations, said Peter Kastner, vice-president of the Boston-based Aberdeen Group, Inc., who observed the Software AG tests.

The Software AG test was audited by Cooper’s Lybrand, which noted that the sustained transaction throughput was 12 minutes for on-line Debit/Credit and five minutes for the 388-transaction TP1. Preliminary TPC guidelines require sustained performance for 15 minutes.

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• Northrop outs documents disappearing act. Page 27.
• User pleads prompt Covia to upgrade Travelmaster. Page 32.

Erasable optical disks step closer to forefront

BY JAMES DALY

The other shoe could soon fall in optical technology’s bid to become an essential storage tool for corporate America.

A few years back, the arrival of the write-once read-many (WORM) optical disk drive was hailed by MIS managers weary of crowding their shops with acres of large-scale direct-access storage devices (DASD). A single optical disk system could replace dozens of large-scale DASDs.

But there was a flaw. While not being able to erase what is stored on an expensive optical platter was fine for applications such as legal and medical archiving, it was limiting for others.

Enter the erasable disk. Erasable disks work by using a laser to burn data on the optical disk. The disk is then erased and written to again.

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<td>June 6</td>
<td>Los Angeles</td>
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IBM custom service strikes gold

Customers willing to pay to have IBM handle time-consuming chores

BY ROSEMARY HAMILTON CW STAFF

While IBM recently made a public splash with its newly announced custom maintenance contract Service-plan, it has quietly been making a killing with customized service options for more than a year.

Both Service-plan and the customized options, which include data center design, relocation and cabling services, center on the service-made-easy concept. Though IBM has offered customized options on a per-request basis for years, customers have flocked to them since they became official offerings last year.

For instance, IBM claimed to have performed only 5,210 relocations in 1987, but it handled 21,250 last year.

Northrop's mountain of paper now a molehill

BY JAMES DALY CW STAFF

EL SEGUNDO, Calif. — Although Northrop Corp. built its reputation in the aerospace industry as a creator of ersatz fighter jets, it may soon be renowned among magicians for a spectacular vanishing act.

Since last fall, Northrop has converted more than 16,000 pages of documentation relating to its assembly work on the F/A-18 Hornet fighter jet into a package of 36 four-by-six-inch microfiche cards that is lighter and smaller than a loaf of bread.

Northrop spent four years and more than $10 million on the slim-down project, dubbed the Integrated Management Planning and Control for Assembly system.

In the past, clerks would deliver thick blue binders to assemblers detailing their shift's work. The files were updated daily, but it was laborious keeping up with unforeseen problems.

"The plans couldn't account for real-world situations, like people calling in sick or drill bits breaking," said Lauren Perresult, manager of manufacturing initiatives programs and one of the architects on the project.

"At the end of each day, we had to reconcile actual practice against what our plans were, then replan the next day's work. It was a struggle." Northrop workers spend their day building the F/A-18's center and rear fuselage, vertical stabilizers and the associated subsystems for the aircraft's prime contractor, McDonnell Douglas Corp. There are 104 assembly positions on the quarter-mile assembly line, with each section taking two days to go from one position to the next on its six-month journey down the line.

A delay at one assembly station can easily ripple down the line, and thus requiring another rewrite of the daily work forecasts, Perresult said. So many reports have been produced, Northrop officials added, that the Hornet assembly operations have already produced paperwork that could reach four times higher than the Empire State Building.

Documentation is now computerized and available instantly, giving engineers, quality inspectors, supervisors and assembly workers the same information simultaneously. Northrop writes its own software, thereby ensuring a tight applications fit.

"Any vendors that continue to focus on fixing broken machines will be out of business in a few years," said D. Wood, vice-president of service and maintenance strategies at Meta Group, Inc., a consulting firm in Westport, Conn. "IBM is going after [customized service] with vigor. They want to sell, sell, sell."

For Leslie Green, an executive vice-president at Equitable in Pittsburgh, the decision to put IBM in charge of a data center redesign was actually an easy one. According to Green, IBM simply had more of a grasp of data center issues than his own staff or vendors that competed with IBM for the job.

"We found that a number could build the data center, but they didn't understand our business," Green said. "I'm not an IBM bigot, but I'm impressed with the number of resources and skill levels they can bring to a problem."
Bruce Sobolov of CBS News, Laura Gismondi and Bruce Goldberg, AT&T, savor the afterglow of their own post-election victory. They take us behind the scenes for a glimpse at some of the reasons why CBS was successful on election night.

FEBRUARY 15, 1989

AT&T: Afterwards, the critics said CBS was the best, the fastest.
CBS: Right, but we sweated it out for more than a year. With more 20-hour days than I care to remember.

AT&T: Your situation was pretty complicated.
CBS: We were faced with election projections, exit-poll analysis, and other studio programming applications running on IBM hosts.

AT&T: Plus the NewStar system we tied in with our wide-area network, ISN. It's distributed networking. Hey, we thrive on this stuff.
CBS: We're impatient around here. Speed is the only way you succeed with election coverage. The first thing we did was provide multi-host access with the 6500 System. Last election, everybody who needed access to two systems used two terminals. Twice the space, twice the cable, additional controllers, added expense, and wasted time.

We had programmers working simultaneously on three host applications, two bisync, one SDLC. They were constantly skating between terminals, wearing ruts in the rug. Now, they have access to multiple sessions simultaneously from one terminal.

AT&T: The data moves over twisted pair, the same type wiring the technicians pulled for your System 75 PBX. That made sense.

CBS: An added advantage was having the same dedicated AT&T technicians installing and maintaining our system, providing consistency to my operation.

AT&T: But really, Bruce, why us?
CBS: Your responsiveness. At AT&T: The data moves over twisted pair, the same type wiring the technicians pulled for your System 75 PBX. That made sense.

CBS: Your responsiveness. At

CBS, we all agreed that what we needed was someone who could deliver it fast, install it, test it, and support it. And you were hungry. You never said, "No, we can't do it." And you never took long to say "yes."

AT&T: You had computer networking problems. Solving them is the house specialty.
CBS: We do distributed computing to the nines. Our reporters are all over the country. They call in their results when the precinct closes. Before, we had over a hundred operators standing by, with phones and terminals. That election night we introduced the voice response system running on AT&T PCs.

AT&T: How many calls?
CBS: Thirty, thirty-two calls at once, reporters everywhere having voice response conversations with the IBM host. And all done with the same
custom host software we always used. We greatly reduced our cost.

AT&T: The other networks are watching, thinking, "How come CBS has the results already and we don't?"
CBS: It was a good night for us. Now the name of the game is streamlining for 1990. We're talking about a networked computer solution as a gateway into different host systems.

AT&T: With the AT&T Systems already up, running, and in place, we can almost completely automate your survey system.
CBS: That's a real big plus for all of us.
AT&T: Something tells me I've seen that same glint in your eye before. (Laughter)

The CBS Solution:

THE CHALLENGE:
Integrate IBM and DEC host computers and NewStar editorial system. Build an advanced computerized voice response system to speed election-night projections.

THE SOLUTION:
AT&T 6500 Multifunction Communication System with multi-host sync/async 6529 terminals. AT&T CONVERSANT® Voice System for advanced communications running on AT&T WGS computers. AT&T System 75 PBX. AT&T Information Systems Network (ISN), a wide-area network.

THE RESULT:
CBS News provided fast, accurate election coverage throughout Campaign '88. The Baltimore Sun reported that, "CBS was recording results in all sorts of key races faster and with far more authority than either of the other networks."

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AT&T
The right choice.
DHL sold on cosmopolitan Unix

Despite software headaches, operating system has global appeal for courier

ON SITE

BY J.A. SAVAGE

REDWOOD CITY, Calif. — William Pigott sees the Unix operating system as a cornucopia just beginning to unfold. Yet after two years of applications development, DHL Airways, Inc. is still caught in the narrow end of that horn of plenty.

DHL may not have a name as big as Federal Express Corp. within the U.S., but Pigott, DHL's vice-president of information services, claims that the firm handles nearly 50% of all international courier traffic.

Headquartered in Brussels, DHL has committed to Unix as an efficient way to maintain cross-border business. This commitment runs so deep that the company has acted as a reseller of Unix-based systems in the international market.

"Unix is the operating system of the future for someone who wants to work in a global sphere," Pigott said, noting that with Unix, "we are the only software seller of Unix-based systems in the international market."

"Unix is a worldwide system for the future of someone who wants to work in a global sphere."

Pigott said the subsequent

system and communications
now run under Unix. DHL would like to test all the applications over to its 15 Pyramid installations, according to Pigott. However, some in-house applications such as accounts receivable, have been running on DHL’s Unix-based Pyramid system in parallel with an Amdahl Corp. mainframe for more than a year. "We still can’t cut over," Pigott said. "It has to do with satisfying the user. They keep adding [requirements], and we keep modifying the system." Another on-line system, from Storage Technology Corp., runs DHL real-time applications in Vienna, Vienna.

Incorporating Unix applications where there had been only the mainframe and IBM's SSP RDBMS, the firm's Unix System/36s has been a headache. But Pigott’s troubles flared last August when the relational database management system management from Unisys Corp. that runs DHL’s shipment information database in Vienna was "corrupted" by a power fluctuation.

"The major problems we’ve had have been in the transition into the database. Now we’re trying to get Unix out of the system," he said.

He added, "I don’t blame Unisys. I blame the programmers who wrote it for the lack of standard development tools. Such tools would have smoothed conversion of DHL’s extensive Unix-based systems to Unix, Pigott said.

For its part, Unisys said it had no comment on the woman that DHL was using an old version of its RDBMS that did not have automatic recovery or 100% uptime. The firm’s Unix 2000, released in November, has these features, she said.

"Although Unix is an open operating system, Unix-based applications still must be crafted to the various types of machines such as the Pyramid 9000, according to Pigott. Because all versions of Unix are a bit different, Pigott noted, "the tools needed [to differ- ent versions of Unix] is not as simple as people think it is."

The CTX 25.2 wide-area network interface posed such a problem. Pigott said he worked with Pyramid for 18 months on its implementation. "X.25 is a beast," he said. "The computers had difficulty talking to the board.

"PYramid's Vlock has 200 users. Pigott said the subsequent transfer from Unify to the Informix, Inc. RDBMS was "pretty quick. We just rewrote the hooks from code that runs well in small applications to code that runs well in big applications," Pigott said. "We realized we didn’t have the tools we needed and found out [Unify] couldn’t fix it."

Pigott said the subsequent transfer from Unix to the Informix, Inc. RDBMS was "pretty quick. We just rewrote the hooks for the financial applications through May 10.

D. Appleton Co. said Release 2.1 of its IDEF/Leverage processors and data modeling software will support database design for Cincocom Systems, Inc.'s recently released SQL-based Super Version 2. IDEF/Leverage will automatically generate the SQL database definition statements directly from its data models, according to the vendor.

Aliant Computer Systems Corp. in Littleton, Mass., said it awarded $10,000 to the University of Texas M. D. Anderson Cancer Center in Houston for the development of a parallel algorithm for use in computer-aided cancer research. Researchers are developing an algorithm to search massive databases to identify and match up similar sequences of DNA or protein.

Symbo- nics, Inc. and Intelli- corp., Inc. entered a joint development agreement under which Intellicorp's knowledge-based system development environment will be provided on Symbo- nics workstations. The companies will offer a version of Knowledge Engineering Environ- ment for Symbolics' Mac- ivory and XL400 workstations.

COMPUTERWORLD

APRIL 10, 1989

SOFI NOTES

Storage Technology plans to bundle Oracle RDBMS

Storage Technology Corp. and Oracle Corp. recently announced a cooperative software venture. In return for a value-added reseller, purchased the right to embed the Oracle relational database management system in its future technology products. Oracle will be a fundamental component of Storage Technology software for management of storage hierarchies in both IBM and non-IBM environments.

Marc Software International, Inc. in Palo Alto, Calif., recently signed a joint marketing agreement with Unisys Corp. covering Marc’s Wordmark word processing software on the Unisys 5000/85 and 5000/95 Unix-based minicomputers. Under the agreement, Marc and Unisys salespeople will make joint sales calls. In addition, Wordmark will be demonstrated at Unisys Solution Centers.

BlueLine Software, Inc. in Missoula, Mont., has developed Vlock software from its develop- er, Thomas Ericson. Vlock is designed to provide virtual lock- file for IBM DOS/VSE users who are sharing the system's storage de- vices under IBM's VM operating system. Vlock has 200 users.

Bull H. N. Information Systems, Inc. of Toronto and Zanthe Information, Inc. in Ottawa announced that ZIM, a four-generation development environment from Zanthe, will be marketed by the Bull sales force. ZIM is available on all Bull XPS Unix Series models at prices starting at $2,560.

Piedmont Systems, Inc. in Middlesex, Mass., said that it acquired all rights to White Hat Systems, Inc.'s White Hat MRP II software, which runs on Digital Equipment Corp. VAX sys- tems. Piedmont renamed the product PSI-MRP II. Piedmont also acquired a suite of financial applications including its White Hat, which it renamed P.S.I. Financial Applications Software.

Piedmont increased a 35% price cut on service and support

never looked at contracting with IBM as a way of handing over his problems. They still be- long to him. IBM is working to see they are resolved.

Hamiton

FROM PAGE 25

In made in his shop?

Of course, IBM dismissed that notion. But more important- ly, so did the customers I spoke with.

Sure, they said, if a user is willing to hand over responsibility to IBM and walk away, then they are putting themselves at risk. But these customized ser- vice customers said contracting with IBM for multiple data cen- ter projects does not give IBM more power in their shop.

They look at IBM as simply hired help and nothing more.

New ditty

We in the industry once talked about IBM’s clout with custom- ers and how it could lock them into its 370 architecture and have them at its mercy. It seems some customers are now singing a different tune.

Take Equibank in Pitts- burgh, Pa. The bank, which was a data center design project but Ex- ecutive Vice-President Lesley Green said it is his stamp of ap- proval that goes on the final plans.

Green meets with the IBM project managers every week and signs off on proposals. He said

Renolds-Lair said she nev- er worried about giving IBM too much control in her shop. She had planned to have IBM in- volved in this project from the beginning — even before she knew they offered the data cen- ter design service — because she wanted their expertise. She views hiring them as project managers as no more than offi- cially tapping into that expertise. She knows there may be more than a speck of truth to IBM’s slick marketing pitch — as long as other custom- ers are willing to hand over the reins IBM can serve as hired help.

Hamiton is Computerworld’s senior editor, systems.
Find out more about the EIS/G series of Executive Information Systems with advanced code generators. Learn how this unique Pilot capability can eliminate up to 80% of the development and support costs of a full-fledged EIS. Return this card today to Pilot Executive Software. Or call Pilot at (617) 350-7035.

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For more information, call (617) 350-7035. Or complete and mail the coupon below to: Pilot Executive Software, 40 Broad Street, Boston, MA 02109.
User requests prompt Covia to upgrade Travelmaster

BY ELLIS BOOKER
CW STAFF

Citing user requests for enhancements, Covia recently upgraded its Travelmaster product for managing corporate travel and entertainment budgets.

According to product marketing manager Dave Near, the Travelmaster User Group was instrumental in developing Version 4.1. "About 60% to 70% of our development effort stems from their suggestions," he said. He added that the product is unique for Covia because it is sold directly to corporate users of travel services rather than providers of these services such as travel agents.

"They hit all our top-priority items," confirmed Leona Campos, president of the 100-member user group and a group leader in the corporate financial systems department at American Cyanamid in Clifton, N.J.

Covia began marketing Travelmaster last year after acquiring the assets of ICS Corp. in Salem, N.H., which developed the Cobol-based accounting subsystem.

In addition to a seven-person dedicated sales staff, Travelmaster is sold by the sales staffs of two of Covia's partners, United Airlines and USAir.

Travelmaster has been implemented on IBM OS/CICS, DOS/CICS and IMS platforms as well as minicomputer and personal computer systems. Depending on configuration, the product sells for $10,000 to $18,000 for the PC version and $30,000 to $80,000 for a mainframe implementation, Near said.

Version 4.1 adds an improved report generator, additional security and control features and a new module for government users.

Syncsort claims edge with ESA version of utility

BY AMY CORTESE
CW STAFF

The sorting race is on. Just last month IBM announced a faster version of its Sort utility that takes advantage of some Enterprise System Architecture (ESA) features. Then, Syncsort, Inc. one-upped the industry giant with the introduction of a new version of its Syncsort utility that takes greater advantage of ESA.

Syncsort claims that its sort utility is the first utility of any kind to take full advantage of IBM's ESA. The new ESA version of Syncsort — due this month — uses both the hyperspace and data space features of ESA to achieve faster performance. IBM's Data Facility Sort Release 11, on the other hand, uses ESA's hyperspace feature but not data space.

Hyperspace makes use of expanded storage to speed up data access drastically. Data space, which extends the memory capacity of IBM's MVS/ESA, is more akin to real memory.

Syncsort claims that with data space, 64 times more memory can be accessed, allowing the use of new sorting algorithms.

IBM said its new release of DF Sort will perform a sort in three quarters of the time the current release requires. Syncsort claimed that with the boost from data spaces, performance will be 40% better for comparable tasks.

However, for the more constant measure of CPU cycles and elapsed time, performance can be improved by up to 80%.

A three-year license for Syncsort is $9,600.

Northrop

CONTINUED FROM PAGE 27

processors and provide a screen display of the work the employee is expected to handle that day. Once the work is completed, it is duly noted, providing supervisors with real-time progress reports.

Changing work orders once took about two hours but now can be done in 30 seconds. Workers used to spend more than 200 hours a week updating and distributing work plans; these are now performed automatically by the system.

Ironically, workers were skeptical of the system. "They were afraid they might not be good at it and lose their jobs," Perreault said. "But we gave them our assurance that we intended to fully train and support them. Nobody was fired."

In addition to the time savings, cost reductions have been equally dramatic. Although the project took more than four years and $10 million to complete, it is expected to save $21 million, or nearly $17,000 per aircraft, over the remaining life of the project.

These savings will be passed on to Northrop's principal customer, the U.S. Navy. Northrop is more than halfway through its contract to deliver 1,442 Hornet jets to the Navy and U.S. Marine Corps. The jets are also used by the air forces of Australia, Canada and Spain.
Until now, the best debugger you could get was a rather primitive tool that did little beyond finding and patching. If you wanted to find out how a bug got into your program in the first place, you were on your own—with an emphasis on intuition and endurance.

Enter SmartTest™ from VIASOFT. It's the first truly intelligent tool for testing and debugging mainframe COBOL code.

SmartTest not only hunts down bugs for you, it lets you do it while your job is up and running in its native environment. And because SmartTest knows where each and every program logic and data modification path is located, the complexities that hide problems are quickly unraveled.

Beyond debugging, a single integrated analysis and testing session shows you how your program and COBOL really work, including a complete analysis of the impact of all logic changes. Best of all, the changes you make are automatically updated in the source.

If you'd like more information or a demonstration diskette, call VIASOFT toll-free at 1-800-622-6682. Or in Canada, call 1-800-543-1578.

One more thing. If you read everything in this ad very closely, there's a good chance you won't lose your shirt in your next trial evaluation. That's a hint.

And a promise.
beam to erase the data bits that have been magnetically re-
corded on the disk. The new me-
dia "can be erased and written
more than one million times," claimed Sony Corp. Chairman
Masasuki Morita.

Although erasable drives
reached the commercial sector
only last year, a latent demand
promises to ensure that the mar-
et will flower quickly. Market
research firm Freeman Asso-
ciates, Inc. in Santa Barbara,
Calif., estimated that more than
364,000 erasable optical drives
will ship in 1992, up from 5,300
last year. Within three years,
shipments of erasable drives will
exceed those of WORM drives.

The arrival of new technol-
gies is also expected to fuel de-
mmand. Of the three technologies
developed for erasable optical
disk drives — magneto-optic,
phase-change and dye polymer
— only magneto-optic has been
commercially available so far.

Tough competition
Consequently, vendor competi-
tion in the potentially lucrative
area should become intense.
Sony, Sharp Electronics Corp.,
Canon U.S.A., Inc. and Hitachi
Ltd., among others, all have 5%-
in. magneto-optic erasable
drives, and a dozen suppliers
could be clamoring for users' dol-
lars by the end of this year, said
Robert Abraham, vice-president
at Freeman Associates.

Meanwhile, Japan's Matsu-
shita Electric Industrial Co. re-
cently introduced the first 34-
in. erasable drive. The drive —
based on phase-change technol-
gy developed by Troy, Mich.-
based Energy Conversion De-

tives, Inc. — uses a thin film that
coats the disk and serves as the
recording medium. The film can
be heated to alter its structure
between a highly reflective crys-
talline state and a less reflective
amorphous state.

Varying the laser's power
causes atoms in the film to
switch between the two states;
at low power, the beam can read
out data on the disk. A direct
overwrite system erases old data
as new data is written.

The good news for users is
that prices should tumble 50%
or more by 1993 as competition
heats up, Abraham said.

Like any virgin industry, a
lack of standards has hampered
the development of the disks.

Although their support for
the Continuous Composite Ser-
vo format for optical disk car-

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NEW PRODUCTS — SOFTWARE

Development tools

Viasoft, Inc. has announced its second product and a platform reported to be the foundation for an integrated suite of intelligent COBOL re-engineering products, called Via/Center.

Saber Software, Inc. has introduced an enhanced version of Saber-C, its C language development environment that reportedly allows software engineers to prototype, test and debug C programs twice as fast as the previous version.

In 60 Seconds.

Long.

Two-shuttle matrix line printers for graphics and bar code printing, at speeds up to 1600 lpm. And a superb 24-wire letter quality desktop matrix printer.

Don't forget that these new models, along with all Genicom printers, are backed by a responsive nationwide service network.

So put your trust in Genicom printers. No matter how fast they go, they always outrun the competition.

Applications packages

Sterling Software's Dylakor Division has announced an enhanced version of Dyl-Audit, its fourth-generation language auditing and financial system.

The software runs on an IBM MVS, VSE or VM environment and can be equipped with a full-screen menu-driven editor to assist with the development of programs under TSO, CICS or CMS, the vendor said.

Version 4.9 reportedly has been optimized for letter processing, a feature that checks for unspecified blanks and eliminates them, thus enabling the printer to generate the fewest possible lines.

Dyl-Audit Version 4.9 is priced from $15,155 to $27,000.

Sterling Software
Dylakor Division
9340 Owensmouth Ave.
Chatsworth, Calif. 91311
818-718-8877

GMD, Inc., an IBM Business Partner, has announced a software enhancement for the IBM Manufacturing Accounting and Production Information Control System environment.

The Material Availability System reportedly provides a common source for all corporate planning functions and allows status questions on orders, purchase requisitions and manufacturing resource planning requirements via a single menu option, the vendor said. The software package runs on IBM midrange systems and is priced at $4,000.

GMD
8601 Dunwoody Place
Atlanta, Ga. 30350
404-587-0934

Medicomp of Virginia, Inc. has introduced an electronic medical records and clinical information system for the health care industry.

The Medicomp system reportedly creates a complete health-care information system with separate modules for record keeping, diagnostics, pharmacy and laboratory data.

The package runs on a wide range of computers, including the IBM Series 1 and Intel Corp. 80286- and 80386-based computers under DOS or AT&T's Unix System V, the company said. Modules range from $600 to $150,000.

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Winner by Technical Knockout.

“It has the most impressive list of features in the database environment.”
—Database Advisor

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—Software Digest

“It will dominate the MS-DOS and OS/2 database market during the next two years.”
—Computer Currents

“It represents a quantum leap over dBASE III PLUS” in functionality, power, and ease of use.”
—BYTE Magazine

Since its introduction last October, dBASE IV™ has sold over 300,000 copies. In fact, it's one of the fastest-selling new software products in history.

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And the applause is growing.
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From new users, who are finding that dBASE IV's intuitive new Control Center offers a fast and easy way to utilize all its power.
From seasoned users of dBASE III PLUS™, who appreciate the more than 310 new or enhanced commands and functions.

From seasoned users of dBASE III PLUS™, who appreciate the more than 310 new or enhanced commands and functions.

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Fuel to the fire. With upgrades that take years to build, this never seems to match the hype, the micro software business can be dull and frustrating. Despite endless squawking about the personal computer revolution, PC hardware is like American autos: Both improve only marginally from year to year and are generally too slow and ugly. Workstation makers are a whole different breed. These folks constantly try to out-Ferrari each other. The machines are never fast or good-looking enough. Yet unlike gastrointestinal cars that most people can't even afford to fix, workstations are becoming cheaper. We should all take our hats (or toupees) off to the workstation engine developers that are pumping out amazing new chips.

Dull and frustrating. Despite

**B**Y WILLIAM BRANDEL
CP 87979

CHICAGO — Comdex shows of

**M**ICRO **B**ITS

Douglas Barney

Chips ahoy!

Processors to steal limelight at Comdex

**B**y William Brandel
CP 87979

Chicago — Comdex shows of

**P**Cs & **W**ORKSTATIONS

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- Screen Handling Alternatives in the Micro Focus Environment
- BillAPI Programming with COBOL II Workbench
- Implementing Workbench in Large MIS Shops
- Developing DB1 Applications on PCs
- Using Workbench for Software Testing and Maintenance
- CICS Development and Testing on PCs
- Using Concurrency in Your DOS Applications
- Using System 370 Assembler Code on the PC
- IMS Systems Development for the Host
- Managing Mainframe Applications to OS/2

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The Micro Focus Users Conference will be held in the San Francisco Bay Area during the first week of May. If you're a Micro Focus customer, consider what your company might gain from attending this conference.

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The solution is INGRES. INGRES Tools are part of a fully integrated environment that ties together SQL, 4GL, host languages, visual forms, and report editors in a way that dramatically accelerates the entire development process.

Shift into high gear. With INGRES, there’s no slowing to switch tools. No need to fabricate tricky solutions. No road blocks. And once your applications are finished, they’re ready to go places. Because your INGRES applications are easily portable across multiple hardware platforms.

What’s more, INGRES open architecture allows you to integrate data from other databases and systems in your applications—easily and transparently. All of which makes INGRES Tools the surest way to maneuver through applications development gridlock.

The tools of choice. Don’t take just our word, ask DEC. They’ve chosen to distribute INGRES Tools to their users. You’ll also find INGRES among the solutions preferred by IBM, Sun, Apple, and a long list of industry leaders. Our clients include two of the Big Three auto manufacturers, major financial institutions, oil companies, and service organizations worldwide.

Take the fast lane. Don’t let backlogs bring your company to a standstill. Choose INGRES, and take the fast way home. For more information or to attend a free INGRES seminar in your area, call 1-800-4-INGRES.
YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39* per year — a savings of 62% off the single copy price. In addition, I’ll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name

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Company

Address

City State Zip

Address Shown: Home/Office

Basic Rate: $49 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.
Xerox spiff up desk presentations

Xerox Corp.'s Xerox Presents is an MS-DOS product for MS-DOS. It creates visually impressive presentations. Xerox Presents features create interactive slides and transparencies, and its Video Presentation feature lets you use your computer as a presentation device for manual or automatic slide shows.

Each presentation can have its own color palette that can be applied to text, objects or backgrounds. Backgrounds can also be animated. Xerox Presents offers page styles — files that contain objects that can be accessed by other presentations. Xerox Presents supports Lotus Development Corp.'s Freelance, PCX or GIF file formats, the .PCX format used by Z-Soft Corp. 's Publisher Paintbrush, MSP files from Microsoft Corp.'s Windows Paint, encapsulated Adobe Systems, Inc.'s Postscript and .TFF files.

Xerox Presents comes with a complete reference guide. Error messages and troubleshooting are covered extensively. A training guide contains self-paced tutorial exercises, and on-line help is provided. Xerox Presents is available on either nine 5¼-in. high-density floppies or 12 3½-in. low-density floppies. Installation is the big-est headache, with the process text file also hung up the system, although no data was lost.

Registration users receive a swee-pstakes newsletter and advance-support plans are available, but not toll-free technical sup-port for 60 days, the Xerox Presents newsletter and advance notice of new products. Extend-ed support plans are available, ranging from $50 to $1,000 per year. Four minutes was the aver-age holding time before reaching a support representative.

Xerox Presents is a bit like learning an integrated package. It is easier if you are fa-miliar with Windows or the Apple Computer, Inc. Macintosh environment.

The Windows environment greatly adds to this product's ease of use. Xerox Presents only serious drawbacks are the lack of a spelling checker and an integrated outline editor. The difficulty in installation is worsened by the fact that you can correct errors only by re-peating the entire installation process. Trying to import a large file takes several minutes.

Self-logic's fast spreadsheet compiler for users of 1-2-3

Softlogic, Inc.'s Liberty spreadsheet "compiler" turns Lotus Development Corp.'s 2-3-compatible spreadsheet templates into files that do not need 1-2-3 to run. It also pro-ducts templates against over-writing or alteration and ensures that the user cannot view formu-las or sensitive data.

To convert spreadsheet tem-plate files with Liberty, you sim-ply select the file you want compiled, and Liberty does the rest. You can customise the convert-ed spreadsheet display and pre-define spreadsheet defaults for users. The result is a semicompiled file that you distribute along with an included runtime module.

Liberty supports math co-processors, and the runtime module runs on computers with as little as 256K bytes of ran-dom-access memory and no hard disk. The product handles files from any program that gener-ates .WKS, .WK1 and Symphony files. It supports the full range of Lotus Functions and macro com-mands.

We tested performance in several cases with three files. As a real-world test, we used a sani-tized version of a 135K-byte file that contained an ordi-nary mix of data and formulas. Macros were tested separately. As a stress test, we created a 390K-byte single-column file consisting of one data cell and 8,191 formula cells, thus filling the spreadsheet with the maxi-mum number of rows possible. We also tried loading files generated by spreadsheets that can produce 1-2-3-compatible files and a public-domain tax work-sheet with a circular reference error.

Spreadsheets convert very quickly with Liberty. Once one is compiled, the templates load with blinding speed, and saving times are very close to those of 1-2-3.

Softlogic Solutions' Liberty Version 2.01

* Price: $250
* Performance: Very good
* Documentation: Excellent
* Ease of learning: Very good
* Ease of use: Very good
* Build quality: Very good
* Support: Good
* Value: Very good

Autodesk explores new dimension

Enhanced Autocad surface-modeling program features 3-D capability

Autocad 10 is the first edition of the AutoCAD, Inc.'s computer-aided design (CAD) software to in-clude full-function, three-dimen-sional wire-frame and surface modeling. Autocad's sib-lings, Autohoshade, has also been updated to do shaded rendering.

Autocad 10's most sig-nificant new feature makes this a complete and power-ful 3-D surface-modeling program. You can create or select a text block. You can vary the font, size, style and color of the text block. Margins, indents and leading can also become part of a group of objects and saved as a page style so that you can incorporate it into other presentations.

Xerox Presents supports its own palette of 256 colors that can be applied to text, objects or backgrounds. Backgrounds can also be animated. Xerox Presents offers page styles — files that contain objects that can be accessed by other presentations. Xerox Presents supports Lotus Development Corp.'s Freelance, PCX or GIF file formats, the .PCX format used by Z-Soft Corp.'s Publisher Paintbrush, MSP files from Microsoft Corp.'s Windows Paint, encapsulated Adobe Systems, Inc.'s Postscript and .TFF files.

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Spreadsheets convert very quickly with Liberty. Once one is compiled, the templates load with blinding speed, and saving times are very close to those of 1-2-3.

One of Liberty's handy fea-tures is a macrocode generator that reads keystrokes and prompts users with a menu of braced macro commands. When you select a command, the ma-crocode generator prompts you for any necessary arguments and then writes the code for you, us-ing the correct syntax.

COMPUTERWORLD 39

Continued on page 41
Autodesk
FROM PAGE 39
and two-dimensional drawings. It uses flip-card animation to show a series of drawings at up to six frames per second.

We tested Autocad 10 on a 10-MHz Everex Systems, Inc. IBM Personal Computer AT compatible with an STB Systems, Inc. Video Graphics Array Extra display card and a Nanao U.S.A. Corp. 16-in. 9070S Multiscan monitor.

The drawing tools provided by Autocad are powerful and versatile enough to have served as a performance benchmark for other CAD programs. All drawing entities can now be used to construct a 3-D model, and all editing commands now work on 3-D models.

The Autolisp macro programming language lets you customize everything — including keyboard, menus and digitizing pads.

With Autocad 10, users are able to directly transfer files between all Autocad platforms, files of older versions are upwardly compatible, and the product supports the industry's longest list of peripheral devices.

The new tutorial is the best yet from Autodesk. It takes you from the basics of drafting through the basics of 3-D modeling. A lucid glossary of computer graphics terms is included.

Autocad 10 is an intricate, complex program. It takes users months to become proficient in all of its subtleties.

Although the complete modeling capabilities are difficult to learn, they do not interfere with the process of basic drawing.

The vendor provides complete installation instructions, but it expects your dealer to install the program for you.

Like most users, you may be accustomed to drawing on a flat plane. However, the seamless integration of full-function 3-D surface modeling, the addition of needed 3-D placement aids such as Viewports, the UCS feature and axis filters and the extension of object snaps to include all 3-D equivalents all add to Autocad 10's ease of use.

Autocad 10 carries over all of the previous version's error-trapping capabilities. You can still undo and restore any number of actions, and there are even more self-explanatory screen messages when you make an error.

24-hour response time
The dealer network remains the vendor's preferred source of end-user support; a response in 24 hours is guaranteed. Users with urgent concerns can call Autodesk's toll-free number for a referral to another nearby dealer. Vendor support is a last resort. Autodesk mails all registered users a monthly magazine.

On each call we made to the nearest dealer, the CAD support technician was out, but he always called back with informative and helpful advice.

Autocad 10 lets you move from design concept through engineering plans to the renderings needed for marketing and client communications. Autoshade ($500 or $400 when purchased with Autocad) now comes with Autodesk and extends your capability to show a design in motion. At $3,000, Autocad 10 costs only $5 more than Version 9, and it provides true 3-D capabilities.
Compiled spreadsheets have the look and feel of the Lotus original, including any window and title setup. Liberty supports stacked bar, grouped bar and X-Y plot graphs. If you want to display graphs, you must define and name them before compiling your spreadsheet.

Liberty’s manual is well-written and has a generous supply of diagrams, flow charts and illustrations to support the text. Although the tutorial takes a bit of time to complete, it is well worth it. It includes a sample worksheet that walks you through the process of preparing some moderately sophisticated macros to work in a compiled spreadsheet.

Run’s subset of Lotus commands is straightforward and understandable. Its context-sensitive on-line Help should answer most user questions on use of the runtime module. You can provide your own Help macros in the template.

Macros are one area in which Liberty could be simpler, as it takes some time to figure out how to rewrite elaborate code. No errors were encountered in compiling files that loaded and ran on Lotus. In a test of how it handled problem files, two faulty worksheets were compiled. One was truly faulty, a “glitched” file that even Lotus could not load. Prepare handled it competently, providing appropriate error messages.

The other error was a worksheet created in a foreign file format and was not designed to be recognized by Liberty. Prepare had more trouble with this one. About 80% of the way through, it froze, locking up the computer and requiring a reboot.

Softlogic warrants the product to work as described in the documentation. Both 5%- and 3½-in. disks are included. There is no limit to the number of copies you can make of the runtime program. Technical support is available by phone or via a bulletin board. Softlogic technicians answered calls for support immediately. The technicians were knowledgeable and eager to help.

If you use Liberty to replace just one copy of Lotus, you have recovered more than the entire cost of the program. At $295, this package is well worth the investment.
Generic Software, Inc. has released an upgraded version of Generic CADD Level 1 for Apple Computer, Inc.'s Macintosh computer. Version 1.1 reportedly includes a Macintosh-to-MS-DOS transfer utility, multiline text placement and backwards-redraw capabilities. Two additional fonts have been incorporated for engineering and architectural applications, according to the vendor. The computer-aided design and drafting package costs $149.95.

Jasmine Technologies, Inc. has introduced an external hard drives for Apple Computer, Inc. Macintosh computers. The Directdrive series is available in 20M-, 40M-, 80M-, 100M-, 140M- and 300M-byte configurations, the vendor said. All units include a full two-year warranty, according to the company. Jasmine Technologies 1740 Army St., San Francisco, Calif. 94124 415-282-1111

Brother International Corp. has introduced the HL-8E, a 8 page/min laser printer for engineers involved in computer-aided design and manufacturing applications. The unit is to be ideal for classroom and presentation use and is priced at $395.

Forte Communications 680 W. Maude Ave., Sunnyvale, Calif. 94086 408-733-5100

GTCO Corp. has introduced the Digi-Pad Super L Series large graphic digitizers. The devices were designed to supersede the company's L Series product line and have been reconfigured with several additional features, the vendor said. Enhancements reportedly include a built-in setup menu that allows users to select key operating parameters via a cursor or stylus. An active area outline is permanently marked on the tablet surface to aid in positioning drawings and application menus. The products are available in five different tablet sizes ranging from 17 in. by 24 in. to 42 in. by 60 in. and are priced from $2,000.

GTCO 7125 Riverwood Drive Columbia, Md. 21046 301-381-6888

Optima, Inc. has announced Designvision ELS, an entry-level version of its Designvision computer-aided software engineering tool. According to the company, the product runs on any personal computer-based workstation with 640K bytes of memory and Microsoft Corp.'s Windows 2.0 or later. The package reportedly uses predefined models for 10 common diagramming methods such as Warnier/Orr, Yourdon and Chen Entity-Relationship. Each model can be customized for individual computing environments. Designvision ELS costs $995 per single copy.

Optima Suite 400 1300 Woodfield Road Schaumburg, Ill. 60173 800-633-6303

Macintosh products

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A two-dimensional graphics software package for computer-aided design applications is now available from Diehl Graphsoft, Inc. Called Blueprint, the product runs on Apple Computer, Inc. Macintosh computers and reportedly offers multiple layers, object-by-object color and precise zoom capabilities. Additional features include a hierarchical symbol library and a built-in DXF translator, the company said. The package is priced at $449.

Diehl Graphsoft Suite 202 8370 Court Ave. Ellicott City, Md. 21043 301-461-9488

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Brother International Suite 202 8370 Court Ave. Ellicott City, Md. 21043 301-461-9488

A handheld remote-control device designed for use with IBM Personal Computers and compatibles has been announced by Forte Communications, Inc. According to the company, the Remote Keyboard controls a PC's display much the same way a remote unit controls a television set. A user can reportly manipulate a PC's program from distances of up to 50 feet. The unit is said to be ideal for classroom and presentation use and is priced at $395.

Forte Communications 680 W. Maude Ave., Sunnyvale, Calif. 94086 408-733-5100

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Optima Suite 400 1300 Woodfield Road Schaumburg, Ill. 60173 800-633-6303

MIS Operations – 7:06 PM
MMC AD Systems has released updated versions of the C Programmer’s Toolbox Volumes I and II for IBM Personal Computers and compatibles. The Toolbox is a set of 21 tools reportedly designed to enhance programmer productivity.

According to the vendor, Volume I Rev. 1.3 and Volume II Rev. 1.1 now include support for the new draft ANSI standard, simplified code generation capabilities and a number of bug fixes. A hard disk is highly recommended.

Volumes I and II retail for $79.95 each, or $140 for both, according to the company.

Polytron Corp. has announced a developer’s toolkit version of the company’s Polyawk programming language.

Called Polyawk Toolkit, the product reportedly includes a translator that allows developers to create and distribute stand-alone, executable programs.

The programs created with the translator do not require Polyawk to run, nor is a runtime license required, according to the vendor. The product requires OS/2 or MS-DOS 2.0 or greater for operation, the company said.

Scheduled to ship this month, the package is priced at $295.

Polytron
1700 N. W. 167th Place
Beaverton, Ore. 97006
800-547-4000

**Systems**

A portable data acquisition system that offers 16 channels of analog and 8 bits of digital I/O has been announced by Elektron Associates, Inc.

The TD-4000 incorporates a Toshiba America, Inc. 1000 Plus portable computer, an internal data acquisition module and a set of software tools, according to the company.

Elekon’s data acquisition system

Vendor. The system was reportedly designed to perform logging, measurement and analysis functions in a field environment.

The TD-4000 user is priced at least $2,000. Elektron Associates

Tektronix, Inc. has announced X Window System Version 11, Release 3.0, for all Tektronix 4310 series graphics workstations.

According to the company, the standard will reportedly be available with the release of Tektronix’ Udesk 4.0 operating system, due in the first quarter. It was designed to provide users with improved graphics and windowing capabilities.

The X Window System is a communication standard and user interface that allows Tek Workstation users to access X Window System client applications running on a variety of host computer platforms, the vendor said.

The Tektronix 4319 color graphics workstation is priced at $11,950.

Tektronix
P. O. Box 1000
Wilsonville, Ore. 97070
503-685-2838

A single-user workstation for capturing compact disk/read-only memory (CD-ROM) or CD-Audio data onto a compact disk has been introduced by Optical Media International.

The TD-4000 incorporates a Toshiba America, Inc. 1000 Plus portable computer, an internal data acquisition module and a set of software tools, according to the company.

Elekon’s data acquisition system

Vendor. The system was reportedly designed to perform logging, measurement and analysis functions in a field environment.

The TD-4000 is priced at less than $2,000. Elektron Associates

### Data storage

A rack-mount expansion chassis that supports up to four 5¼-in. removable Winchester drives has been announced by Sigma Information Systems.

The SA-H188, the chassis contains a front console with write-protect and ready switches for each drive. It also includes a controller I/O panel, the vendor said. The product costs $1,270, and quantity discounts are available.

Sigma
3401 E. LaPalma Ave.
Anaheim, Calif. 92806
714-630-5417

A product designed to extend the life of half-height hard disks used in personal computers is now available from American Technology Labs.

According to the vendor, PC Disk-saver is a fan the size of a half-height disk unit that mounts below a half-height disk in an IBM Personal Computer, XT, AT or clone system. The device reportedly cools the disk temperature by as much as 30 degrees and is priced at $39.95.

American Technology Labs
115 W. 3rd St.
Stevensville, Mont. 59870
800-233-9758

### Situation: Critical

“. . . 37 new sites in 4 regions dumped in my lap... and they want my recommendation by tomorrow? Who’re they kidding?... Means we’ve got to decentralize... Distribute the application... Build a high integrity network... Add processing power. We’ve got to be on-line in how long? Five months? And put it all together without losing a single transaction?... Who can I put on it? And what, God forbid, if the computer goes down?"

### Solution: Stratus

Stratus XA™2000 Continuous Processing Systems. Engineered to handle critical on-line transactions. To expand as business dictates. To give you control over your business as it happens. Second by second. Year after year. Contact your local Stratus representative or call (508) 460-2566. For dynamic businesses, a dynamic solution.

Stratus
We keep business on-line.
Rural county reaps high-tech bounty
Utah agencies on the cutting edge in micros

BY DOUGLAS BARNEY

VERNAL, Utah — Watch
eight enough television and you
will begin to believe that rural areas
are backward in the arts,
sciences and technology. But just
try telling that to Dave Thomas.

Thomas, an MIS manager, is
165 miles away from Salt Lake
City in the thinly populated coun-
ty of Uintah, Utah. However, to
help manage the seat of county
government here, Thomas has
acquired a veritable who’s who
and what’s what of hot micro-orien-
ted technology. In the pro-
cess, he has put to rest the tired
and false image of the country
bumpkin who is years behind
big-city technical hotshots.

The county now has four 25-
MHz Proteus Technology Corp.
multiuser microcomputers
hooked to gigantic 360M- and
740M-byte Maxtor Corp. hard
disk drives running Oracle
Corp.'s Oracle database man-
germent system. These leading-
edge systems are replacing the
aging 3B minicomputers from
AT&T. “They were too slow,”
Thomas said of the 3Bs.

Faster boards due
To keep the Proteus systems im-
mune from the same criticism,
Thomas will upgrade them with
snazzy 33-MHz Intel Corp.
80386 boards as soon as the
boards are available.

Beyond speed, the Proteus
micros offer other benefits. “We
decided it was cheaper to go that
way — maintenancewise and ev-
erything else,” Thomas said.

Does this sound like enough
leading-edge micro technology?
How about tying in Sun River
for county draftsmen? That
would be plenty for most tech-
nology freaks, but Thomas is not
stopping there. He is also plan-
ing to widen the use of Borland
International’s Paradox, but he
will not run this database manag-
er under MS-DOS as most of his
contemporaries have. Instead,
he will use VP/IX, an operating
system from Phoenix Technol-
ogies Ltd. that allows MS-DOS to
run as a task under Unix.

Thomas and his partner Anita
Nokes do not buy technology be-
cause it looks good on paper.
They buy it because it is cost-
effective and works. So far, so
good, Thomas reported.

With some 22,000 residents,
the county has made steady in-
rades toward downsizing, having
moved from a former Burroughs
Corp. host to AT&T 3B minicom-
puters and finally to the Pro-
teus micro-based systems that
act as hosts.

You Want A Laser Printer
With Faster Processing Speed,
Sharper 400 dpi Resolution
And More Powerful Functionality.
But You Think
You Can’t Afford It.
Watch out for the incredible shrinking laptop

BY JULIE PITTA CW STAFF

Riddle: What's smaller than a bread box — much smaller — and can access electronic mail on the road?
Answer: The new class of personal computers.

PCs are getting smaller. No surprise; that has been the trend for the last couple of years. What is likely to astonish some computer users is just how small PCs will get in the not-so-distant future.

Several vendors are promising MS-DOS-based laptops that fit in the pocket of a suit jacket before year's end. Robert Gerwer, marketing vice-president of Poget (pronounced, you guessed it, "pocket") Computer Corp., said his company's laptop will measure 8½ by 4 in. and will weigh approximately one pound. The screen area will be 25 lines long and 80 characters wide. However, questions remain about whether serious computer users will tolerate the inherent limitations of such tiny computers.

The price for a Poget computer will be about $2,000, a little more than the price of the average IBM Personal Computer AT compatible.

Poget is offering few details — such as storage capacities — about the product. But, before you put this laptop on your list of potential vaporware, note that Poget's founders hail from Texas Instruments, Inc., the same company that brought you inexpensive pocket calculators.

**Briefcase-size**

NEC Home Electronics, Inc. began shipping a briefcase-size laptop last December. "It's a little fatter than a magazine," NEC Vice-President Tom Martin said. The Ultralight, which also runs MS-DOS applications, measures 8½ by 11 in. and weighs about four pounds. Its screen is a backlit LCD with a resolution of 640 by 200 pixels. It uses silicon hard-disk storage. The price of the Ultralight is $2,999 with a 2,400 bit/sec. modem.

Meanwhile, Atari Corp. plans to announce its Portfolio pocket computer at Comdex/Spring '89 this week. The 7½- by 4½-in. product is based on an Intel Corp. 8088 microprocessor and MS-DOS. It offers an 8-line by 40-character LCD display and weighs 1 pound. It costs about $400.

Both Poget and NEC are aiming at business executives on the go. "We're dealing with the unfulfilled promise of the laptop," Gerwer said. "The typical executive didn't go for the [earlier] laptop because of its size, weight and battery life. We're attempting to resolve those issues."

NEC's Martin said the company has been pleasantly surprised by the Ultralight's broad appeal.

"We saw the executive segment and saw its potential as an extension to the desktop," Martin said. "There have been these little pockets of interest that we didn't anticipate. One that wasn't obvious when we were introducing the product is that it appeals to women. Women aren't happy with 15-pound box-type machines.

**Skeptic users**

Corporate computer users are still leery about these new laptops.

"There's a conflict between a decent screen and a laptop that could fit in a pocket," said Phil Gordon, manager of office automation at Charles Schwab & Co., in San Francisco. "The kind of people we have here want to see a spreadsheet on the screen. Reducing the screen size is going to cause some problems."

"I doubt you would do anything long and protracted with it," said David Newman, a vice-president at Citibank NA in New York, noting that it would be useful for accessing electronic mail on the road or for pressing tasks. "There would be limitations with the keyboard and the screen."
A corporate personal computer user group has one message for 3½-in. drive and high-density disk manufacturers: standardize.

As systems based on the Intel Corp. 80486 microprocessor wait in the wings, the 486 Standardization Committee hopes to influence floppy disk manufacturers to standardize their high-density products before they reach dealers' shelves. The group, a subset of the powerful Microcomputer Managers Association, consists of corporate microcomputer managers from firms such as Bear Stearns & Co. and Dow Chemical Co.

At present, manufacturers of 3½-in. storage disks are planning to launch very high-density disks in the 10M- to 20M-byte storage range, said Brian Livingston, the 486 group's chairman. However, the disks under development and the read/write heads they will operate with are not compatible, the 486 group charged. This has raised the ire of the committee's corporate micro managers.

Livingston said at least three major floppy disk manufacturers plan to release very high-density 3¼-in. disks of varying media storage sizes. These manufacturers include Insite Peripherals in Santa Clara, Calif., Brier Technology in San Jose, Calif., and Panasonic Industrial Co. in Milpitas, Calif., he said.

Livingston noted that 486 systems — which will be used as minicomputers, high-resolution technical workstations and local-area network servers and will support memory- and processor-intensive operating systems such as OS/2 and Unix — usually require more data storage than their PC counterparts. So before the incompatible 3¼-in. floppies and drives force users into the hard disk drive corner, the 486 group is making its stand.

"Our committee members are frustrated already about the incompatibilities," Livingston said. "We can do nothing about the present 720K-byte and 1.44M-byte 3½-in. diskettes. But when you can see something like this coming over the horizon, we can make it compatible for MIS ahead of time."

BRIAN LIVINGSTON
486 STANDARDIZATION COMMITTEE

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The high-density disk products are expected to fill the needs of workstation users previously dependent on the comparatively expensive 20M-byte hard disks. "Instead of having three or four manufactur-
Fox plans Netware SQL client

**Custom version of Netware SQL currently in the works**

**BY DOUGLAS BARNEY**

AUSTRALIA, Texas — Get out your scorecard. Yet another firm has entered the client/server vaporware sweepstakes. Fox Software, Inc., known for its speedy Dbase-compatible client, called Fox, and Dbase compiler and its well-publicized competitive pricing and exceptional quality standards, UDS modems continue to lead the industry in performance, reliability and value. We haven't lost our touch.

For specific product details, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/721-8000; FAX 205/730-5657.

**Universal Data Systems**

From its very inception, Universal Data Systems has been known as a company with a special touch when it comes to manufacturing OEM modems. Technical leadership, competitive pricing and exceptional reliability are the historical hallmarks of the UDS product line.

And, as the manufacturing environment has changed, UDS has changed with it. New, smaller components, sharply increased component densities and new techniques like surface mounting have changed the manufacturing rules. At the same time the pressures for higher quality and improved price/value relationships have been unrelenting.

In response, UDS has created one of the most thoroughly automated modem manufacturing facilities in the world.

Since the new machines are tended by skilled and dedicated workers, and since incoming components and outgoing products are monitored for conformance to the toughest quality standards, UDS modems continue to lead the industry in performance, reliability and value.

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HE PCers, with their MS-DOS and OS/2, are really doing poorly when compared with the RISC-takers.

The one common element that anchors all these processors and keeps the market from imploding because of the violence of confusion is Unix. This portable operating system will run on just about any mainstream processor.

The PCers, with their MS-DOS and OS/2, are really doing poorly when compared with the RISC-takers. Intel has fanned the PC price/performance flames with its 386, a chip that keeps getting faster. The firm will begin shipping quantities of its 33-MHz chip, which vendors are anxious to build around. Later this year, the even speedier 80486 is expected to make its debut and spawn a whole new cycle of hardware primarily running MS-DOS, OS/2 and even Unix.

Motorola is up to the 68030, which offers high-speed operation and built-in multitasking, with the 68040 just around the corner.

These chips aren't shabby, but the constraints of compatibility limit creativity. With Unix able to port to most anything that can be loaded with a few megabytes of random-access memory, workstation chipsets have great freedom. Maybe what the PC folks need are a few more firms like Phoenix Technologies and Chips & Technologies to work out compatibility kinks, so they too can take a walk on the wild side.

Barney is a Computerworld senior editor, PCs & Workstations.
COMDEX/Spring '89 will be the launching pad for numerous systems based on Intel's 80386SX and the new 33-MHz 80386, which will be the stars here this week. Intel will also unleash the widely anticipated 80486, or "the mainframe on a chip."

Metaphor
CONTINUED FROM PAGE 37
connecting icons.
Another tool creates capsules by opening a window and copying all of the icons needed for a procedure into it.

The software's tools work well together but are individually not competitive with their respective counterparts in the spreadsheet and word processing worlds, he said.

IBM alliance
In a move to boost its software's capabilities, Metaphor signed a pact with IBM to jointly develop software that can be used with IBM's Personal System/2 running OS/2 Extended Edition and relational databases on the IBM 9370 and MVS-based systems.
The company claims to have 110 customers with 175 installations. Nearly half are packaged-goods companies such as Colgate-Palmolive Co., Helene Curtis, Inc. and American Home Products.

Metaphor is particularly appealing to marketing executives because they typically work with large volumes of data, and Metaphor helps them gain access in a relatively easy way, said Joyce Young, manager of decision-support systems at Helene Curtis in Chicago.

From the MIS point of view, systems that enable end users to write their own applications or retrieve data exactly the way they want it has benefits, Young said. "It's the old backlog story," she said.

"Metaphor does help reduce the backlog because users are in control of their environment."
However, the system is not without drawbacks for MIS. "It requires a technical staff to implement and support the networks and to maintain them," Young said. "We made the mistake of not understanding that early on."

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The AST system also supports an Intel 80387 numeric coprocessor chip. The standard configuration includes a 512K/64K 1.2MB floppy disk drive and three external drive bays. The product is available in three configurations that range in price from $6,595 to $11,595.

* Mylex Corp. will announce its IBM Personal Computer AT-compatible 386 33-MHz system and 386SX add-in hardware products. The MX386 33-MHz system board reportedly provides zero-wait state performance of 7.5 MIPS, which the company claims will make a PC run 53 times faster than the original XT. The MX386 is also available in a 25-MHz version, which the company rated at 5.7 MIPS. The products carry a list price of $2,400 for the 25-MHz version and $2,900 for the 33-MHz board when sold in OEM quantities.

* Companies that are planning to announce systems but did not provide information prior to the show include the following: Acer Technologies Corp., located in San Jose, Calif.; Advanced Logic Research, Inc. in Irvine, Calif.; and DTK Computer Corp. in City of Industry, Calif.
Networks shine on Sun systems

By Patricia Keefe

**ON SITE**

Baltimore — At most newspapers, the news, advertising and production departments seem to have a Chinese wall keeping them and their computer systems apart. But The Baltimore Sun has launched an ambitious plan to connect those departments with local and wide-area networks.

The Sun plans to install a broadband LAN, running at a speedy 100M bit/sec., to handle color graphics for both news and advertising. At the same time, the Sun’s integrated publishing system will comply with industry standards to avoid dependence on any one vendor, a common situation resulting from specialized publishing systems.

“We’re now at the point where we are ready to replace various stand-alone systems, so we’re taking this opportunity to implement our philosophy of integrated systems,” said James P. McCrystal, director of information systems.

“Many newspapers look upon color graphics, for example, as an adjunct function in a separate studio system. But it should be an integrated function so you can see color where it’s needed at any workstation in the newsroom,” McCrystal explained.

To accomplish this, the newspaper recently signed a contract with Crosfield Electronics Inc., a publishing systems vendor based in Glen Rock, N.J., for a $13.5 million integrated publishing system. The system includes Crosfield’s editorial and advertising workstations for page design, which are Digital Equipment Corp. Vaxes that use Crosfield software.

The project, due for completion, will manage needs, rather than waiting for the Open Systems Interconnect protocols to mature, according to a recent study by Infonetics Inc.

The Santa Clara-based research firm interviewed 150 IS and systems managers, 70% of whom played a major role in networking decisions at Fortune 500 companies. The survey avoided government and academic organizations, which are traditional TCP/IP users, according to Infonetics.

More than a quarter of respondents said that they see TCP/IP’s Simple Network Management Protocol (SNMP) as important for their companies, despite the fact that only 23% of the respondents had TCP/IP networks installed. Infonetics said. In contrast, only 11% of the respondents attached any importance to OSI’s Common Management Information Protocol (CMIP) or CMIP Over TCP/IP (CMOT), which was designed to provide a way for users to migrate their existing TCP/IP network systems.

The importance of protocol

A survey of 150 information managers among Fortune 500 firms suggest SNMP will be a more important network management protocol than either CMIP or CMOT this year and two years from now:

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP</td>
<td>20%</td>
</tr>
<tr>
<td>CMIP and CMOT</td>
<td>19%</td>
</tr>
<tr>
<td>CMIP</td>
<td>19%</td>
</tr>
<tr>
<td>CMOT</td>
<td>13%</td>
</tr>
</tbody>
</table>

Will be important during 1989

Source: Infonetics Inc.

Continued on page 58
To all those unlucky enough to be stuck smack in the middle of the current spreadsheet confusion, take heart. There is, at last, a viable alternative to war: revolution. One that delivers even more performance than you have (ahem) been waiting for, but without demanding expensive new hardware or extensive retraining. And without abruptly cutting you off from any user in your company, even those on mainframes.

The name of the spreadsheet is SuperCalc®5.

And what it can do for you is, frankly, quite revolutionary.

Let's begin at the end. Stand-alone quality graphic capabilities have been built in.

Offering hundreds of presentation treatments from word charts to three-dimensional bar, pie, scatter, and polar graphs.

And with SuperCalc5, you select fonts, lines, boxes, grids and shading. All of which can be used to produce the highest quality customized reports.

Plus, SuperCalc5 actually makes productivity easier. An integrated Undo feature simply reverses unwanted commands. And a truly comprehensive system of debugging highlights costly errors and analyzes macro logic.

Perhaps even more impressive is the way SuperCalc5 can link spreadsheets. Up to 255...
to be precise. Linking either in memory or on disk, either pages of the same spreadsheet or independent, either SuperCalc5's files or Lotus® 1-2-3®'s.

Which brings us to the "L" word. SuperCalc5 not only reads and writes Lotus® 1-2-3® files, it totally coexists with Lotus.

But not for Excel®.

Which now brings us to the "E" word. Unlike Excel, SuperCalc5 runs on all IBM®, compatible computers but also takes full advantage of 286 and 386 machines when you decide to make that transition.

And if all that isn't enough to make you run out today and join the revolution, there's even more incentive.

Like our free demo disk offer through July 31, 1989. And our $100 upgrade offer for just about any spreadsheet you're using. Call 1-800-331-5236. In Canada call 1-800-663-6904.

Which finally brings us to our admittedly biased outlook for the much touted spreadsheet war.

With SuperCalc5, peace is at hand.
tion in 1992, will be split into separate phases to avoid disrupting newspaper operations, ease project management and build on each layer of technology.

In the first phase, the Sun's news and advertising page-composition functions will be integrated via an Ethernet LAN, to be installed by midsummer. The equipment will include workstations for ad composition, terminals for editing news photos, input scanners and file servers. Next, McCrystal said, the Sun will focus on a network to transmit facsimiles of the composed pages for printing. Initially, full-page facsimiles will be sent to an on-premises printing plant. But when the Sun's remote printing plant near the Baltimore harbor is completed in 1991, a wide-area facsimile network will be installed, he said.

This fiber-optic network, called Hydra, supports T1 and microwave links at speeds up to 2M bit/sec. Hydra was developed specifically for the controlled transmission of high volumes of text or image data to remote printing sites.

Meanwhile, the Sun will be implementing Crosfield's Graphic Arts Local Area Network (GALAN), a fiber-optic network with a very wide bandwidth for handling high-resolution color graphics, McCrystal said.

GALAN uses the Token-Ring topology based on Fiber Distributed Data Interface (FDDI). The FDDI specification adds a measure of fault tolerance to the network, McCrystal said, noting that an FDDI net will reconfigure itself to recover from faults. "We're constantly on deadlines and we just can't have failures," he said. "We can't tell people, 'Sorry, we're not going to produce the paper this afternoon.'"

The contract for the Baltimore Sun's networking project, based on a demanding request for proposals (RFP) drawn up by a user committee, will be implemented in phases during the next several years, with completion targeted for 1992.

The detailed specifications in the RFP were developed by a committee of 12, only two of them from the IS department, James P. McCrystal noted. "It was very refreshing to see all of the disciplines — news, advertising, production and information systems — come together and produce a requirements document," he said.

McCrystal called it a "first-class document that describes the business of The Baltimore Sun the way we want it to be through the rest of the century."

MITCHEL BETTS

The final phase of the systems overhaul will consist of editorial design and page-information control systems, which provide management with centralized control over the integrated systems.
The U.S. market for ISDN services should grow from $200 million this year to $17.8 billion in 1998, according to Eastern Management Group. If traditional carriers do not move quickly enough to fill the service gap, others will step in, said Warren Williams, a senior consultant at the Parsippany, N.J., research firm. Two likely groups of candidates are enhanced service providers such as McDonnell Douglas Communications Systems Co. subsidiary Tymnet and Fortune 500 service companies such as Sears, Roebuck and Co.

The spread of ISDN services should in turn help launch the still-augmenting ISDN equipment industry, Warren said. Indeed, that market is already heating up, as shown by the following recent and pending announcements:

- Apple Computer, Inc. recently announced an OS/2 Extended Edition version of its proprietary ISDN workstation, which reportedly can maintain up to five concurrent sessions over an ISDN link.
- International Computers Ltd., in Stamford, Conn., last week announced a device that is said to allow local carriers to deliver Concurrent Sessions over an Integrated Services Digital Network (ISDN) link.
- Northern Telecom already has brought out a device that is said to provide file sharing for personal computers as well as a call manager that will handle both voice and data transmissions, screen sharing and other capabilities.
- Raleigh Technology Group, Inc. in Raleigh, N.C., expects to announce its first ISDN software product soon, which will target vertical markets such as law, real estate and banking. The products will provide such industry-specific functions as automatically calling up a law firm's client database on-screen when the client calls. It will also use existing PC-based generic ISDN applications.

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1. World-class CAE system, helped design and manufacture many components of the new car that will carry the couple off to their honeymoon.
2. The future looks bright for the bridesmaid too. Her Big Ten MIS curriculum included system development using Unigraphic's CASE tool, PRO*WORKBENCH!
3. The cost per line is 60% to 80% less than it would be for dedicated channels connected to the mainframe's backbone, AT&T claimed.
4. Telephone companies will be able to provide the X.25 connection over central office-based local-area network services, which support data communications among corporate sites within one local access and transport area, AT&T said. 

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☐ Over 1000 employees

☐ 100 to 1000 employees

☐ Less than 100 employees

☐ VAR/Developer

☐ Computer Reseller

☐ OEM

☐ Gov't. Organization

☐ Educational Institution

☐ Student

☐ Other

What kind of hardware operating system do you use?

☐ I plan to purchase a DBMS product:

☐ within 6 months

☐ 6 months or longer

☐ do not plan to purchase

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For a brochure, free demo diskette or more references, call 1-800-531-5236. In Canada call 1-800-663-6904.

Because, in the final analysis, we want your project to receive reviews along the same lines as ours.
Host access made simpler
Two releases take some sting out of the need to transfer data

BY PATRICIA KEEFE
and PATRICK WAURZYNIAK
CW STAFF

End users and corporate programmers eager to sidestep complicated, time-consuming host-access procedures may want to look at two recent product debuts. As demonstrated at a recent trade show, Now PC/Host from Attachmate Corp. of Bellevue, Wash., streamlines the cumbersome process typically required to transfer data between a personal computer and an IBM host.

It automates the command structure of IBM's High-Level Language Application Programming Interface by replacing multiple screens of awkward commands with a simple menu of choices. The product costs $195.

On the programmer side, a $595 version called Author provides a series of macro commands said to enable users to customize Now programs.

Also targeting programmers, Aspen Research of Burlingame, Calif., unrolled Mozart, said to enable development of PC-based front-ends to support simplified user access to mainframe and midrange systems.

Mozart combines the application-to-application communications of Aspen's former Enter 3270 product with such additional capabilities as 5250 support, a built-in screen painter, an extended window manager and an integrated database. Great-West Life Assurance Co. in Englewood, Colo., uses an Enter 3270 front end to enable unsophisticated PC users at a dozen field sites to furnish about 250 customers with access to IBM 3090 mainframes at its Manitoba headquarters.

"As far as the capability they [say Enter 3270 has], it does that quite well," said Karl Berry, Great-West's assistant manager of systems support. "We took [Mozart] a step further and built scripts with IBM's TSO time sharing option." As with Now PC/Host, the key to Mozart is that the user is shielded from the underlying mechanisms. "They just see the pretty screens," Berry said.

Walter Tate, systems analyst for Atlanta-based Life Insurance Co. of Georgia, said Enter 3270 came in handy last year when the insurer needed to change some software packages. Previous efforts to adapt the programs were stymied by the manufacturer, who would not allow any changes to the underlying code.

"It's a real good development tool, and it enabled us to do things we couldn't do any other way," Tate said.

Mozart costs $500 and reportedly runs in conjunction with most standard 3270 and 5250 emulation products.

NEW DEALS

Four companies recently became major implementors of Hewlett-Packard Co.'s Private Packet Network line of X.25 products.

Hertz-Europe has implemented a backbone network to connect its car rental outlets, using not only HP's switches but also its network management services.

Longs Drug Stores Corp. has implemented HP X.25 switches in order to connect 240 retail drug stores throughout six Western states.

SCS-Thomson Microelectronics chose HP's products to connect Digital Equipment Corp. and IBM systems, as well as HP hosts.

The Singapore Stock Exchange is using the vendor's switches to handle trading volumes of up to 118 million shares per day among 30 member brokerage firms.

After six years of planning, California State University, Fresno and Fujitsu Business Communications Systems have announced a 10-year, $17 million contract for an integrated telecommunications system on the university campus. Fujitsu will construct both a broadband network and a fiber-optic cabling system to support the school's interactive data communication and instructional television distribution requirements. The core component will be the vendor's Integrated Services Digital Networks (ISDN)-compatible F9800 private branch exchange.

The National Aeronautics and Space Administration's Communications Division has selected a micro-based X.25 packet-switching network to handle communications for a scientific satellite that will investigate black holes and other phenomena. Amnet, Inc. will supply the switches, which will support a backbone network transferring satellite data to project participants. NASA said it selected the X.25 standard because it links a variety of computer hosts.

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Concentrate on your new application, not a new language. Call Realia for a free 30-day evaluation.

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**Backbones**

CONTINUED FROM PAGE 49

physical paths, providing more efficient data routing and built-in redundancy.
- Custom filters can limit specific traffic to one network segment, establishing a secure network domain. They can also filter or forward packets based on protocol.
- SEF provides network administrator-defined workstations with exclusive privileges to access resources outside the local-area network segment.

After six weeks of testing, one early user, Kurt Rader, a senior software analyst at Oregon’s Department of Environmental Quality (DEQ), gave 3Com’s approach a thumbs-up. If the IB/2000 continues to perform well during the test period, Rader said he plans to purchase five bridges: “We just plugged it in, and it’s been very trouble-free, which is generally my experience with Bridge and now 3Com products.”

He is anxious to relieve the traffic load rapidly building up on his backbone. Currently, the DEQ has an eight-floor 3Com network with 160 nodes supporting 300 users. Rader says the department is moving rapidly toward a 1-to-1 ratio of users to workstations and added that it will only get worse as the number of users climbs if something is not done.

“The traffic level has already reached the point where it is impacting the user, and come the end of the year [with more users on the network], it would be intolerable without these intelligent bridges,” Rader said. Rader’s plan is to use the bridges in conjunction with 3Com’s Multi-connect product to isolate each of the floors from the backbone.

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**TCP/IP**

CONTINUED FROM PAGE 49

works to OSI network management. Although respondents indicated that they would have less interest in SNMP two years from now, interest in the OSI-based protocols is expected to increase only slightly, Infonetics found.

“There is a well-defined migration path from SNMP to CMIP, so people may expect to migrate in a few years,” Infonetics Vice-President Steve Spanier said. “But even by 1991, there’s not much interest — the most startling result for us. These people seemed interested in having integrated network management now, and there isn’t much on the market.” SNMP products are currently available from five to 10 vendors, including Wellfleet Communications, Inc. and Wolfgang Group, Inc.; also, “I think IBM is developing one for [National Science Foundation network] NSFNet,” Spanier said. In contrast, while most major host and networking vendors have announced CMIP-based products, few are now commercially available.

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**Evolution**

CONTINUED FROM PAGE 49

— who also have to manage this nightmare — will undoubtedly find themselves less able to wait for the perfect product. Even if they grab something only as a stopgap, when push comes to shove, many will reach for that lifesaver.

Pundits are fond of holding up IBM as an example of how superior marketing can sell sometimes-mediocre products. The reverse is also true. The most technically superior product will rot on the shelf if you don’t have the resources or know-how to market, distribute or support it.

If you look closely, Banyan appears to be in danger of falling victim to a squeeze play. On the high end, minicomputer and systems vendors are trying to connect into personal computer networks. On the low end, market leaders such as 3Com and Novell are pedaling furiously to extend their work group connectivity into the wide-area arena.

These firms are buying other companies, striking technology and service alliances with industry heavyweights and issuing statements of directions. The competition is very busy and very visible. They appear to be gaining on Banyan, which continues to plod along.

Most of the Fortune 1,000 is probably more inclined to entrust the technological lifeflood of their companies to a known entity. They’re more likely to question Banyan’s ability to stay the course for the long haul or to provide a full suite of services and products.

If Banyan wants to ease these concerns, it’s going to have to be a little less tight-lipped and a little more aggressive. While it continues to perfect and expand its technology, it had better pay attention to the other pieces that make up a solid contender.

Keefe is a Computerworld senior editor, networking.
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It's the latest milestone in the UNIX System V heritage of responding to the marketplace and customer needs. Key product enhancements are also evidence. Releases 3.0 and 3.1 delivered networking and internationalization. Release 3.2 was built around these enhancements and included XENIX/386 compatibility and security features.

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To find out more about UNIX System V and the UNIX Software Operation, call 1 800 828-UNIX.

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Local-area networking hardware

A dot matrix printer designed to function as a shared networking device in local-area networking environments has been introduced by C. Itoh Electronics, Inc. The 18-wire Prowriter CI-5000 reportedly features four print speeds and is compatible with the IBM Proprinter XL, Epson America, Inc.'s FX-286E and Digital Equipment Corp.'s LA216, LA75 and LASO dot matrix printers.

The unit outputs 540 char./sec. in draft mode at 12 char./in. and 73 char./sec. at 16 char./in. in letter-quality mode, according to the vendor. Standard features include bottom and rear paper loading and a 15-character display, multifunction control panel.

Scheduled for availability in the second quarter, the printer will carry a price tag of $1,995, with quantity discounts available.

C. Itoh Electronics
2505 McCabe Way
Irvine, Calif. 92714
714-660-1421

International Communications Equipment Corp. (ICE) has introduced a product that incorporates a five-port active hub and an Arcnet interface onto a single board, according to the vendor. Called the Icecard-5, the device reportedly resides in a local-area network server and can support as many as 35 users without the use of extra hubs. The product is compatible with Novell, Inc.'s RX-NET and is priced at $349. ICE Suite E 17945 Skypark Circle Irvine, Calif. 92714 714-860-0191

Network management

Compuserve, Inc. is offering an enhanced on-line network management system to customers of its value-added packet data network service, the company said. The on-line system reportedly allows users simplified access to all network administration functions, including access setup control for user passwords, phone number lookups, electronic-mail facilities and usage reports.

According to the company, the network management system now provides troubleshooting and load monitoring functions as well as the tools necessary to shut down network links in the event of a data center outage. The service is provided free to current Compuserve packet data network customers.

Compuserve
P.O. Box 20212
Columbus, Ohio 43220
614-457-8600

Links

A hardware platform that reportedly connects two or more geographically remote local-area networks into a single, integrated network has been introduced by Advanced Computer Communications. The ACS 4100 is targeted at medium to large-scale users that require high-performance capabilities in network management, according to the vendor. The product reportedly features the Simple Network Management Protocol and open systems management protocol for heterogeneous systems in a networking environment.

Several software modifications are available, and the unit can be configured to function as a router or a bridge, the company said.

Data can be transmitted at speeds up to 11 Mbps in a single link, and two serial links reportedly can be split to connect LANs in different directions and transmit data at different rates. The ACS 4100, an Ethernet-bridge based on the ACS 4100 platform, costs $7,500. Pricing for the ACS 4100 will be released at a later date.

Advanced Computer Communications
720 Santa Barbara St.
Santa Barbara, Calif. 93101
805-963-9431

A network interface card with four serial communication ports, each said to support T1 transmission rates of up to 4M bit/sec., has been announced by Cisco Systems, Inc.

Developed as an option for the company's line of internetwork routers, the Serial Communications Interface (SCI) network attachment card connects to wide-area networks over asynchronous serial lines, the company said. The lines reportedly can serve either as dedicated circuits or as connections to public or private CCITT X.25 data networks. The product comes in three versions: the SCI with four high-speed ports supporting rates up to 4M bit/sec. is priced at $7,100; the SCI with four low-speed ports supporting up to 64K bit/sec. costs $3,800; and a configuration of two high-speed and two low-speed ports is priced at $6,200.

Cisco Systems
1350 Willow Road
Menlo Park, Calif. 94025
415-326-1941

Cisco Systems' internetwork router

Tiara Computer Systems, Inc. has announced a software protocol designed to enable incompatible operating systems to share data via a Tiara Ethernet adapter board. The Transmission Control Protocol/Internet Protocol-DOS program reportedly includes a file transfer protocol, terminal emulation and remote commands. It is slated to ship this month and will be priced at $495.

Tiara Computer Systems
2700 Garcia Ave.
Mountain View, Calif. 94043
415-965-1700

American Data Technology, Inc. is offering enhanced software with its Smartfax facsimile boards. Designed for IBM Personal Computers and compatibles, Massfax provides mail-merge and broadcast-distribution capabilities. The software is bundled with the Smartfax boards and costs $664.

American Data Technology
44 W. Bellevue Drive
Pasadena, Calif. 91105
818-578-1339

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SDM International, Inc. PC Box 579 Fugui-Vanna, N.C. 27526
The house that Bob built

Tufts University's Curran crafts relationships and information systems

BY NELL MARGOLIS CW STAFF

Like his father, Robert J. Curran is a builder. But even though he completely rebuilt his suburban Boston home 15 years ago, Curran's main aim is constructing information systems.

The 51-year-old executive director of computer services and telecommunications at Tufts University started his IS career in the U.S. Army, where he created a supply order system. In his current task — leading a major urban university to the front lines of computing — Curran is a creator of both computer systems and cooperation among the diverse groups that deal with them.

Like any good builder, Curran knows the value of a solid foundation. "A lot of IS shops fail because they don't really know where they're going — what's the policy, what's the philosophy," he says. Especially at a university, where the dollars are few and the demands are legion, he adds, "We can't afford to make a mistake. We have to have a plan, because we have no choice but to get it right the first time."

At Medford, Mass.-based Tufts, the IS foundation was pretty shaky when Curran was hired from a commercial IS career in 1982. The entire university was being served by a single Digital Equipment Corp. Decsystem-10, and calling the support staff a skeleton crew would be generous (see story page 66). But since 1983, Tufts' IS staff has more than doubled to 68 members, the computing budget has increased 300% and IS capital purchases, including 10 DEC VAXes and an IBM 3081, exceed $7 million in value.

"One of the greatest strengths that enabled Bob to do what he's done at Tufts is his ability to see that one man couldn't do it," says William Durgin, the former Tufts vice-president who hired Curran. "He quickly realigned functions within the university and then went to vendors for outside help." Curran "was able to prioritize, to say, 'Here's what we have to do; I'll take the heat,'" adds Durgin, now vice-president of business affairs and treasurer of the College of the Holy Cross in Worcester, Mass.

Curran's ability to face up to difficult situations and construct a useful route through them extends beyond technology and even beyond enlarging the family home. Early on, for instance, he reacted to his fear of public speaking by attempting to learn the art. Since then, seminar leadership stints have taken him from South

Continued on page 66

Knocking down the organizational walls

BY CLINTON WILDER CW STAFF

Fire up the sandblasters and the wrecking balls.

To implement truly strategic information systems, the IS executive and his company must knock down some organizational walls so that information can be shared among appropriate functions both within and outside the company.

"If a system doesn't cross traditional boundaries, it's not strategic," Nolan Norton & Co. President David P. Norton said at the recent Nolan Norton Institute symposium in Tarpon Springs, Fla. "You must rethink the relationship between the parts of your company as well as with customers and suppliers."

Then, IS executives must not only understand their company's business, they must additionally work with senior management to break through what Norton calls "functional gridlock" — organizational structures that block the sharing of data across functions.

Norton cited Federal Express Corp. as a prime implementer of cross-functional systems. Federal Express' well-publicized package-tracking system involves sharing information among operations, customer service and accounting functions.

Other examples cited by Norton included the following:

- Firestone Tire & Rubber Co., which made tire-design information available to functions such as quality control, production and testing as well as to customers' engineers.
- Sundstrand Corp., which halved its warehousing staff and hastened customer-order processing by improving IS links among spare-parts ordering, warehousing and manufacturing control in the aerospace industry.
- Du Pont Co., which saved $13 million in textile-fiber plant maintenance by linking stores' control and accounting to the maintenance function.

As with so many IS success stories, partnership between IS and business management is the key. "If we're going to build systems for customers, we need to work with people who deal with customers," said William Symnot, a Nolan Norton consultant and the former chief information officer of Bank of Boston.

Continued on page 66
Survival of the informationally fittest

BY ALAN J. RYAN CW STAFF

NEW YORK — Businesses that will do more than just stay afloat during the coming decade will have strong, information systems-minded executives at their helms.

That is according to the recent Arthur Young report, "The Landmark MIT Study: Management in the 1990s," which warned that significant technological investment without organizational change and thorough employee training is a prescription for failure.

The report was drawn from a five-year, $5 million research program conducted by the MIT Sloan School of Management. The role of information technology will change more drastically in the next decade than it has in recent years, said Arthur Young Chairman William Gladstone in introducing the report. As information technology moves away from its role as a support mechanism for routine tasks, companies must watch for innovations that could revolutionize some part of the business — no matter how small, the report said.

Information systems will also be a viable tool to bolster the revenue stream of all kinds of companies, according to the report. It suggested that companies establish a comprehensive information base for internal use and develop that information as a product for outside sales.

"Some U.S. industries have lost their competitiveness in the global marketplace because of failures to put technology to work for them," Gladstone said. "Winning companies will understand the potential of new technologies early and act to ensure their competitiveness," he said.

"SOME U.S. industries have lost their competitiveness in the global marketplace because of failures to put technology to work for them."

WILLIAM GLADSTONE
ARTHUR YOUNG

The report, based on the findings of business and government agency researchers, Arthur Young workers and Sloan School professors and investigators, also found that systems will be used by small companies competing against larger firms. It said that information systems will promote the emergence of strategic alliances among smaller firms.

Connectivity is a must, and those who plan to partake of such alliances should build an electronic bridge with strategic partners in the U.S. or abroad to assure the proper pace and level of information sharing.

In manufacturing, complex technologies such as computer-aided design and manufacturing and computer-integrated manufacturing may require a multiyear implementation. However, that time commitment can be worthwhile if it brings about a reduction in the time it takes to bring the company's products to market.

Technology "will open markets where there were none before and create new ways of buying and selling" during the next 10 years, according to Gladstone. The report said one of those areas will be electronic markets for manufactured goods, which are a logical follow-on to the success of electronic markets for airline reservations. Executive support systems, used by a small percentage of top managers today, will become commonplace and easy to use — as well as critical — in the 1990s, the report said.

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Relational executive think tank in the pipeline

BY ROBERT MORAN

NEW YORK — Relational Strategies, a division of Computer Horizons Corp., has called for the formation of an Executive Users Group for Enterprise Architectures. The purpose of the group is to help senior information systems executives tackle strategic and tactical data planning in a relational environment.

At a seminar held in New York late last month, Martin Pelcyger, president of Relational Strategies, said that the proposed group would convene three times a year to review successful projects, exchange information and listen to academic and industry leaders speak about future directions and techniques in relational environments.

According to Pelcyger, five senior executives have signed on as charter members of the group, which will probably meet in June.

Just in CASE

The call for the group comes at a time when the IS profession has been awaiting IBM's repository and witnessing the increase of computer-aided software engineering tools. However, using the new technologies may pose problems for organizations that want to integrate their systems to maintain strategic advantage.

"The vast majority of companies that undertake the development of enterprise architectures and plans are not successful," said Steven Spewak, director of information architecture planning for Relational Strategies.

Spewak said that companies frequently fail because they do not understand that enterprise architectures are an evolutionary and data-driven process. He added that many companies lack the support and commitment of the organization or have ineffective project leadership and methodologies.

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Without the oft-publicized partnership between senior management and the IS function, this is the unfortunate truth. When the stars of IS tell their stories—from Federal Express to Du Pont to USA Insurance—they almost always begin by praising the CEO and his vision of how technology could help the business. That's not just boss-stroking; it's a strong reminder that important changes in IS can be achieved only when IS and business management are willing to effect change at the same pace and in the same direction. When that occurs, change can go hand in hand not only with survival, but with success.

Wilder is Computerworld's senior editor, technology.

SCIENCE/SCOPE

A new amplifying device can operate at much higher frequencies, and with lower noise, than traditional field-effect transistors. The High Electron Mobility Transistor (HEMT) device implemented in a new material system, pioneered and developed by Hughes Aircraft Company, is fabricated by using indium phosphide as a substrate with gallium indium arsenide and aluminium indium arsenide grown onto it, one layer at a time, using a process known as molecular beam epitaxy. In a HEMT device, the semiconductor material containing the impurities is separated from the region of charge-carrying electrons, allowing the electrons to move much faster, so the device can operate at much higher frequencies, with lower noise, than an ordinary transistor. Potential uses include ultra-high frequency communication systems, high-speed radar signal processing equipment and high-power millimeter-wave circuits.

An advanced targeting aid will allow pilots to launch multiple Maverick missiles and provide maximum combat effectiveness during low-altitude, high-speed attacks. The pod-compatible Automatic Target Recognizer, under development by Hughes, receives imagery from an advanced infrared sensor and then uses statistical pattern recognition algorithms, combined with high-speed digital processing, to automatically detect, classify, and prioritize targets in the field of view. If desired, the system can make target selection and automatically fire the missiles. Several missiles could be launched in seconds, enabling the pilot to complete the mission quickly, possibly in a single pass.

A new technique for packaging large-scale integrated circuit (IC) chips will permit much denser packaging on the substrate than previously possible. High-density multichip interconnect (HDMI) technology, being developed by Hughes, is designed to meet the needs of the next generation of VHSIC II hybrid circuits, which require dense packaging with no signal degradation at frequencies over 100 MHz. HDMI packaging achieves these results using a multi-layer substrate, a polymer dielectric highly suited to fine line metallization processing, and lithography techniques capable of producing 10-micron line widths. The technology is expected to be used in radar, sensing, tracking and guidance programs.

Higher performance focal plane arrays are one potential result of research into superconductivity being performed at Hughes. Focal plane arrays form the core of infrared sensor systems used in a variety of space, airborne and battlefield defense systems. For maximum sensitivity, the detector elements in the arrays must be cooled to extremely low temperatures. But scientists at Hughes are working with new ceramic materials which exhibit superconductivity at much higher temperatures. By making arrays from these new ceramics, some of the requirements on the cooling equipment could be reduced. This would cut the power requirements of the system, increase its performance, and decrease the cost.

Hughes' Combat Systems Engineering Facility in San Diego, California has immediate openings in advanced development and training to support the Navy Command and Control Processor (C2P) and Advanced Combat Direction System (ACDS) Programs. Experience desired for Combat Systems Engineers includes 7-9 years of system level development of military systems, preferably Surface Navy Combat Systems. For Computer Programmers/Instructors the level of experience desired is 4-5 years of designing, coding and debugging computer software. Teaching or training experience is desired. Applicants must have a B.S. Degree in Computer Science or the equivalent. Please send your resume to Hughes Aircraft Company, Ground Systems Group, Dept. S3, P.O. Box 4275, Fullerton, CA 92634. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box 45068, Los Angeles, CA 90045-0068

CALENDAR

A P R I L 1 6 - 3 0

Dylogue '90 Users Conference. San Antonio, April 16-18 — Contact: Sterling Software, 3333 Four})


 IBM's Systems and Applications Conference. Ottowa, April 24-27 — Contact: David Demond, Telécorn Canada, 5th floor, South Tower, 45 Bay St., Toronto, Ont., Canada MSG 2E3.


 Advanced Manufacturing Systems Exhibition and Conference. Chicago, April 29-30 — Contact: Calmar Equipment Group, Calmar Plaza, P.O. Box 5060, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.


 Executive Uniform: Charting the Course of Unix into the Commercial Arena. Santa Barbara, Calif., April 30-May 1 — Contact: Office Computing Group, Suite 615, 148 State St., Boston, Mass. 02109.

 M A Y 1 - 3 1

 Association for Systems Management's Information Systems Conferences. Dallas, May 7-10 — Contact: Association for Systems Management, 94587 Bagley Road, Cleveland, Ohio 44138.

 Devon, Atlanta, May 9-12 — Contact: Digital Equipment Computer Users Society, 210 Boston Road (BP02), Marlboro, Mass. 01752.


 J U N E 1 - 2 7

WITH SO MANY DIFFERENT OPERATING SYSTEMS TO CHOOSE FROM, WHERE DO YOU DRAW THE LINE?
CONTINUED FROM PAGE 61
America to Europe to Australia.

"You can safely say he got over the fear," says David Brown, chief financial

McKesson Place, Chicago

firm where Curran

"Academia — a year of work and then

Tufts. Nothing in the industry or on the lec-

ture circuit prepared Curran for what he

be his IS act to the fabled
groves of academe in 1982. Curran had

n the third MIS director in two years.

years ago, was minimal. The college had a single

According to the university's or-
ganizational chart, the computer

services staff numbered 19; howev-

March for computer services,

however, was as fierce as supply

limits, however, McKenzie adds. "At bud-
gett time, for instance, [Curran] is never

easy to work with," he reports. "In fact,
at that time, he's a real pain to work with

because he's trying to get his group their

share of the pie."

Next, Curran says, is network expan-
sion, including plans to rewrite the four-
campus, 90-building Tufts sprawl across a

fiber-optic backbone. "Our biggest goal

for the next two years," he says, "is plan-

ning for the next 15."

ARK is a subsidiary

of AT&T Paradyne.

The results of this approach have been
impressive, Curran says. For example, a

fund-raising application package that

Tufts co-developed with Waltham, Mass.-
based Business Systems Resources, Inc.

is only half-installed at Tufts. Neverthe-

less, BSR has sold some 20 packages to

third parties, including Princeton Univer-
sity. Tufts, Curran hastens to add, re-

ceives no royalties; the university's bene-

fit, he says, lies in being treated like

royalty by the vendor.

Vendor cooperation has not been limit-
ed to software. Much of Tufts' hardware

was received gratis after Curran's inter-

cession. 'I've traded the patches on my

Elbows for patches on my knees,'" he says.

Beyond the installation itself, Curran

is pleased that the working relations be-

tween Tufts IS and faculty have made

quantum leaps in the past several years.

Much of the credit, says Tufts CFO Resi-
dent of Finance Peter McKenzie, goes to

the fact that Curran "is attuned to the

sensitivities of a large organization.

Curran's talent for diplomacy has its

limits, however, McKenzie adds. "At bud-
gett time, for instance, [Curran] is never

easy to work with," he reports. "In fact,
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ning for the next 15."

Picking up

the pieces

The Tufts University com-

puter setup, as Robert J.

Curran found it seven

years ago, was minimal. The college had a single

Decsystem-10.

According to the university's or-
ganizational chart, the computer

services staff numbered 19; howev-

er, Curran says, only six of the posi-
tions were actually filled. Of three

jobs authorized for academic com-
puting support, he says, only one

was filled — that of the newsletter
editor. Systems programming con-

sisted of one student.

Demand for computer services,

however, was as fierce as supply

was short. The department was

called between academic and ad-

ministrative users, each feeling

slighted in favor of the other. "What

was left of the computer services

department had circled the wagons

into a defensive position," Curran

says.

The self-appointed change agent

and lover of challenges had more

than met his match. "Looking

back," Curran says, "we were pret-

ty close to the edge. I thought I

knew what I was getting into, but

truthfully, I had significantly under-

estimated the technological and the

political depth of the problem. If I

had to do it again, I'm not at all sure

that I would."

But back in 1982, the builder

simply forged ahead. First, to keep

chaos at bay, he brought in a VAX-

11/780 and increased the depart-

ment's staff by 10. Then he began to

lay the foundation for future com-

puting at Tufts.

Today, the Decsystem-10 has

been replaced by 10 DEC VAXa. In

addition, Tufts colors now include

Blue, at least in the IS department,

where an IBM 3081 holds sway.

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Fedcase '89, a conference designed to explore software standards and data management solutions for software engineering environments, has issued a call for paper submissions. The conference, sponsored by the National Institute of Standards and Technology, will be held in Gaithersburg, Md., Oct. 30 to Nov. 2.

Proposals are requested for minitutorials, workshops and panel sessions. Suggested topic areas include computer-aided software engineering (CASE)-related standards and industry trends, data management research for software engineering and data-oriented CASE applications and methodologies.

For more information and rules regarding submissions, contact Fedcase '89, Margaret Law or Wilma Osborne, National Institute of Standards and Technology, Room A266, Building 225, Gaithersburg, Md. The deadline for submissions is May 15.

A Corning Glass Works executive and two IBM senior vice-presidents were honored recently at dedication ceremonies for Syracuse University's Center for Advanced Technology in Computer Applications and Software Engineering Center, according to center director Bradley Strait.

Possible topics include CASE technology and trends, maintenance productivity, software development tools, human factors and motivation, software metrics, quality assurance, project management, information centers and end-user computing.

For more information on the conference, contact ACR at P.O. Box 9280, Phoenix, Ariz. 85068. The deadline for submissions is May 1.

Applied Computer Research, Inc. (ACR) has issued a call for participation in the fourth annual conference on Improving Productivity in EDP System Development, which is scheduled to be held in Phoenix, Jan. 22-26, 1990. Speakers, panelists and chairpersons are being sought for the conference. No formal papers are required, although copies of handouts and visuals will be required later. ACR said that user experiences and case studies presented by information systems managers and their staffs are desirable. The conference is mainly oriented toward management issues.

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SPECIAL REPORT

INNOVATIVE CONNECTIONS

The ties that bind PCs and hosts empower organizations

- A user’s do-it-yourself link enriches decisions
- Preaching coprocessing, practicing it with CASE
- The struggle to integrate Macs and VAXs

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to-mainframe links, coprocessing. The
point is today's managers need to make
"just-in-time decisions" — in the words of
Robert Trenchard, Sony Corp. of America's
senior vice-president of MIS — in the exec-
tutive suite as much as on the factory floor.
That need is fueling the drive to tie PCs
implemented by a user. It down-
loads graphics from a mainframe
to PCs, responding to a directive
from the department's commis-
sioner that decisions be based on
comprehensive information, not
fragmentary data.

A homegrown PC interface lets analysts at the International
Monetary Fund access four dif-
ferent host systems, including
the newly automated library
card catalog. Library Director
Michael Gehringer says this ap-
lication eliminates the expense
of maintaining half a million
cards. It also frees librarians
from mundane chores.

Spalding Sports Worldwide is
equipping salespeople in field of-
ces with laptops, eliminating
the need for the sales support
staff to print out and mail mas-
sive reports and freeing the
salespeople from their own pa-
perwork. As Sales and Market-
ing Vice-President Charles Yash
notes, however, the chief moti-
vation is to improve customer
service.

Chevron Chemical Corp. has
pushed to make it easier for ana-
lysts and executives to manipu-
late data from the mainframe.
The Refinery Division boosted
one year's sales by $500,000
with a single type of report.

The Burlington Coat Fac-
tory's new warehouse LAN sup-
ports a fundamental shift in dis-
tribution. A new distribution
center now centralizes inven-
tory tasks with PCs, a worksta-
tion and a superminicomputer
linked to a remote mainframe.
Vice-President of Operations
Mark Nesci says savings in store
space and manpower flow
straight to the bottom line.

At Unocal Corp., a LAN has
streamlined operation of minia-
ture refineries used in develop-
ing new products. Using a main-
frame to track tests on sample
products was cumbersome and
error-prone. Now, the network,
with its PC database, is easier to
use and issues bar codes to en-
hance accuracy and then uploads
data to the mainframe.

At Lawrence Livermore Na-
tional Laboratory, researchers
have sought to free themselves
from the expense and clutter of
different host systems, including
micro-to-mainframe CASE.

None of these technologies
are ideal solutions. But while
managers cite shortcomings,
they also point to payoffs, often
in hard numbers. Sometimes,
these benefits appear to trans-
scend saving or even making
money.

At the New York Health De-
partment, user Mike Zleh says
it's almost a social duty to make
better use of masses of main-
frame data on diseases and other
issues. "Otherwise, it all means
nothing," he says.

INSIDE

New York State Department of Health
By Glenn Rifkin
A user links a mainframe with a desktop graphics package. The result: more accessible informa-
tion for making decisions on treatment of diseases and other health care issues.

Sony Corp. of America
By David Gabel
To beat global competition in new lines of business, the manufacturer needs "just-in-time" infor-
mation. It plans to generate it with coprocessing systems, including micro-to-mainframe CASE.

Chevron Chemical Co.
By Philip J. Gill
The database's 4GL didn't cut it with business analysts and executives. A proprietary system
geared for data manipulation does; savings and increased sales explain why.

Spalding Sports Worldwide
By Alan Dodding
Sales representatives have been burdened by paperwork but struck out with laptop computers
because of inadequate training and support. This time, a more controlled approach is going more
smoothly.

International Monetary Fund
By Sharon Baker
An effort to provide users with desktop windows into four different systems dovetailed with the
plans of library managers, who wanted to automate a card catalog of half a million records.

Burlington Coat Factory Warehouse
By Janet Mason
The retailer bet it could save a bundle by centralizing receiving and distribution at a new facility,
a tactic that called for support from a sophisticated three-tier computer network.

Unocal Corp.
By Michael Harper
Even research technicians can have trouble getting data into a mainframe and waste time to
boot. So an R&D facility set up a PC-based database that communicates with the mainframe.

Lawrence Livermore National Laboratory
By Barbara Sahr
Scientists at the lab don't need an easy-to-use computer, but they still like Macintoshes. The
trouble is linking the Macs with VAXes, especially with the vendors on the sidelines.

Editor: David Ludlum Production Editor: Deborah Pickling Art Director: Nancy Kowal
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User seizes the initiative at N.Y. Health Department

BY GLENN RIFKIN

ike Zdeb loves his work — which is lucky for the New York State Department of Health.

Zdeb is the type of personal computer user that MIS often fears rather than embraces. Instead of railing against a difficult-to-access mainframe environment, Zdeb, a research scientist in the Information Systems and Health Statistics Bureau, took it upon himself to figure out how to work within that world. In the process, he has boosted the value of the Health Department's information base beyond all expectations.

Through tireless research and endless tinkering, Zdeb has effectively hooked the department's vast IBM mainframe environment into the PC world to produce quality graphics and mapping for the bureau's myriad reports. As a result, a thick wall that had prevented researchers from gaining interactive access to vital data is tumbling down.

The Health Department has clearly embraced Zdeb's work. According to Vito Logrillo, director of information science and policy, Zdeb is representative of a key group of users in the department who have taken the initiative in making mainframe data interactive.

"In government, the presentation of data is as important as the data itself," Logrillo says. "What Mike has done has revolutionized the way we look at data in the department."

Steve Kim, director of the Information Systems and Health Statistics Bureau, points out that Zdeb's work stems from a mandate set down by Health Commissioner Dr. David Axelrod seven years ago.

Because of the vastness and complexity of the mainframe environment, users faced endless obstacles in getting important data.

Axelrod wants to make data available so that decision making in the department is based on quantitative studies rather than anecdotal evidence. Work by users such as Zdeb has helped bring that vision to reality.

Axelrod merged the Computer Systems and Data Processing group with the Office of Biostatistics just over a year ago to form the Information Systems and Health Statistics Bureau. Prior to that, the DP people were content to run the computers and process the data; researchers were left to their own devices in finding ways to use the data.

By merging the groups, it was done the cesarean study anyway, according to Kim, the work has worked extremely well. "The users have taken over MIS," he says.

"We start with nothing, and what we make out of it is policy," says the lanky, bearded Zdeb, reaching into a file cabinet filled with reports such as "Maternal Mortality in New York State" and "Cesarean Childbirth in New York State."

The reports are clean, easy to read and filled with clear, understandable maps and graphics — not as slick as many corporate productions but much more accessible than much of the fare from government agencies.

"Our job is to get people to make decisions based on the best information — to make it easier for people to get at this massive data that comes in here daily," Zdeb continues, picking up the cesarean report. "We produced this entire document on our own from data received from hospitals around the entire state. Now there is a task force in place to study cesarean births and find ways to lower their incidence."

For Zdeb, the challenge was finding a workable path from the department's centralized IBM 3081 environment down to the desktop. The standard approach in the department was to use SAS Institute, Inc. products for data analysis in a batch mode over MVS. End users had standardized on VM for access to the mainframe. There was no interactive environment on the mainframe.

"We realized that we had better output devices off PCs than off the mainframe," Zdeb says. "So he searched for tools that would help get the SAS graphics down to the PC level. He realized that finding a common graphics language was difficult, with many vendors' promises failing to materialize."

"Graphics tend to work only in a proprietary environment for a particular software package," Zdeb explains. "You need to find a true common graphics language."

Through a process of trial and error, Zdeb found a route from SAS Graph to Lotus Development Corp.'s Freelance on the PC. Using a program called Metafile from Xenographics, Inc. in Irvine, Calif., Zdeb discovered he could filter protocols such as Hewlett-Packard Co.'s Graphics Language from the mainframe to the PC and then to a laser printer.

Suddenly, reports that had taken weeks and months to generate could be done virtually overnight — with far better results. "We do the reports ourselves, and now the art unit just has to put a cover on it and staple it," Zdeb says.

Logrillo observes that studies that the department has been turning out for the last 30 years are being done more quickly and efficiently and are generating tremendous interest.

"We probably would have done the cesarean study anyway, but now this gets the staff much more interested and excited.

SNAPSHOT

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The department has set up a user lab complete with IBM PCs, Sun Microsystems, Inc. workstations and Apple Computer, Inc. Macintoshes, as well as printers and plotters.

According to Logrillo, the department has spent more than $2,500,000 on hardware alone for microcomputers, printers and plotters, most of which reside in a common user lab. Software costs are minimal — $4,000 for a site license for SAS Graph, for example — and are more than offset by the benefits of better and more timely reports.

Zdeb points out that the user lab in his group enables others in the Health Department to take advantage of the technology without having to duplicate the buying or building efforts.

Even with the merger of the two groups, the users must remain knowledgeable, Zdeb points out. "If I don't ask the question, it doesn't get asked," he says. "You need to know enough about the environment to ask the right question."

Zdeb had plenty of opportunity to work through the issues. Prior to obtaining the 3081, the department ran Digital Equipment Corp. VAXs. When IBM arrived, the two environments co-existed, and Zdeb found himself learning communications protocols to move data from one environment to the other.

As his experience with computers grew and his office shelves became lined with documentation binders, Zdeb suddenly found himself in great demand.

"I've acted as an interpreter for the staff," he says. "People now call me with their questions. Indeed, Zdeb has started offering courses in graphics and mapping for groups throughout the Health Department.

However, his expertise with computers belies his role as a researcher. His commitment means that he virtually works two full-time jobs. Also, because he is a state employee, his rewards come in the form of a certificate from the commissioner rather than raises and promotions.

"I'm not a state employee; I'm a research scientist. This is my career," Zdeb insists. "My mind doesn't shut down at 4:30. We have vital data pouring in here day after day, and it's almost a duty to find something to do with that data. Otherwise, it all means nothing."
A yen for just-in-time decisions aids Sony's drive for coprocessing

BY DAVID GABEL

Sony Corp. of America is hustling to provide managers with the information they need to improve customer service. The aim is to establish micro-to-mainframe integration on a grand scale.

The demand for faster delivery of information stems in part from new business strategies, according to Jeff Dorn, controller of Sony Component Products Co., which sells electronics gear to personal computer makers and other manufacturers.

Sony's information systems were developed when Sony was less focused on supplying manufacturers. Dorn says: "Existing systems are aimed at the consumer market and the aftermarket. Our needs are more critical. If we don't deliver, we shut down production lines."

Selling goods to a manufacturer that uses just-in-time delivery requires specifying delivery times within a window as narrow as two hours, Dorn says. That need means people inside Sony must get detailed information on receipt of materials, turnaround time and value added as well as delivery schedules.

"The biggest problem is that we often don't get the information we need from our factories as we need it, so we can't provide good delivery information to our customers," Dorn says. "If we aren't responsive to those needs, someone else will be."

Dorn is working with Robert Trenchard, senior-vice president of MIS at Sony, to develop systems for interfacing with factories and salespeople, including micro-to-mainframe integration.

"We're in the early end of the design process, and we found that you can really define your business quickly," Dorn says.

He expects salespeople to have access to information on the availability of products when they make pitches to customers. Data on accepted orders would then flow to factories and help generate information for procurement of materials needed to make the goods and, eventually, data on deliveries.

To foster this faster delivery of data, Trenchard's MIS organization is itself adopting computer-aided software engineering (CASE) tools that employ micro-to-mainframe links in an effort to speed system development. Moreover, it aims to let systems designers use the flexibility of a local workstation along with the power of a mainframe.

With this system, code is the last thing developed. The relationships come first. That means systems developers become business experts: if the systems designer is to develop a model of the business, he must understand the portions he is modeling — personnel, sales or any other department. Addressing staff, the goal is to make application programming more productive.

The CASE system has boosted programmer productivity substantially, managers say. It converted 4,000 lines of its inventory code to run an interactive executive filing system and an on-line scheduler that Sony was developing, says Philip Kunz, manager of data administration.

In this pilot project, Sony saw a sixfold rise in programmer productivity, but it is budgeting for a 2-to-1 increase, Kunz says. In using the system, the designer first enters statements that describe the data to be used. The designer also establishes the links between the data files to be employed.

The system performs internal checks to make sure the data relationships are consistent; then it generates pseudocode to describe the relationships.

Data administration analyst David Levine says the approach speeds up his work. "Once you're used to the system, you can generate a query menu in just a few minutes," he says. "If we didn't have the system, it would take two or three days."

The system stores the data and the description of the data, including its relationships, in a global "encyclopedia" of corporate information. Using this kind of approach, Sony's systems analysts developed a model of how the company works, which is stored in the data encyclopedia. The encyclopedia can then serve as the tool for changing and updating the computing systems that deliver management information. In response to a change in the way the company does business, a designer alters the corporate model, then the CASE system modifies system code to conform to the changes.

"A change in the company ripples through the model and the information system all the way to the documentation, which is generated automatically," Trenchard says.

Sony's Trenchard seeks speedy solutions for data delivery

"The central problem is a lack of productivity with the programmers," Trenchard says. "Programming is a craft. It has a creative aspect, and it takes talent. Not everyone has it. Being a good manager in this area means getting the projects done without having to hire all the superstars."

The MIS organization studied the available tools and settled on the Information Engineering Facility from Texas Instruments, Inc., which uses artificial intelligence like constructs to develop code. Moreover, it aims to let systems designers use the flexibility of a local workstation along with the power of a mainframe.

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The system performs internal checks to make sure the data relationships are consistent; then it generates pseudocode to describe the relationships.

Data administration analyst David Levine says the approach speeds up his work. "Once you're used to the system, you can generate a query menu in just a few minutes," he says. "If we didn't have the system, it would take two or three days."

The system stores the data and the description of the data, including its relationships, in a global "encyclopedia" of corporate information. Using this kind of approach, Sony's systems analysts developed a model of how the company works, which is stored in the data encyclopedia. The encyclopedia can then serve as the tool for changing and updating the computing systems that deliver management information. In response to a change in the way the company does business, a designer alters the corporate model, then the CASE system modifies system code to conform to the changes.

"A change in the company ripples through the model and the information system all the way to the documentation, which is generated automatically," Trenchard says.

Sony's Trenchard seeks speedy solutions for data delivery

"The central problem is a lack of productivity with the programmers," Trenchard says. "Programming is a craft. It has a creative aspect, and it takes talent. Not everyone has it. Being a good manager in this area means getting the projects done without having to hire all the superstars."

The MIS organization studied the available tools and settled on the Information Engineering Facility from Texas Instruments, Inc., which uses artificial intelligence-like constructs to develop code. Moreover, it aims to let systems designers use the flexibility of a local workstation along with the power of a mainframe.

With this system, code is the last thing developed. The relationships come first. That means systems designers become business experts: if the systems designer is to develop a model of the business, he must understand the portions he is modeling — personnel, sales or any other department. Addressing staff, the goal is to make application programming more productive.

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Merger helps propel easier data manipulation at Chevron Chemical

BY PHILIP J. GILL

Some managers believe that if they could just get to the data on the mainframe, their problems would be solved. But it's not always that simple. Setting up micro-to-mainframe links is the easy part. Often what users really need is more flexible tools to analyze and manipulate the data.

Like most large corporations, Chevron Chemical Co. in San Ramon, Calif., holds vast quantities of information in its glass-boothed IBM mainframe. Much of that data is in Must Software International's Nomad database management system. While Nomad's fourth-generation languages (4GL) and other tools are designed for easy access to corporate data, they have proved too difficult for Chevron Chemical's average end user, typically an executive or business analyst.

Instead of using the tools, the executives and analysts would tell the programmers what information they needed and the programmers would extract it, usually in the form of printouts. The users would then key the data into spreadsheets to do analysis and prepare their reports.

This approach was cumbersome, unproductive, error-prone and costly, not to mention timely. "There was no guarantee that the information would be ready in the time frame needed," says Don Matto, Chevron Chemical's director of MIS.

Still, Chevron Chemical continued operating this way for a number of years, right through the 1984 merger of its parent company, oil giant Chevron Corp., with Gulf Oil Corp. The merger added two divisions as well as many Gulf executives to Chevron Chemical. Chevron's MIS systems tended to prevail, and some of the Gulf managers grew frustrated with the Chevron procedures. They began asking for more flexible data access and manipulation.

Requirements for viewing the data vary from one manager to the next, Matto says. Those needs, combined with a drive to improve quality and decentralize decision making, brought about an experiment in technology that has freed many Chevron Chemical users from the confines of mainframe information.

One afternoon in early 1986, Matto was discussing a proposed rewriting of Chevron Chemical's financial forecasting modules when he stumbled across the Metaphor Computer Systems, Inc. in Mountain View, Calif. "I was talking to a financial analyst at Chevron [headquarters] about my problem, and he mentioned that they were evaluating Metaphor," Matto explains.

Metaphor's fourth-generation programming language, a Metaphor spokesman said, IBM owns 8% of Metaphor, whose workstations combine a graphical interface, file servers, database machines and an Ethernet local-area network as well as application software.

Taking a cue from object-oriented programming, Metaphor uses capsules that appear as on-screen icons and contain one or more programs or macro routines. These capsules are standard parts of either the system or third-party applications and some have been developed by Chevron Chemical's own analysts from other tools.

Users create new applications and reports by linking capsules with lines on the display screen. They can alter the work by drawing new lines or inserting new capsules.

His appetite whetted, Matto arranged to participate in a demonstration. He also looked for similar products; the closest thing he found, he says, was Odesta Corp.'s HeliX relational DBMS for the Apple Computer, Inc. Macintosh. Unfortunately, it was still in the development stages.

"The Metaphor didn't have as many bells and whistles as Odesta, but it was ready now," Matto says.

He decided to conduct an experiment. Reluctantly, he says, Metaphor management agreed to "lend" him a few systems. Using real data from Chevron's mainframe, three programmers devised a mock business and created standard reports that Chevron analysts and executives produced. Matto says the results surprised him. "They did in three weeks what everyone agreed would normally have taken a year," he explains.

Matto won approval for purchase of $800,000 of the company's equipment, including 20 workstations. Despite the substantial cost, this installation was barely more than a pilot.

The experiment has paid off for Chevron Chemical, which now has more than 100 of the workstations and more than 800M bytes of file server capacity — a total investment of more than $1.2 million.

Chevron Chemical's Fertilizer division has the largest number of workstations. During one year, the division refined its system for allocating scarce products among customers, boosting sales by $500,000, Matto says. In another division, an estimated $75,000 by generating its own answers to management's questions rather than turning to MIS and another $25,000 by creating presentations in-house rather than through an outside studio.

Doing that work in-house also means presentations can be changed at the last minute, assuming they are up-to-date when presented, says Holly Newman, a marketing analyst at the fertilizer division.

One of the most valuable applications has been creation of a long-term plan for the division. Spanning four to five years, the plan includes projections for revenue, customers, products and costs. The long-term plan also allows analysts to track performance from month to month and week to week.

Another application tracks Chevron's railcars around the country three different ways — by car number, fleet number and railroad carrier.

In addition to enhancing productivity, Metaphor says the technology has fostered a cross-fermentation of applications and techniques among divisions. "The analysts are talking to their counterparts in other divisions," he says. "And they're trading capsules, which means they're beginning to standardize on the way they do things."
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Spalding Sports moves cautiously in pitching laptops to sales reps

INNOVATIVE CONNECTIONS

S
ales representatives at Spalding Sports Worldwide spend most of their time alone covering their territories, but they are in almost constant communication with company headquarters in Chicopee, Mass.

The task of managing that communication rests with the sales support staff, which must continuously provide representatives with reports and information. As a program unfolds, representatives with reports and information must continuously provide representatives with reports and information. As a program unfolds, the representatives will be required constant report-generating efforts from MIS and ongoing telephone support as sales representatives called in.

Out in the field, the representatives were equally unhappy with the process. They were burdened with excessive paperwork, which was cutting into the time they had to spend with customers. The time they spent playing telephone tag with the home office or plowing through paperwork was time they couldn't spend selling.

The notion of providing the sales reps with laptops had been kicking around Spalding for a few years and had been broached by several people.

Spalding's White keeps the ball rolling with laptop-toting sales force

STELLA JOHNSON

BY ALAN RADDING

Their ideas were all aimed at letting the representatives call into the central computer at any hour and download reports, send and receive electronic mail, ask about customer records and pick up price changes. They also might file orders and reports electronically, eliminating the need for the data to be keyed into the computer at headquarters.

An early effort at implementation did not work. "We couldn't control it. We couldn't train the users fast enough, and we couldn't support all those users," White acknowledges.

But the idea remained appealing because of the steady growth of business. "The pace of the growth was just taxing MIS," says Lori Basalone, Spalding's manager of sales information at the Leisure Products division.

Basalone's sales group and the Golf Products sales group were demanding more applications and data from MIS because, as she explains, "The representatives were demanding more information, faster" from the field.

Try again

Last October, Yash decided to try again, but on a much more controlled basis. This time, instead of a vague idea about computerizing the sales force, there was a more concrete plan.

The approach was to introduce laptops slowly rather than trying to computerize the sales force of 170 at once. First, district managers and a few representatives were issued laptops. Currently, Spalding has placed about 40 laptops in the field. Within three years, all the representatives should have one.

It will also take several years to get all the software and support for such service in place, Yash adds.

"We don't want to overtax the system and generate frustration by building expectations," he says. One thrust of the gradual approach is getting feedback from representatives in order to develop the applications they need.

For now, the representatives are getting the same applications used by the sales support staff at headquarters, somewhat modified by the MIS department. The modifications are aimed at ensuring data security by preventing salespeople from accessing information unrelated to their territories and adjusting the mainframe screens for the laptops.

Simply reproducing the applications used by the sales support staff, however, may not be the best approach, Basalone explains.

"We're going to have to learn. They may need something different from what we do in here," she says. One upcoming application is electronic forms, which will allow the field force to file their expense reports and other paperwork electronically.

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APRIL 10, 1989
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Network Systems.
International Monetary Fund opens user-friendly PC window on four hosts

A unified interface helps automate library shared with the World Bank

BY SHARON BAKER

The timing was fortuitous when managers of the library shared by the World Bank and the International Monetary Fund (IMF) decided to put their card catalog online. At the same time, the IMF was beginning to buy PCs, and its MIS organization was searching for an easy-to-use interface that would provide access to hosts Digital Equipment Corp., Hewlett-Packard Co., Unisys Corp. and IBM.

"It became quite clear to us that we wanted to go to a distributed processing approach," says Warren Minami, director of the IMF Bureau of Computing Services (BCS). "We had to find a systematic way of getting the PCs to access the various applications on the mainframes."

Today, that interface, PC Query, provides a window into the four hosts, including two new automated library databases on the HP 3000. The new applications, free librarians from routine chores and eliminate the expense of maintaining a card catalog of half a million records.

The Joint Bank-Fund Library serves employees at the World Bank, which grants loans for national development, and the IMF, another international agency that issues short-term loans to countries troubled by a poor balance of payments.

Minami and Ali Semsarzadeh, senior computer systems officer, along with Lakshmi Narasimhan, computer systems officer, could not find a product that would transparently transfer the user from one host to another and offer an easy-to-use interface. So they decided to develop one.

"It was not our desire to get into the software business," Minami stresses. "The only thing we were thinking about was solving user problems."

Meanwhile, the Joint Library, which had already automated several functions, wanted to give its users on-line access to its card catalog. The library was also undergoing a major relabeling of its books, changing from the Dewey decimal classification to the Library of Congress system, and did not want to update its card catalog as well.

Susan Turner, automation systems librarian, began working with the BCS four years ago. A little more than a year later, PC Query was born, followed in several months by the library's new system, Jolis Online, or Joint Library Information Services. Jolis includes both card catalog and bibliography databases.

PC Query, which works on an IBM Personal Computer XT or AT, sits beneath Microsoft Corp.'s Windows interface.

When a user calls up Jolis' card catalog database, a form appears that resembles a card. At the top of that form is a search-word category; the system will seek any word typed in that box in a number of fields — title, author, series, notes or subject. Users do not have to know the name of the book or author to find a particular item; one word will start his search. "Users seem to be able to just sit down and use [Jolis] with very little background," Turner says. "It's practically self-explanatory on the screen."

"This is a good first step toward developing a truly friendly interface that people can use without a lot of training and still get an honest and accurate response back from the system," says Michael Gehringer, head of the Joint Library.

As a manager, Gehringer says he appreciates Jolis because it has enabled his reference staff to do more extensive research and customer interaction rather than just look up books for clients. On-line access also saves the library the expense of maintaining a card catalog.

Implementing PC Query was not without problems. The biggest surprise, Semsarzadeh says, was that it took more than a year to do.

The fact that the IMF was one of Microsoft Windows' first users also created a few headaches. "It was not really worse than expected," Semsarzadeh says, "but Windows had bugs in it. It was slow."

Turner says Jolis itself still has some limitations that are being addressed. For example, when it downloads records, it does so in random-access memory, thereby limiting the number of records that can actually be brought in from a search.

Jolis also met some resistance from users who liked the card catalog and were upset when the familiar tool was taken away.

"The process of thumbing through a card catalog gives users a serendipitous approach to research," Gehringer says. "They learn things they wouldn't ordinarily learn if they just got a computer printout."

The Joint Library currently has six PCs, and there are two in a satellite reference center at the IMF. Two more machines are planned for the Joint Library, and between 20 to 25 PCs should be placed throughout the World Bank and IMF libraries and information centers by the end of the year, Turner says.

Gehringer and Turner's ultimate goal is to give users some kind of remote access to PC Query, possibly allowing economists to conduct research without leaving their department. Minami — who was wary about his BCS going into the software development business — is inclined to proceed cautiously and is still looking for a third-party vendor to take over.

MINELLO PAGANELLI/WOODFIN CAMP

SNAPSHOT

Challenge: To provide a unified, friendly PC window to incompatible host processors from four vendors.

Response: Internal development of a PC interface using a pioneering application of Microsoft Windows.

Response back from the system," Turner says. "We learned things they wouldn't ordinarily learn if they just got a computer printout."

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MINELLO PAGANELLI/WOODFIN CAMP

April 10, 1989
At this point, it's hard to tell which end of the system is in charge.

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Retailer taps decentralized computing to power centralized distribution center

BY JANET MASON

The Burlington Coat Factory Warehouse tracks its inventory down to the color and size of every garment, meaning each store carries some 650,000 stock-keeping units, known in the trade as SKUs.

Until recently, the 135 stores bore the brunt of keeping abreast of their inventories, receiving most merchandise directly from manufacturers and initiating the record-keeping process. "It's very difficult to track all those receipts," notes Mark Nesci, the company's vice-president of operations. More difficult still were the tasks of maintaining quality control and replenishing merchandise when a store's stock ran low.

To tackle these problems, Burlington has built a new distribution center in Burlington, N.J., with a less automated system or even on the center itself. But he says there is no doubt it captures the initial costs of building a distribution center.

The network, conceived by Nesci with MIS Director Michael Price, helps Burlington ensure that it receives the goods ordered by buyers in New York. It also helps track items in the distribution center and see that they go to the right stores.

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The MIS staff began installing the network last May. "In July, we did a full-scale testing, worked out the bugs and were ready for our busy season by the end of August," says Chris Kraemer, assistant manager of the distribution center in charge of data processing.

The system has boosted productivity about 70% from the level at a facility in Secaucus, N.J., with a less automated system that had centralized about 20% of the distribution and tracking, according to Kraemer.

The network has cut processing time for merchandise from seven or more days to three or four. "The ideal time is 48 hours," Kraemer says. "We expect to achieve this soon with enhancements to the network.

The tracking network's Sun 3661 workstation provides a buffer between 30 PCs and the Sequent Symmetry S-81. It moves messages from PCs to the Sun, where they enter a queue. The Sequent reads the messages, processes the data and updates the Oracle Corp. database.

The machines are linked via Ethernet and Sun's Network File System. The network is tied to the mainframe with a 56K bit/sec. X.25 link.

The network is vital to the distribution center because if it goes down, no goods get processed, Kraemer says, so it is designed to run continuously.

"The Sequent rarely goes down," said Brad Friedman, DP manager at Burlington's corporate headquarters. "If it were to go down, the Sun would do the processing and the system wouldn't stop. If the Sun were to go down, we would have our spare running in 10 minutes."

Burlington opted for the Sequent processor because of its power and cost-effectiveness and for Unix because of its portability among hardware and open architecture, according to Mike Prince, DP manager at the company's Lebanon, N.H.-based data center.

When goods reach the receiving department, the data entry staff keys merchandise numbers into the network. The network then matches the figures against buyers' records from the corporate mainframe. Data from the mainframe center has to be allocated among stores.

From the receiving department, merchandise moves to a sorting area, where it is broken out of cartons. Employees using handheld wireless terminals from Tektron Corp. record the movement of each piece of clothing. "At any event, we can track where a piece of merchandise is," Kraemer says. "This is good for buyers, who may be in the building and want to see a piece of merchandise. It also allows us to track our production time."

The system creates bar code labels for outgoing cartons that include weight data generated from conveyor belt sensors. When the cartons reach the shipping area, they are scanned as they go out the door to verify unit count and destination. This data is printed onto a bill of lading, which is delivered with the goods. The network sends electronic messages to the stores telling workers there what kind of merchandise to expect.

Data on the network is uploaded to the mainframe, which tracks inventories for all stores by style, color and size. Buyers in New York use the mainframe data to reorder merchandise.

Friedman says the system was installed with little trouble: "At first we had a problem tracking goods with the system because it was new and we had some untested line applications. But primarily, the problems were small."

Prince says he plans to install more Sequents in Burlington and eliminate mainframe use in three years. "Eventually, we want to have everything that is now running on the mainframe running in a Unix-based Oracle database on Sequents," he says. •

Friedman says it was little trouble to install the centralized system.
Unocal taps LAN and PC database system to speed work of R&D facility

BY MICHAEL HURWICZ

While the petroleum business has picked up in the last year, through much of the 1980s many companies were forced to cut back on employment. Even where the work load was growing, as at Unocal Corp.'s Science and Technology Division in Brea, Calif., organizations avoided increases in personnel.

"The general thrust is that we are expecting more of our operating people all the time," says Alex Barloewen, manager of personnel. "Any time we get rid of routine work, it helps streamline the operation."

One move made by the Science and Technology Division is the deployment of a local-area network-to-mainframe application to support 21 small oil processing units used to improve refining methods. The processing units operate around the clock seven days a week, producing samples of gasoline, jet and diesel fuel, solvents and petrochemicals.

The work of the units is crucial to Unocal, says Dave Dalesandro, Unocal's manager of new technology development.

"Things are rapidly changing in this industry. If you don't change, you fall behind. If processes are ineffective and costs go up, you eventually become noncompetitive," Fenton says.

One project involving the processing units, for example, has allowed refining of gasoline or jet fuel from heavy crude oil that previously would have produced only less profitable fuel oil, according to Barloewen.

The Science and Technology Division refines hundreds of sample products every day. But despite the introduction of mainframes in the 1960s, it was still identifying samples with handwritten tags in 1985.

The process went like this: An engineer would order tests on a sample. Technicians then bottled a portion, filled out a tag to identify it and describe the tests to be performed, attached the tag to the bottle and walked the bottle to the analytical laboratory in a neighboring building. There, a data entry clerk keyed information from the tags into the IBM mainframe. The machine generated printouts telling laboratory workers what tests to run. It also produced management reports.

Among other problems, however, management found that senior technicians were spending half an hour daily, and sometimes as much as two hours, filling out all the tags. Much of the information was redundant from tag to tag, yet it had to be repeatedly filled in and later rekeyed. Furthermore, data entry clerks sometimes misinterpreted handwritten identification numbers. To make the process a more accurate one, in 1986 a group led by Dave Dalesandro, a computer scientist specializing in LAN systems support, revamped the procedure for some tests at one of the 11 labs. Technicians could then print stickers bearing the identification numbers, making them easier to read.

In addition, technicians began entering the information into the mainframe themselves instead of filling out the tags. This change was meant to reduce mismatches between numbers on bottles and what was in the computer and avoid the need for data entry clerks to rekey the information.

The new method improved accuracy, but it did not sit well with the technicians. First, they found it more difficult to use the mainframe than to fill out a tag. This difficulty itself led to mistakes, including the failure of the system to reflect information that the technicians thought they had entered.

"It was kind of a pain," says Bill Torok, the senior technician who first used the system. Dalesandro agrees that it was more efficient but not good enough.

"It had to make each step of the process easier in order to be adopted," he says.

Dalesandro developed an easier way to use system using Borland International's Paradox database management system on a Novell, Inc. Netware LAN. The division abandoned the stickers. Instead, information that technicians entered into Paradox was printed on tags.

Further, identification numbers on the tags were replicated as bar codes. Paradox uploads the information into the mainframe twice a day, using a Novell Systems Network Architecture gateway and a program developed in-house with the Novell Applications Programmer Interface. Senior technicians can now enter data with an easy-to-use PC program rather than a mainframe application.

"One key to the efficiency of the new system is that we can carry information over from one tag to another," notes Steve Henderson, another senior technician. "Since each tag usually differs only marginally from the last, this is a big time-saver." Torok says he can make 50 tags, which used to take half an hour or more, in a few minutes.

Life has also become easier for others. When the sample bottle comes to the lab, Gaile David, the data entry clerk, scans the bar code instead of rekeying the identification number. "The bar codes are much faster and easier for me, and there's less chance for errors," David says.

There were still drawbacks to the system, which was completed in the middle of last year. Because of its location, the printer could not easily be attached to a server to be shared. It was attached to a workstation and could be used only from that workstation. Lanspool, a printer-sharing program from Lan Systems, Inc. in New York, now lets Unocal attach the printer to a workstation rather than a server, yet share it over the LAN. The printer is attached to the same workstation that serves as a mainframe gateway for the purpose of uploading Paradox files.

In February, the automated sample tag application was being used to produce only 50 to 60 tags on an average day, out of a total of 700 or more tags for all units. The application is now working smoothly enough to allow technicians on all units to begin using it, Dalesandro says.
Lawrence Livermore takes on role of matchmaker to reluctant DEC, Apple

BY BARBARA SEHR

I
n the barren Nevada desert, at the U.S. Department of Energy's Atlas Laboratory, a unique system separates "noise" from the signals in camera images of a light source.

The camera images are transported by microwave to the University of California Lawrence Livermore National Laboratory in Livermore, Calif., several hundred miles away. At the laboratory, they are stored in a Digital Equipment Corp. VAX minicomputer connected to an Apple Computer, Inc. Macintosh. The image is then driven through third-party software to the Macintosh, connected to an Apple Computer, analyzed by the architects of the U.S. nuclear weapons program.

The drive for connectivity actually began long before the formation of the highly skilled employees there. "Our engineers were fascinated early on," says George Pavel, manager of Labnet, Lawrence Livermore's proprietary network.

That appreciation has become a dedication to joining the Apple and DEC platforms — or without the leadership of the hardware manufacturers. The attraction to the Macintosh may seem incongruous in such a labyrinth of high-tech. But the computer promoted as easy to use has attracted the interest of the highly skilled employees there. "Our engineers were fascinated early on," says George Pavel, manager of Labnet, Lawrence Livermore's proprietary network.

The link between the labs is the most unusual example of Macintosh-to-VAX connectivity at Lawrence Livermore, which is operated by the Department of Energy and staffed by the University of California.

More than a year after Apple and DEC announced plans to link their platforms, there has been little action between the two vendors. Lawrence Livermore has not received a comprehensive response from the vendors to its efforts to forge the links, according to Marianne Marino Sehr is a free-lance writer based in Hayward, Calif.

about 10 times as many Macintoshes as PCs," notes Peggy Poggio, manager of small systems at the laboratory. The attraction to the Macintosh may seem incongruous in such a labyrinth of high-tech. But the computer promoted as easy to use has attracted the interest of the highly skilled employees there. "Our engineers were fascinated early on," says George Pavel, manager of Labnet, Lawrence Livermore's proprietary network.

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The drive for connectivity actually began long before the formal engagement of the two architectures, and it may outpace the actualization of any union between them. It started with a simple premise — to have a microcomputer perform various tasks, Poggio says. The offices of many laboratory engineers and research personnel are cluttered with computers and terminals. There may be a VAX terminal for access to a large database, a Macintosh for simple PC applications and a Sun Microsystems, Inc. workstation for demanding calculations or graphics-intensive work such as computer-aided design. Using a Macintosh to get to the VAX not only reduces costs and clutter but makes everyone's job easier, Poggio says.

While the action is simple, using one machine for critical calculations, graphics design and database access has proven more complex in implementation.

About 60 Apple LocalTalk networks allow Macintoshes to use a VAX as a server. All but a few of these networks tie into Labnet, which connects all of the laboratory's computing power. There are two separate Labnets — an open network that carries data to and from Macintoshes and a classified network that holds government secrets.

Third-party emulation

Lawrence Livermore is relying on two third-party emulation programs — Alisatalk from Alisa Systems, Inc. in Pasadena, Calif., and Pacerlink from Pacer Software, Inc. in La Jolla, Calif. Under both packages, the VAX acts as a file server on the LocalTalk network, and the Macintosh can access VAX files. Currently, these packages are the only resources available to employees who want DEC-Apple connectivity. "It doesn't really matter if connectivity is achieved by having the VAX see the Mac as just another Decnet node or if the Macintosh sees the VAX as a huge disk drive," Pavel says. "All we want is that they work together."

However, neither package is complete, according to lab officials. "We want to see improved performance from both Alisatalk and Pacerlink," Pierce says.

Pavel notes that Alisa has sacrificed some performance to adhere to standards of the two platforms. Pacer, on the other hand, pays less attention to standards while providing stronger performance.

Pierce says none of the divisions implementing the Mac-to-VAX link is completely satisfied with the performance of either third-party product. Ultimately, users in the divisions expect some joint effort from DEC and Apple. "I just don't think they know yet how far the companies are going to go," she says.
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Finding the best rotation for PC lineup

BY JOHN J. XENAKIS

The "PC Shuffle" is a new dance that has been forced on corporate America during the past few years. As new computers come in through the door, something has to be done with the older machines, but figuring out exactly what can be a tricky maneuver.

What frequently happens is that the older machines are handed off to secretaries and other clerical personnel. Some organizations worry, however, about creating what amounts to a class system, based on computer capabilities.

That thought troubled Neal Hill, president of the Boston advertising agency Rossin, Greenberg, Seronick and Hill, when the firm purchased a number of IBM Personal System/2 micros to network with its IBM System/36. Hill and his partners wanted to find a use for their old XTs, but they did not, he says, "want to create a subclass of users."

A better alternative, Hill decided, was to create a subclass of machines, turning the old XTs into so-called "utility" machines. "They're used for overflow computing," he explains. He put the old XTs in a back room and uses them as batch processors for monthly spreadsheet runs. "Once the programs are set up, it's the kind of activity that can be performed by an entry-level person. Also, one of the machines has a software program on it that I use only once a month. When I want to use it, I walk back there and use it."

Charles River Associates, a Boston consulting firm, came up with a similar idea when its XTs were replaced by new Intel Corp. 80386-based machines. One of the XTs was transferred to the night shift, running a complex econometric modeling application for one of the firm's clients in batch mode. "We could run the application more quickly on a 386, but why bother?" says company President Gerald Kraft. "We just let it run all night and get the results in the morning. We don't need a 386 for that."

Ivan Brass, vice-president and director of information systems in the audit department at Manufacturers Hanover Trust Co. in New York, found another use for slightly dated personal computers. When a number of XTs and Intel 80286 machines were made obsolete by the purchase of several 386 models, Brass converted some of them into printer servers and communications gateways for the department's local-area network.

Recycling old PCs and XTs to act as batch processors, printer servers and communications gateways is not the norm. Most older computers don't fade away at all, but simply slide from desktop to desk in an almost endless spiral.

Kenneth Bosomworth, president of International Resource Development in Norwalk, Conn., points out that most firms have a large number of IBM PCs dating back to 1981 and Apple Computer, Inc. and Radio Shack machines dating back to 1977. IBM PCs of 1982-84 vintage are also in widespread use.

"What's happened," he explains, "is that [PCs] have been passed down from user to user. The enthusiastic power users, the individuals who have extensive requirements for spreadsheet applications or other functions for which speed is important, pass their older and slower machines along to others who use it for applications in which the speed requirements match the application. So the newer and faster equipment is being procured by the same people who got the PCs a few years ago and is being passed down to the secretaries, who don't care about the speed."

Bosomworth says he expects this pattern will quickly repeat itself when the Intel 80486 machines become available later this year. "Intel intends to fit the 486s in at the high end and entice the power- and the space-hungry user," he predicts.

You might think from Neal Hill's phrase, "subclass of user," that there is a potential for trouble, that the person who inherits an older machine might be jealous of the one getting a new 386 machine, but Robert Holmes, computer technology research analyst at the Southern California Gas Co. in Los Angeles, says that is not so.

"There isn't any squabbling because older machines that are replaced are moved to new locations in the company, and..."
Conspicuous consumption?

Within the Fortune 1,000, life insurance companies average more PCs per site than any other industry group, and only retailers report more aggressive acquisition plans.

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* Sample includes Fortune 1,000 U.S. sites with more than 500 employees or with a midsize computer or mainframe.

SOURCE: COMPUTER INTELLIGENCE

CW CHART: JOHN YODER

Gift PCs should keep on giving

If you don’t feel like trying to resell aging PCs, charitable donation is another option. Forwarned, however, most of your reward will come in the form of gratitude, and even that may be missing if the machines in question are extraordinarily shrewd.

The tax savings are not very great in any case, says Susan Corrigan, senior vice-president of Edas in Kind, Inc., an Alexandria, Va.-based organization that coordinates corporate donations of non-monetary products to charity. The write-off is even less if the machines are obsolete, she adds.

"The tax deduction is based on the depreciated value of the computer, she says, and "most companies are so computer-oriented that they are only good for doorstops." "My advice to clients is that they should look at workstations as a investment with a two-year writedown," says Art Caston, director of emerging technologies consulting at the DMR Group, Inc. in Toronto. He contends that computers can maintain a competitive advantage unless all their computers are on the leading edge. "Over a longer period, you're prohibiting the usage of the newer workstations to the end user."

To support this contention, Caston provides a complicated analysis of the technological capacity of workstations, which is his name for personal computers. He emphasizes the fact that workstations today have different uses than they did just a few years ago.

"The whole concept of a workstation has changed over three years," Caston says. "Now, I see, in one area, the achievement of integration of different computer architectures and server platforms, structured databases, document management systems and messaging."

Such sophisticated functional integration can be achieved with XT’s or AT’s, which are not powerful enough, Caston says. For this reason, he says, "We must convert our workstations to those that provide multiprocessor, sophisticated window management and user interfaces across platforms."

What does this mean for the user who simply wants to do some spreadsheet or word processing? "That’s a reflection of the slowness of adopting true end-user computing," Caston explains. "If a workstation is being used [solely] for the occasional spreadsheet analysis, [the user] company is still in the early phases of computer technology. The user achieves a much higher degree of functionality through the PC than just spreadsheets.

Those kinds of considerations will be driving them toward the more powerful and sophisticated workstations."

Caston maintains that users should look at the value of a computer to their organizations. If a more powerful computer saves several hours a day of a manager’s time, then in today’s competitive world, the cost of the more expensive computer will be small compared with its value.

"What it comes down to," he says, "is whether you’re applying technology planning from a cost orientation or a value orientation."

Many companies, however, are not buying the argument that there should be a 386-based machine on every desktop and are downright skeptical about anything beyond that.

"We have only one 386 in the Computerworld

IBM PCs and Compaltes

PRODUCT SPOTLIGHT

Rotation

FROM PREVIOUS PAGE

they’re used to fill outstanding requisitions," explains Holmes, whose firm has a current installed base of almost 5,000 PCs, two-thirds of which are PS/2s. Pacificorp Financial Services in Portland, Ore., tries to practice frugality at both ends of the system life span. On the acquisition side, according to Robert F. Thrasher, Pacificorp’s director of telecommunications, the company has begun buying Compaq Computer Corp. 386s without a hard drive and connecting them to a file server through a LAN.

When PCs reach the end of their useful life, Thrasher says, "We make them available to our internal employees to purchase for home use."
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Timing is key to good trade-in on old PCs

Kenny Rogers could have been singing directly to corporate PC purchasers when he cut his popular hit, "The Gambler." Knowing when to hold them and when to fold them can make a big difference in terms of both PC residual value and maintenance outlays.

Figuring out exactly when to sell is not necessarily easy. There is an optimal selling time for used computer equipment, and if you keep the equipment longer than that, it becomes technologically outdated and does not net as much money.

A recent example of how this works is last year's precipitous decline in resale value for IBM Personal Computer ATs.

"The AT was the premier IBM machine for several years, but in six months it lost nearly $800 of its value," says Alex Randall, president of the Boston Computer Exchange Corp., an organization that specializes in the sale of used computer equipment. What happened, he explains, was the laptop revolution.

"After six months, the first AT-compatible laptop came out," Randall says. "Then everybody and his brother introduced a laptop computer, and the desktop AT [market] began to fall apart."

All too often, corporations tend to hang on to computer equipment beyond its useful lifetime — and beyond its maximal dollar value. "They treat computers as lifetime purchases like houses, when they should be treating them as cars," Randall maintains.

Holding PCs for prolonged periods is not advisable, not only because of declining resale value but also because of escalating maintenance costs.

Like cars, computers tend to develop costly problems as they age. Furthermore, new models are, by and large, more easily maintainable. It costs about half as much to maintain a Personal System/2 Model 30 as it does to maintain a comparably equipped XT, and over a long period of time those expenses add up.

In most cases, explains John Erickson, an analyst at market research firm Future Computing, Inc. in Dallas, organizations wind up paying third-party service providers to keep their old systems up and running.

That is not to say that firms should jump to trade at the first signal of change. Murray's rule of thumb is that the best time to consider such a move is after it has become obsolete for the second time.

The IBM PC came out in 1981, he points out. Managers should not have sold those machines when XTs came out. But when AT's arrived, he says, the writing was definitely on the wall: "After a machine has become obsolete for the third time, it goes into hopeless decline."

JOHN XENAKIS

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IBM PCs and COMPATIBLES

PRODUCT SPOTLIGHT

April 10, 1989

**Rotation**

**CONTINUED FROM PAGE 72**

The complete story begins on page 72 of this issue.

**Change of plans**

As processors become more sophisticated, the role of PCs will also evolve, forcing companies to reevaluate their purchasing plans.

**Model**

**Best role**

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<td>80286 SX</td>
<td>Midrange workstation</td>
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<td>80286 SX</td>
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<td>80286</td>
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SOURCE: INTERNATIONAL DATA CORP.

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Do corporate controls on PC purchasing work?

Figgie International, a diversified operating company headquartered in Willoughby, Ohio, is an example of an organization that tries to closely regulate the acquisition and configuration of personal computers.

"We set a procurement standard here starting in the early 1980s," says Walter J. Hayes, Figgie's director of MIS. He says that the corporate standard is IBM, but he provides a second choice for those divisions that are concerned about saving money.

"Our first choice is IBM, but our divisions have the latitude to choose Wyse, and they've been doing that because of the price-difference," he explains.

Hayes also has a specific architectural standard. "On the business side, our standard is the 286 — that is not an option. Our primary applications have been for spreadsheets and financial analysis, and we have not seen the need for the power of a 386 for these applications," he says. Occasional exceptions are made, but only for users with engineering and design applications.

Not all corporations are as successful with central control of PC purchasing. Timothy A. Kenney, manager of information services at Systemetrics/McGraw-Hill, Inc., an operating company of New York-based McGraw-Hill, Inc. located in Santa Barbara, Calif., says that local standards supersede central ones.

"We're an operating company of McGraw-Hill, and they have a corporate policy that we're supposed to follow," Kenney says, "but we do things a little differently because we're really autonomous."

According to Kenney, both Systemetrics and McGraw-Hill have a policy of choosing IBM Personal Computers, but McGraw-Hill prefers Epson America, Inc. clones as a backup preference that Kenney does not share.

Kenney says Systemetrics often buys Compaq Computer Corp. units and recently acquired two Dell Computer Corp. machines for their speed. But he also favors a clone from Bentley Computer Products for his personal use.

"They [McGraw-Hill] actually try to influence our purchasing by offering good rates through the McGraw-Hill bookstore in New York," Kenney says. "As a result, we can buy IBM and Epson machinery at a significant discount, but we still don't feel that gives us the best bang for the buck."

No support p. obiem

Many corporate managers are concerned about support issues when a variety of different types of computers are involved, but Kenney has not found that to be a problem.

"We find that different clone makers now use fairly standard stock components," he says. "So I think reluctance to buy clones because of support problems is a moot issue. It's becoming like [buying] stereo equipment — at a certain level you almost can't buy something bad."

LIMITING support and training to products that adhere to standards can act as a rein on some users, but it is a limited control mechanism at best.

Thomas Cimino, senior vice-president of information services at the Great American Life Insurance Co. in Los Angeles agrees that corporate standards do not work very well.

The trouble, he says, is that most users have enough money to acquire what they want. The central organization can go ahead and create a standard, Cimino explains, "but then one user wants a board that costs only $100 or a $60 software package, and that's the end of the standard."

In terms of standards, Cimino adds, the only realistic and reasonable approach is to focus on protecting corporate data:

"That should be our focus, rather than whether users are buying different word processors."

Loose rein

Limiting support and training to products that adhere to standards can act as a rein on some users, he points out, but it is a limited control mechanism at best.

"Frankly," he says, "if you don't need our support, you can do what you want to do. If you're content with that, good luck and adios."

James B. Grinham, MIS manager at Tremco, Inc., a subsidiary of B. F. Goodrich Co. in Cleveland, is more positive in his assessment of training and support as a means of encouraging standardization.

"We have not intentionally tried to control acquisition, but because we've been successful in how we advise people, including providing them with thorough training, every time someone needs a computer, they come to us."

JOHN XENAKIS

APRIL 10, 1989
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Right away, it's easy to see what makes the new Dell System 316 different from the Compaq 386s. While they both utilize Intel's new 386SX™ chip, the System 316 is a full featured system designed to give you uncompromising 386SX/16 MHz performance. But for a price that's somewhere in the neighborhood of a 286-based system.

Now, cynics might be inclined to think we achieved this at the expense of expandability. Obviously these people own the 4-slot Compaq.

The System 316 has a total of seven open slots. Leaving you enough room to add modems or network cards, fax boards, high-performance graphics cards or tape backups. Not to mention all the bells and whistles that'll be coming out next year. And the year after that. And the year after that. And the year after that. Point is, the Dell System 316 was designed for the long haul. Not as a passing fad.

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What type of monitor do you prefer? VGA mono with paperwhite screen, or VGA Color Plus, for high resolution colors displayed on a larger screen? Or perhaps you need even larger monitors capable of displaying 1024 by 768 pixel resolution? You've got your choice. You've also got your choice of operating systems. The 316 can run either Microsoft MS-DOS, MS/OS/2, or UNIX® systems. Making it extremely versatile, as well as extremely powerful.

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And even though each and every System 316 we build is individually configured, they all come with a 30-day, money-back guarantee. And if leasing makes more sense, we can see to it you get a custom designed lease plan to fit your exact business needs, too.

DON'T GET STUCK IN THE MIDDLE.

Have you noticed how most computer retailers seem to know far too much about sales techniques and far too little about computer technology? Ask even the simplest of questions and the answer will undoubtedly involve the highest margin item in the store. And heaven forbid you should ever have to go back there for service. Well, when you buy from us, you never set foot in a store. Because we've eliminated it.
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1. Which products are you most interested in?
   A. 286-based systems
   B. 386-based systems
   C. Other

2. How many PCs do you (your company) plan to purchase in the next twelve months?
   A. 1-10
   B. 11-20
   C. Over 21

3. Is your requirement:
   A. Immediate
   B. 1-3 Months
   C. Over 3 Months
   D. Info only

4. Are you a (select one):
   A. End user
   B. Consultant
   C. Reseller
   D. Corporate Purchaser
   E. DP/MIS

5. How many PCs do you have installed now?
   A. 1-10
   B. 11-20
   C. Over 21

6. Name:

7. Title:

8. Company:

9. Address:

10. City: State: Zip:

11. Phone:
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[If you provide industry specific solutions, stop by booth 808 at Comdex. See the entire line of Dell systems and learn about our comprehensive VAR program.]

**THE $5700 COMPAQ 386S COMES WITH A GUY IN A SUIT.**
Gearing up for high-end needs

BY ANDREW TOPPER

Making the right match is critical when you want high-end personal computer products to support demanding applications such as computer-aided software engineering (CASE), computer-aided design and manufacturing (CAD/CAM) or local-area network file and SQL server use.

Because the CPU determines the amount of addressable memory and the relative speed of the machine, high-end uses typically require a fast (16- or 20-MHz) Intel Corp. 80286- or 80386-based computer. The Intel 80386SX chip offers an inexpensive alternative to 386-based computers as well as the 32-bit addressing that is missing from 286-based units.

The amount of random-access memory (RAM) needed for these applications often goes beyond the traditional 640K bytes available with DOS, and the hard disk requirements can far exceed the 40M-byte hard disk supplied with most 286-based machines. With memory prices declining, buying additional memory will soon become more feasible.

CASE tools that run on PCs or LANs are very resource-intensive because they use high-resolution graphics and provide a wide range of sophisticated development services.

Although CASE tools will usually run on standard IBM Personal Computers or PC XT, those machines often cannot provide the level of response time needed to support an interactive development tool. In most instances, CASE tools are most effective when used on an 80386-based computer running at 20 MHz or higher.

CASE tools also usually require memory above the DOS 640K-byte mark for disk caching buffers. Lotus/Intel/Microsoft Extended Memory Specification and, in some cases, protected-mode operation. Because most PC-based CASE tools use a central repository or data dictionary, the disk requirements are typically 20M bytes or more. The CASE repository contains all objects collected in the development effort, often resulting in dictionaries that are as large as 60M or 70M bytes.

The majority of work involved in CASE products moves objects to and from the dictionary (and thus the hard disk). Therefore, a fast hard disk drive can make using the tool very time-saving.

The monitor and display adapter requirements for CASE tools range from IBM's Enhanced Graphics Adapter to Multisync and up. Most CASE tools include some form of diagraming aid such as data flow diagrams or design diagrams, and these products generally use the graphical capabilities of the display adapter and monitor to their fullest.

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Leery users take support tasks into their own hands

BY DANIEL GROSS

The uneducated enthusiasm that sold personal computers in the early 1980s is unacceptable to a new generation of users who know exactly what they want. More sophisticated today than they were a decade ago, these users have grown wary and weary of the service and support promises made by PC manufacturers and value-added resellers (VAR).

Richard Kuiper, MIS director at Portland, Ore.-based Sulzer Bingham Pumps, Inc., says he finds untrained sales representatives, who pitch products without being aware of the products' technical capabilities, to be a hindrance. "You can wait forever for them to get the answers to your questions from the technical people behind the scenes," he explains.

Sometimes, the answer never comes because the person has left the company. "It seems like turnover is very high. You never talk to the same person twice," notes Robert Voltz, director of MIS at Rieke Corp., a South Bend, Ind.-based industrial manufacturing firm.

As a result, neither PC vendors nor VARs have much of a reputation for real-world problem solving.

"We have circumvented most of the problems our companies have by finding a very good PC vendor," Kuiper says. "We pretty much sole-source all our PC needs through one [VAR]. But we did go through a number of bad situations [with VARs] before we found this one company, including a three-week siege with a Diablo Systems, Inc. printer that the salesman said was IBM-compatible. "T'd like to see faster delivery time on the things such as memory boards. Last time I ordered an upgrade, it took months to get memory. That can be a serious problem when you're in a project environment," says Kenneth Platt, manager of information services at Bethlehem Steel in Bethlehem, Pa.

"We are developing a large project with [IBM's] Presentation Manager and OS/2," he explains. "We get the memory, but [getting it] is a problem. We have our own technical people repairing [the cards]."

Educated caution seems to be the mood among PC users in dealing with their suppliers these days. As Voltz explains, "I learned early on to take a hard look before I buy, so I haven't gotten severely burned."

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At NCR, we're open to finding the PC solution you have in mind for your business.
Laptops for sales support
BY STEPHEN SATCHELL and HEATHER CLIFFORD

Sales representatives need all their big guns close at hand. Laptop personal computers can provide them with easy access to the ammunition they need.

Savvy sales reps can benefit from laptops by making on-the-spot use of the same software that is running on their desktop systems in the home office. This is especially true for those reps selling customized, price-sensitive products and services to corporate markets. A laptop PC for sales support use needs room for a hard disk drive to store data and programs, especially for graphics. This requirement eliminates virtually all of the low-end (under $2,000) systems, which have only one or two 720K-byte floppy drives.

But it also needs to be light and compact enough for the salesman to carry inconspicuously into meetings, a feature found in most of the newer portables.

The main difference within this group is the power supply. Most, such as the Zenith Data Systems Supersport, can run on batteries — something no desktop computer was designed to do. But some, such as the Toshiba America, Inc. T-3100E, are solely AC-powered.

The Supersport and the T-3100E have much in common. Both systems do a fine job of letting two or three people see what is on the screen. Both allow you to send data via the video port to a separate IBM Color Graphics Adapter monitor. Each offers a 20M-byte hard disk for room to run even the most demanding applications. Further, both manufacturers recognize the importance of reliability, providing 24-hour repair/service programs.

The briefcase-size T-3100E is a complete IBM-compatible, Intel Corp. 80286-based system. Its 25-line, dot-based gas-plasma display doesn't diverge too much from traditional types, whatever they were being displayed. Circles look like circles instead of eggs, and pie-charts look like, well, pies. Although the bright-orange-on-dark-orange display may sound like a less than ideal color combination, it has enough contrast to be easily readable from anywhere within a 120-degree angle in front.

AC-powered laptops such as the T-3100E are able to provide the power necessary for sharp and clear images. AC-powered displays also have a much wider effective viewing angle than battery-run units. In other words, users can see what is on the screen without having to be directly in front of it.

The $3,599 Zenith Supersport is roughly comparable to the Toshiba T-3100E; it uses an 8-MHz Motorola, Inc. 80C68 processor. The Supersport is AC-powered as well as the aforementioned battery supply.

The T-3100E provides the power for sharp and clear images. . . . For the Supersport and other battery-run systems, freedom from the power cord comes at a cost. For users who find themselves on battery-powered laptops, these laptop systems need to use as little power as possible. This means that their screens, whether gas-plasma or superbist LCD, lack the sharpness or clarity of screens in desktop systems.

Instead of a power-hungry two-color gas-plasma display, the Supersport uses a backlit LCD screen. The 24-line display has three levels of blue characters and graphics on an off-white background, which provides a good contrast range. The dots that make up the characters take fractions of a second to change state, although this is noticeable only when you scroll quickly through text. Because the screen is not readable from a sideways angle, however, no more than two people can watch over your shoulder.

As for batteries themselves, power technology is still at the point where users should think of their laptops' nickel cadmium batteries as insurance against data loss, instead of treating cordless computing as the system's main mode of operation. Even at full charge, the batteries in the most powerful laptop PCs only give you about two hours' worth of full-tilt cordless computing, despite manufacturer's claims. So carrying an extension cord and using AC power whenever possible is a wise safeguard.

For sales reps who find themselves in places where finding a power outlet is a problem, battery-powered laptops computers have the advantage of cordless operation. But for users who find themselves in boardrooms more often than on factory floors, AC-only laptops may offer an edge worth considering.

Satchell helped found Infoworld's Test Center and has been writing product evaluations for 15 years. Clifford is the author of several computer books.
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The companies included in this chart responded to a recent telephone survey conducted by Computerworld. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.
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## IBM PCS AND COMPATIBLES

### PRODUCT SPOTLIGHT

<table>
<thead>
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<th>PRODUCT</th>
<th>CLOCK SPEED (MHz)</th>
<th>OPERATING SYSTEM</th>
<th>SUPPORTS OS/2</th>
<th>RANDOM-ACCESS MEMORY (MEGABYTES)</th>
<th>STORAGE (MEGABYTES)</th>
<th>NUMBER AND TYPES OF EXPANSION SLOTS</th>
<th>NUMBER OF SERIAL PORTS</th>
<th>NUMBER OF PARALLEL PORTS</th>
<th>TYPE OF BUILT-IN GRAPHICS CAPABILITY</th>
<th>DESKTOP OR PORTABLE SYSTEM</th>
<th>FOOTPRINT (INCHES)</th>
<th>WEIGHT (LBS)</th>
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<td>SBC System 380/24</td>
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<td>386/10</td>
<td>25</td>
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<td>40-320</td>
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</tr>
</tbody>
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**Note:** Prices are subject to change and may vary by location and configuration. For the most accurate information, please contact the vendor or dealer directly.
OS/2 promises you the moon.
You're looking at a total eclipse of the moon.
Namely, the Sun386i™ workstation.
Whatever OS/2 does, the Sun386i with UNIX® does better.
Which is not a pie-in-the-sky promise, but a down-to-earth fact.
While the OS/2 operating system limits your network horizons primarily to fellow PCs, the UNIX operating system on the Sun386i opens them to the world.
Mainframes, minis and personal computers of every shape and size.
So not only can you save all the IBMs, DECs and Apples you've ever bought, you can effectively tie them all together right on your desk.
And if that's not enough to make you thank your lucky stars, there's this: You don't have to give up one bit of DOS.
In fact, you can make more out of it.
Whereas with OS/2, you can run just one DOS program at a time. With the Sun386i's multitasking, you can run all sorts of DOS and UNIX programs at the same time.
Say you're working on currency trading figures under UNIX, you can update your Lotus® 1-2-3® spreadsheet under DOS. Make a Harvard Graphics™ slide show under DOS. Cut and paste results of all three into a sophisticated publishing package under UNIX. And e-mail it to the coast.
Simultaneously.
Far out, you say?
Not really. Well within reach.
Because you can forget the UNIX hieroglyphics of yesteryear. The Sun386i, with its point-and-click interface and Hypertext help system, is easier to use than most any personal computer.
And it'll no longer take you a sidereal year to figure out how to plug into your corporate network. In this solar system, it's a 30-minute job.
After all, the Sun386i is just part of Sun's concept of Open Computing. A corporate-wide universe of truly distributed computing based on industry standards. Something out of sight for OS/2.
Which just goes to show you.
Once you look at the moon, you'll see how much the Sun really shines.
To find out more, phone 1-800-223-6736. In California 1-800-322-6736.

Sun Microsystems
Systems for Open Computing™
<table>
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<th>COMPANY</th>
<th>OPERATING SYSTEM</th>
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<th>STORAGE (MEGABYTES)</th>
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<th>NUMBER AND TYPES OF EXPANSION SLOTS</th>
<th>NUMBER OF SERIAL PORTS</th>
<th>NUMBER OF PARALLEL PORTS</th>
<th>SUPPORTS OS/2</th>
<th>FOOTPRINT (INCHES)</th>
<th>WEIGHT (LBS)</th>
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<td>36</td>
<td>Vendor</td>
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<td>$5,999</td>
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<td>NCR Information Systems, Inc.</td>
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<td>1-16</td>
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<td>Vestor Computer Corp.</td>
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<td>Packard Bell</td>
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<td>Profi Technology, Inc.</td>
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<td>Vendor</td>
<td>$3,999</td>
<td>$5,999</td>
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</table>
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*Audit Bureau of Circulations Supplemental Data Report, May 25, 1987
<table>
<thead>
<tr>
<th>COMPANY</th>
<th>PRODUCT</th>
<th>OPERATING SYSTEM</th>
<th>CLOCK SPEED (MHZ)</th>
<th>SUPPORTS BIOS/2</th>
<th>RANDOM-ACCESS MEMORY (MEGABYTES)</th>
<th>STORAGE (MEGABYTES)</th>
<th>NUMBER OF SERIAL PORTS</th>
<th>NUMBER OF PARALLEL PORTS</th>
<th>DESKTOP OR PORTABLE SYSTEM</th>
<th>FOOTPRINT (INCHES)</th>
<th>WEIGHT (LBS)</th>
<th>SERVICED BY</th>
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<td>Sanyo Business Systems Co.</td>
<td>MS-DOS</td>
<td>16</td>
<td>NP</td>
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<td>40-170</td>
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<td>40-170</td>
<td>Seven 16-bit</td>
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<td>1</td>
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<td>SCI 304</td>
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<td>SMSB-5100A</td>
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<td>Sun Microsystems, Inc.</td>
<td>Sun386/150</td>
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<td>Yes</td>
<td>4-16</td>
<td>35-155</td>
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<td>Desktop</td>
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<td>Tandy Computer Corp.</td>
<td>Tandy5000MC</td>
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<td>1</td>
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<td>Desktop</td>
<td>17 x 15.5 x 6.2</td>
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<td>Tandy9000L</td>
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<td>1</td>
<td>None</td>
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<td>TCS-8000</td>
<td>25</td>
<td>Yes</td>
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<td>2</td>
<td>1</td>
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<td>Third Coast Technologies,</td>
<td>EL368</td>
<td>18, 20</td>
<td>Yes</td>
<td>2-16</td>
<td>20-765</td>
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<td>1</td>
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<td>Desktop</td>
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<td>Toshiba America, Inc.</td>
<td>TS2000</td>
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<td>Yes</td>
<td>2-8</td>
<td>40</td>
<td>One 16-bit, one 8-bit</td>
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<td>Toshiba America, Inc.</td>
<td>TS1000</td>
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<td>Yes</td>
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<td>Trillian380/15</td>
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<td>Yes</td>
<td>1-16</td>
<td>708-1.5G</td>
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<td>Data Corp.</td>
<td>PW2800002A</td>
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<td>Yes</td>
<td>2-16</td>
<td>80-292</td>
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<td>Wang Microsystems, Division of Wang Laboratories, Inc.</td>
<td>PC 386</td>
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<td>20-321</td>
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<td>Wang Microsystems, Division of Wang Laboratories, Inc.</td>
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<td>Wang Microsystems, Division of Wang Laboratories, Inc.</td>
<td>GW 306</td>
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<td>Wyse Technology</td>
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<td>Wesley, Inc.</td>
<td>M68000/15</td>
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<td>1-4</td>
<td>60-644</td>
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<td>Z-386</td>
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Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much. But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods. What's more, many of today's recruiters don't use today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand
The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely is competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better — and that's sure to make your recruiting tougher now and into the '90s.

Ads in local papers don't reach your major hiring market anymore
That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent Computerworld job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would consider new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.) In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade
That's because Computerworld reaches over 627,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers. That's why more companies advertise more jobs in Computerworld than in any other professional newspaper. And why Computerworld is the single place where America's computer professionals expect to see the most jobs every week.

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Computerworld needs just 3 working days for your ad to appear
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Computerworld leads candidates to your ad
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It's no surprise that today's global market is growing even more competitive. So, it's no surprise more and more organizations are exploring new ways to get ahead. Like distributed manufacturing systems. This approach has many advantages but it also presents some challenges of its own.

Get An Insider's View At Our Educational Seminar. If you've been pondering the pros and cons of distributed manufacturing systems, it's time you heard from the industry experts. Attend our half-day seminar, "Trends in Distributed Multi-Plant Manufacturing Systems," and you'll learn about the move toward managing multiple plants with distributed information systems. And the system and network technology making this trend possible.

All in all, you'll see a new approach to creating the loosely-coupled distributed multi-plant manufacturing systems that can give you the edge you need in today's dynamic marketplace. From recognized authorities on distributed manufacturing systems.

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First Name

Title

Company

Address

City

State

Zip

Address Shown:

Home

Business

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   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail Trade
   50. Business Service (except DP)
   60. Government — State/Federal/Local
   70. Communications/Telephone/Utilities
   80. Communications/All Other
   90. Computer & DP Services, including Software/Service
      Bureau/Time Sharing/Consulting
   100. Computer/Peripheral Dealer/Distributor/Reseller
   110. User
   120. Other

2. TITLE/FUNCTION (Circle one)
   1. President, General Manager, General Vice
   2. Vice President/Assistant Vice
   3. Treasurer, Controller, Financial Officer
   5. Sales/Marketing Mgt
   6. Consulting Mgt
   7. Medical, Legal, Accounting Mgt
   8. Educators, Scientists, Librarians, Students
   9. Other

3. COMPUTER INVOLVEMENT (Circle all that apply)
   1. Mainframes, Superminis
   3. Microcomputers/Desktops
   4. Communications Systems
   5. Office Automation Systems
   6. No Computer involvement

Please specify)

Please complete the information to the right to qualify for this special rate.

1. BUSINESS INDUSTRY (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail Trade
   50. Business Service (except DP)
   60. Government — State/Federal/Local
   70. Communications/Telephone/Utilities
   80. Communications/All Other
   90. Computer & DP Services, including Software/Service
      Bureau/Time Sharing/Consulting
   100. Computer/Peripheral Dealer/Distributor/Reseller
   110. User
   120. Other

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   1. President, General Manager, General Vice
   2. Vice President/Assistant Vice
   3. Treasurer, Controller, Financial Officer
   5. Sales/Marketing Mgt
   6. Consulting Mgt
   7. Medical, Legal, Accounting Mgt
   8. Educators, Scientists, Librarians, Students
   9. Other

3. COMPUTER INVOLVEMENT (Circle all that apply)
   1. Mainframes, Superminis
   3. Microcomputers/Desktops
   4. Communications Systems
   5. Office Automation Systems
   6. No Computer involvement

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In the CICS world, it takes all sorts
How IS can fulfill user requests for on-line sorting in the environment

BY MARTIN GOETZ

If CICS is going to be a part of information systems for another 20 years, as IBM has claimed, then isn't it time IS updated its thinking about on-line sorting for CICS applications?

Having access to a generalized sorting utility for the development of on-line — or real-time — applications is really nothing new. At least, not if you've been developing programs for IBM's System/36 or Application System/400.

For these and other computer systems, on-line sorting utilities have often been made available as an integral part of the real-time operating system. Or sometimes they have been made available as completely separate products.

But if you've been developing CICS applications for IBM mainframes, even those going back as far as the IBM 360, then a concept like on-line or real-time sorting may seem revolutionary to you.

And that's because it is. Indeed, because this capability has never been made available by the mainframe vendor, most CICS program designers and developers have assumed that there must be something particularly insidious or dangerous about real-time sorting within the environment. In keeping with that line of thought, application developers have spent decades searching for ways to circumvent the need for on-line sorting.

Historical stumbling blocks

The absence of a sort utility for CICS traces back to limitations of the IBM 360, which came out 25 years ago.

When it was first released, the 360 provided several basic batch operating systems along with a Cobol compiler, a generalized batch sort and other systems software. This was followed in the late 1960s by the availability of the CICS teleprocessing monitor to support the building of on-line applications.

But because the CICS monitor was, in a sense, a mini-real-time operating system that ran under the batch operating system, there were several restrictions that needed to be applied to the building of CICS applications using Cobol.

The most severe of these was that the application developer could not use the Cobol language's "SORT" verb in the CICS application. If it was invoked, the resultant Cobol program would call and execute the batch sort utility in the CICS partition, and CICS would crash.

There were other hardware and software characteristics of the 360 line that contributed to the general agreement in data processing departments that on-line sorting was to be avoided at all costs.

For instance, because of valid concerns about resource utilization, the motivation was never there to build an on-line sorting capability. By today's standards, CPU speeds were lethargic, I/Os were slow, internal memory space was at a premium, and operating system speed and function was limited. Thus, even if CICS would not crash entirely, the system would certainly have been brought to its knees by on-line sorting.

The upshot has been that, for 20 years, application designers have had to respond to user requests for sorted information displayed on-line in one of four ways:

- They could provide the sorted
- Circuitous methods no longer necessary
- Real-time displays of sorted data possible
- It's not just for the System/36 anymore
The invention and spread of computers in the last three decades isn't just a new technology finding its way into society. It's the start of a revolution in the way mankind operates: the end of the Industrial Age and the beginning of the Information Age.

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To put everything in perspective, we have taken a brief look at where this young industry has been and how it is doing right now. It's all shown in the poster pictured here. Life size, it's 26" by 38", and it's full of interesting information on the new Information Age.
In the mid-1960's, a major leap in computer productivity occurred.

In the 1950's, the United States left the Industrial Age and entered the Information Age.

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Examples of on-line sorted screens in a VSAM file

Some users require applications that must produce certain on-line screens with certain headings.

VSAM file records
- Customer ID
- Order number
- Date of order
- Planned date of delivery
- Status of order
- Salesperson
- Amount of order
- Amount of order
- Status of order

In DEPTH: ON-LINE SORTING IN CICS

information as a part of an independent batch operation.
- They could program specialized internal sorts into their applications.
- They could design their VSAM files — or database management system files — so that alternate indices would maintain specific data in the desired sequence.
- They could request the user's request.

Like good sports, most CICS veterans have tacitly accepted the inability of the CICS environment to allow for on-line or real-time sorting. So, where possible, they have responded to users' needs by employing the circuitous routes outlined above.

Of the possible alternatives, the most frequently used has been that of maintaining data in a specific sequence. This has meant that, to satisfy user requests to have information on screens or summary reports appear in a desired order, application designers have had to spend time preparing specially sequenced VSAM files or databases or designating alternate indices for retrieving the data in the desired sequence.

But this approach has not only proved technically complicated and time-consuming, it has also added many layers of grief to the maintenance and enhancement of these systems once they are put into production.

Many applications required the creation of alternate indices for VSAM files so that data could be displayed in the varying sequences that screen and report output dictated. But, because of the restrictions of VSAM, a separate alternate index for each sorted sequence usually needed to be established.

For example, assume a VSAM file in which the records contain a customer identification number, an order number, the date of the order, the planned date of delivery, the status of the order, the salesperson and the amount of the order.

Assume, in addition, that a user has requested an order entry application that must produce the following on-line screens or reports for all orders for a specific customer ID:
- Sorted by date of order and amount of order.
- Sorted by order and amount of order.
- Sorted by planned date of delivery and amount of order.
- Sorted by salesperson, date of order and amount of order.

To satisfy the requests for these four desired screens (see chart, left), four alternate indices would have to be established according to the above sorts, with each index beginning with the same customer ID. Each sorted sequence would then require a separate secondary index.

This example is by no means extreme. It is not unusual to require 10 or 20 alternate indices to satisfy the different ways in which data must be displayed for a VSAM application.

Other complications
But the time it takes to create the alternate indices is not the only complication of this technique for application designers and database administrators.

The process can extract a high cost in other areas, including disk space, I/O accesses, CPU time, operational and programming complexity and program maintenance time.

Disk space. For each alternate index associated with a VSAM file, there are additional disk-space requirements for storing that index file. And, in most cases, the VSAM records must be enlarged to hold the redundant information that forms the alternate keys to be sorted. On top of this, more buffer space is required as well.

I/O and CPU time. Each time a record is updated, there are CPU and I/O costs associated with updating the alternate index and the related additional search keys in the VSAM record. These alternate indices also must be updated continuously, even when the sort occurs only once a month, once a week or once a day.

In addition, if these files are...

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ORTING on-line in the CICS environment offers a more efficient solution compared with using several alternate indices.

All index files must be backed up at the same time.

- Program maintenance. When the addition of an alternate index requires that the VSAM file be modified, it is not unusual to need to modify all of the programs that refer to that file. This is expensive in terms of programmer time, and it also requires considerable testing to confirm that the program changes did not corrupt the operational system.

- Programming complexity. In many sorting situations, the use of alternate indices is not an easy or convenient way for programmers and designers to get sequenced data.

This is true, for instance, in cases in which there is a need to produce data by descending search keys or by numeric fields in which the data can be either positive or negative.

The alternative of sorting on-line within the CICS environment offers a more efficient solution compared with the use of several alternate indices.

**Primary access**

For instance, in the above example, there is no need to establish any alternate index if the VSAM records that are given to the real-time sort are accessed by the primary Customer ID search key. All of the fields to be sorted are defined to the sort separately and can be located in any positions within the VSAM record.

The actual sorting of any number of search keys — such as Date of Order, Amount of Order, Salesperson and so on — can be performed by the on-line environment of the CICS Journal File.

**Operational complexity.**

The addition of alternate index files creates several significant operational problems as well. Further operational complexities are involved in backing up and restoring a VSAM cluster because the base VSAM file and designated as recoverable by CICS, there will be CPU and I/O costs associated with the maintenance of the CICS Journal File.

**In DEPTH: ON-LINE SORTING IN CICS**

---

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sort. A single access against the primary index (see chart page 107) can generate all of the four desired reports.

So, depending on the file design, the application and the types of information needed to be sorted, the data can be extracted by accessing only the primary index or a limited number of alternate indices.

And if there is a request, for example, to sort by Salesperson as the major search key, one alternate index can be established to produce many combinations of sorted information.

Furthermore, system performance is enhanced with on-line sorting. There is no need to update or maintain the indices. The amount of required disk space is reduced. And additional sorted screens or reports can easily be added or modified without changing any file designs.

In network DBMSs — such as IDMS — sets are defined as named collections of records that have an "owner" record type and one or more "member" record types. Sets can be established as either sorted or unsorted.

In many instances, sorted sets are established when a report or screen must be produced on-line or with the output listed in a specific sequence.

This technique has many similarities to the setting of secondary indices in VSAM files. When a new member is added to the set, it is inserted into the chain according to the value of a sort-control item within the record (see chart above).

Eliminating methods

Given the availability of a generalized real-time sort utility, these methods of producing on-line sorted output can also be eliminated. The net result is simplification of database maintenance, execution of the sort only when the report or screen is specifically requested, elimination of expensive updates to the databases and reduced CPU speeds have increased by at least a factor of 50. I/Os are faster by a factor of 10. Our systems have a lot more internal memory. And today's hardware and software products allow for possibilities that simply were not feasible back in the late 1960s.

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COST SYSTEMS DESIGNERS, especially those less than 35 years old, do not understand that the only thing that has been holding them back is adherence to a 20-year-old technology.

In hierarchical DBMSs — such as IMS — ordered records have often been used to accomplish sorting. But this solution, too, is slow and expensive.

Using the IMS search field for sorting not only complicates the IMS design, it is also a very time-consuming method of accessing records.

In this case as well, real-time sorting within the CICS environment saves time and money. Where there is a parent/child relationship established, the sort utility can be used to eliminate the need for ordered records.

So, after 20 years, on-line real-time sort utilities can provide program developers with a reasonable alternative for meeting the sorted screen and report requests of end users. From here, education and acceptance become the key issues.

But old bugaboos die hard. And most system designers, especially those less than 35 years old, do not understand that the only thing that has been holding them back is adherence to a 20-year-old technology.

Today's hardware and software products allow for possibilities that simply were not feasible back in the late 1960s. CPU speeds have increased by at least a factor of 50. I/Os are faster by a factor of 10. Our systems have a lot more internal memory. And today's hardware and software products allow for possibilities that simply were not feasible back in the late 1960s.

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The team continues to deliver major enhancements, including automatic alerts, recommendations and modeling.

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(Please Print)

Title: ________________________

Company: ________________________

Address: ________________________

City: ____________________ State: ______ Zip: ______

Telephone: ________________________

Operating System: ____________________ No. of CPUs: ______

CW04 1089
Mips casts line and sinks windows

Ardent rolls up its shirtsleeves

Mapping the road to survival

Frame painting pretty picture for itself

INDUSTRY INSIGHT

Peter Bartoliak

Snipe the hype

Dealing press releases aside, the clear-cut loser so far in the legal battle over Microsoft Windows 2.03 is marketing hype. Due to the fact that the Seattle Slinger was undercut by its own marketing claims, the Apple Computer, Inc. is readying for a legal conference this Friday on the copyright infringement battle. Nevertheless, industry pundits are rabidly debating the words issued by both companies.

Keep in mind that Microsoft and Apple are readying for a legal revenge this February on the next market for a software product. March 21 by U.S. District Judge William S. Schwarzer and the competing claims of victory quickly issued by both companies.

Continued on page 112

Ardent's Michaels

Michels, the units have yet to reach many commercial sites.

Michels, who said recently that he anticipates shipping nearly the same number of systems this year, is not worried. The company is still growing on its original bankroll of $67 million in venture capital — $44 million of it from Kubota Ltd., a Japanese manufacturer of agricultural equipment. Even as industry analysts fault him for failing to ship more systems, Michels said he is negotiating sales to national research laboratories and universities.

Ardent is ramping up both production capacity and staffing in anticipation of multiple sales in the computer industry in the early 1990s, according to Michels. Kubota is expanding the Japanese factory where all Ardent machines are made. Ardent's staff of 205 is expected to reach 275 by year's end; 60 of the new hires will be dedicated to research and development.

Michels said he believes Ardent will stay ahead of a hard-ware trend now under way. The dramatic drop in hardware costs is bringing interactive supercomputing to the laboratory or desktop at minicomputer prices.

Whatever success Ardent has will come slowly and in stages, according to Michels. "It's on the development side where you'll begin to see our Titan machines," he predicted (see story page 113). "You may even see them lined up side by side. Price/performance is everything in our business right now. Later on, it will be less so. Later, it'll be more dependent on applications." Titans cost between $256 and $295 by year's end; 60 of the new models will be dedicated to research and development.

Continued on page 112

Frame's painting pretty picture for itself

BY JULIE PITTA CW STAFF

SAN JOSE, Calif. — When some of the heavyweights of the personal computer software industry recently announced that they would create applications for the Next, Inc. workstation, they were following in the footsteps of a tiny Silicon Valley start-up.

Frame Technology Corp., bears the distinction of being the first independent software developer to port to the Next computer. While industry watchers wondered aloud about the Next machine, a Frame software engineer spent a year at Next headquarters working to port Frame technology, the firm's publishing package for Unix-based systems, to Next.

After nearly three years of silence, Next founder Steve Jobs ended all the speculation at a gala event in San Francisco last fall. Notably absent were PC software giants such as Lotus Development Corp., Microsoft Corp., and Ashton-Tate Corp. In the packed auditorium sat a small band of excited Frame staffers waiting for their president to take the stage.

It never happened. Jobs got caught up in showing off his new machine that a testimonial from Frame co-founder and President Steve Kirsch had to be scrapped at the last minute.

But Frame did not go entire unnoticed. At recently announced that they would create applications for the Next, Inc. workstation, they were following in the footsteps of a tiny Silicon Valley start-up.

At a recent press conference, Jobs made up for his omission. "Frame was one of our first developers," Jobs said. "And it's one of the most successful products on our platform. It's a dynamic document-processing package."

Frame is also currently holding discussions with Businessland, Inc.

No surprise

The union of Frame and Next, both 3-year-old start-up companies, should not be surprising to anyone who knows Jobs. It is also typical of how Silicon Valley works: Casual acquaintances often turn into business relationships.

"Steve Jobs likes young, entrepreneurial companies," a source close to both Frame and Next said. "The people at Next are a group of young, creative people. Steve Kirsch is very much an MIT computer jock."

Jobs became acquainted with Steve Kirsch when Jobs was at Apple and Murray was at Filevision, a now-defunct third-party developer for Apple's Macintosh microcomputer. Although Filevision was not expected to be successful, its product caught Jobs' attention.

Frame's relationship with Next is second to a hot Silicon Valley workstation company. The original platform for Frame was Sun Microsystems, Inc.'s Unix-based workstations. Like Next, Sun is considered a computer-industry rebel, particularly in its quest to create a new version of Unix.

What may have gained the attention of both Next and Sun is continued on page 113
Survival
FROM PAGE 111

wrote off $3.1 million in sander.
ning its agreement with mini
puter Corp. put up a for-

Saxpy Com-

Alliant Computer Systems Corp.
ning their agreement with mini

wrote off $5.1 million in sunder.

Later that month, Alliant axed one-

fifth of its positions.

Analysts said problems began

when vendors focused on better-

ning their competitors' technical

specifications and gave little

thought to user concerns.

"Customers don't care about

Linpacks; they care about how

their own tapes, running their

own applications, are going to do

based on wall-clock time," said

Gary Snaby, managing director

of Needham & Co., a market re-

search firm.

Besides a disarming lack of

software, a perpetual product

transition created fundamental

problems, Snaby said. "Custom-

ers get confused," he said, "and

delay purchases, which

leads to reduced revenue."

Only Convex Computer Corp.

seems to have healthy financials.

The Richardson, Texas-based

company logged 1988 revenue

of $105.6 million, a 52% in-

crease over 1987.

But the smoke has yet to

clear, and several vendors are

shoring up their defenses. Al-

liant, for example, added greater

visualization capability to its

minisuper line, while Multiflow

announced plans to merge with

workstation manufacture Ad-

rage, Inc. [CW, March 27].

Not all such strategies have

been successful. Scientific

Computer Systems tried to be a

Cray look-alike and found that

people preferred the real thing," said Bob Trier, director of tech-

tical programs at Research Con-

sortium, Inc. in Minneapolis.

EMC has since switched its ef-

forts over to high-performance

networking.

Minisuper vendors are also

feeling the heat from above.

Graphics supercomputer maker

Stellar Computer, Inc. last week

announced a machine that it

claims offers the performance of

a minisuper at less than one-

third the price.

Some say this shakeout is just

the tonic the niche needs to sur-

vive. "The maturation process is

complete," Trier said. "Sure,

there'll be some more shifting,

but I think we'll be seeing even

more entrants into the market."

Still, if the lean days in the

minisuper field pass, the survi-

vors in what is estimated to be a

$1.5 billion market by 1991 may

find they have ensured only to

see their harvest gathered by in-

dustry giants such as Digital

Equipment Corp. and IBM.

EMC Corporation's 3090 storage

facilities as attractive add-ons to

its 3090 mainframes. Mean-

while, rumors continue to sur-

face that DEC might enter the

market with a VAX vector pro-

cessing machine, possibly as ear-

ly as September of this year.

Computer Intelligence, a

market research firm, estimates

that more than 20,000 high-end

8800 series VAXs are installed;

analysts estimate the number of

minisupers at around 700.

Snaby said DEC could capture

20% of the market within a year

of a product introduction.

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Corporation

Ardent
FROM PAGE 111

$80,000 and $150,000 each.
Michels declined to say how

much Ardent is making.

Commercial applications

should emerge, Michels said,

within the development divisions

of major pharmaceutical, chemi-

cal and aerospace companies.

Some industry analysts are

skeptical about Ardent's chances

of breaking out as a large-scale

manufacturer.

"The problem they're running

into is that they found a niche

that closed up very quickly," said

Chris Willard, senior industry

analyst at Dataquest, Inc. in San

Jose, Calif. "It remains to be

seen if there's a large segment of

the market which has $100,000

to $150,000 each."

Willard explained that techni-
cal and scientific users now have

the ability to choose ever more

powerful reduced instruction set

computing (RISC)-based work-

stations that perform visualization

applications at a price of

APRIL 10, 1989
nies. Never one to hesitate in donning the pundit’s robe when he edited this section, your humble hacker decided to take keyboard in hand and see what spats he could put on the muddy catfight.

So, with the press releases relegated to the round file and a deaf ear turned to the official spin controllers, your would-be paralegal went right to the written Memorandum of Decision and Order penned by the honorable Judge Schwarzer.

It’s a pretty simple document to read, given the technolo-

gy issues involved and the fact that it was drafted within days of a hearing on motions from Apple and Microsoft. The pretty simple fact that comes out of that reading is that there is to date no clear winner or loser in the courtroom, although the user community may indirectly benefit from this precedent if the industry learns a lesson or two—soft was damaged by its own advertising campaign.

To sum it up, the judge ruled that, yes, Microsoft had a valid license to use certain visual aspects of Apple’s Macintosh technology in Windows 1.0 and future products. Great for Microsoft, you would think.

But, in a stunning challenge to standard software industry practice, Judge Schwarzer held that Windows 2.03 is significantly different from Windows 1.0. That, he said, repudiates Microsoft’s claim that a licensing agreement for Apple for the earlier Windows product can be extended to the later, enhanced product.

Now, your humble hacker has watched both of Microsoft’s interfaces, and, other than the fact that the boss coughed up the interface with overlapping windows Graphics Adapter screen that provided for colorized Windows, he edited this section, Microsoft 2.03 was merely an enhancement of 1.0.

Being somewhat jaded about marketing campaigns, this casual personal computer enthusiast didn’t give much weight when Microsoft said 2.03 was a new and wonderful product featuring overlapping windows, rather than tiled windows.

Well, the judge apparently puts more significance on marketing claims than you’ll ever find in these pages. He noted that a key claim to fame of 2.03 was the fact that Windows did not overlap and that users for the first time would be able to see the "true" or "false" windows.

"When marketing 2.03 as a "new visual interface with nonoverlapping windows," Microsoft pointed out that a key difference in the later product was that it did not use tiled windows. Hence, in the judge’s view, 1.0 and 2.03 have "fundamentally different" visual displays.

There is a clear message here for the software industry to cut back on the marketing hype. The ruling from this court would be a disaster for Microsoft if it were able to produce Windows 1.0 not a complete defense for what it did with 2.03. Despite the churning of apples and Microsoft public relations staffs, he has yet to rule that what appears in the overlapping windows of 2.03 infringe upon Apple’s copyrights, or even whether Apple’s copyrights are valid.

Bartolik

FROM PAGE 111

OW, YOUR humble hacker has watched both versions of Microsoft’s interface, and he would swear that 2.03 was merely an enhancement of 1.0.

Having a business partner like Kubota could help Ardent survive any coming industry shakeout in the minicomputer segment (see story page 111), said analyst Jeff Canin. "Like other Japanese firms, they’re adopting a long-range perspective where they try to invest. It’s really too early to say whether Ardent will be a success or a bust, but they have to wait a couple of years, and Ardent can afford to do that."

Before most commercial sites will even try to play host to a supercomputer, they want to see working software applications.

"Many of the large companies don’t even want to see a machine until they see those applications running," explained Gale Aguilier, Ardent’s vice-president of industry marketing.

For that reason, Ardent has also started a program under which Titan application software is being produced by scientific laboratories and universities. Among the participants are NASA Ames Research Center in Northern California, Los Alamos National Laboratories in New Mexico and Lawrence Livermore National Laboratories in Livermore, Calif.

Michels, a co-founder of Concurrent Technologies, Inc., now part of Unisys Corp., hired a team of computer industry all-stars for his latest venture, Gordon Boll, designer of the Digital Equipment Corp. VAX machine, former president and vice-president of engineering, research and development, and Gregory Hopwood, formerly director of technical support at Titan. Ardent Computer Systems, Inc., is vice-president of product marketing.

In January, they were joined by Aguilier, a 27-year IBM veteran who was vice-president of marketing at Prime Computer, Inc., in Natick, Mass.

Frame

FROM PAGE 111

Frame maker’s graphical user interface. Both companies seem to recognize the need for Unix to become an easy-to-use operating system. "We’ve always tried to make software easy to use and approachable," Kirsch said.

"Unix is a desirable platform because of its power," said Ajit Kapoor, a vice-president at market research firm CAP International, Inc. "But between these products, it’s really six of one and half-dozen of the other. The name of the game is having good distribution alliances. With Sun and Next, I think Frame has a very good future."

To augment its team of young software engineers, Kirsch hired a couple of sales and marketing veterans. Former Sun marketing director John Hime joined Frame and formed the marketing team, and former Interleaf sales executive Steve Klamn is the sales vice-president. Hime resigned last week to become marketing vice-president at MIPS Computer Systems, Inc.

Score Round 1 for Apple, but don’t wire any congratulations to John Sculley just yet. All it means is that the licensing agreement for Microsoft to produce Windows 1.0 is not a complete defense for what it did with 2.03. Despite the churnings of apples and Microsoft public relations staffs, he has yet to rule that what appears in the overlapping windows of 2.03 infringe upon Apple’s copyrights, or even whether Apple’s copyrights are valid.

IN BRIEF

Growing


Going

Former IBM executive and Xerox Corp. Vice-Chairman William Glavin will retire early from Xerox, effective June 1, to become president of Babson College. He began school in Wellesley, Mass. The 57-year-old executive will also remain on the board of Xerox and a member of its four-person corporate office.

Gone

In line with its goal to focus on systems integration rather than packaged systems, Computer Sciences Corp. announced a mid-March sale of its Computer- pact division to Santa Clara, Calif.-based Madics Corp., a spokesman said. Like its new owner, Computer- pact sells turnkey- manufacturing systems that run on Prime Computer, Inc. platforms.

Difficult decision

NCR Corp. last week announced plans to market its wares in South Africa through distributor Flat- tech Ltd., a South African-owned group of technology companies. The decision, an NCR executive said, was a difficult one. Terms of the deal were not disclosed.

Wysz decision

Troubled microprocessor products vendor Wysz Technology, which earlier this year warned that an imminent quarterly loss endangered the status of its principal loan agreement, last week announced that it has obtained waivers that will keep it alive for another year.
Surviving a restructuring

BY ALAN RADDING

When James McCormick was the corporate vice-president of MIS at Transways International Corp., a diversified transportation organization that was involved in a takeover battle in 1985, he lacked a broad base of contacts in the MIS profession. "In retrospect, I didn't have nearly as much outside contact as I should have. I was cocky, I felt good about Transway," he says.

Today, he is a partner at Eastbourne Consulting Group, a management consulting firm specializing in cost containment and loss control, an opportunity that he says came about when he reestablished contacts with former associates from his pre-Transway days.

From the Transway experience, McCormick learned some valuable lessons about how to survive a corporate restructuring. First, he says, always return telephone calls from headhunters, even when you are not considering any change. Always return calls from reporters, too, because they can provide visibility. Finally, return calls to consultants, because the more people you know, the more options you possess when problems arise.

It is possible to successfully navigate a corporate restructuring, acquire new opportunities, or downsize. But the key is to establish the elements of your survival strategy in advance, long before you are faced with a major change. It is wise to assume that the ax will never fall or to wait until it does to take action, managers and consultants say.

Nothing lasts forever "It may sound cynical, but you can't depend on the company to take care of you forever. These days, nobody feels they owe you anything," says Donald Sweet, a human resource management consultant based in New Bern, N.C. Even a golden parachute, which only the highest level executives can command, does not guarantee that you will come out unscathed. In some instances, an executive may need to go to court to get the golden parachute enforced.

Surviving a corporate restructuring means positioning yourself so that you can continue to advance your career with minimum disruption, whether you remain at the restructured organization or move on. In addition to keeping your skills sharp, it helps to maintain a high profile within the profession and build an extensive network of MIS industry contacts. Also important are broadening skills and experience and maintaining good relations with people throughout your organization.

"People must develop their network before a merger or restructuring is announced," says Howard Pines, a principal at Beam Pines, Inc., a New York-based outplacement firm. While it is never too late to start, you cannot expect to boost your profile or build a network overnight. Pines emphasizes the importance of publishing papers, playing an active role in trade associations by volunteering to participate on committees and speaking at industry functions and conferences.

"Even if someone is young, he or she may need to go out and get the new skills," Pines says.

Still, if Biddle, a 32-year veteran at American Standard, suddenly found himself being bumped from his organization in the kind of restructuring that almost took place there, that network of contacts would be a tremendous asset.

American Standard recently thwarted a hostile takeover bid through a leveraged buyout by top management. As the news spread concerning the hostile takeover, Biddle started receiving telephone calls from his outside contacts inquiring if he or any of his top people would be available.

Diane Chilton, a human resources information systems supervisor at Dallas-based Southland Corp., also weathered a restructuring in which the company was asked to join the firm. "A lot of people were laid off," Chilton adds. But by remaining flexible, she managed to advance in the organization.

Within Southland, the majority of jobs fall in the central personnel department or in the 7-11 stores that the company operates. Chilton says her ability to move from the smaller MIS group into personnel possibly saved her career at the firm.

Survival training Chilton's experience illustrates other outcomes to surviving a restructuring, consultants say.

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SOFTWARE DESIGNERS: C, UNIX, NETWORKING COMPUTING OPERATIONS, ACT AS TECHNICAL ADVISOR TO PRODUCT DEVELOPMENT STAFF AND DEVELOP SPECS FOR INTERNAL DEVELOPMENT STANDARDS, TESTING AND IMPLEMENTATION.

SYSTEM ANALYST: DETERMINE REQUIREMENTS FOR LARGE SYSTEM PROJECTS. INTERFACE WITH USERS DEFINING SYSTEM REQUIREMENTS, MARKETING FEASIBILITY SURVEYS, IMPLEMENTATION SPECS, ETC. EXPOSURE TO STRUCTURED DESIGN METHODOLOGIES, FLOW DIAGRAMMING.

INSTALLATION SPECIALIST: EXPERIENCED IN LARGE COMPUTER SYSTEM INSTALLATION MANAGEMENT INCLUDING TRAINING AND TROUBLESHOOTING.

TECHNICAL SPECIALIST: PROVIDE TECHNICAL SUPPORT TO INSTALLATION AND CUSTOMER SERVICE PERSONNEL IN AREAS SUCH AS SYSTEM APPLICATION PROGRAMS, INTERFACES AND RELATED SOFTWARE PRODUCTS.

HARDWARE SPECIALIST: EXPERIENCED WITH MINI SYSTEM INSTALLATIONS AND MAINTENANCE ISSUES, PERIPHERALS, DATA COMMUNICATIONS, NETWORKING AND VENDOR COORDINATION.

SOFTWARE ENGINEERS/PROGRAMMERS: TRANSFER SYSTEM DESIGN TO HIGH LEVEL LANGUAGES. C, UNIX, NETWORKING.

OPPORTUNITIES IN HEALTHCARE WITH HEALTHCARE INDUSTRY LEADER

Now is the time to consider new exciting career opportunities at Community Health Computing, Inc. An aggressive new product development effort using leading technologies has created the following opportunities at the Houston, Texas headquarters.

SOFTWARE DESIGNERS:
- C, UNIX, networking computing operations, act as technical advisor to product development staff and develop specs for internal development standards, testing and implementation.

SYSTEM ANALYST:
- Determine requirements for large system projects. Interface with users defining system requirements, marketing feasibility surveys, implementation specs, etc. Exposure to structured design methodologies, flow diagramming.

INSTALLATION SPECIALIST:
- Experienced in large computer system installation management including training and troubleshooting.

TECHNICAL SPECIALIST:
- Provide technical support to installation and customer service personnel in areas such as system application programs, interfaces and related software products.

HARDWARE SPECIALIST:
- Experienced with mini system installations and maintenance issues, peripherals, data communications, networking and vendor coordination.

SOFTWARE ENGINEERS/PROGRAMMERS:
- Transfer system design to high level languages. C, UNIX, networking.

If interested, send resume and salary history in confidence to:

Director of Human Resources
5 Greenway Plaza, Suite 2000
Houston, Texas 77046
Contel. Telephones. IBM. Atlanta. Today, the combination of the four is yielding a new systems initiative like none you've ever heard. For systems professionals, this means projects that provide the challenge and excitement of building sophisticated new systems with leading edge technology.

THE INITIATIVE AND THE COMPANY BEHIND IT.
The company is Contel, the $3-billion Forbes 500 corporation providing telecommunications and information services around the globe. We're also the third largest independent telephone company in the nation. Because the scope of our telephone business is so far-reaching and fast-growing, we've committed millions of dollars to centralizing our telephone operations' billing, customer service and financial systems at our new facilities in Atlanta, Georgia—our corporate headquarters. And for systems professionals, bringing the telephone business home to Atlanta means a whole new set of opportunities in an industry on the move.

THE APPEAL OF THE TELEPHONE.
The telephone business is one of the most technically challenging and progressive industries in communications today. And the telephone business at Contel is even MORE exciting. Because we're a customer-driven company, we're dedicated to providing the industry's most outstanding and efficient telephone service. That's why we're installing three new customer support systems: Billing Information System (BIS)—to assure more accurate and timely billing for our 2.5 million telephone customers, Service Information System (SIS)—to provide fast and efficient customer service, and the Financial-Administrative System (FAS)—to serve as an integrated financial applications system. And if you join us as a systems professional, how these systems run will depend on your expertise and our mainframe environment.

THE TECHNOLOGY BEHIND THE INITIATIVE.
In a word, IBM—the technology that promises to make our new facility one of the largest, fastest-growing, technologically advanced shops in the Southeast. A shop complete with IMS, DB/DC, DB-2, PACBASE, CICS, CASE Tools, and SNA networks. Where experimentation and innovation are all part of the process. And where performance is not just recognized, but rewarded.

WHERE IT'S ALL HAPPENING.
Atlanta, Georgia. A city where the people and climate are warm, and business and technology are booming. A place where you can enjoy a dynamic lifestyle filled with educational, sporting and entertainment events. Or just sit back and soak in the grandeur of the Deep South. It's no wonder we're bringing our telephone business home to Atlanta. For us, there's just no sweeter place to be!

HOW ABOUT YOU?
You've heard the pitch. You've read the facts. Now it's time to act. If you're an IBM systems professional with a college degree, 3-10 years of large scale IBM systems development experience and the ability to really make things happen, Contel in Atlanta is where you want to be. So pick up the phone, dial 1-800-426-3956, 24 hours a day, 7 days a week, and tell us loud and clear that you're sold on Contel. It could be the smartest call you'll ever make. And that's no sales pitch. We are an equal opportunity employer m/f/h/v.
**COMPUTER CAREERS MID-WEST**

**YOUR CONTACT POINT WITH A POWERFUL FUTURE...**

Madison Gas & Electric

MGE is a gas and electric utility serving the people of Wisconsin. As we grow, we need highly motivated people who can help us continue to provide electric and gas services in a safe and reliable manner.

**SENIOR SYSTEMS PROGRAMMER—TECHNICAL SERVICES**

The position, located in the Technical Services Group of the Information Management Department, will have the opportunity to play an important role in directing our ongoing environments.

**Requirements:**
- At least four years of progressively responsible technical support responsibilities.
- Demonstrated ability to handle multiple tasks and resolve problems.
- Excellent written and oral communication skills.
- Willingness to work in a 24-hour technical support center.

**SECURITY SPECIALIST—DATA ADMINISTRATION**

The position, located in the Data Administration section of IBM, will perform duties related to security and information protection.

**Responsibilities:**
- Ensure that the mainframe security packages are maintained.
- Perform periodic audits and checks of security packages.
- Provide security training to users.

**General DataComm, Inc.**

We are in equal opportunity employer. m/f/h.

**Get with the program.**

**Systems Programmers/Programmer Analysts**

Working for Humana will give you opportunities to further your systems career with one of the largest names in the health care industry.

Our company is constantly growing, and to keep up with our growth we need experienced professionals to handle our advanced technical systems. We offer a great salary, a generous benefits package, a fitness center and an excellent work environment.

As a Systems Programmer, you must have a minimum of two years experience with TAND, TACL and MEASURE. This position will be responsible for network systems design, development of applications, and direct pre-sales support. Qualified applicants will be familiar with protocols, networking, and mainframe applications. Excellent communication and business acumen skills are desirable.

Other openings are currently available across the country. In addition to a very attractive salary, we offer an outstanding benefit package which includes medical and dental insurance, a 401K plan, and stock purchase plan.

For prompt, confidential consideration, send your resume to: Mr. Larry Braun, General DataComm, Inc., 915 Hartgro Rd., Suite 250, Oak Brook, IL 60521.

**Honeywell DOCS COBOL, Datacomm, General DataComm, Inc.**

We are in equal opportunity employer. m/f/h.

**HAVE YOU CONSIDERED CONSULTING?**

It offers unsurpassed variety, exposure to the latest technologies, and interaction with business and technical professionals in diverse industries.

**Consider AIC.**

**Analysis International Corporation is Minneapolis-St. Paul's leading computer consulting firm, offering excellent training, competitive salary and full benefits for professionals with 3-5 years of experience in any of the following:**

- IBM Mainframe
- Honeywell DOCS COBOL
- DEC BASIC
- DEC Modula-2
- DEC DB2
- VAX/VMS
- RDB
- VAX
- VMS
- RALLY
- ORACLE
- HPE

**For consideration, call Carol Lee at 1-800-339-9629 or send your resume to her at: Analysts International Corporation, Dept 204, 6020 Nicollet Blvd., Minneapolis, MN 55409**

**AIC**

**Atlanta Group Systems, Inc.**

We are an equal opportunity employer.

**RESEARCH TRIANGLE OPPORTUNITIES**

We are recruiting experienced leaders for a new research group focused on Computer Aided Design and Engineering. Computer Aided Design and Engineering systems are being developed to provide comprehensive and integrated CAD/CAM/CAE solutions. This new group will be responsible for the development of these new systems. Requirements include extensive experience in existing CAD/CAM/CAE systems, as well as the ability to work effectively on a team. Excellent verbal and written communication skills are also required. Our goal is to attract the best people available. We offer competitive salaries and benefits, including health insurance and retirement plans. For more information, please call or send your resume to:

**MIS DIRECTORS**

If you need good people, we've got them. Computerworld reaches more than 612,000 computer pros every week. That's more qualified computer pros than any newsletter can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your openings.

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 408-879-0700.

**Computerworld**

APRIL 10, 1989

**Mind Spring Press**
AMERICAN MANAGEMENT SYSTEMS, INC.

PROFESSIONALS

Testing the Limits of Technology

A Terrific Opportunity

Computer Consulting Group

One of the leading systems development and consulting firms in the country has immediate openings for talented Programmer-Analysts and Systems Analysts. Each position offers a competitive salary & benefits package, microcomputer experience, and on-the-job training in Systems Design. Qualified candidates will have experience in the areas of FORESIGHT, OS/VS, CODADD, and DB2.

POC/PC: SPECIALIST
SPECIALIZING IN: SYSTEMS DESIGN, OS/VS, CODADD, DB2

TECH EX: SPECIALIST
SPECIALIZING IN: SYSTEMS DESIGN, OS/VS, CODADD, DB2

A major Fortune 500 company, located in Northern California, has immediate openings for Senior Programmer-Analysts. These positions will include responsibility for a major accounting system. Qualified candidates will have experience in the areas of IBM's IMS and 1-2 years experience in developing computer programs for IBM's MVS. All candidates should have a BSCS degree. This position requires a MVS background.

Computer Consulting Group

Salary Range $33,000 to $42,000

AMERICAN MANAGEMENT SYSTEMS, INC.

803/831-2129

An Equal Opportunity Employer

COMPUTER CAREERS MID-WEST

Ameri-Sys, Inc.

Ameri-Sys, Inc.

Now staffing for long term growth. One person at a time.

1989 completed our 19th consecutive year of revenue growth. As one of the nation's largest independent computer systems and services firms employing more than 2,700, we are best known for applying information systems technology to the complex management problems facing America's largest organizations.

Our advanced technology requires experienced professionals to meet the challenge of developing and creating new systems that are critical to our growth. You'll experience the diversity of multiple projects, exposure to all aspects of the business, working with the most talented individuals in the industry and an environment that not only accepts but encourages your creative ideas.

Programmer Analysts

Requires 2-5 years IBM mainframe experience including COBOL, OS/MVS and CICS on-line development. Demonstrated interpersonal skills are a must.

Systems Programmers

We have excellent opportunities for talented individuals with skills in one or more of the following areas: DPHSM, DASD monitoring packages, security packages, CICS interfaces, IDMS internals, VTAM, NCP, and NETERW.

If you would like to join a progressive organization that rewards talent with comprehensive benefits, attractive salary, stock purchase and an environment that promotes personal growth, send your resume with salary history to: LIMITED DISTRIBUTION SERVICES, Employment Manager, Two Limited Parkway, P.O. Box 182198, Columbus, Ohio 43218. An equal opportunity employer. M/F.

LIMITED DISTRIBUTION SERVICES

Data Processing

Now staffing for long term growth. One person at a time.

1989 completed our 19th consecutive year of revenue growth. As one of the nation's largest independent computer systems and services firms employing more than 2,700, we are best known for applying information systems technology to the complex management problems facing America's largest organizations.

Our expanding Chicago office offers significant opportunities with a great group of people working at the top of their profession, we warmly welcome your inquiry.

DATA PROCESSING PROFESSIONALS

Become a member of the team who has made the company's reorganizations, recoveries, performance analysis and tuning. logical design and physical implementation knowledge of computing systems, preferably BM running System/370. Requires a college degree. BSCS, Math or related field, 1-2 years experience.

Salary is Commensurate with experience and qualifications. We also offer outstanding benefits, including pay for overtime, medical insurance and much more. If you meet these qualifications and wish to be in a challenging career with Union Electric Company, submit your resume and college transcript for consideration to: J.L. Heitman; UNION ELECTRIC COMPANY; P.O. Box 1449; St. Louis, MO 63166. Equal Opportunity Employer M/F.

UNION ELECTRIC

FORTRAN/VAX & PC TURBO PASCAL

heavyweight chance of a lifetime to build a DP department from scratch and launch a remarkable new PC software system in the market.

Our core business requires you to take over complex statistical analysis and enhance this essential application. Hours flexible, unusual gratuities, well-known organization.

Come to a place where people work hard but always have fun. The Cessna Aircraft Company, World Leader in General Aviation has openings for the following positions:

ANALYSTS ENGINEERING DATA PROCESSING/CAD SPECIALISTS

Requires a college degree in Computer Science or Math. Must have 1-2 years experience with Data Graphics Systems. FORTRAN and good working knowledge of assemblers and operating systems. Also, working knowledge of computing systems, preferably IBM running under MVS.

DATABASE ADMINISTRATORS

Requires a BSCS or equivalent and 1-3 years experience in IBM mainframe databases. Experience with DB2, IMS and CODADD knowledge of monitoring, performing analysis and tuning, logical design and physical implementation.

ANALYSTS PROGRAMMERS

Requires a college degree, BSCS, Math or related field, 1-2 years experience in developing computer programs for IBM's MVS and 1-2 years experience in developing computer programs for IBM's relational database management system (RDB). You should have experience in developing and testing systems, knowledge of DBMS, CODADD, and MVS.

If you are qualified for these positions and would like the opportunity to work in an environment of challenge, please send your resume and salary history to: apply in person at:

Cessna Aircraft Company
World Leader in General Aviation
P.O. Drawer 1449, St. Louis, Missouri 63166

Equal Opportunity Employer M/F.
APPLICATION SYSTEM MANAGERS

SENIOR SYSTEMS ANALYSTS

SENIOR PROGRAMMER ANALYSTS

Renton's leading Truckload Carrier offers a unique opportunity to become a team member of one of the most exciting Data Processing developments around. Plus, the opportunity to live in the beautiful Arkansas Ozarks. We are growing rapidly and need several individuals who are energetic, professional and seek a challenge. Equipment includes an IBM 3090 running MVS/ESA.

APPLICATION SYSTEM MANAGERS

The ideal candidate will possess 5+ yrs experience as a project leader or Applications Manager, and have a proven track record of good project management. Must be capable of applying techniques for structural programming and top-down systems design. Excellent team management skills are a must.

SENIOR SYSTEMS ANALYSTS

The ideal candidate will have 5+ yrs experience in systems analysis and design. Capable of conducting user interviews to determine detail requirements and procedures which meet departmental needs. Responsible for writing program specs, conducting system and acceptance testing, writing user documentation.

SENIOR PROGRAMMER ANALYSTS

The ideal candidate will have 5+ yrs experience in the data communications industry and a bachelor's degree. Specific experience in LAN industry is required. For consideration, candidates will possess a minimum salary of $24,642 (experience a plus.)

EMPLOYMENT MANAGER

Dukane Corporation

2900 Dukane Drive

St. Charles, IL 60174

An equal opportunity employer M/F/H/V

Now you can target your recruitment advertising to the qualified computer professionals you want to reach - where you want to reach them. All you need is the new Computer Careers Network. Here's how it can work for you:

You choose the newspapers. Depending on who you're looking for, you can select the combination of five newspapers that best suits your needs - Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week Editions.

You choose the region. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Of course, national buys of individual newspapers or various combinations are also available when you need to extend your reach.

You don't pay for readers you don't want. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network puts you in touch with qualified computer professionals - and only those qualified computer professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Classified Advertising Director, at 508-879-0700.

Sales Offices

John Corrigan, Classified Advertising Director, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 508-879-0700.

BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, Nancy Percival, Regional Manager, 508-879-0700 (in Massachusetts, 508-879-0700) Andrew Rowe, Account Executive.

WASHINGTON, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031; Katie Kress, Regional Manager, 703-573-4115; Pauline Smith, Account Executive, 800-343-6474.

NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652; Warren Kolber, Regional Manager, 201-967-1350; Jay Novack, Account Executive 800-343-6474.

CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018; Patricia Powers, Regional Manager, 312-827-4433; Ellen Casey, Account Executive 800-343-6474.

LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474.

SAN FRANCISCO: 18088 Sky Park Circle, Suite 145, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474.

It's the efficient way to reach qualified computer professionals.

Systems Testing Engineer - Plans, designs, and executes testing of AT&T and dial digital equipment and software for a complete line of communications equipment. Requires knowledge of testing equipment, software for a complete line of communications equipment, computer systems and data communications. Send resume to: Dukane Corporation, Employment Manager, 2900 Dukane Drive, St. Charles, IL 60174. Reference: ST-9952-D.

RPG PROGRAMMER

FOR IMMEDIATE OPENING!

Seeking a qualified individual with 3 to 5 yrs experience in Data Processing. Must be capable of writing program specs, conducting system and acceptance testing, writing user documentation. Ideally, we are seeking someone with experience in the data communications industry.

EMPLOYMENT MANAGER

Dukane Corporation

2900 Dukane Drive

St. Charles, IL 60174

An equal opportunity employer M/F/H/V

PRINCIPALS ONLY PLEASE

ASSOCIATE SYSTEMS ANALYST

Dukane's continued growth and expansion has resulted in the development of a LAN product line. An immediate opportunity exists for the qualified individual to assume a high visibility Product Manager position to lead the marketing plan for this state-of-the-art product line.

For consideration, candidates will possess a minimum of 5 yrs experience in marketing, sales or sales support in the data communications industry and a bachelor's degree. Specific experience in LAN industry is required. For consideration, candidates will possess a minimum salary of $24,642 (experience a plus.)

PRODUCT MANAGER, LAN

Dukane Corporation

2900 Dukane Drive

St. Charles, IL 60174

An equal opportunity employer M/F/H/V

PRINCIPALS ONLY PLEASE

It's the efficient way to recruit qualified computer professionals.
The Switch
The Newsletter for Telecommunications Professionals
April 10, 1989

Stromberg-Carlson
Seeking VAX Cluster Management Specialist.

Stromberg-Carlson has an excellent opportunity for an experienced professional highly motivated by complex network challenges to provide VAX system and cluster management expertise.

The Orlando, Florida subsidiary of GPT has an extensive and expanding investment in VAX with multiple clusters which include 86XX and 63XX machines. This network also includes over 500 PC's and a number of HP3000 systems.

A BS in Computer Science or appropriate discipline plus 3-6 years' experience in a cluster environment is required. Intimate VAX experience in a business systems environment is ideal.

Candidates Asked to Respond Immediately.

Forward resume to: STROMBERG-CARLSON, Box DB, 400 Rinehart Road, Lake Mary, FL 32771 or FAX to 407/333-5180. NO PHONE CALLS PLEASE. Equal Opportunity Employer.

SYSTEMS PROGRAMMER/SENIOR SYSTEMS PROGRAMMER

AMTA Buildings, a leader in the non-residential metal building industry, headquartered in Memphis, Tennessee has an opening for an experienced systems professional. This position will be key to maintaining sophisticated systems planning both distributed and centralized processing.

The successful candidate will possess 5 to 10 years experience supporting IBM mainframe software, the ability to manage projects and evaluate new products in a state-of-the-art environment.

This opportunity allows a unique candidate to work with the technical areas with decision-making responsibilities.

The systems infrastructure includes over 40 IBM 4381's in Memphis networked with over 7 IBM 3037 systems located coast-to-coast. Primary software includes VM/VAX, SOLIDS, VMICOMP, and CICS. Responsibilities will include operational control of systems software at all locations, implementation of software upgrades and enhancements, software problem solving and advising on linkages and linkages. Other responsibilities include the development, implementation and support of an extensive CICS pac system network linked to AMTA Buildings mainframe network.

This is an excellent opportunity for an experienced systems professional to work with wide latitude in all areas of computer operating systems including planning, performance measurement, installation and maintenance. Experience in telecommunications, hardware software and systems software and programming is essential.

We offer a highly competitive salary, comprehensive benefits package, a professional work environment, and a challenging career.

Send your resume with salary history in confidence to:

Margaret Olsen
AMTA-Buildings
400 Poplar, Suite 400
Memphis, TN 38119
An Equal Opportunity Employer M/F

SYSTEMS DESIGN ENGINEER

Design, test, and debug Operating System software to leverage best practices in an environment using UNIX, VAX/VMS, etc. Familiarity with UNIX, VAX/VMS necessary. Requirements include 3 years experience in developing Operating System software. Requires BS degree in Computer Science. Industry experience in software design is also required.

KENDA SYSTEMS INC.

Multiple Openings in NY - NJ - CT

SOFTWARE SUPPORT TECHNICIANS

We provide consultative services to the financial industry. Our consultants will have the opportunity to work on a variety of projects including assisting clients in setting up VAX systems, implementing new products, and providing product training.

Send resume to KENDA SYSTEMS INC., 50 E 42nd St., Suite 1508, NY, NY 10017 or call 212/896-0800.

COMPUTER CAREERS

"It takes genius and courage to originate, not imitate." -Anonymous

Originality at Ashton-Tate takes many forms: dBASE IV™, FRAMEWORK II™, Multistack Advantage II™, DBMS/APPLI-AKT™. Full impact from our Macintosh line and more of the world's best-selling software products. The future was a success to simple we dream it and do it before anyone else. What is why our organization has grown more than 2000% since 1983 to include five advanced development centers and twelve subsidiaries.

Now the third largest company in the microcomputer software industry with opportunities available in California and throughout the country. Ashton-Tate's view of the future is wide open. Open to ingenious ideas and courageous individuals who can put them into action. Your direct involvement will begin in one of the following positions:

TECHNICAL EDITORS

Openings available in Southern California

Will edit documentation for style, consistency and clarity to ensure compliance with company standards and correct communication for target audiences. Requires related BA/BS degree or equivalent. 2 years experience in software documentation editing and PC knowledge desired.

TECHNICAL WRITERS

Openings available in Southern California

Working closely with Programmers, Product Managers and Graphic Artists, will develop, organize and write technical reports, white papers, product documentation for print and on-line use. Requires related BA/BS degree or equivalent. 3 years software/document technical writing experience; database product knowledge and familiarity with Ashton-Tate products desired.

ADVANCED SUPPORT REPRESENTATIVES

Openings available in Southern California

Will assist customers in building pilot projects and developing applications models to prove feasibility and increase user knowledge of Ashton-Tate products. Requires experience in UNIX, VAX/VMS, System 1/X or SOLARIS in C or Mathematics 400 preferred. Background must include 1-3 year applications or systems development experience with large DBM environments.

ACCOUNT EXECUTIVES

Openings available Nationwide

Will sell productivity and establish/maintain positive relations with existing and prospective large corporate accounts. Involves developing sales strategies, implementing merchandising programs, securing/processing orders, researching/resolving customer problems, recommending product modifications, coordinating negotiations with regional personnel and providing input for sales forecasts. Minimal requirements include 4+ years sales experience with 2 years handling medium to large accounts.

SENIOR SALES REPRESENTATIVES

Openings available Nationwide

Will sell productivity and establish/maintain positive relations with existing and prospective large corporate accounts. Involves developing sales strategies, implementing merchandising programs, securing/processing orders, researching/resolving customer problems, recommending product modifications, coordinating negotiations with regional personnel and providing input for sales forecasts. Minimal requirements include 4+ years sales experience with 2 years handling medium to large accounts.

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Opportunities also exist in Northern & Southern California for:

MEMBERS SOFTWARE TECHNICAL STAFF

PRODUCT MANAGERS

SOFTWARE SUPPORT TECHNICIANS

ADMINISTRATIVE ASSISTANTS

Our goal? To extend Ashton-Tate's leadership in the microcomputer software industry. We're realizing this goal by attracting the finest people and giving them the tools and environment to realize their dreams in the business. You're mind.

Think about the innovative environment, the challenging opportunities and the competitive compensation/benefits package. Then take your resume across the form of a resume to the Ashton-Tate Human Resources Dept. KH-15C-02, 3001 Hamilton Ave., Torrance, CA 90402. An Equal Opportunity Employer.

OPENINGS AVAILABLE

Software Consultant

A nationwide company needs a talented and well-rounded professional to assist them in providing sales support. In addition to handling daily tasks, this position will be responsible for: providing sales support and training to regional offices; working with Programmers to develop new products; presenting new products to target audiences. Requires related BA/BS degree or equivalent. 3 years sales or sales support experience with major software products desired.

APPLICATIONS SPECIALIST

A nationwide company needs a talented and well-rounded professional to assist them in providing support to end users. In addition to handling daily tasks, this position will be responsible for: providing end user support; maintaining and updating documentation; presenting new products to target audiences. Requires related BA/BS degree or equivalent. 3 years sales or sales support experience with major software products desired.

SOFTWARE ENGINEER

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Josie P. Beach, 20101 Hamilton Ave., Torrance, CA 90402. An Equal Opportunity Employer.

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Josie P. Beach, 20101 Hamilton Ave., Torrance, CA 90402. An Equal Opportunity Employer.

O A P R 10, 1989

COMPUTERWORLD
Computer Horizons

Gives You The Royal Treatment

DB2 Training Provided

At CHC, our staff members reign supreme. We treat you royally because we value your skills and realize you are the driving force behind our impressive success.

Behind our impressive success, we've grown into a network of 31 state-of-the-art facilities around the country with treatment reflected in your career advancement.

We seek several experienced CICS professionals to join several exciting projects. Many of these assignments are for DB2 professionals with CICS and we will provide training.

Now is the ideal time to move up to Consulting Opportunities. Send your resume or FAX (615/244-4947) resume to your regional office.

COMPUTER CAREERS

COMPUTER CAREERS

**DB2 Training Provided**

At COMPUTER CAREERS, we provide comprehensive training in DB2 and other technologies. Our courses are designed to help you advance your career and stay current in the fast-paced world of information technology.

**Programmer Analysts**

We are currently seeking qualified professionals for various positions throughout the country. If you are interested in DB2 and have experience in this area, we encourage you to apply.

**Computer Horizons**

DB2 Training Provided

We treat you royally because we value your skills and realize you are the driving force behind our impressive success.

We seek several experienced CICS professionals to join several exciting projects. Many of these assignments are for DB2 professionals with CICS and we will provide training.

Now is the ideal time to move up to Consulting Opportunities. Send your resume or FAX (615/244-4947) resume to your regional office.

**COMPUTER CAREERS**

We provide comprehensive training in DB2 and other technologies. Our courses are designed to help you advance your career and stay current in the fast-paced world of information technology.

**DB2 Training Provided**

At COMPUTER CAREERS, we provide comprehensive training in DB2 and other technologies. Our courses are designed to help you advance your career and stay current in the fast-paced world of information technology.
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World Class Opportunities Throughout the US.
Controller market softens

New IBM communication controllers put a dent in the used marketplace

BY BENJAMIN T. GALE
IDC FINANCIAL SERVICES CORP.

Secondary market prices for IBM's 3725 communication controller have declined severely during the last 12 months. This downward trend began on Jan. 26, 1988, when IBM announced its 3745 high-end communication controller.

Because the 3745 can perform two to four times the work of a 3725, users, in many cases, consider two to four times the work a single 3745. The announcement of the 3745 aroused concern from users of 3725s, causing values of used 3725s to drop. Once the 3745 Model 210 began shipping in March 1988, 3725 values began to drop even faster. This imbalance caused the current tremendous supply of 3725s on the secondary market.

According to Framingham Mass.-based IDC Financial Services Corp., used retail values for the 3725 dropped 72% on the secondary market between March 1986, when the machine was introduced, and March 1988. Currently, the supply of used 3725s is far outstripping the demand, which is the primary reason the 3725s have lost their value so rapidly.

Additionally, rumors of IBM announcing a smaller version of the 3745 have also contributed to the decline in used 3725 values. The current 3745 models are more of a migration path for 3725 users, whereas the smaller version of the 3745 would be considered a direct replacement of the 3725.

**Baby steps**

This low-end version of the 3745 would likely offer the same processing power as the 3745— but with a smaller footprint. The number of lines supported would also be similar to the 256 lines that are handled by a 3725. In addition, the low-end 3745 would support T1 lines; the 3725 does so, but only one T1 line can be installed and only through a request-for-price quotation.

Because the 3725s have lost their value so rapidly, some end users have elected to retain their 3725s by installing additional memory and features. This, along with demand for memory, has strengthened, and used values have increased. For instance, 2656K-byte increments are trading at 85% to 95% of list price on the wholesale market.

Dealers report that supplies of both memory and features are good, which illustrates that it is not the lack of supply that has forced the used values of memory and features, but the strong demand. Also, a dealer can deliver memory and features to a customer faster than IBM — another reason dealers can command these high values.

IDC Financial Services forecasts that values of used 3725s will level off by year's end as they reach low price levels. Over the last four to five months the price decline of 3725s has strengthen, and used values are close to IBM's list price. The 3720 is the most popular machine within the 3720 communication controller family. This model provides direct attachment to the host processor through a byte multiplexer, block multiplexer or selected channel of host processors.

According to IDC, demand for the 3725 is currently not available on the secondary market because it has been shipping for more than a year. IDC Financial Services forecasts that demand for the machine has been reasonably strong.

For sale by contact IDC Financial Services' Terri LeBlanc at 508-872-8200.

Controller contraction

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Closing prices for the week ending March 31, 1989

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<th>XT Model 086</th>
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<tr>
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<td>$700</td>
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<td>$1,750</td>
<td>$2,775</td>
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<td>$2,400</td>
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<tr>
<td>Recent low</td>
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<td>$900</td>
<td>$1,000</td>
<td>$1,000</td>
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**COMPUTERWORLD**

APRIL 10, 1989
A training management system

The ideal one would help groom employees amid constant flux

BY BILL SERRELL

In most companies, data processing training operates directly out of the DP organization. Invariably the instructors have worked on production systems and rarely gets any systems development support — nor do DP development units construct the training department as a client or user.

The assumption that the technical training unit includes a technical staff and can take care of itself is not accurate. The instructors are busy teaching and developing courses and frequently do not possess the technical skills to develop a training management system. They certainly do not have time to run and maintain a system. It is a constant battle to get the training staff to simply input all the necessary data into a system.

As skills inventories in personnel systems have been almost impossible to build and maintain, it is mandatory that companies keep an accurate record of employee participation in self-study courses, off-site courses, or the training department, and internally developed training and public seminars.

Training managers, however, need considerably more than a history of student activity to do their job — they need a system to analyze and report on the past, present and future.

The ideal system

If you were to build the ideal training management system, what kind of information should it maintain? For starters, student data is important. You would want names, titles, organizations and supervisors as well as training histories, including the time and place of courses; how they were delivered and how long they ran; test scores; student critiques; and instructors' evaluations.

You would also want to track which courses an individual enrolls in and perhaps maintain a customised plan for the training needed at his job level. The plan should include courses the person needs but has not enrolled in.

To measure the cost of training, a record of the student's salary at the time a course was taken would have to be maintained, as would any travel expenses. It would also be important to keep schedules in your system. You would want to track which courses are available and their software requirements. For in-house courses, you would want to know what room will be used and whether there are alternatives. You would want to know the instructor and assure there are no conflicts with his schedule. You would want to know what equipment is required, and again, avoid conflicts with other classes.

The concern with such conflicts implies that you must maintain a course inventory. This inventory could contain prerequisites for the course, the class length, who is capable of teaching it, any special equipment or software required and the preferred room layout.

In an ideal system, you could also maintain an inventory of course materials, the last time any maintenance was performed on them and the last time the course underwent a technical review to see that it conforms to the current corporate standards.

To handle registrations, you have to be concerned with in-house courses, public seminars and self study. If there are prerequisites, you want to know whether students are registered for courses in the proper sequence and the right time frame.

What happens if students cannot attend courses as planned? The registration sequence should automatically change.

What happens when there are students who are overbooked? Is their entire training plan and schedule modified appropriately, or can you adjust the order of student registrations in a given class based on criteria determined by business needs?

How do you automatically adjust the whole sequence of schedules and the student registrations for canceled courses? Can you compensate for these cancellations by adjusting your schedule or rearranging the student load in future classes?

How do you automatically notify both the students and their supervisors of all of this activity? How do you automatically keep the system clean and accurate when you have to add, subtract, or change employee information and what kind of filters are there with promotions, internal movement, turnover and replacements in the student population?

Your training management system requires some forecasting capability as well. Without a forecast of the courses you plan to deliver and an estimated student load spread over time, planning and the support staff become mere speculation at best.

In addition, without a forecast it is not possible to deliver management reports. It is not necessary for a corporation to understand how much it is spending on technical training and for what purposes, but it is important that the organization is confident that it is spending the right amount.

It is interesting to note that as necessary and generic as training management systems are, there are not that many available on the market. In most corporations, the systems operating today are either poorly maintained manual ones or homegrown automated systems that may not be documented, readily maintainable or transferable.

Well-designed training management systems will get the attention and the support they deserve as corporations move to strategic systems and begin to understand that their competitive advantage and productivity can stem directly from the quantity and quality of their technical training.

Serrell is a vice-president at Data Base Management Inc., a subsidiary of American Management Systems, Inc. in Manchester, Conn.

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Computers, however, opted for Sungard's "market validation" spin on the IBM entry. Sungard closed at 1442, up % of a point from the week's start.

NELL MARGOLIS

Wild world

Prices keep falling as unmet expectations pull shares down

In the wake of recent stock shocks from IBM, Digital Equipment Corp. and Unisys Corp., high-tech investments last week seemed to be going by the book — in this case, The World According to Garp. In John Irving's novel, both hero and reader get so conditioned to downers that the question becomes not whether there will be a next disappointment, but when it will occur.

It looked last week as if Tandem Computers, Inc.'s second-quarter revenue growth, while significant, would underperform Wall Street expectations, largely because of a European sales shortfall. Tandem stock closed Thursday at 1442, down 2% points.

IBM's midweek product debuts did not keep its falling stock from losing an additional 1% points by Thursday; it closed at 108. DEC, last seen inching upward, slid back 212 points to a Thursday close at 96.

Sungard Data Systems, Inc.'s stock slipped on the strength of IBM's announcement of its imminent entry into the disaster recovery market. Investors, however, opted for Sungard's "market validation" spin on the IBM entry. Sungard closed at 1442, up % of a point from the week's start.

NELL MARGOLIS
**A deal on storage**

IBM's price break on memory last week was the third time in two months that those price tags have been trimmed. The latest promotion offers customers discounts in the 20% range for both central and expanded storage if they buy before September.

In February, IBM reduced the prices by 11% for the initially expensive storage purchase and 17% for expanded storage. Central storage was cut by 9%. At the same time, it offered customers another $50,000 off total memory costs if they made their purchase by June. The latest promotional deal replaces this one.

When asked if the 20% promotional deal was enough incentive to make a purchase, Louis McKick, data center manager at Pacific Telecom, Inc., said, "It sure would be if we needed it. We just went from a 200E to a 400E and doubled our real memory. We don't have a need for expanded storage right now."

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**9370 clearer target for 8100 users**

**BY STANLEY GIBSON CW STAFF**

IBM released Version 2 of DPPX/370 last month, giving the system the ability to handle the operating system for new users as well as those migrating from IBM's old System/360.

DPPX/370 was announced last year as a migration platform for 8100 users converting to the Enterprise System/390. Version 1 bowed in December 1988.

Although IBM is seeking to reach out to new customers with DPPX/370, its appeal is limited mainly to a distributed processing niche in which an MVS-based IBM host controls a number of remote 370 systems.

The company encourages 8100 users to migrate to the IBM 370 architecture using DPPX/370, even though the operating system will only run on the ES/9370 and not other 370 architecture systems such as the ES/4381. DPPX/370 is also outside IBM's grand plan to offer consistency across all IBM processors and operating systems.

Among the enhancements in Version 2 are several improvements to the Distributed Processing/Display System (DPS)/DPPX and DisplayWrite/DPPX, which offer interfaces similar to MVS versions of those products.

- Support for both 16M bit/sec. and 4M bit/sec. versions of the IBM Token-Ring network.

IBM has added more enhancements to DPPX/370 and reiterated its intent to provide larger and more complex systems.

Bill Falconer, president of PS Technology, Inc., in Denver, a developer of DPPX-based railroads, said he is selling his package to new 9370 customers as well as migrating 8100 customers.

DPPX offers remote maintenance features that other 9370 operating systems, such as OS/VS/VS, don't have, the developer claimed. "DPPX can run at a site without an operator. It is more compact and easier to use than VM," Falconer said.

Carl Wohlers, IBM product administrator for DPPX/370, also praised DPPX's distributed processing features, which he said were ahead of those offered by other operating systems. He added that DPPX still has deficiencies, and he cited the lack of a relational database management system. Therefore, many users may continue to prefer VM.

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**IBM rallies with recovery service**

**BY JAMES DALY CW STAFF**

ARMONK, N.Y. — IBM unveiled plans last week to tap into the rapidly emerging disaster recovery market with a backup contingency service it will begin offering immediately.

IBM said its Business Recovery Services will be available on a limited basis and will provide customers access to a recovery center for recovery-plan testing and disaster recovery operations.

IBM has long been rumored to have its eye on a full-blown entry into the disaster recovery business but has previously only dabbed in the market. IBM Germany offers a mobile disaster recovery setup, while domestically the firm offers classroom training and consultancy, albeit on an individual basis. "More and more of our customers are telling us that disaster recovery plans are a vital part of their business that they cannot function without," said Jim Boyle, an IBM division vice-president for Domsie, which will be in charge of the operation.

IBM has little to lose on the venture except a bit of red ink. The firm has recently been forced to formulate some disaster recovery plans of its own. Domestic business has been off, third-quarter financials are not expected to meet early predictions, and IBM has increasingly turned to the services market to help push its $50 billion annual revenue boulder uphill.

Well-publicized calamities such as a fire at a telephone-switching station near Chicago last May that knocked out more than 150,000 computer-to-computer connections have turned the disaster recovery market into a mother lode.

The trend toward contingency planning — which has been spurred by government regulations requiring firms with federal contracts to have such plans — will cause the market to grow 20% annually until it pops the $1 billion mark in 1995, said a study by The Legewey Group.

Unstoppable overseas potential is also great in markets such as the Far East, where interest in contingency planning is just beginning to secure a beachhead.

**Hot sites**

IBM will employ two large systems, hot sites — one in Tampa, Fla., and another in Franklin Lakes, N.J., that is scheduled to open by the third quarter — as well as a dozen regional sites for smaller midrange system backup. Up to $45,000 is claimed on a 3909 Model 600. Users may subscribe to the service for one, three, or five years. Initially, service will only be provided to IBM or IBM-mixed sites.

Other disaster recovery-service vendors said they did not feel threatened by the IBM move because the market still allows plenty of elbow room. "We think it will be a boost for all of us," said John Butch, a division manager of Hotwire, which provides disaster recovery services for IBM midsize mainframes.

*COMPUTERWORLD APRIL 10, 1989*
IBM takes a peek: VM runs on a PS/2

IBM is quietly showing off the smallest expression yet of its 370 architecture at user group meetings from Boston to Los Angeles. The as-yet-unnamed product is a five-card 16M-byte system that runs IBM's V50/SP Release 5 in its entirety.

However, the box, priced at $18,000 per unit, is only being sold in quantities of 25 or more through special bids to customers with VM/SP licenses, according to IBM. It is also being marketed as a single-user-only workstation to distinguish it from the lower end of IBM's 370 line.

Although the 7437 will remain an unannounced IBM product, it will be shown at the IBM booth at Comdex/Spring '89, this week, IBM said. At the same time, IBM is reportedly considering whether it will sell the 7437 machine in single units rather than in lots of 25. No price has yet been set for a single-unit sale, according to Gary L. Smith, manager of market development for the 7437 in Poughkeepsie, N.Y.

IBM shaves PS/2 prices

WHITE PLAINS, N.Y. — IBM reduced the prices of its popular Personal System/2 Model 507 and Model 70 systems last week and also introduced a new version of the low-end Model 50. The 507 was reduced in price by 20%, bringing a 30M-byte fixed disk system down to $3,650. The Model 70 with a 64M-byte hard disk was shaved 8% to $5,494.

IBM also introduced a PS/2 Model 40 for $4,150 with one diskette drive and storage options, including a second diskette drive, a 20M-byte hard drive or a $950 30M-byte hard drive.

ED! software package rounds out IBM's line

BY ELISABETH MORWITT CW STAFF

WHITE PLAINS, N.Y. — IBM last week achieved its goal of becoming a full-source provider in the burgeoning electronic data interchange (EDI) market with the announcement of software that translates a variety of business documents to be exchanged electronically, speed-EDI transactions, IBM said. Soft-

mints business documents to be exchanged electronically, speed-

ings communications between business partners such as manu-

facturers, suppliers and distributors.

The software offerings come in three levels of service currently offered by IBM Information Net-

work, a value-added network service based in Tampa, Fla. IBM already offers the Expedite Communicator Series, which support a variety of communications interfaces — including a direct link to Information Network via a Remote Job Entry link.

"You don't have to use Com-

municator to access Information Network, but obviously IBM

would prefer you did," company spokesman Andrew Russell said.

Ace Hardware Corp., an Oak-

brook, Ill.-based hardware retailer, recently uses Information Net-

work to communicate with its dealer-owned stores and is thinking about using the ser-

vice for EDI as well, according to Don Schuman, Ace's director of information services. "Until now, we have not seen the 7437. They've been waiting for a practical desktop version of VM for some time. However, large numbers of VM developers might be better served by a single IBM 4381, which can serve 50 or more programmers for about $100,000, according to several software developers who have not yet seen the 7437."

"Individual workstations have only limited use in a soft-

ware development environment," said Peter Kronenberg, president of marketing at Cadam Corp. in Burbank, Calif. "Until now, we have set up 7437s at the shows, which required more space and more cooling. We were unable to demonstrate Cadam at many of our regional sales offices except in Denver and Detroit, where we had 9370s installed."

Booming expectations

The market for EDI products is projected to increase at a compound annual rate of 56%
**TRENDS**

**IBM's DOS/VSE**

For IBM, DOS/VSE may be both a dream come true and a nightmare. Despite rumors that company management longs to sign the operating system's death certificate, DOS/VSE — IBM's aging flagship system for small and mid-range machines — is thriving amid a young crowd of competitors, according to Jerry Berry, an analyst at Computer Intelligence in La Jolla, Calif.

To say simply that DOS/VSE has been a success would be an understatement.

Although its installed U.S. operating systems license base has slipped from 44% in 1984 to 35% this year, DOS/VSE remains the most widely used operating environment on IBM mainframes. Since 1984, the number of DOS/VSE licenses has climbed more than 10%.

However, at a time when IBM is soliciting conversion to its brassier MVS and MVS/ESA, according to Jerry Berry, an analyst at Computer Intelligence figures it, DOS/VSE retains a loyal user base.

**Penetration greater on smaller systems**

PERCENT OF EACH TYPE OF SYSTEM THAT RUNS DOS/VSE

**Native mode makes a comeback**

PERCENT OF INSTALLED DOS/VSE BASE

**I N S I D E L I N E S**

Merger maven turns inward? Computer Associates will announce something later today, but Sanjay Kumar, vice-president of product planning, wasn't providing any clues last week. Kumar would not confirm or deny internal and external reports that the company will merge its SPD and IPD divisions, which were formed after the company acquired Applied Data Research. "We pushed back the announcement because we wanted to make sure that all of our employees knew all the details before we announced it to someone else," he said, declining to specify what announcement he was referring to. Several sources, who requested anonymity, said the reorganization will bring 10% to 12% layoffs in both service and support and sales. If mum's the word at CA, so is SPFD, the trim new name of the combined SPD and IPD divisions, sources said.

Apple, of course, can do better. Apple engineers are said to be less thrilled with 3Com's emerging personal computer than Apple's Ethernet card; Apple thinks it can do better and has assembled a team to look into the matter. One idea is to build Ethernet onto the Mac's motherboard, said a source close to the project team.

This capability could work well with a Motorola 68030 but requires a higher clock speed than Apple now offers (16 MHz). On the Digital side of Ethernet, Apple and DEC have slated a May 8 briefing — also the first day of Apple's developers conference. The agenda features an Apple/DEC Communications Toolkit seminar, so it's a good bet the product will be unveiled then.

No copyright on ad copy? Executives at Access Technology, makers of the 20/20 spreadsheet package, are miffed at claims being made by Lotus in its promotional literature towing 1-2-3 Release 3.0. Lotus claims the yet-to-be-shipped Release 3.0 is the only spreadsheet that will be available across a range of environments with consistent commands, simplifying training and support for users. Access said 20/20 has had those features for several years and now seeks to have Lotus pull its literature out of distribution here and in Europe.

ISDN — In Search of Demand Now. Count MCI among the ISDN skeptics, at least in the short term. Dick Liebhaber, MCI's executive vice-president, said he hasn't seen much user demand for ISDN's Primary Rate Interface, although MCI is technically prepared to offer it if customers ask for it. He said the only ISDN service in demand is Automatic Number Identification, which MCI is preparing to offer as a separate feature unrelated to ISDN.

Success or sayonara. The supercomputing market should take an interesting twist this week when Japan's NEC announces a high-powered machine that will reportedly blow by any U.S.-made competition. Sources say NEC's machine, dubbed the SX-3, will attain a performance of 22 billion floating-point operations per second and utilize the Unix operating system.

Pulling in the NET. Network Equipment Technologies is expected to announce this week everything but the kitchen sink in an effort to plug up its weak spots in a no-holds-barred T1 market. A spokesman confirmed NET will be announcing expert systems-based network management; announced expert systems-based network management; the IDNX/10, which will fill in a yawning NET gap at the low end; and fractional T1 services, which will target even smaller sites that need bandwidth than full T1. Several industry sources said they also expect to see NET expand its plans for 45M bit/sec. T3 links as well as its relationship with local-area network bridge vendor Cisco Systems.

It was the Great Kahn who pulled off the PC Forum coup. Berland's president slipped under attendees' doors (read on, obviously) and offered a magazine featuring a story that cast aspersions on Lotus Chairman Jim P. Manzi. Kahn telegraphed Manzi and apologized twice for having "crossed the line in what is considered to be acceptable competitive marketing tactics." You tricksters out there don't have to sink to such depths; just call the hot line at 800-343-6474 or 508-879-0700, or contact News Editor Pete Bartolik on the CW electronic bulletin board at 508-626-0165, 508-626-0214 or 508-626-0235.
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hardware. All of which makes it a rather brilliant idea to call Robert Carpenter at 404-239-2000.

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anyone intending to spend some time there.