INSIDE

In Depth — Shaping the next five years of computing. Page 77.

Profile: Batman and Time are part of the high-stakes environment in which Don Winski thrives as head of information services at Warner Communications. Page 53.

CA fulfills Cullinet’s promise with code generator for IDMS users. Page 6.


Give capitalists enough rope, and they’ll try to pull Eastern Europe out of the information systems backwaters. Page 4.


LAN strategies: Don’t junk that old mainframe just yet

OS/2 lite pledge may fall flat

D&B unites software rivals

Systems give Gillette the razor’s edge
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**Quotable**

"Excitement is one thing, and instability is another."

VIVENI SPATHIPOULOS

**MANAGER'S JOURNAL**

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**UPDATE**

Cycle theory. In the year 1958, the U.S. was the No. 1 producer of every single consumer product — with one exception — and also led the world in production of all durable goods. We were even a net exporter of oil in that year, which will go down in history as our high watermark of the century. Today, our remaining clear dominance is in two areas, computer products and armaments. Of the top 20 publicly held firms in the world, only four are in the U.S. Oh yes, the lone product that kept us from our monopoly of world economic leadership in 1958? Bicycles! China wheeled ahead of the pack in that category.

**EXECUTIVE BRIEFING**

- Mainframes are not dinosaurs. Even with the growing number of applications moving from CPUs to local-area networks, IS executives say that mainframes retain a crucial role as central data repositories. Very large applications, such as airline reservation systems, payroll and direct-deposit checking, will continue to be mainframe-resident for the foreseeable future. Page 1.

- **MSA and McCormack & Dodge**, the ultra-rivals of packaged mainframe applications, will merge in a $333 million acquisition of MSA by M&D parent Dun & Bradstreet. For now, both companies' product lines will be maintained and each firm's veteran CEO will stay at the helm. Customers expect some consolidation of products in the future but expressed confidence in potential migration tools. IBM will sell its 5% stake in MSA and will gain a seat on the new firm's board of directors. Pages 1, 113.

- The Bay Area Rapid Transit System continued its rough IS ride last week, deciding not to renew its contract with vendor Logica Data Architects to finish its ill-fated automated routing system. In a contentious meeting, BART authorities, Logica and BART's auditors traded charges about flaws in the $40 million system. Page 8.

- Gillette's new Sensor razor will hit the shelves in January with a big boost from CAD, factory-floor automation and manufacturing control technology. A user-led project team implemented a revamped production line, while designers used three-dimensional CAD to completely change the look and feel of the product in 18 months. Page 1.

- "Technology shock" is an occupational hazard for IS managers deluged by the latest and greatest high-tech tools. The solution: Don't ignore new technology, but be selective about it and carefully delegate some of the research and responsibility. Page 54.

- Users are increasingly taking open systems matters into their own hands, spearheaded by the X/Open user consortium. Most members agree that major issues such as graphical user interfaces and connectivity to existing systems still must be resolved before open systems will present a viable alternative to currently installed proprietary systems. Page 23.

- IBM delivered used computers to the federal government in contracts that specified new equipment, a Congressional panel ruled. IBM offered to pay a $1.5 million settlement, but investigators refused any deal until the probe is completed. Page 89.

- On-site this week: Boston-based financial services firm The Putnam Co. is testing the paper tiger as a pilot site for IBM's Imageplus imaging system. Imaging technology has completely replaced paper in the department that processes correspondence and account updates for Putnam's pension and mutual fund shareholders. Page 25. At Louis Vuitton's specialty shops, however, paper receipts are part of the personal touch that well-heeled customers expect. So in-store automation, in the form of IBM Personal Systems/2s, is carefully hidden behind the scenes. Page 37. At Mary Kay Cosmetics in Dallas, a pretty face is a common interface. Mary Kay is standardizing corporate systems on DEC platforms connected by Decnet, replacing a hodgepodge of Datapoint, Wang and other vendors' equipment. Page 45.

- Smart planners take command and shape the computer industry's future instead of merely waiting for important things to happen. The key to this type of strategizing, dubbed "Future by Objective," is to select the desired outcome and then figure out the needed events that will take you there. Page 77.
You Shouldn't Be Punished For Moving Up To A Relational Database
Hungry like the capitalist wolf

**Lifting Eastern European barriers brings U.S.-high-tech opportunities**

BY AMIEL KORNEK
CW STAFF

In the best capitalist tradition, U.S. businesses aim to make a buck on the hard times befalling Communism. And as Russian entrepreneurs ponder how to market rubble from the crumbling Berlin Wall, U.S. computer hardware vendors and software developers are hungrily eying new business opportunities in Eastern Europe.

While the bricks were falling, the political reforms rocking the Eastern Bloc in recent weeks set the stage for moves by those countries to mend their tattered economies. Their future technological foundations will need to improve such fundamentals as manufacturing productivity, the distribution of goods and services, and foreign trade.

"What the Soviets and East Europeans need most is distribution of goods and services," said William Chastka, vice-president at Washington, D.C.-based International in Washington, D.C. "Computer items are very central to their policy of trying to improve increases in general," said John Slater, an economist at the United Nations' Economic Commission for Europe in Geneva. "There's a big pent-up dynamic that could cause a great increase in their imports of Western computer equipment."

U.S. computer companies believe that, sooner or later, this will translate into a business opportunity. "As all the countries that have been under that system look around the world and see where they're behind, they're going to see that one of the most important ways by which they can catch up will be to computer-erize," said Rod Canion, president and chief executive officer of Compaq Computer Corp.

The lifting of travel restrictions alone is sure to increase business of the installed base of personal computers, insiders said. "The first thing people do when visiting the West," said Bruce Marquart, director of research services for the U.S. Congress, "will be video equipment and PCs."

The 1988 installed base of professional PCs in the U.S. was estimated at 80,000 to 120,000 by Helkki Avunen, managing director of Asumer Oy, a Helsinki-based firm specializing in the Soviet market. The Soviet government's five-year plan, which runs through the end of 1990, calls for the installation of 1.1 million PCs, although this includes 8-bit machines designated for schools.

As the reforms gain momentum, U.S. computer firms already doing business in Eastern Europe have begun seeing double-digit growth in demand. Hewlett-Packard Co. released figures last week showing that its Eastern European business grew 58% in fiscal 1989 ended Oct. 31, to $67 million. "We see increased interest. The economy is opening up and developing. They are investing now," said Theresia-Maria Kucera, HP's East European marketing manager in Vienna.

Microtest Corp., which currently makes $5 million in revenue in the East, plans to re-engine its business plan there. "All the rules have changed in the past month," said Ida Cole, manager of international marketing. "I think in our midyear business review in January, we're going to put a lot more focus in this particular area."

Swift growth in the number of joint ventures with Eastern European partners attests to the interest of U.S. firms from all sectors in the new market.

**High hurdles**

However, for U.S. firms hoping to cash in on the reforms, some hurdles must be overcome before business ventures become viable in Eastern Europe.

Paradoxically, one of the reasons some vendors hesitate to make any moves now is the state of revolutionary fever currently gripping Eastern Europe.

"Until we see this new freeing drive problem is a hit-or-miss deal. Two other users contacted last week had not experienced any problems in recent months.

According to earlier statements from IBM, the bearing first used in the HDA unit of the Model K drives could drive in some cases vibrate too much and result in error messages. IBM first became aware of the problem in early 1988, and drives made after fall 1988 used a new bearing.

In addition, it offered several fixes to users with Model K drives already installed, including the replacement of entire HDA units and microcode that would alert them to potential bearing problems.

Last August, it began shipping a new bearing as an engineering change for Model K users.

At that time, Wood noted that there had been several problems with his Model K drives and that all HDA units were operating smoothly. But looking at his current situation he said, "Whatever it is, I mean, it has no viable replacement. If I find out it's the bearing again, I'm going to go crazy."
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**CA generator takes on AD/Cycle**

**BY ROBERT MORAN  CP STAFF**

**GARDEN CITY, N.Y. — Computer Associates International, Inc. announced a code generator last week designed to speed up the applications development and management process for CA-IMDS users on the mainframe.**

**Analysts said, however, that CA is also fighting the strong industry perception that IBM's AD/Cycle will be the principal provider of computer-aided software engineering tools and that IBM's DBZ database management system will be needed to use them.**

**“CA wants to say to users that you don’t have to abandon IDMS because we will provide you with CASE tools,” said Shulu Atre, president of Atre Data Systems.**

**The software, called CA-ADS/Generator, fulfills Cullinet’s promises to its users. It is geared for on-line entry and inquiry, according to CA, and will automate coding procedures, data validation and error handling — parts of the application program-writing phase that consume numerous hours and expenses.**

**The software creates applications using forms, tables, code modules and expert systems that are defined in a set of nonprocedural, high-level statements, called Program Specification Rules (PSR), that represent an application's programming requirements.**

**Further, the generator leverages Cullinet's highly reputable Enterprise code generator, which runs on Digital Equipment Corp. VAX computers. According to CA, the PSRs are independent of hardware, operating systems and databases; they can be ported across the mainframe.**

**VAX computers under VMS and DOS-based personal computers. The software product is immediately available and costs between $36,000 and $96,000, depending on the size of the system and its configuration.**

**Staying ahead**

According to Jeff Tash, president of Database Decisions, Inc., a consultancy in Newton, Mass., the new software is what Cross Systems Product, IBM's code generator, can't do. “This places CA between 18 and 24 months ahead of CSP,” Tash said.

He added that “PSR is much more mainstream and intuitive to developers” than IBM methodologies.

**Beta-test site user Gary Stone, a database technical analyst at the Metropolitan Dade County Office of Computer Services and Information Systems in Miami, said that the software “lists some of the development components of the application and defines and creates a good first cut.”**

With the initial legwork completed, Stone said, applications developers are able to work at a higher level. He added that in comparing the number of lines of code that his organization generated vs. the lines of code employed by the company’s code generator, he saw a 2-to-1 and 4-to-1 ratio, depending on the application.

“I don’t think the code generator will do for you, the higher the ratio you will get,” he explained.

Another beta-test site user, John Laludis, systems development support manager at Volvo North America Corp. in Rockleigh, N.J., said that one of the company’s biggest expenses is in writing and maintaining code, about 70% of which is written in AD/Cycle.

“We anticipate about a 40% improvement in the time that it takes to generate code,” Laludis said.

In addition, both users said that they anticipate easier maintenance and debugging as well — a savings yielded from working at the program specification level. With this approach, they will have to maintain fewer lines of code, they said.

While the VAX version produces C, Fortran and Cobol, the new mainframe version now produce AD/Cycle fourth-generation language words with embedded SQL. George Van Schack, CA’s vice-president of marketing, confirmed that the company will offer other languages on the mainframe — for example, Cobol — in 1990.

**Air Force bombshell: Unisys gets micro pact**

**BY MITCH BETTS  CW STAFF**

**WASHINGTON, D.C. — Unisys Corp. surprised the experts recently when it won a megaccontract with the U.S. Air Force for up to 250,000 general-purpose microcomputers.**

**Unisys essentially becomes the successor to Zenith Data Systems as the military’s standard supplier of desktop systems.**

**The so-called Desktop III contract, awarded Nov. 17 by the Air Force Standard Systems Center (SSC) in Montgomery, Ala., is worth as much as $700 million if all options are exercised.**

**The bid apparently beat proposals from the incumbent Zenith; Grid Systems Corp. (a unit of Tandy Corp.); Government Technology Services, Inc.; and Syntox Information Systems, Inc.**

**T**

**HE SO-CALLED Desktop III contract is worth as much as $700 million if all options are exercised.**

James F. Kerrigan, a federal market analyst at Input in Vienna, Va., said the Unisys win was a surprise, in part because Unisys has not played a leading role in the federal personal computer market in the past.

Kerrigan also cautioned that the Desktop III contract award is very likely to hit with an official protest, since that has be-
Andersen installs international ISDN video link

BY ELLIS BOOKER
CW STAFF

CHICAGO — The Integrated Services Digital Network (ISDN) will take two giant steps forward this week with the announcement of the world's first ISDN-based international video teleconferencing link over commercial facilities.

Andersen, a New Jersey-based company that operates in 27 countries, and AT&T Network Systems will provide the service to Andersen Consulting, which will use two Basic Rate Interface (BRI) Ameritech ISDN Centrex lines and AT&T's Switched Digital International (SDI) service to link its Tokyo office and its Chicago world headquarters.

Not only will this be the first international ISDN video link of its kind, it will be the first time a local telephone company and an interexchange carrier in the U.S. have collaborated to provide a commercial ISDN service.

Andersen previously was a BRI customer of Illinois Bell, which last March became the first local telephone company in the U.S. to announce a BRI ISDN tariff. A BRI ISDN line contains two 64K bit/sec. B channels for carrying digital data and one 16K bit/sec. D channel for packeted signaling data.

Andersen will evaluate the link for a month and hopes to illustrate the cost savings of using ISDN over traditional leased-line videoconferencing methods. Typically, full-motion videoconferencing must be delivered over dedicated 56K bit/sec. or T1 lines.

In the demonstration, the two B channels of one ISDN line will be combined into a single 112K bit/sec. video channel; voice traffic will be interleaved with the video signals. The result, according to Illinois Bell, is a "business-quality" picture which is better than compressed video but not television quality.

For some time, Bellcorp, the Livingston, N.J.-based research and development arm of the seven regional Bell holding companies, has heralded the use of ISDN as an inexpensive way to deliver video teleconferencing over ordinary phone lines. Andersen is using PictureTel Corp. coder/decoders — hardware that delivers video images over networks.

In addition to the video connection, Andersen will use a second BRI ISDN line for Group IV facsimile.

Because AT&T does not have a BRI ISDN service, the two ISDN Centrex lines have been rate-adapted to 56K bit/sec., the speed of AT&T's SDI service. The two circuits will be carried from an AT&T CESS digital central-office switch in downtown Chicago over separate 56K bit/sec. facilities to Tokyo, where they will be carried by Kokusai Denshin Denwa Co. Ltd. (KDD), the Japanese international carrier.

KDD, in turn, will pass them to Nippon Telegraph and Telephone Corp. (NTT), one of Japan's local phone companies, and then on to Andersen's Tokyo offices. A terminal adapter there will convert the circuits to the standard 64K bit/sec. ISDN rate.

Sources said the project may also represent the first time KDD and NTT have interconnected their networks for an ISDN service.

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TSI's chips sink in sea of losses

BY RICHARD PASTORE
CW STAFF

The National Advisory Committee on Semiconductors revealed its rescue plan for the U.S. semiconductor industry last week. But the news was too late to help chip maker Texas Instruments, Inc., whose stock has fallen in a sea of losses.

The semiconductor committee has been studying the slumping sector since Congress established the group in 1988. Its plan calls on U.S. industry and all levels of government to foster availability of capital funding, revise trade and antitrust laws, boost support for the Sematech consortium, increase protection of intellectual property and improve the educational system.

The committee recommended formation of a business-backed, for-profit investment firm that would offer affordable capital to U.S. consumer electronics firms. A revitalized consumer electronics industry would in turn generate high-volume chip sales, the committee said.

David Garcia, a semiconductor analyst at Needham Whitney Financial Corp. in New Orleans, has doubts about the strategy's chances in the long term. "I don't think attempts to emulate Japan's industry-government consortium can work in this country," he said. "Investors here aren't willing to wait as long as the Japanese for a return on investment. And at best, it will take years to see benefits" from these proposals.

November 27, 1989

NEWS

COMPUTERWORLD
Calif. transit board dumps software vendor

BY J. A. SAVAGE CW STAFF

OAKLAND, Calif. — Overruling an auditor's recommendation, the Bay Area Rapid Transit (BART) system board last week declined to further its contract with Logica Data Architects, Inc. to finish a controversial software project.

The estimated cost to finish the over-schedule project for automated routing and tracking of BART trains [CW, Nov. 20] was $1.8 million beyond the $20 million already spent. A second audit discovered $2.67 million in excess costs already charged to the district and paid to Logica.

Bill Shrimpton, vice-president of Northern California operations of Logica, disputed the complaints lodged against the Waltham, Mass.-based company. Shrimpton concluded that "should we have inadvertently overcharged, we would return the money."

Many in contention meeting called to discuss the findings of BART's auditors — LS Transit Systems, Inc. and Peat Marwick Main & Co. — Logica was warned by board member John Glenn that its reputation in the U.S. is riding on the project to develop the Integrated Control System.

A recent test of the system, which carries an overall price tag of approximately $40 million, reportedly revealed that if the current design will not support

- it does not meet capacity requirements
- it cannot be transported to a larger computer.
- it has only a single communication link to BART engineers, and none to field stations.

Shrimpton said that the software prioritizes jobs, but he generally agreed with LS Transit's findings.

LS Transit estimated it would cost another $1.8 million to have Logica complete the project. LS Transit recommended that path because of the steep learning curve of hiring another contractor or a lengthened period for in-house engineers to finish the project.

No BART-softening Although no actual vote was taken, BART board members essentially decided not to pay Logica any more than the $20 million already sunk, according to board member Sue Hone.

The board is considering completing the project with in-house engineers.

The board was stunned when Hal D'Ambrogia, auditor for Peat Marwick, said his company found a $2.673 million discrepancy between Logica's allowable costs and its billing. He claimed that BART was billed for overtime that was not often received by Logica employees and that administrative and overhead costs were less than rates proposed in the contract.

He added he could not conclude there was deliberate fraud but, "Logica hasn't been able to locate evidence to support our review." According to D'Ambrogia, Logica also kept two sets of books for hours worked, one for billing to BART and the other for internal use.

BART's Steiner said that Logica had requested another $2.63 million in September, which was already paid out, but of which, upon review, Shrimpton believes less than 10% should be considered for payment.

Nello Bianco, a 20-year veteran of the BART board, estimated that the whole project was about $35 million over budget. At a total of $40 million, Logica accounts for about half of the entire cost.

However, Shrimpton charged that Peat Marwick's findings were based on an "invalid interpretation of the contract" and that Logica's company overcharged BART.

Disagreeing with LS Transit, board member John Glenn said it would be ported to a larger machine by rewriting only a small portion of the code for the applications.

LS Transit said that it could be rewritten at a cost of "under $5 million."

LAN plans

FROM PAGE 1

processed on the mainframe and what can be processed out on location using a micro or LAN. I don't believe all this talk about going totally distributed or that the mainframe is a dinosaur of the past...

...The Wilton, Conn., in-sourcing task force has already implemented a homedgrown screens-based system on which brokers can generate their own queries and reports on LAN servers, said Brad Calcagni, director of data communications at the firm.

Applications are now generated three times as fast as the way when everything resided on the mainframe, Calcagni added. "In three years, I guess we won't have any direct mainframe transactions left, except background maintenance like changing codes and files; day-to-day work will all be on PC-based applications."

However, Home Equity still needs its mainframes to provide a common view to a client who may do business with the insurance firm through several divisions, each served by a Home Equity regional office.

"The PC LAN database would hold data a given group would need but our clients want to look at everything, and we can't have them hopping from region to region," Calcagni added.

Covia Corp. "has been very successful so far" in moving applications down to LANs and having them coexist with "traditional monolithic mainframe dumb terminal systems," according to Mark Teflian, Covia's vice-president and chief information officer.

A LAN-based system provides the flexible applications development tools and modular architecture to serve the airline subsidiary's broad range of customers, including "large sophisticated and very small travel agencies, airline reservation offices and airports," he added.

However, large mainframes continue to be the "data serv-ers" for airline operations; they are used for routing aircraft, baggage, flight and day-to-day operations to the right department, Teflian said.

LAN servers need to make some major technical advances before they can take over the mainframe's role of data repository, sources said. Intel Corp. 80386- and 80486-based microprocessors may have the raw computing power to process large batches of data, but they lack the IO CPU capacity for applications that involve "lots of disk access, lots of data moving around," said Norman Weizer, a senior consultant at Arthur D. Little, Inc.

This applies to both on-line transaction processing and batch applications, "where you get a whole slew of paper in every night," Weizer said. Airline reservation systems, payroll for large corporations and direct-deposit checking systems for large banks are likely to stay on the mainframe in the foreseeable future, he added.

Is managers' reservations about using LAN servers as data hubs go beyond the I/O port, however. Many are waiting for the new breed of SQL-based database servers to fulfill their promise of providing true, host-style data sharing.

"The whole area of SQL database servers is pretty new; from what I can figure out, not too many people are using them yet in a real industrial-strength type of application," said Gary Savar- ene, a project manager at Eastman Kodak Co. who has been involved in the organization's pilot testing of such servers on a 3Com Corp. LAN[CW, July 24].

Another major user concern is in the "technical stability of the [LAN server] platform, when they have a mission-critical system which they need up 24 hours a day," said Theodore Klein, president of Boston Systems Group, Inc., a Boston-based consulting firm. The problem has two sides, in that many firms do not feel sufficiently mature to support decentralized LANs, and the LAN industry is far behind the mainframe culture, when it comes to providing LAN management and diagnostic tools, Klein said.

Covia had to grow its own LAN management software in order to provide acceptable levels of reliability for a "mission-critical," 2,000-node 27-ring LAN at O'Hare Airport in Chicago, Teflian said. The firm developed the applications for backup and recovery during distribution of data and software, as well as Heartbeat, a diagnostic package that "keeps up with trends of traffic, routing and general health of LANs," he added.

"We feel we've got our cooperative processing strategy of moving data to where the people are," said Teflian.

LANS ARE crucial to our cooperative processing strategy of moving data to where the people are.

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OS/2 lite
FROM PAGE 1

factor in the system's slow sales.

However, in a series of inter-
views with Computerworld in
the wake of the Nov. 13 an-
nouncement that stated Micro-
soft and IBM were "making a
concerted effort to enable OS/2
for 2M-byte entry systems," ex-
ecutives could provide little evi-
dence of a concrete foundation
for the plan.

Instead, the executives por-
trayed a statement of direction
rife with caveats and cautions.
Neupert himself demonstrated
little enthusiasm for the capabili-
ties of OS/2 on a platform of less
than 3M bytes, saying that any-
thing below that minimum con-
figuration would be severely lim-
ited in function.

"Even in the office automa-
tion market, there will always be
tension around the entry point
into OS/2, particularly with the
cost of memory coming down," Neupert said.

"I will be happy with a point of
entry at 4M bytes. You can't
have application integration be-
low 4M bytes. At 3M bytes, you
can run a limited LAN client that
won't be very fast. It won't run
as a server," he added.

In addition, Microsoft execu-
tives for the first time conceded
the existence of a now discarded
plan for a "Presentation Mana-
ger Lite" interface to the ubiqui-
tous MS-DOS operating system.

Ballmer claimed his company
had actively considered the pros-
pects and had run the proposal by
independent developers to see if
there was support for it. He said
it was just one of several propo-
sals aimed at averting resis-
tance to the memory require-
ments of Presentation Mana-
ger's interface.

"There was a lot of brain-
storming to make OS/2 more
competitive," Ballmer said.
"But we categorically decided not
to do that."

"There's lots of different
ways that can be misconstrued," Neupert added. "PM on DOS
was never real — fragmenting
the [independent developer] com-
community for another platform
never made any sense.

IBM's announced plans to
converge its own LAN Server
with Microsoft's LAN Manager
was another concession that
splitting the OS/2 market was
not making sense. "The LAN
piece we screwed up," Neupert
said. "Two similar products did
not help when competing against
Novell. We had to make them
identical."

Start 'n go
Ballmer said the trade-offs and
false starts that finally resulted
in the announcement of an at-
tempt at a 2M-byte version of
OS/2 had been in discussion be-
 tween IBM and Microsoft for
about nine months but that the
final decision to announce the
2M-byte direction "wasn't sewn
up until a month" before the an-
nouncement.

"Comdex tends to drive deci-
sions that are on the fence so
that people can get on with life," Ballmer said. "We are continu-
ing to collect more data."

The resulting downsized
OS/2 effort and IBM's con-
current endorsement of Microsoft
Windows for low-end personal
computer was seen by many in
the industry as a trade-off
whereby Microsoft would limit
future plans for Windows; Ballmer denied that interpreta-
tion, however.

"We haven't capped Windows
in any way, shape or form," Ballmer said. Next year, he said,
the company will roll out "the
most significant Windows re-
lease ever."

Although the prospects for a
downsized version of OS/2
struck a responsive chord in us-
ers, few were holding their
breath waiting for a shipment
date.

"I don't think there will ever
be an OS/2 below 3M bytes," said Gary Frenkel, an analyst in
the emerging technologies
group at Martin Marietta Corp.,
in Lexington, Va.

"As the price of memory
comes down, I will simply be
looking for critical applications
and a mature OS/2 on a 286 plat-
form. My guess is that will come
together in about a year. The an-
nouncement helps us by creating
a more stable climate for applica-
tions developers," Frenkel com-
mented.
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DG has plans to tie multivendor nets together

BY JOANIE M. WEXLER CW STAFF

WESTBORO, Mass. — Data General Corp. set out last week to put remote multivendor networks on speaking terms with one another and tap what the company sees as a $300 million to $400 million market over the next two years for protocol, directory and document translation capabilities.

The company is aiming its standards-based Communications Server software at worldwide Fortune 1,000 corporations and network service providers. Initially running on the vendor’s AOS/VS-based minicomputers, the product is slated to support DG’s Unix-based Avion computer strategy next year.

Once the software becomes available on Unix, DG intends to license the code openly to other makers of Unix-based products. “That will open up a whole lot of choice for end users,” noted Steve Wendler, program director at Gartner Group, Inc. in Stamford, Conn.

Communications Server is designed to allow the exchange of messages among X.400, DG’s

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Comprehensive Electronic Office automation software, IBM’s Distributed Office Support System, facsimile and telex users and have them received in the format used by the recipient. In addition, a C language custom-tailored tool kit contains a library of routines that interface proprietary applications to the communications system.

The product was designed from the ground up as an open standards-based platform to allow for the development of value-added data services, said Herb Osher, director of DG’s distributed computing group. Value-added services are often cited by industry analysts as a major distinguishing characteristic among vendors in the standards-based networking environment of the future.

Electronic switch

The software allows for the switching of electronic mail, directory services, document conversion, systems configuration and management, and users/network accounting, which provides record-keeping and tracking but no built-in charge-back system. The product incorporates the X.400 message-handling and X.500 directory standards, which reside in Layer 7—the Application Layer—of the Open Systems Interconnect reference model.

Wendler said the product will appeal to worldwide telecommunications users for reducing costs.

"You can put a Communications Server out on various parts of your network and send a mail message across your internal telecom network, which you’re already paying for," Wendler explained. "Your telex or fax is carried by your internal network to, say, Japan, and then to get the telex or fax to the specific Japanese location, you pay for a local phone call—not for an expensive, intercountry long-distance call."

Voices carry

Wendler added that the product will appeal to telecommunications providers because "the voice business has gone flat, and they are looking for new revenue. [U.S. District Judge Harold Greene] has allowed the telecom carriers to provide messaging services, and they’re all moving over to X.400," he said.

George Colony, president of Forrester Research, Inc. in Cambridge, Mass., acknowledged that the Communications Server product "has some real value" but expressed concern about DG’s ability to attract customers for a complex product of this nature.

Prices range from $99,000 for a basic package that contains the platform, Comprehensive Electronic Office gateway and two optional gateways to $641,000 for five CPU licenses.
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There is a better way.
Time's not on Datapoint's side

BY PATRICIA KEEFE
CW STAFF
SAN ANTONIO — History repeated itself last week at Datapoint Corp., but time may finally be running out for the struggling firm that invented the Arcnet network technology.

At least one large Datapoint customer is skeptical and noted that the company needs new products, not just new sales approaches. Plagued with software and maintenance problems, the user suggested that Datapoint revitalize its network software; otherwise, it will not have many customers left to worry about.

Datapoint also appointed Martin Goldberg, formerly director of operations analysis, as vice-president and chief operating officer.

Three weeks ago, shareholder Martin S. Ackerman dropped his bid to take control of Datapoint's board and ousted Chairman Asher B. Edelman.

Last week, company President Michael Michigami confirmed the layoff of 44 employees, primarily in the field sales offices, and declined to rule out further staff reductions.

"If things continue to get soft, we'll have to look at areas to bring down the cost structure," Michigami said.

Michigami positioned the restructuring of sales and marketing as key to Datapoint's continuing quest to respond better to customer needs.

After some prodding, Michigami said recent talks with customers revealed that many want gateways — which Datapoint does not provide today — to network standards such as Token-Ring and Ethernet. He said the company hopes to have these gateways ready when it ships Arcnetplus, a 20M bit/sec. version of Arcnet, in the first quarter of 1990.

"Everyone wants [the gateways] to give us an easy migration path away from Datapoint without having to toss everything away and start all over," a customer said.

Michigami also promised to "undertake an accelerated program to get costs in line with what we think our U.S. revenue stream will be." He said he has been eliminating operations "where we historically have not had much success." He predicted increased revenue despite "a fairly slim cost base."

Three sales offices have been closed so far; others will be relocated or downsized. Overall, there are 16 sales offices nationwide.

Michigami said he expects downsizing of the sales effort to result in a $2.3 million charge against fiscal 1990 first-quarter earnings, which were to be released last week.

Similarly, restructuring charges in fiscal 1989 were blamed in large part for a net loss of $239.2 million on revenue of $312.5 million for fiscal 1989 (CW, Oct. 2). In addition, four strategic business units were formed to focus better on key market segments: major end-user accounts, value-added resellers, the public sector and video teleconferencing.

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SCIENCE/SOURCE

Electro-optic sensors will track targets even in highly cluttered environments. The Dual Mode Tracker, developed and being readied for production by Hughes Aircraft Company, has the capability to track missiles, aircraft and vehicles. Using an advanced correlation/centroid tracker, the system can simultaneously track targets while automatically selecting the preferred mode of tracking. It will also automatically acquire moving targets in the field of view of any video imaging sensor connected to it.

The Dual Mode Tracker can be utilized in tactical and strategic applications.

A new processor that may one day outperform today's supercomputers uses incoherent light and a unique arrangement of electro-optical modulators. Called PRIMO (programmable, real-time, incoherent, matrix, optical), the processor, being developed by Hughes, passes light signals through successive grid layers, forming a two-dimensional matrix that can modulate the signal. The entire gridwork is addressed with electrical signals fed only to the edges. Thus, the processor can perform complex mathematical functions in parallel, manipulating data at extremely high speeds. The compact device is rugged, requiring no lenses or precise alignments, and is small enough to hold in one hand.

New computer-controlled milling machines automatically correct for tool wear and other machine misadjustments. By operating up to 10 times faster than conventional equipment, these new Hughes machines make continuous off-line inspection of machined parts prohibitively expensive. So before and after each tool is used, an internal contact probe measurement system checks the dimensions of a trial cut. If the cut does not meet specifications, computer software in the controller adjusts the tool to bring it back into tolerance. These machines are used to manufacture radar system parts whose thousands of dimensions must be held to tolerances of three thousandths to .5 thousandths of an inch.

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.

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A Different Kind of Computer Company

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**EDITORIAL**

**Give and take**

The season for giving will fast be upon us, but the Bush administration may well have other sentiments in mind as it contemplates how it can do a better job of keeping its spending more in line with its income.

For some time now, the primary target of the president’s budget ax has been the Department of Defense budget, which grew so disproportionately during the Reagan years. Initial efforts did not garner much savings, because every time the president and defense secretary omitted an obsolete or useless weapon from the DOD budget, some congressmen would stick it back in to protect local constituencies.

Now there are reports that the president will aim at a different flank of the DOD juggernaut: the prodigious spending on research and development that has been so beneficial over the years to both the military and the private sector. The administration is floating a balloon before officially committing to the budget-reduction effort.

That the reports of the intended cuts are so plentiful has led some to believe that the administration is floating a balloon before officially committing to the budget-reduction effort. As would be expected, criticism has been sharp. Because the White House will say nothing official yet, everyone associated with literally hundreds of DOD-related research projects is crying foul, invoking everything from the global competitive imperative to the Bill of Rights in demanding that cuts not be made.

In fact, it is tempting to jump on that same bandwagon. Private industry and the U.S. economy in general have benefited tremendously from government-sponsored research. The ballooning of federal R&D funds.

Maybe it is time to begin thinking about doing things differently. The federal government has several ways of fostering high-tech research in the private sector without actually paying for it directly. For example, a recent report claimed that the administration is mulling a multibillion-dollar venture capital operation to help resuscitate the nation’s consumer electronics industry.

No doubt, other interesting plans will be aired in the coming months. The most prudent of them will be those that help wean business R&D away from that big earth mother known as the federal government.

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**LETTERS TO THE EDITOR**

**Fair or not?**

In “Call it unfair at the job fair” (CW, Oct. 23) Michael B. Cohn entertained us with an amusing story of the recruiting frustrations of today’s hiring manager. Poor Mr. Cohn. Well, there is a flip side to this coin, and it is one that I am eminently qualified to tell.

In August 1988, I was laid off. I polished my resume, prominently displaying what I thought were highly marketable aspects of my background — an M.S. in computer science from a well-known major university and over 10 years of programming experience. After visiting dozens of booths at several job fairs, I got only a few interviews and no job offers. My problem, simply put, was that my experience was with unpopular languages and hardware. I was considered a “re-tread,” a derogatory term used to label a programmer with obsolete skills that nobody wants.

Finally, after 10 months of unemployment, I received a job offer, but not through a job fair or even through a headhunter. I got it by mailing an application to a company that was hiring at the time. It was a minor miracle. I took a 20% pay cut, however.

With the current glut of programmers, my guess is that poor Mr. Cohn’s company cannot attract candidates because the pay is too low, the computer hardware is too obsolete or the company has a negative reputation. So, take heart, Mr. Cohn; it’s not just your fault.

Real good programmers are talented people that deserve good pay and real respect, not false promises and pigeonholes.

Norby Dooley
Camden, N.Y.

**Gap gaffe**

In “3Com announces stopgap network measure” [CW, Nov. 6], I was quoted as saying “For most heterogeneous campus LANs, the solutions are the worst possible mess that you can imagine.” I would like to make it clear I wasn’t talking about 3Com’s new products, but the appearance of that statement immediately after an announcement of 3Com network management APIs must have confused lots of people. It certainly confused 3Com (sorry, folks).

For the record, my comment was meant to indicate the vast distance between the functionality of most network management products available today and the needs of typical users. It did not refer to 3Com products. In fact, I was impressed with 3Com’s new products.

Steve Spanier
Vice-President
Infometrics, Inc.
Santa Clara, Calif.

**Update the CASE**

“Banking on a CASE project” [CW, Oct. 30] includes some outdated information about our Information Engineering Workbench family of CASE tools. It is true that early in 1988 our Gamma application generator was not yet integrated with our front-end CASE tools.

However, in September 1988, our company shippedIEW/GAMMA, which is completely integrated with our PC-based tools for planning, analysis and design through a common encyclopedia now shared by all of our tools.

Currently, Knowledgeware customers can choose from three integrated application generators: the mainframe-basedIEW/GAMMA, our PC-based Construction Workstation and IBM’s Cross System Product, available from Knowledgeware through our relationship as an IBM Business Partner.

Donald P. Addington
Executive Vice-President
Knowledgeware
Atlanta

**Not so open**

My response to Douglas Barney’s “Not an open and shut case” (CW, Oct. 23): Well said. It is a great shock for me to discover that not all of the computer press has fallen for this nonsense about proprietary systems being passé in our new, open world.

What still amazes me is how Apple Computer, Inc., the ultimate in closed systems, is widely portrayed as the leader of the new wave, friend of the masses and so forth. A real triumph for public relations.

Update the CASE

The open systems hysteria (your phrase and very correct in my opinion) is largely the product of the press, the Unix fanatics, the OB politicians and the long-haired types who inhabit the academic world. In the commercial world where people do real work to earn money for their employers, I never yet have heard anyone sitting around demanding open systems.

Philip H. Dorf
New York

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.
Beware the outsourcing horse

JOHN L. KIRKLEY
Imagine for a moment that on one bright and glorious morning in the last summer, you came to work at Eastman Kodak in Rochester, N.Y., and in the parking lot, there was a huge wooden horse with IBM stenciled on its side.

You dashed into the data center shouting, "Get rid of that thing, it's a trick!" but nobody listened to you.

When you looked out the window, you saw that a door had opened in the horse's side and men clad in blue suits and white shirts were spilling out. They began running in your direction, clipboards ready.

The scenario is, of course, nothing but fiction. A little information systems nightmare that might convene over someone during that period between sleep and wakening.

The reality is much more straightforward. Last July, Kodak announced that IBM would consolidate and manage all of its U.S. data center operations over the next decade. Kodak, in essence, awarded a super facilities management contract to Big Blue in what this newspaper termed "a dramatic example of the current trend toward outsourcing information systems operations..."

IBM will construct a new data center to consolidate Kodak's existing four centers and has hired several hundred Kodak IS operations employees to help run the shop.

Now, some months later, the dust has settled, and we've had a chance to talk to some IS managers at other Fortune 500 companies. Reactions are mixed.

The major concern mentioned by managers, and carefully considered by Kodak, was the use of mixed vendor technology. Kodak has set up two committees - a strategy committee and a technology committee with representatives from both IBM and Kodak, as well as outside consultants, to ensure that decisions are made in Kodak's best interests, not IBM's.

Commenting on the contract award, one IS manager said wryly, "It looks like Kodak's MIS management admitted they couldn't handle the situation. So they turned to IBM." At his company, this particular manager remembered a time when it had constructed a homegrown telecommunications package. IBM told it that it could save money and operate more efficiently by installing IMS. "We now have 35 people just to service IMS," he said.

"This is a classic management problem," another IS manager told me. "Forget Peter Drucker, let's go back to someone who really knew what was up... Niccolo Machiavelli. Just what would he tell Kodak?"

Based on Machiavelli's comments in The Prince, the 16th century Italian would advise his 20th century counterparts to use extreme caution.

When it comes to waging war - the chief occupation of Italian princes in the 1500s - or managing a huge data center operation in the late 1980s, the prince can look for help among his own subjects, hire mercenaries or contract with auxiliaries.

"Mercenaries and auxiliaries are at once useless and dangerous, and he who holds his State by means of mercenary troops can never be solidly or securely seated... Whenever they are attacked, defeat follows; so that in peace you are plundered by them, in war by your enemies," writes Machiavelli dourly.

Machiavelli has little use for auxiliaries, "by whom I mean, troops brought to help and protect you by a potentate whom you summon to your aid... Auxiliaries may be excellent and useful soldiers for themselves, but are always hurtful to him who calls them in; for if they are defeated, he is undone, if victorious, he becomes their prisoner."

However, one can argue that this is not 16th century Florence. As the top information officer of a large financial services firm told me, "Any CIO who is not investigating outsourcing his information processing functions is doing his job.

Because of technology, he said, we have moved away from the days of hierarchical management typified by the old General Motors (and 16th century Italy). In the past, vertical integration made sense. Management could read the key and correctly estimate the scale and maintain tight control by doing everything in-house.

These days, the IS director commented, economies of scale within the information processing function can be realized in a different way. It's a result of the new networked organizational structure within corporations: Management reporting relationships are becoming flatter, less hierarchical.

"We've had time-sharing for years," he said, "but now, because of advances in telecommunications, we can be truly different as to where the processing function is taking place." We trust utilities to supply us with power and telephone companies to provide communications, he noted. To him, it makes the same kind of sense to turn the processing function over to a facilities management firm such as EDS... or IBM's National Service Division.

But the days of IS and telecommunications development. That must be kept in-house. "Applications programmers and analysts will be inside the companies, but no longer in IS," he said. "They'll be in the marketing, distribution, finance, marketing and human resource departments."

"If the heart and soul of the particular business is not tied to information systems processing, then there is a powerful argument to farm it out," he continued. "Kodak, after all, is in the business of providing photographic systems and supplies. It houses, live or die by its IS functions, so they have to be cared for..."

As Machiavelli pointed out, "A wise Prince should build on what is his own and not on what rests with others."

VIEWPOINT

Do you have what it takes to make it to the corner office?

MICHAEL COHN
Are you a project leader who is tired of long hours and low pay? Or a first-line manager who, frustrated by high-tech's high stress, want a job in which you can meet new people, see new places and pull down incomprehensible sums of money? Well, if you answered "yes" to any of these questions, consider a career in executive IS management. Low-level managers are promoted every day into positions well over their heads. You could be one of them!

We're looking for a few good managers. Managers with the courage to climb out of the trenches and into the corner offices. But are you qualified? Are you an effective executive? Just take this simple test. And then you'll know if you've got what it takes to be one of us... the few, the proud: the VPs of DP.

1) A. You write good specs and requirements.
B. You write good specs and requirements, if you had to do it all over again.
C. You write good specs and requirements, since you have to do it all over again.

2) A. You challenge your really good people.
B. You know who your really good people are.
C. You know where your really good people went.

3) A. You expect the unexpected.
B. You survive the unexpected.
C. You cause the unexpected.

4) A. You usually run out of buffers at the end of a project.
B. You usually run out of Buffers at the end of the project.
C. You've never seen the end of a project.

5) A. The night a system goes live, you hope no one will find any problems.
B. The night a system goes live, you know no one will find any problems.
C. The night a system goes live, you know no one will find any problems.

6) A. When the going gets tough, you keep your head.
B. When the going gets tough, you leave early to beat the traffic.
C. Users call you a lot of things.

7) A. You still stand out as technically current.
B. You still stand out as technically current because you're surrounded by technically current people.
C. You still stand out as technically current because you're surrounded by hopeless idiots.

8) A. People do as you say.
B. People do as you say, not as you do.
C. People say they don't know what you do.

9) A. Users call you because you know a lot of things.
B. Users call you to fix a lot of things.
C. Users call you a lot of things.

10) A. You love to wake up and go to work.
B. You hate to wake up and go to work.
C. You hate to wake up while you're at work.

11) A. You can see the forest through the trees.
B. You can see the forest through the trees, until you're flattened by some executive who goes out on a limb.
C. You're smart enough to keep out of the woods in the first place.

12) A. When the going gets tough, you get going.
B. When the going gets tough, you get going.
C. When the going gets tough, you leave early to beat the traffic.
In The 1990s, New Technology Will Change Computing As Radically As The PC Did In The 1980s.

How Will Your Company Manage That Change?

Skepticism from users when behind it. Certainly some more caution is warranted. But what we saw instead was an outpouring of support for IBM. Users said that if IBM said the problem was solved, then they had to believe it was so. I don't want to suggest that this loyalty is misplaced, but certainly some more caution is called for here.

IBM's story of what went wrong with the 3390 was believable. People close to IBM have said they buy it, and they are sure the problem is fixed. But the IBM story left a few shreds of doubt that shouldn't be overlooked.

A similar tool is offered by Adapc Corp., the San Francisco-based Case Research Corp., a consulting firm in Bellevue, Wash. "The marketplace tells us it is their biggest need, but products that address the need don't sell very well."

The software, called Datatec-DS, is used to convert undocumented and inconsistent Cobol data definitions into standard data elements and record definitions. That is a prerequisite to converting, migrating or redesigning systems and also for bottom-up modeling and data dictionary and repository population, according to the organization.

Larry Sikon, chief technical officer at DHL Systems, Inc. "But users will ultimately make or break it."

Sikon said the X/Open conference and market research program gives users a long-overdue voice: "It holds out the promise of letting the user community have greater say in what gets built and what happens in the future."

Bill Keatley, director of technology at American Airlines, paraphrased his Chief Executive Officer Max Hopper's predictions that said users will be specifying to vendors what they want rather than taking what they are given. "There has been a strong movement to having the world Unix community get together," Keatley said.

It is time for companies on the "consuming side" of technology to become more active, added Danny Wagle, a senior systems consultant at Du Pont Co.'s fiber department. The X/Open conference was part of a broader program to solicit input from the user community. As part of an initiative, IBM is leading the way in this area.

Larry Sikon, chief technical officer at DHL Systems, Inc. "But users will ultimately make or break it."

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## A Comparison Chart of the Major Cooperative Processing Software Products:

### Functions:

<table>
<thead>
<tr>
<th>SAA/CUA Interface for existing 3270 applications</th>
<th>SUPER-LINK&lt;sup&gt;®&lt;/sup&gt; Family</th>
<th>Easel™</th>
<th>Mozart™</th>
<th>Arbitre®</th>
<th>IBM's HLLAPI&lt;sup&gt;TM&lt;/sup&gt; or C/C++&lt;sup&gt;TM&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under PC/DOS</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Under OS/2</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Transition from PC/DOS to OS/2</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>3270 Communications</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Peer-to-Peer Communications:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>for extending 3270 applications</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>for new applications</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Maintenance of PC applications &amp; data from a central library</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Background file transfer in PC/DOS</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Background peer-to-peer processing in PC/DOS</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Object Orientation</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>CASE/Application Generation</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>SAA/CUA Support:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>All functions supported on PC/DOS</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Action Bar</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Pull-down menus</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Pop-up menus</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Messages and Prompts</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Dialog Boxes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Forms</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Direct support for multiple levels of action bars and pull-downs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Action bars and Pull-downs in a form</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Single and multiple selection menus</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Menus and Label within a form</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>CUA defined help</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Field-level context-sensitive help</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Optional learning mode (help always displayed)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Embedded User Assistance (pop-up selection lists)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Dictionary for storage &amp; re-use of definitions &amp; documentation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Data Editing/Validation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Data type/mask checking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Range/limit checking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Date formatting/checking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Validation against database files</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Required fields</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>&quot;Must Fill&quot; fields</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Zero not valid fields</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>Multiple validation points during PC processing of transaction form</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Complete local application testing, database maintenance, interface testing, and mainframe communications</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Language Objects Available Without Low Level Programming</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Display and selection from:</td>
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<tr>
<td>In-memory lists</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<td>File lists</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Database lists</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Menu display and selection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>Help at all levels (Panel, Action Bar, Menu, Form, Field)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Error Processing</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Add/subtract/locate on:</td>
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<tr>
<td>Sequential files</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Database files</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Hardware sequence</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Determining 3270 screen identification</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Read/Write all fields on 3270 screen with a single command</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<td>Determine dynamic 3270 field attribute changes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<td>Dynamic modification of field attributes based on form entries</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Initial values displayed</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>Protected/unprotected fields</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Development Environment Comparison</td>
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<tr>
<td>Object Orientation</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Dictionary and documentation</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Panel/Form painter for Creation/Maintenance</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>3270 screen capture Forms and attributes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>Application Generation (CASE)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>Intelligent editor (language sensitive)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>System/user defined templates</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Integrated completion/debug</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>Keyboard re-mapping</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>Compiled environment</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Execution-time source debugging</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Host Environments Supported for Peer to Peer</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

---

*Easel does not support the SAA CUA style interface under PC/DOS only under OS/2.

---

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EasySAA is an advanced Object Oriented CASE tool for creating SAA/CUA-compatible interfaces and cooperative processing applications with many features including:

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30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User: Other
95. Vendor: Other
(If applicable)

TITLE/FUNCTION (Circle one)
19. Chief Information Officer/Vice President/General Manager
21. Dir./Mgr. MIS Services, Information Center
32. Programmers, Software Developers
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Manager
12. Vice President, General Manager
13. Treasurer, Controller, Financial Officer
51. Sales & Marketing Mgt
OTHER PROFESSIONALS
60. System Integrators/VARs/Consulting Mgt
70. Medical, Legal, Accounting Mgt
80. Educators, Journalists, Librarians, Students
90. Others
(If applicable)

COMPUTER INVOLVEMENT (Circle all that apply)
Mainframes/Superminis
Minicomputers/Small Business Computers
Microcomputers/Desktops
Communications Systems
Office Automation Systems
No Computer Involvement
VAX guardian suits DEC style

BY MARYFRAN JOHNSON CW STAFF

MARLBORO, Mass. — Bob Glorioso likes to be called "The Environmentalist," but it is not birds and bunnies he has in mind.

The vice-president of high-end equipment at Digital Equipment Corp. — the man behind the VAX 9000 mainframe — picked up that subtitle from a former boss who commented on Glorioso's management style.

"I trust people. I believe everyone wants to contribute, can contribute, and given the right environment, they will," Glorioso said. "People have to be able to express themselves without fear of reprisals."

Well respected by his colleagues as a scientist and engineer, the 48-year-old former college professor is portrayed by coworkers as an affable leader, politically astute enough to handle the DEC bureaucracy and visionary enough to acquire commitments to a seven-year project.

"Bob loves people who are bright, who make things happen," said Rich Whitman, product manager for the VAX 9000. "He likes risk-takers. If you're hard-charging, he's the best boss you can have," said Peter Schay, a DEC employee and now a vice-president of the division.

While working with his engineers to iron out technical bugs in the VAX 8600 design, Glorioso formed a team of five DEC engineers and managers to start advance development work on the mainframe VAX.

The project was formally launched in April 1984, the year Glorioso became manager of high-performance systems. He was promoted to vice-president of the division in 1985.

While the most imposing hurdles to the mainframe project were technical ones, there were political and cultural stumbling blocks as well.

"Bob had to sell the vision of a mainframe VAX to people who would have preferred to stay in a safe midrange niche," said Peter Schay, once a DEC employee and now a vice-president of the division.

To make sure the right software would be developed to fuel the mainframe VAX for commercial sales, Glorioso managed to move DEC's on-line transaction processing program into his own systems group.

"That was a major political coup," Schay noted.

When the VAX 9000 was announced last month, industry watchers also took note of the formation of sales account teams to peddle the mainframe.

"That development is not at all trivial," said Robert Cameron, a senior analyst at Dataquest, Inc. in San Jose, Calif.

Imageplus undergoes paperless pilot project

ON SITE

BY ROSEMARY HAMILTON CW STAFF

BOSTON — Maybe the paperless office is just a myth. If so, then the Putnam Co., like any other company, will never achieve it. But if nothing else, the Boston-based financial services firm is becoming a much less cluttered office environment.

Putnam is the site of the latest pilot project for the IBM Imageplus imaging system. Earlier this month, the company went live with the IBM system for its clerical operations in its Shareholder Priority Processing Department.

Forty workstations are up and running now, and the plan is to spread the technology into other departments and other applications areas over the next 18 months. By mid-1991, Putnam should have close to 400 image workstations on-line, said Gavan Taylor, senior vice-president of the information systems division.

The system consists of an IBM 3090 Model 200S mainframe running Imageplus software under the IBM MVS/ESA operating system, as well as IBM Personal System/2s supporting workstation-based Imageplus software.

"Big accounts, multiregional, multivisual accounts need that help from the vendor to cross their own organizational structures. DEC is giving customers better access, which parallels MIS expectations. It's the way they're used to dealing with IBM."

DEC also began hiring ex-IBMers, particularly in sales and support, said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass.

"DEC knows they aren't selling just another VAX," Shannon said. "They're fully aware of the different class of clients, with different needs and prerogatives."

In the labor and delivery of the mainframe VAX, Glorioso said he watched the birth of a cultural change at DEC. "There were thinking changes that took place, through the company as a whole and in the way we service customers," he said. "If you sell in the environment marketplace, you have to do it directly,"

result, incoming documents are now scanned for the image system and filmed for traditional microfiche storage.

So far, Putnam is giving both IBM and its mainframe-based imaging system a thumbs-up.

"They're fully aware of the clerical portion of the Shareholder Priority Processing Department is operating without paper."

The group handles incoming correspondence from shareholders, and the department's work consists of account updates, changes of client addresses and funds transfers.

Putnam's business seems to have been tailor-made for imaging. The company, which manages $42 billion in mutual funds and pension accounts, moves 35,000 pieces of paper a day, according to Taylor.

A large chunk of that paper is handwritten correspondence from shareholders. The handwriting can be read; in addition, the paper itself comes in

Continued on page 28
There's a sleek new shape on the landscape. A gleaming testament to the fine art of engineering. It's the new North American headquarters of BMW. But like all things BMW, the real power lies under the hood. At the heart of the communications system—the 9751 CBX from ROLM. Why ROLM, of all the systems they could have chosen? It began with a set of expectations. A voice message system that was simple to use. An installation that wasn't a nightmare. Service and support they could count on. All the things they assumed they could get anywhere. But which, surprisingly, only one company had: ROLM. The installation went so smoothly that BMW's normal, efficient operations never hit a bump. On the first day in the new building, every phone had dial tone, every computer display was aglow. Before long, PhoneMail had become an everyday part of doing business, from the board room to the mail room. But even with all this, a feature that wasn't even on their list of expectations turned out to be the clinching factor: ROLM's association with IBM. This combined expertise in voice and data offered benefits no one else could match. Voice/data integration, up-to-the-minute solutions and a solid link for the long term. A long term that includes the technology of Siemens, a world leader in ISDN. These days, there's a new standard of performance at BMW. You'll find it parked on every desk: ROLM.
The selection of a solid vendor was perhaps the most critical factor because Putnam was planning on putting close to $10 million on the line. In the end, it was IBM that gave Putnam this confidence.

Software Spectrum makes 1-2-3 upgrades as simple as dialing the phone.

- Are you one of the millions who will upgrade to Lotus' 1-2-3? Release 3 — the most powerful, graphic and productive spreadsheet ever! Or will you move up to Release 2.2, the newest 1-2-3 written for 80X- and 286-machines? Either way, Software Spectrum has your number. For one of the few resellers authorized to offer Lotus upgrades. We now have plenty of Release 3 and your choice of upgrade is free, or 10 of these.

Software Spectrum makes it easy to get there. Just call and we'll tell you how to get it. If you bought Release 3 or 2.2 from us for just $35. But hurry, this special introductory price is good through December 31, 1989. If you're upgrading in quantity, Software Spectrum can host an Upgrade Event at your location. You may even be able to upgrade without turning in your old 1-2-3 diskettes or documentation. Just call us for information about putting a Lotus Master Upgrade Agreement in place. Now stop and look again at the numbers above. Then pick up the phone and dial. Because the two new 1-2-3s are the most powerful spreadsheets in the world. And Software Spectrum is the best place to get them.
asked if the disk drive lost something when IBM elected not to use this new lubricant, he said, "Absolutely not." Then, when Low was asked why IBM was using this lubricant in the first place, he said he hadn't determined why. So are we to assume that a company as smart as IBM was messing around with a different lubricant for the heck of it? And assume that decisions are made, willy-nilly, on a project as important as this disk drive - a product that could bring in revenue in the multi-billion-dollar range? I placed a call to the IBM public relations office and said that Low's answers really didn't sound good. Perhaps he would like to clarify them. An IBM spokeswoman said the reason Low said he hadn't determined why the lubricant was used in the first place was because, as president of the division, he doesn't have a hands-on role in these engineering projects.

Good answer — except that it doesn't fit with something else Low said. At the tail end of the interview with him, he was asked if there would be a reprisal for the person responsible for this technical problem. Low said, "That was me." Well, maybe that was the sort of answer from a division chief that, in effect, says, "The buck stops here." If not, we have a situation that stirs up the question: This isn't adding up, so is there something you're not telling us? One thing the IBM spokeswoman pointed out a number of times is that Low is a scientist first and foremost. The implication is that he is not as slick as the typical IBM marketing executive who knows what kinds of answers to give the press. Maybe so. Maybe Low is a stereotypical scientist who's more comfortable in technical discussions rather than question-and-answer exchanges. I sure hope so. Because if he's not the stereotypical scientist, then we have a story from IBM with a few holes in it. And that means every 3390 customer had better be checking those disk drives very closely.

Hamilton is Computerworld's senior editor, systems.

Why Experienced Computer Users Don't Think Very Much About Modems

Our research shows that knowledgeable MIS managers, PC coordinators, and end users simply don't want to think of modems at all.

Not exactly what modern makers relish hearing! But it's hardly surprising that you want to save your thinking for bigger and more important things.

Modems are a lot like plumbing. As long as the data is flowing, they're practically invisible. However, when something goes wrong, those little boxes are just lavished with attention.

By then, you've lost data, time, money, and perhaps an opportunity. Both senders and receivers are dismayed and disarrayed. Fortunately, there are simple ways to limit this aggravation. Our research suggests a few points to keep in mind.

The cost of the modem is not the modem's cost.

The fixed price of the modem is relatively insignificant. Ongoing costs far more. In the long run, for example, a high-speed modem can save you a small fortune on phone bills. More data sent in less time means less money to the phone company.

You can also save with more reliable and robust modems that communicate over a wide range of telephone line conditions. Resending data costs both time and money. The less time you spend transmitting data, the more time you have to spend on your business.

Downtime and adaptation time can also cost you dearly. Be sure to ask if the modems are compatible with your earlier generations. You don't want to start with suppliers who regularly obsolete their own products, or who don't offer you an upgrade path.

Modern support can be a real hassle with the wrong vendor.

Setting up and installing your modem can affect both your budget and your sanity. Many manufacturers forget to make their modems easy to use!

This becomes expensive when you want to start up fast or need to support a large number of users.

Dip switches, on-line help screens, and easy-to-use manuals should be demanded. It also helps to have a quick-reference guide printed on the bottom of the case.

In sticky situations, it's vital to have toll-free support and application engineering.

Bottom line: The data must get through.

A bit of data traveling from your computer is converted by your modem and sent to your local telephone office.

From there, it is exposed to the vagaries of phone lines, various transmission media, and weather patterns.

They all conspire to corrupt your data and slow down your throughput.

All modems are not created equal; some are less sensitive to noise and have better error-correcting protocols.

Some are simply more robust and have better filters.

Modems are more than mere commodities - technology does count.
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LASER PRINTING HAS BEEN OUT OF REACH FOR MANY PEOPLE IN BUSINESS.
Opting for the quality of a laser printer has just become decidedly easier. Introducing the EPL-6000 laser printer from Epson®

Coming from the company with the longest running success in the printer business, reliability is a given. What's more, the new EPL-6000 is compatible with application software written for the HP LaserJet II®.

As for value, this new Epson combines solid, businesslike performance with a price that is as attractive as the printing. In fact, for quality, reliability and value in a laser printer, you could say Epson has the solution well in hand.
NEW PRODUCTS — SOFTWARE

Utilities

Velocity Software, Inc. has announced XASSD, an IBM VM/XA solid-state disk support software.

According to the company, the product adds support to the VM/XA SP Control Program for solid-state disk devices and expands the VM/XA paging hierarchy to allow these devices to be treated preferentially. Operator controls are included to permit disk allocation control on either a global or individual user basis. XASSD is available for a $6,000 annual fee, and a 30-day free trial is provided for evaluation purposes.

Velocity Software
60 Albain St.
Boston, Mass. 01214
617-825-3599

New Generation Software, Inc. has introduced an uninterruptible power supply automatic-power-down function to its Home Free software for the IBM Application System/400 computer.

The software interface performs a normal power-down before powering down the AS/400’s “battery weak” signal, the firm said. A standard version of the product is also available without the UPS interface function. Pricing ranges from $285 to $795 depending on CPU model number and selected software version.

New Generation Software
Suite 195
1016 Burlington Way
Sacremento, Calif. 95825
916-920-2200

Leads Associates, Inc. has announced a software product designed to increase processing speed and reduce the response time for most IBM mainframe applications running with VM/XA.

Called MIS-Turb, the product reportedly generates optimum statistics from its database facility to produce the recommended changes without affecting the application code. The product’s cost can be fixed at an hourly rate or established at a flat contract price, depending on the client’s preference.

Leads Associates
5 Alma Rock Road
Stamford, Conn. 06903
203-322-3516

Applications packages

GE Information Services (GEIS) has introduced a credit management system developed specifically for banks running internal credit operations.

Called CreditPro, the integrated credit decision support software is expected to run in an IBM Application System/400 environment. The system permits managers to manipulate raw data for use in strategic analysis and forecasting. It can use information from any application residing on the AS/400, according to the vendor.

Reporting and on-line viewing functions are included, and the software is priced from $25,000 to $50,000.

Training and help line support are also available.

Interactive Software Services
Suite 506
4825 N. Scott St.
Schiller Park, Ill. 60176
312-671-4450

Cognos’ Powerplay analyses detailed VAX/VMS information

An end-user reporting and analysis tool for managers and other decision-making personnel has been announced by Cognos, Inc.

Designed to provide access to corporate data from the desktop, Powerplay is scheduled for release in January 1990 and will initially be available for Digital Equipment Corp. VAX/VMS personal computer platforms. The software employs a graphical format and multidimensional approach to information analysis that allows the user to view and report on corporate information at increasing levels of detail. The company is also offering Inquisitive, a menu-driven report writing system for generating list style reports.

Powerplay offers an unlimited number of categories and will be priced at $995 for each PC and at $15,000 for the host component. Users will be able to run the product as either a stand-alone package on the PC or in conjunction with the host machine.

Pricing for Inquisitive and the VAX/VMS environment will range from $2,500 to $14,000, depending on machine configuration.

Cognos
13755 Riverside Drive
Ottawa, Ont., Canada
K1G 3Z2
613-738-1440

Interactive Software Services, Inc. has announced Annex, a decision-support software system developed to run in an IBM Application System/400 environ-

ment. The system manages query data and integrates with other systems as well as scoring applications. Other functions reportedly include authorizations, mailing lists, promotions, accounts receivable and collections. The full software package is available for a license fee, which includes installation and support. Modules are also sold individually.

GEIS
401 N. Washington St.
Rockville, Md. 20850
800-433-3683

NEW PRODUCTS — SYSTEMS

Processors

Prime Computer, Inc. has announced the introduction of a low-end multituser commercial system for Unix-based application programs.

The Prime EX1 MBX Plus utilizes a 32-bit 80386 microprocessor from Intel Corp. and can reportedly support up to 32 users.

A basic configuration for the system includes an 80386 processor, 4M bytes of memory, a 1.2M-byte floppy disk drive and a 4M-byte hard disk drive. The price for this basic system is $9,800.

Prime
Prime Park Way
Natick, Mass. 01760
508-655-8000

Sky Computers, Inc. has introduced an Intel Corp. 860/9600-based reduced instruction set computing application accelerator board.

The single-board Skybolt reportedly combines the two microprocessors to provide 40 million instructions per second and 60 million floating-point operations per second of computational power for Sun Microsystems, Inc. workstations and Digital Equipment Corp. VME-based systems. The board was designed for scientific and engineering desktop applications.

Pricing starts at $12,240, and OEM and system integrator discounts are available.

Sky Computers
27 Industrial Ave.
Chelmsford, Mass. 01824
508-250-1920

Data storage

Maximum Strategy, Inc. has announced the Strategy HSC Storage System for the ANSI high-speed channel supercomputing environment.

The product has a storage capacity scalable to 300G bytes and a sustained throughput scalable to 160M byte/sec. It incorporates a proprietary disk array technology and is field-upgradable to support the user’s growth requirements, the vendor said. Deliveries are scheduled for the first quarter of 1990. Pricing will start at $200,000.

Maximum Strategy
1450-B Berryessa Road
San Jose, Calif. 95132
408-729-1526

Amazonian 8 mm helical-scan tape sub-system created to provide unattended backup for Digital Equipment Corp. VAX/VMS and Digital Equipment Corp. VAX/VMS hierarchal storage controllers.

The SL/932-XP has an average seek time of 16 ms and can be mounted in the IBM AS/400 computer cabinet for an EMC E309 cabinet or an EMC E309 cabinet. The product uses dual actuators and drives single HSC data channel port and up to 36.8G bytes per HSC tape data channel card, the firm said. The product costs $24,000.

American Digital Systems
490 Boston Post Road
Sudbury, Mass. 01776
508-443-7711

Transitional Technology
1411 N. Batavia
Orange, Calif. 92667
714-744-1030

Distributed Logic Corp. (Dilog) has introduced two host adapter boards that provide single-ended small computer systems interface (SCSI) capabilities for connecting multiple disk and tape drives to Digital Equipment Corp. Microvax III systems.

The S23706A Host Adapter permits the connection of as many as seven SCSI disk drives to the host computer, while the S23703A Host Adapter allows the attachment of several tape drives or tape emulation devices per system. Both quad-sized boards incorporate a 64K-byte data buffer and sell for $1,650 each.

Dilog
118 S. Sinclair St.
Anaheim, Calif. 92806
714-937-5700

-American Digital Systems, Inc. has announced a tape backup system designed to support Digital Equipment Corp’s HSC-40, HSC-50 and HSC-70 hierarchical storage controllers.

The Mastertape II/HSC 8 mm backup system is available in configurations with one to four 8 mm tape drives, coupled to a small computer systems inter-face-to-tape data channel communication protocol converter. The basic version provides as much as 2.3G bytes of data per HSC tape data channel port and up to 36.8G bytes per HSC tape data channel card, the firm said. The product costs $44,000.

American Digital Systems
490 Boston Post Road
Sudbury, Mass. 01776
508-443-7711

A 600M-byte direct-access storage device subsystem for the IBM Application System/400 platform has been announced by Electronic Data Systems (EDS).

The SL/932-XP has an average seek time of 16 msec and can be mounted in the IBM AS/400 computer cabinet for an EMC E309 cabinet or an EMC E309 cabinet. The product uses dual actuators and drives single HSC data channel port and up to 36.8G bytes per HSC tape data channel card, the firm said. The product costs $24,000.
Bus drivers clash over speed

**Verbal sparks fly over differing EISA, MCA performance claims**

**ANALYSIS**

**BY PATRICIA KEEFE**

**CW STAFF**

LAS VEGAS — Users and analysts may not perceive much difference between the two buses slugging it out for control of the 32-bit desktop, but to listen to IBM and Compaq Computer Corp., there's a world of difference worth fighting over, particularly in the speed zone.

The sparks flew at a recent Comdex/Fall ’89 panel entitled “MCA vs. EISA: Which Bus Will Users Ride?” The session consisted of Robert Carberry, IBM’s Micro Channel Architecture (MCA) evangelist, vs. Gary Stimac, Compaq’s senior vice president of systems engineering and resident Extended Industry Standard Architecture (EISA) expert.

“There is no one winner,” said panel moderator Seymour Merrin, a consultant and former reseller. He said the issue is about choosing between multiple ways to get to the same destination.

Unlike some of his patrons, Merrin agrees with IBM and Compaq that EISA and MCA are very different architectures, even down to the trivial level.

“The differences are momental in concept, philosophy and in what they do, how they do and what you end up being able to do,” Merrin said. Yet he concludes that there is no war here, just choices for users.

Maybe so, but it is turning out to be a no-holds-barred battle for user dollars.

Compaq dropped the gloves early, taking some clear shots at an IBM briefing that prestaged Compaq’s EISA rollout, at which IBM laid out plans for future MCA advancements. “We want to end the bus wars. We want to deliver [products], not just promises,” said Stimac. “We think our customers are not interested in future bus specs, just what they can get today and move into the future.”

Stimac hammered home Compaq’s contention that EISA is evolutionary and builds upon the user investment in ISA, whereas MCA is closed.

In an interview at Comdex, an obviously annoyed Carberry stopped short of calling Compaq a liar. Users may yawn, but both vendors have good reason to be touchy. The future of the desktop lies in 32-bit data transmission, and so both are rushing to stake claims in a pristine territory only slightly sullied by Unix workstations.

Based on separate interviews with Mike Swavely, president of Compaq North America, and Stimac, Compaq’s claims boil down

Continued on page 41

Quantum gets a little egg on disk-drive face

**BY RICHARD PASTORE**

**CW STAFF**

Disk-drive maker Quantum Corp., whose name has surfaced quite a bit in the past two months. But to its chagrin, the publicity was generated by product failure rather than the new 1-in.-high OEM drives it unveiled earlier this month (see story page 40).

Beginning in September, some Apple Computer, Inc. Macintosh users reported frequent crashes of their Quantum-made hard disk drives. What followed were weeks of vendor indifference, then acknowledgement, and finally a repair program that has left many users more worried than ever about the health of their Macs.

After users had insisted that something was definitely wrong with their drives, Quantum determined that the lubricant in some of its products had somehow thickened enough to hammer the movement of the actuator arm and cause a drive crash.

The company designed a fix to the device’s programmable read-only memory (PROM) that directs more power and extra seek motions to the arm to help it break through and stir up the viscous lubricant.

However, some users’ frustrations continued even after the PROM was changed. They voiced concerns that their drives made loud dirtier noises and expressed fears that the extra seeks were slowing the drive’s access rate or de-stroying data.

One Mac user, who asked not to be identified, said his 4-month-old Mac IICX started making annoyingly loud access noises after a dealer changed the PROM four weeks ago. “The great thing about the Mac IICX was that it was supposed to be a quiet machine,” the user said. “It isn’t anymore.”

Quantum Chairman and Chief Executive Officer Stephen Berkley tried to put the increasingly embarrassing matter to rest in a recent interview with *Computerworld*.

“The noises you don’t normally hear are caused by the additional seeks,” Berkley said. With frequent use over a few weeks, the lubricant should thin out enough for the drive to revert to normal operation, he said. He also assured users that the additional

Continued on page 40

The COBOL Programmer Workstation and its Impact on Productivity

**The Micro Focus Developers Conference 1989 Schedule**

The Programmer Workstation environment uses personal computers as intelligent, distributed workstations for developing, testing and maintaining host-based COBOL applications. At these developers conferences you will:

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- Evaluate the workstation's potential in your organization
- Learn about latest product developments and future trends

**A Better Way of Programming**

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The Micro Focus Developers Conference 1989 Schedule

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November 27, 1989

**COMPUTERWORLD**

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There is no charge for attending a Micro Focus Developers Conference. For more information about the Developers Conferences or about Micro Focus products call 415-856-4161.
Robert was sold on Hewlett-Packard PCs while
He was studying engineering and contends an HP calculator was the secret to his success. Since then, HP LaserJet printers have been a big help to his growing company. So when he found he could get Hewlett-Packard reliability in a network of personal computers, Robert decided to stay with a sure thing.

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When Texas Instruments decided to offer their latest portable solutions, they focused on two things users really wanted in 286-class laptop computers.
Model 12: All the power — half the weight.

Weighing a remarkable 6.7 lbs. — including battery and 20 MB hard disk drive — TI’s TravelMate LT286 Model 12 delivers all the processing power of a desktop PC in a laptop. It’s the perfect choice for professionals who need to work on-the-go.

Getting started couldn’t be easier. That’s because the Model 12 has MS-DOS 3.3® and LAPLINK™ in ROM. It also comes with a preformatted disk drive, making it ready to use right out of the box.

With the Model 12, you don’t sacrifice performance for small size and weight. Business software runs fast, thanks to a 12 MHz 80286 microprocessor. There’s plenty of storage for all kinds of software applications — the internal hard disk drive comes standard. Plus, you get 1 MB of RAM, expandable to 4 MB.

Not only does the Model 12 perform like a desktop PC, it has the same touch. The AT-style keyboard provides full-size, full-travel keys that give your fingers plenty of room.

Other features include an easy-to-read, enhanced Supertwist backlit LCD screen. A removable 3.5" high-density diskette drive provides additional flexibility and convenience — snap it on for loading software or remove it and travel light. And, sending critical work to your office takes only a phone call with an internal modem.

The TravelMate LT286 Model 12: the laptop that doesn’t compromise performance for size.
LT286 Series of laptop computers: the industry’s lightest, brightest portable solutions.

Models 25 and 45:
Dazzling display for windowing and graphics.

If you want portability and an exceptional display for graphics, you’ll appreciate the bright side of this solution. TravelMate LT286 Models 25 and 45 feature a brilliant black-on-white VGA display that rivals that of most desktop PCs.

This makes text easy on the eyes and provides crisp, well-defined graphic images for applications that use MS® Windows, like PageMaker® and Excel™. The VGA screen is perfect for presentations to clients and prospects, plus your own personal use.

Not only do you get a superb display, you get superb performance as well. Like standard AT-compatible desktop PCs, Models 25 and 45 operate with a 12 MHz 80286 microprocessor for quick and powerful processing. You also get a 20 MB or 40 MB internal hard disk drive; an internal 3.5” diskette drive; 640K of RAM, expandable to 3.64 MB; an AT-style keyboard with full-size, full-travel keys; and an internal battery.

In addition, an intelligent power management system turns off the screen and fixed disk drive during periods of inactivity to extend battery life, allowing you to use the laptop longer.

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Twenty years ago, TI introduced the world’s first portable data terminals. Today, with nearly a million units sold, we’ve established ourselves as a market leader by offering products that increased in functionality and decreased in size. This unparalleled experience has enabled us to provide you with the TravelMate LT286 Series – laptop computers that are powerful, innovative and durable. Qualities you have come to know and expect from TI. The choice for lighter, brighter portable solutions.

For more information, call TI today.
1-800-527-3500.
Louis Vuitton takes on PC style

**ON SITE**

BY ALAN J. RYAN

NEW YORK — Standing in line to buy a tube of toothpaste at the local discount store may be at least tolerable to most folks. To buy a tube of toothpaste at the Louis Vuitton store in Beverly Hills is not.

The toothpaste buyer is likely to be happy that the product is bar-coded so that service at the register is quicker. But customers at the chic store might not accept the technology with the same good humor as their discount department store counterparts. In fact, the customers in Beverly Hills might find the practice of bar-coding, scanning, machine-printed receipts and computerized operations a tad too tacky for specialty stores.

That was precisely the challenge faced by Nadine M. Hayes, manager of Louis Vuitton USA, Inc.’s retail personal computer operations, as she went about the process of automating the Louis Vuitton stores throughout the country.

At Louis Vuitton stores, customers expect personalized service and handwritten receipts. The salespeople do not even have experience working with a cash register.

"They enjoy the personal touch," Hayes explained. "We have individual salespeople working on the floor to help them with their purchases. We feel that the traditional way of going one-on-one with a customer is, in this country, the better way to go."

Prior to automation, 23 free-standing stores worked entirely on paper systems. The last store was brought into the computer around June, Hayes said.

Until that time, some of the demographic information requested by the company’s Far East-based corporate headquarters was still being done manually. Even though most processes are automated today, the retail aspects of the stores remain unchanged.

"The stores have an image," Hayes said. "You can walk into a Louis Vuitton store anywhere in the world, and they all look the same." That attention to detail means upper management looks with a wary eye on changes.

"The service was targeted mainly at medium-sized businesses, "companies who may not have a data center operation to enforce backup," Reed said.Texaco spends about $59 per month to back up its Data Network service. Secure Data Network will also ship backup files on floppy disk, tape, or cartridge.

"Painless installation" was brought into the computer department. Information was not gathered in real time; it is entered during a slow point in the day or at the end of the day and then sent in batch form via modem to the company’s U.S. headquarters in New York on a weekly basis.

IBM PS/2 Models 50, 50Z and 70 are the predominant hardware choices, Hayes said.

**HIGH-TECH CONVENIENCE**

The software — designed by Hayes’ department and Management Information Solutions, Inc. a consultancy in New York — collects all sales information, repair orders, employee discounts, shipping charges and sales tax information. Users can track sales by the day, week, month or year and through various criteria such as top items sold based on price or volume, type of payment received, or salesperson. The system also tracks information on overstocked or understocked items.

At 16 other Louis Vuitton locations in leased spaces within department stores, the workers use Zenith Supersport 286 laptops with built-in modems because "sales information is entered at the end of the workday," Hayes said.

The process of creating the new systems faced many challenges. Since the stores use handwritten receipts, "Many of the salespeople did not even have experience working with a cash register," Hayes said. "Some weren’t sure they would be able to catch on and make them comfortable while they were learning something new."

Three weeks ago, the stores began sending all of their sales reports through the computer system. Previously, that information was being relayed through human voice over the phone system, she said.

Future challenges include working with the North American sales information to consolidate it demographically and send it directly to Paris over phone lines as well as creating a network. Vuitton also plans to tie together all of the North American-based computer centers for transferred goods and use electronic mail.

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Quantum
CONTINUED FROM PAGE 33

seeks will not slow access performance since they occur only when the drive is idle.

Berkley partly blamed Apple for user frustrations. Apple did not adequately explain the details of the fix to its customers, he said. He also noted that "for some reason, it took Apple over a month to put a fix together" after Quantum had discovered a solution.

An Apple spokeswoman said she was not aware of any delay and claimed Apple had worked with Quantum on the problem from the start. She added that only a small percentage of users have reported problems; she would not say how many.

However, bad feelings remain on the part of customers who say this episode is just the latest in a series of Mac drive problems. Some end users took swipes at Apple during a Mac users conference that took place at Comdex/Fall '89 earlier this month.

Richard Emerson, news editor/technical resources at The Los Angeles Times, complained about what he called the drives' extremely high failure rate over the course of several years. "Apple doesn't pay it much attention," Emerson added, "and only Apple is allowed to get away with this. If such a thing happened with IBM equipment, there would be such a howl that it would bring the company to its knees."

"If JOHN SCULLEY had been within arm's reach last week, I would have wrung his neck."

"It's a problem that is dogging Apple," said Amy Wohl, president of computer consulting firm Amy D. Wohl & Associates in Bala Cynwyd, Pa. "It happened to me just recently. If [Apple chief executive officer] John Sculley had been within arm's reach last week, I would have wrung his neck."

Berkley said the problems may have resulted from the drives' exposure to excessive heat and humidity in Japan, where they are made.

In any case, "the ultimate fix is that we have changed the type of lubricant used in the manufacturing process," Berkley said.

West Coast correspondent James Daly contributed to this report.

Reduce the drive limit

With portable computers losing bulk almost proportionately to their gain in market share, disk drive makers are chasing out smaller versions of the 3¼-in. hard disk drive and new models of the 2½-in. units to feed this miniaturization trend.

Quantum Corp. announced four new entries in its 1-in. high, 3½-in. hard drive series earlier this month. The Prodrive units feature capacities of 52M and 105M bytes.

The "low-profile" drives were designed to satisfy a growing OEM desire to downsize machines vertically as well as horizontally. Quantum expects to ship the drives in February.

One type of drive that the firm will not ship in the near future is a 2¼-in. model, said Quantum Chairman and Chief Executive Officer Stephen Berkley. Unlike some of its competitors, who are popping up with new 2½-in. models to satisfy the swelling notebook computer market, Quantum is biding its time.

"It's a specialty area with a very low volume right now," Berkley said. But, he noted, "We're developing drives smaller than 3¼-in. because in two or three years, not having one will be a competitive disadvantage."

Companies that are not willing to wait include Pravitek Corp., which pioneered the small drive. That firm announced the third member of its 2¼-in. family earlier this month.

With power consumption rates that average 0.7 watts and an average seek time of 2.5 msec, the Prairie 120 single-disk hard drive is said to be faster and more energy-efficient than its predecessors. The single-disk unit packs a capacity of 21.4M bytes, the Longmont, Colo.-based company claimed. Production quantities reportedly will be available in the first quarter of 1990. Pricing for individual units is $550.

Arrow Technology, Inc. earlier this month unveiled its second 2¼-in. drive of the quarter. The MD-2100 crams up to 100M bytes on a single disk. The Arrow drive features average seek times of less than 29 msec, the San Jose, Calif.-based company said. Expected to ship in the first quarter, MD-2100 pricing starts at $795.

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So when Microcom needed a new corporate telephone system, they made another logical choice. They chose NYNEX INTELLIPATH II.
Bus drivers
CONTINUED FROM PAGE 33

to the following — some of which are readily apparent and others which are subject to interpretation:
• Standards. Compaq claims MCA is proprietary, while EISA is a continuation of the AT bus, also known as ISA.
• Design factors. IBM uses a smaller, nonstandard card, 90 watts to Compaq's 300 and offers fewer expansion slots.
• Better performance. Compaq claims that only one IBM model vs. all Compaq EISA models separates the I/O bus from the memory processor bus, which provides greater performance.
• Multiple processor support.

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NOVEMBER 27, 1989

COMPUTERWORLD

Keefe
CONTINUED FROM PAGE 33
because Microsoft Corp., which is partnered with Sybase and Ashton-Tate to develop an SQL database for client-server as well as area networks, has charged both Gupta and Oracle with unfair play.

So far, Gupta and Oracle benchmarks compare their products against Microsoft's SQL Server, but, says Dave Kaplan, Microsoft's SQL product manager, he can't do that.

By now, you should be asking yourselves, "What are these guys afraid of? What are they hiding?"

Give Microsoft some credit. Kaplan challenges his rivals to release benchmark source code so users can duplicate the results. Otherwise, as Kaplan notes, they might as well be publishing in a vacuum. Microsoft also uses an industry-standard test suite for its benchmark and did its testing on shipping software over a wide range of users.

But we need to go much farther than this. Even if these vendors release their test information, Neal Nelson at Neal Nelson and Associates — which makes its living doing benchmarks — claims these tests are "all hogwash" because the tests are all done at different points in time on different architecture machines.

Nelson said that Oracle takes these tests to a ridiculous extreme. He claims Oracle has signed an agreement with Ncube, maker of a supercomputer studied with 2,000 — yes, 2,000 — CPUs, allowing Oracle to benchmark its server on Ncube for a transaction per section test. Now here's a realistic test.

Nelson recently fell into this frustrating morass. He was asked by a federal user to benchmark four database servers: Oracle, Ingres, Informix and Unify. Nelson did so, devising a benchmark that he obviously thinks is a good one. He says he took pains to use the same programmer to implement all four products, using the same queries and the same version of each program running on the same two platforms.

In all, he spent three months testing 75 different things over a range of users. The result is a 205-page report that Nelson can't publish because the vendors involved — who know their own test results but not those of the other three — won't let him do it.

Only Informix has shown any guts (so much for Ingres — formerly Relational Technology — recent full-page ad in the Wall Street Journal slamming what it claimed was marketing hype and mumbo jumbo in the database industry), Sybase volunteered to be tested, agreeing to public disclosure of the results. But when asked to talk to me about it, the firm backed down, Nelson claimed.

"The problem is that we need a fair public comparison, which obviously these companies don't want," Nelson said. So hit 'em where it hurts. Don't let them get away with it. Refuse to buy products from vendors who are afraid to have their products fairly compared to the competition. "As a customer group, we need to get radical and insist on public, impartial benchmarks. It's really scandalous that a vendor would think it can prevent free transfer of test information," Nelson said. Amen.

Keefe is Computerworld's senior editor, PCs and workstations.
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The word at Comdex: More storage

BY SALLY CUSACK
CW STAFF

Disk-drive vendors waving both promises and products scrambled to outshine one another at this year's Comdex/Fall '89 trade show in Las Vegas with offers of greater storage capacities and faster data transfer rates.

Among the announcements were the following:
- Eastman Kodak Co. presented an automated optical-disc library with 75G bytes of storage capacity. Designated the Model 560, the unit supports as many as five 5%-in. optical-disc drives and up to 61 5%-in. International Standards Organization standard or nonstandard disk cartridges, the company said.
- The device can be fitted with write-once-read-many (WORM) drives, erasable drives or a combination of both.
- Kodak also announced that it will manufacture a WORM optical-disc capable of storing 8.5G bytes of information — the equivalent of 48 fully loaded reels of magnetic tape.

The products will be compatible with the hardware component of the Kodak 6800 optical-disc system. Availability dates and pricing have not yet been determined, according to a company marketing representative.
- Verbatim Corp., a Kodak subsidiary based in Sunnyvale, Calif., introduced its TMO 5%-in. double-sided, erasable optical disc available in two versions: the Model 505, which provides 600M bytes of storage; and the Model 510, which has capacity for 650M bytes.
- General availability is slated for January, with a suggested list price of $250 per disk.
- A 1.2G-byte, 5%-in. Winchester disk drive was introduced by Siemens Information Systems, Inc. in Boca Raton, Fla. The Megaslide 6200 series offers a 14-msec seek time, the company said, and is scheduled to be available with a small computer systems interface.

Add-on features include a 20M bit/sec. transfer rate and a mean time between failure of 100,000 hours. Evaluation units are scheduled for delivery in the first quarter of 1990 and will be priced at $3,000.
- Seagate Technology in Scotts Valley, Calif., announced a 760M-byte, 5%-in. magnetic disk drive that it claims has an 11.9 msec. access time and a maximum data transfer rate of 3MB/sec.

Christened the Wernerunner-2, the device is targeted for use in engineering workstations, network file servers and on-line transaction processing environments with high-speed disk requirements.
- Three IBM Micro Channel Architecture-compatible 3%-in. hard disk drives that mount directly in the IBM Personal System/2 Model 50 expansion slots were introduced by Procon Technology, Inc. in Costa Mesa, Calif. The Pira 50-70, 50-100 and 50-200 offer 70M, 100M and 200M bytes of storage, respectively, and are said to be compatible with DOS, OS/2 and Novell, Inc. Netware environments.

The Pira series drives are shipped with all hardware, cableing and documentation necessary for plug-and-play installation, and are priced from $1,195 to $2,695, depending on memory configuration.

N E W P R O D U C T S

Systems

Headstart Technologies Co. has introduced a programmable personal computer that reportedly has an animated icon-based interface.

In the Explorer, the machine comes with 512K bytes of random-access memory, expandable to 768K bytes, the vendor said. It includes a 5%-in. floppy disk drive and an Intel Corp. 8086-1 processor operating at 9.54/4.77 MHz, switchable.
- The Explorer carries a suggested retail price of $599.

Headstart Technologies Suite 438
40 Cutter Road
Great Neck, N.Y. 11021
516-482-4255

U-Tron, Inc. has announced a 12-MHz diskless LAN station.

The company reports that the UT1612 comes standard with 1MB byte of memory. It can be configured with an Ethernet or Arcnet network card and either a Universal remote boot read-only memory or Novell programmable read-only memory.

Retail prices on the UT1612 start at $1,695 for an Arcnet version with monographics to $2,195 for an Ethernet, IBM Video Graphics Array system.
- U-Tron, Inc. 243 Charcott Ave.
  San Jose, Calif. 95131
  408-943-1920

Compaq Corp. has introduced a series of desktop personal computers that require 29% less desktop space than previous models, the vendor said.
- The product line comprises five systems ranging from an entry-level $595 model to a $4,495, Intel Corp. 80386SX-based machine. All of the units reportedly include a dual hard drive interface, dual-disk drive controller, two serial ports and a parallel port. Each also provides three full-size and two half-size expansion slots. The products are available immediately.

Compaq
2320 Technology Blvd.
Austin, Texas 78727
512-350-1489

Macintosh products

Accel Computer Corp. has introduced a pair of handheld scanners for Apple Computer, Inc. Macintosh computers.
- According to the company, the Model 400 is a 400 dot/in. monochrome scanner with a scanning speed of 3.1 in/sec. and a scan width of 4.1 in. The Model 270A has a reported scanning speed of 1 in/sec. and pixel resolution of 4 bit/pixel. Both models are to be released in the fourth quarter of 1989. Accel has announced that pricing for the Models 400A and 270A will be below $500 and $800, respectively.

Accel's Macintosh-compatible 400 dot/in. handheld scanner

Algo, Inc. has announced Plotdisk II, a floppy disk drive intended to rival print workstations of other key clients.
- It runs on IBM Personal Computers, XTAs, ATs, Personal Systems/2a and compatibles.
- The Retrieval/60E is a QIC-40 standard, error-correcting tape system; a version with a driveserver is also available. The company reports the price to be $795.

Alloy
165 Forest St.
Bothell, Wash. 98011
425-483-8088

Daisy data storage

Algo lists the price for a single five major components: a client database, a dialer, a tickler, a calendar and report-writing functions. It is priced at $495 per single user.

Adamation
1435 Oakland Center
Cleveland, Calif. 94067
415-452-5252

Finance: os the financial software designed to assist executives and managers with data analysis and forecasting functions is available from Realworld Corp.

The Business Forecasting package utilizes a descriptive, nonprocedural English-like language, the vendor said, and includes What If, Goal Seek and Analyze capabilities. Models can be built that include variables, and different models can be integrated from multiple sources can be used.

The package runs in DOS and networked environments and is priced at $795.

Realworld
P.O. Box 2051
Cleveland, N.H. 03302
800-478-6336

CommonTouch, Inc. has introduced a business letter-generator program that works without word processing, the company said.

Called Letterware, the software is especially suited for entry-level users who do not want to purchase a word-processing system. It is also available. The company reports the price to be $795.

Alloy
165 Forest St.
Marlboro, Mass. 01752
508-481-8500

Software applications packages

Adamation has announced an Ingres, Inc. Ingres-driven application for the Novell, Inc. computer.

Christened Who's Calling, the software utilizes the Ingres relational database system to monitor phone calls and other key client information. It consists of

The company also announced the PXX 2880, a 2.88M-byte floppy disk drive intended for AT-type machines. The product reportedly reads, writes and formats 2.88M-byte, 1.44M-byte and 512K-byte file cartridges and has a data transfer rate of 1MB/sec. Priced at $459, the drive ships with a proprietary controller capable of coexisting with any other floppy controller, the company said. The drive is also available with DOS 3.3 and higher.

Fujitsu America, Inc. said that its latest generation of disk drives features a mean-time-between-failure rating of 200,000 power-on hours and a five-year warranty. The drives are the 8-in., 2.88M-byte M2392 and the 5%-in., 778M-byte M2263 model.

In 100-unit quantities, the M2263 costs $1,900, and the M2392 is priced at $4,995. Both prices are quoted in 100-unit quantities.
The new makeup at Mary Kay
Dallas cosmetics maker aims for systems consistency with DEC network

BY JOANIE M. WEXLER CW STAFF

DALLAS — A corporate make-over under way at Mary Kay Cosmetics, Inc. might remove a few wrinkles from the brows of more than 300 decision makers demanding a common view of information.

To establish a consistent data architecture to provide that view, the 26-year-old company is replacing incompatible systems across the country with Digital Equipment Corp. computers networked over leased telephone lines using Decnet protocols. The linked sites include Mary Kay's corporate headquarters, factory and ware- house in Dallas and five branch distribution centers in California, Georgia, Illinois, New Jersey and Texas.

The company has hauled its 12-year-old Datapoint Corp. order-entry systems out to the curb and is preparing to pull the plug on its 6-year-old Wang VS processors when their leases are up in early 1991. DEC Microproces- sors have replaced the order- entry systems, and word pro- cessing functions will be handled by MS-DOS-compatible personal computers linked through the VAX network.

A DEC 630 host now operates alongside an IBM 4381 in the Dallas corporate headquar- ters, and the company plans to wean itself off the 4381 throughout 1990 and 1991, said Gary Bishop, vice-president of MIS.

About 170,000 independent beauty consultants throughout the country place orders for skin-care products and cosmetics through the company's five branch offices by mailing in an order form. The consultants serve as the primary source of information for the company in analyzing sales trends and demo- graphics and pinpointing product problem areas.

"Gateways and bridges don't provide a common view across a complex network," Bishop said. "We're moving to a DEC VMS strategy that is based around the operating system software — not around the DEC hardware. We chose DEC because of its strength in networking," Larry Moore, director of operations at Mary Kay, added that "DEC gave us the ability to grow"

Continued on page 48
Third parties solidify release dates for DEC manager links

BY ELISABETH HORWITT CW STAFF

Some of the more solid announcements that came out of Digital Equipment Corp.'s Enterprise Management Architecture (EMA) update two weeks ago were made by third-party vendors.

Four of the seven original EMA partners set release dates for links between their own products and Version 1.0 of DEC Management Control Center (Decmcc) Director, which is scheduled to ship in the third quarter of next year. The announcements included the following:

- Stratacom, Inc. will provide access modules to connect its IPX line of T1 multiplexers to Decmcc Director via the Open Systems Interconnect Common Management Information Protocol. Stratacom will also develop EMA-based applications to enable Decmcc Director to manage its IPX line of T1 multiplexers directly. Delivery of both products is scheduled for shortly after Decmcc Director ships. Stratacom will sell Decmcc Director as one of several management options. Stratacom and DEC recently announced an alliance for integrating DEC's LAN bridges with Stratacom's fast packet-switch technology.

- Vitalink Communications Corp. said it will provide applications and links to allow Decmcc Director to manage its 9800 network connections to local area network bridges as well as communicate with Vitalink's wide-area network manager, Wamanager. Vitalink's Decmcc connections will ship at the same time as Decmcc Director, it said.

Vitalink and Stratacom also announced a plan to develop an integrated, Decwindows, VAX-based platform that will provide troubleshooting and configuration management for users who want to feed LAN traffic through Vitalink's bridges onto an IPX multiplexer. The platform is scheduled to ship in early 1990.

- Codex Corp. said it will ship an access module to link its 9800 network management system to Decmcc Director on the date Decmcc Director ships. Codex said the 9800 will manage all Codex products, including multiplexers, T1 switches, packet switches and digital service units.

- TSB International, Inc. announced that it will deliver an access module for its Hub family of boxes, which collect alerts and performance data from a variety of private branch exchange systems. TSB also announced plans to implement the functionality of its Hub systems as applications within Decmcc Director.

Of the remaining three original EMA supporters, Timeplex, Inc. has yet to commit to writing any type of connection to Decmcc's platform. Meanwhile, DEC and Siemens AG are working out details of other communications-related alliances. Digital Communications Associates, Inc. committed to interfacing its network management system with Decmcc's, but it has set no definite time frame.

Six new EMA supporters made the following commitments:

- InforNet Services Corp. announced plans to adopt EMA as its "architecture for standards-based network management" for the firm's global packet-switched networking services, according to InforNet's President of Development and Operations, W.E. Perren. Decmcc Director will also manage portions of InforNet's recently announced private and hybrid network offerings, Perren said.

- Nynex Information Solutions Group agreed to develop management modules within Decmcc Director for its telemanagement system, which runs on DEC VAXs and IBM mainframes.

- Chipcom Corp. committed to developing a module to integrate its LAN backbone products with Decmcc Director.

- 3Com Corp. announced intentions to connect peer-managed communications between Decmcc Director and applications designed under 3Com's new Open Management Architecture.

Such peer connection is one of the features that Charles Schwab & Co. wants in an integrated network management system, said staff telecommunications analyst John Payne. "Right now, when you manage a remote LAN you essentially have to log into the server, fiddle with the parameters and essentially act like a local terminal. This is probably not the best approach if you have 2,000 LANs."

Also agreeing to develop a Decmcc Director management module were telemanagement system vendor Telwatch, Inc. and the European division of T1 switch vendor Newbridge Network Corp.

Network manager aid released

Digital Equipment Corp. recently introduced a program for customers who would neither like to manage their networks nor have someone else do it all, but rather have something in between.

Netsupport Shared Services reportedly allows customers to use the same tools that DEC's Netsupport Services Program uses to manage customers' networks. Among them, which DEC has not yet provided commercially, are a network configuration manager and "a database to put in all the information about all the devices," said DEC spokesman David Lindsey.

The tools provided by Shared Services enable customers to take a more active role in managing their own networks, with or without the participation of DEC people, according to DEC.

DEC said the management tools provided through Shared Services will include support for Decmcc: Management Station V1.0 as well as management of Transmission Control Protocol/Internet Protocol networks via the Simple Network Management Protocol.

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PC Magazine. 10/31/88

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KEDIT is a trademark of the Mansfield Software Group, Inc.
Local-area networks to put on laser light show

BY JOANIE M. WEXLER CW STAFF

LAS VEGAS — Fiber optics — without the fiber — will soon have remote 4M bit/sec. Token-Ring networks communicating as the crow flies.

Laser beams will reportedly travel at channel speeds through the air across distances of up to one kilometer when the Lace L00-19 Token-Ring System, a LAN-to-LAN product announced at Comdex/Fall '89, starts shipping in January.

"The high throughput of laser technology is a major advantage," commented Patrick Springer, director of industry services consulting at Telecommunications Management Corp. in Needham Heights, Mass.

According to the vendor, the system reduces communications bottlenecks by connecting Token-Rings at their full 4M bit/sec. data rate. By contrast, bridges and switched local-area network linkages tend to provide throughput that is substantially slower than the actual speed of the LANs.

Springer added that the reliability of lasers is much greater than that of infrared waves, which are more distance-constrained and prone to being dissipated by fog or smoke. He also said that lasers, unlike terrestrial links, are not susceptible to cuts.

The $26,000 Lace system consists of two pairs of repeater-like units operating at the physical layer. At each network location, a front-end unit interfaces directly to the Token-Ring and connects via cable to a rooftop laser transceiver. The transceiver sends a 20-milliwatt gallium aluminum arsenide laser through the air to its mate at the receiving location, where the reverse process occurs.

Unrestricted

The vendor is targeting applications in campus environments, manufacturing complexes and downtown areas, where it can be difficult to get a license for microwave "because they often run out of frequencies," according to Michael Berman, director of marketing at Laser Communications.

Unlike microwave transmissions, lasers do not require Federal Communications Commission licensing. Berman said that the lack of a licensing requirement makes the laser system a viable choice for a disaster recovery system, because "you can have it up and running in a day."

Springer expressed concern over the safety and potential liability of the lasers, which he said can cause retinal damage in human eyes. Berman pointed out, though, that because laser beams require a line-of-sight path to communicate, the devices are generally mounted on rooftops or other places where it would be unlikely for humans to cross the beam.

Berman did concede that the one-kilometer transmission limit is more prohibitive than microwaves, which can travel up to several miles. He also noted that the laser system's biggest enemy is dense fog that would prohibit the rooftop transceivers from being able to "see" each other. But said that his company has determined the average nationwide availability of the link to be 99%.

The company has similar laser repeater products for Ethernet and T1 networks, which were released in March. According to Berman, the company currently has 70 Ethernet installations in place.

Network access from Ameritech

BY ELLIS BOOKER CW STAFF

ATLANTA — Ameritech Services, Inc. recently announced a network management system that reportedly gives customers access to the Ameritech network. The Ameritech Service Management System was demonstrated at the Centrex Users Group Conference earlier this month.

The new service reportedly allows customers with a Digital Equipment Corp. VT100 terminal or personal computer to examine the configuration of their Ameritech communications services, check the service orders placed with the phone company, electronically send trouble reports to the phone company, test and monitor the performance of lines and even reconfigure the Centrex services.

Ameritech said the service will be available in the first quarter of next year from its five operating companies in Illinois, Indiana, Michigan, Ohio and Wisconsin.

Of potentially keen interest to those users with existing network management systems, Ameritech said it is working to provide interfaces between its service with other network management systems. Those interface requirements will be published next year, according to Ameritech.

While pricing details must await state-by-state filing of tariffs, an Ameritech spokesman said users will pay a start-up fee, a monthly subscription fee and a usage-sensitive charge.

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For information, references, and a head start on avoiding The Notwork, call JWP Information Systems at: 1-800-USA-2JWP.
Bypass
CONTINUED FROM PAGE 45

pathetic to these types of claims," said Stuart N. Brotman, a communications industry consultant in Lexington, Mass.

Business users will support the initiative because they want route diversity "and they also want to put some leverage on the BOC," commented Joseph S. Kraemer, national director of the telecommunications industry consulting practice at Deloitte & Touche in Washington, D.C.

"The users and the interchange carriers really want [local competition] to happen, so you've got two fairly strong forces in the regulatory arena that are going to be in favor of as much alternative access as possible," Kraemer said.

But the MFS proposal is likely to be fought tooth and nail by the regional Bell holding companies. Bell South Corp., for example, issued a statement that called the MFS initiative a "cream-skimming device." Bell South holds 25% of the fiber-optic network in the South, and it seeks to gain more access to the network by offering more local services.

In its petitions, MFS said its share of the business market could grow if regulators gave alternative carriers equal access to BOCs' central offices. The BOCs' bundled tariffs and high interconnection fees make it too expensive for MFS to provide service to user sites located off the MFS network, the MFS petitions charge.

MFS has installed its fiber-optic network in several major cities, including Baltimore, Boston, Chicago, Houston, Los Angeles, Minneapolis, Philadelphia and San Francisco.

Kraemer said he expects that by the end of 1992, there will be at least one alternative carrier in two-thirds of the top 75 U.S. cities.

Beefed-up efficiencies in distributed computing environments will likely be one bottom-line benefit of a Gazelle Microcircuits, Inc. gallium arsenide chip, which reportedly will let a new generation of supercomputers communicate with one another as fast as they can process data.

"There's no point in having a parallel processing setup if you can't transfer data fast enough to use the processing speeds," explained Jon Zierk, Gazelle's product marketing engineer.

Supercomputers using the high-speed pair of integrated circuits should be announced during the second quarter of next year, according to Zierk.

Gazelle's Hot Rod transmitter and receiver pair functions as a multiplexer/demultiplexer that converts 40 bits of parallel data to a 1G bit/sec. serial bit stream in the sending computer, then demultiplexes the serial stream back into parallel data in the receiving computer.

Gallium arsenide is an attractive alternative to silicon for integrated circuits because of speeds of at least five times faster and low power consumption, said E. Lawrence Hickey, a consultant at First Analytics Corp. in Chicago.

Countering volt jolt
One reason gauging arsenide has not been widely adopted, according to Hickey, is that it runs on a different voltage than silicon, which can make interaction with silicon components cumbersome.

Zierk said, "Our strategy is 'slow' gallium arsenide. On many of our products, our chips don't run faster than two times the silicon rate, so they'll interact comfortably with the silicon components."

According to Zierk, workstations operating at 30 millions of instructions per second on a 32-bit bus are effectively using 960M bit/sec. of data. The fastest silicon solution at the moment is only 100M bit/sec.

Data on sales transactions and personal information about the beauty consultants are integral to Mary Kay's personalized reward-and-recognition corporate culture, according to Bishop. He explained, for example, that individual sales records help determine when consultants have earned special incentives such as a renowned pink Cadillac.

"Mary Kay is a major business need in the company is to speed up the order-fulfillment cycle. He said he is looking forward to automatic availability of data and identification, an Integrated Services Digital Network (ISDN) feature, in his region.

ANI allows the automatic display of caller information on a computer screen and speeds up customer service by eliminating time spent taking customer information over the phone and accessing customer files.

Bishop noted that while ISDN is available from his local-exchange carrier, the ANSI feature is not. Other technologies he is exploring to step up filling of orders are optical scanning of order forms and videotext.

Mary Kay
CONTINUED FROM PAGE 45

with operating system upgrades rather than with total conversions. The new levels in IBM would tend to require complete conversions, where the DEC equipment is all upward-compatible."

Moore added, however, that the company will have to give up some IBM-world efficiencies for that convenience. "As the VMS operating system continually gets larger, it eats up more memory," he said.

"So there's a trade-off in benefits."

Bishop noted that the pressing need to establish a cohesive wide-area network came at a fortuitous time, because most of Mary Kay's computer equipment, which spanned five operating systems, needed to be replaced or upgraded anyway.

"The old systems had really lived full lives, and we had the luxury to be able to start over," he said. "Aside from the incompatible systems no longer being able to support business objectives, maintaining so many different computers created a lot of redundant costs."

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Horwitt

CONTINUED FROM PAGE 45

an integrated network management platform are the following: setting up communications between the platform and other vendors' devices or network management systems; and implement- ing the applications to manage those systems.

Both IBM and AT&T have provided third-party connections to their platforms, but no one seems particularly excited about the links so far.

IBM's Netview/PC is the interface that users and vendors love to hate. It's expensive to use a personal computer as your liaison to Netview, and two-way communications appear to be technically possible but kludgy. Networking companies, as well as big users such as Sears and American Express, are bypassing Netview/PC by developing direct links to Netview.

AT&T, like IBM, provides a two-way connection between its network management platform and its own products. Other vendors, however, currently have to make do with a primitive one-way link for sending alerts up to Accumaster Integrator.

AT&T has promised to provide full-function, two-way links to other vendors' systems, based on Open Systems Interconnect protocols such as Common Management Information Protocol by late 1990 or early 1991. IBM now offers OSI Communications Subsystem, which provides an OSI connection to Netview.

Unfortunately, it only supports Manufacturing Automation Protocol 3.0 so far, not the OSI standards currently being finalized by ISO, and reportedly it is both clumsy and expensive. IBM has promised to provide OSI commands as a native part of Netview at some unspecified date (but don't hold your breath).

While multivendor party connectivity is an important element of an integrated management platform, applications to manage that third-party equipment are both more crucial and much more difficult to provide. Part of the problem is that leading vendors don't like giving their rivals access to the inner workings of the network management software. IBM reportedly has refused to cooperate with vendors that want to implement their own management applications under Netview; also, Netview development tools are said to be ponderous at best.

AT&T is said to be developing network management functions that will work across various systems, but one vendor complained that it does not want to be told by AT&T how to manage its own products.

The path for DEC's belated entry into the integrated management market has therefore been made smoother by the fact that neither of its chief rivals has yet provided a satisfactory solution, a slew of announcements to the contrary.

Decmcc Director won't hit the streets for another year, but when it does it will almost certainly offer full OSI compatibility as well as an object-oriented network management information repository that neither IBM nor AT&T has announced yet.

And DEC has already provided something ahead of its rivals: software tools and specifications for adding both equipment and management applications to the platform as needed.

Early EMA supporters, who have had their hands on DEC's systems reference manual for some time, praised DEC for spelling out how to develop not only full-function connections to Decmcc Director, but also management applications that, once plugged in, can be used to manage any relevant piece of equipment that is hooked into DEC's system.

As one third-party spokesman said, it would be technically possible to write the modules needed to turn Decmcc Director into an IBM-only management system. As a DEC spokeswoman said, DEC is counting on its own management products' superiority, since it is making the technical core of its management system available for a $200 license fee.

If this is true, a round of applause for DEC.

The one vendor I've left out of this equation is Hewlett-Packard. No one seems to have a bad word to say about Openview; they believe HP when it says it will provide OSI compatibility; they praise the openness of the tool kit and user interface; they look forward to HP's incorporating its strong set of LAN management tools into the multivendor system.

However, I don't hear a lot about Openview making the short list among companies choosing integrated management platforms. Nor have I heard much lately about Openview's progress from an HP-only management system to a multivendor system. So, what's going on, HP?

Horwitt is a Computerworld senior editor, networking.
Local-area networking hardware

C. Itoh Electronics, Inc. has entered the Ethernet local-area networking marketplace with the announcement of two Ethernet graphics terminals — the monochrome C1T334ET and color C1T344ET — that allow connection to both LAT and Transmission Control Protocol/Internet Protocol-based networks. Both devices were designed to expand the company's Tiger line of Digital Equipment Corp. compatible terminals.

Single-unit prices, including the Ethernet option, are $2,495 for the C1T334ET, and $3,495 for the C1T344ET. C. Itoh Electronics 2505 McCabe Way Irvine, Calif. 92714 800-347-2484

Front ends, multiplexers

Advanced Computer Communications has enhanced the ACP 5250, a 4-bit resident X.25 controller that operates as a front-end for the Ultrix-based reduced interface directly integrated with the Ultrix Transmission Control Protocol/Internet Protocol networking kernel, thereby permitting remote applications. DECsystem 5400 configurations are priced at $4,400, and a multiprotocol device driver option is available for $900, the company said.

Advanced Computer Communications 720 Santa Barbara St. Santa Clara, Calif. 95010 805-963-9431

Local-area networking software

Pernetix, Inc. has announced its line of software products designed to integrate DOS and Unix networks. The Pernetix system enables DOS users to access Unix files and printers by using DOS commands and Unix users to access DOS via Unix commands, the company said. The product line reportedly includes an IBM-compatible DOS file/print server that runs on Unix systems, interconnect products for dissimilar networks and Netbios programming interfaces for DOS and Unix systems.

Pricing for the product line ranges from $595 to $3,995.

Pernetix 13633 Gamma Road Dallas, Texas 75244 214-385-2376

Santa Cruz Operation, Inc. has announced the JSB Multiview Desktop user interface, a graphical windowing system for networked DOS, Xenix and Unix systems.

The product was designed for MSDOS users who want to share data and files with SCO Xenix and Unix systems on a network. It is said to allow users to connect any Intel Corp. 80286- and 80386-based personal computer running Microsoft Corp. Windows to an SCO Unix or Unix workstation via an RS-232 connection or a local-area network.

A single-user license costs $149. Five- and 10-user licenses are available and are priced at $495 and $795, respectively. SCO P.O. Box 1900 Santa Cruz, Calif. 95061 408-425-7222

D.L. Hiller and Associates, Inc. has enhanced its Factory Data Manager software package to include support for up to eight communications ports per control system, the vendor said.

The software reportedly operates on both local-area and bar-code networks and provides artificial intelligence recognition of the DBS software is $10,000. The multi-node version costs $15,000 per DBS. Simpact Associates, Inc. has introduced software that allows a Digital Equipment Corp. Microvax computer to serve as the basis for a data broadcast network.

The Q17000 Data Broadcast Switch (DBS) software reportedly allows 50 to 3,000 user terminals on a network to send large data files to many destinations. The product comprises a DEC Microvax computer, DBS software and up to eight proprietary Intelligent Communications Processor boards.

A license for the stand-alone version of the DBS software is $10,000. The multi-node version costs $15,000 per DBS.

Simpact Associates 9210 Sky Park Court San Diego, Calif. 92123 619-565-1865

Farallon Computing, Inc. has introduced the Portable Pack, a set of hardware and software tools for connecting the Apple Computer, Inc. Macintosh portable to remote AppleTalk local-area networks.

The product reportedly allows modem-equipped Macintosh Portables to operate and exchange files with their office machine and any telephone. The tools also permit high-speed file transfer between the portable and other office machines.

Portable Pack carries a suggested retail price of $495.

Farallon Computing 2150 Kittredge St. Berkeley, Calif. 94704 415-841-5770

AT&T has announced two offerings aimed at the facsimile marketplace: a set of international messaging functions, dubbed the AT&T Enhanced Fax, and the 9015PF, a two-line machine for simultaneous voice and facsimile transmission.

Enhanced Fax reportedly features store-and-forward calling, automated broadcast capability and a personal mailbox function. It is priced on a per-page basis, with U.S. messaging available at 60 cents per page. The 9015PF provides several telephone functions, and the suggested retail price is $1,595.

AT&T National Product Center 1 Speedwell Ave. Morristown, N.J. 07960 800-624-5672

Applitek Corp. has announced that it has added Transmission Control Protocol/Internet Protocol to its line of inter-networking products.

Its TCP/IP offerings support all three primary classes of IP addressing, including the AT&T Enhanced Fax, and the V.32BP, a multifunction modem for simultaneous voice and facsimile transmission.

Prices range from $3,200 for the terminal server to $32,000 for the network performance monitoring software.

Applitek 2033 Chennault Drive Carrolton, Texas 75006 214-900-4000

Mitek Systems Corp. has announced two networking products to provide greater distributed processing power between IBM Systems Network Architecture Networks and Transmission Control Protocol/Internet Protocol networks.

The Openconnect/FTP Server for VM resides on IBM VM systems and reportedly permits TCP/IP users to access the SNA VTAM host from their TCP/IP terminals. Features include bidirectional transfer of binary and ASCII source files, password checking and directory viewing.

The server is priced at $5,450. The product uses the standard mail transfer protocol for TCP/IP, according to the firm.

It is available as both a communications and software product on an IBM Personal Computer AT, and as software only for customers who have an available AT machine on the network. The complete package costs $10,000 and includes the PC, required software and an Ethernet card. The software-only version is priced at $3,000.

Mitek Systems 2033 Chennault Drive Carrolton, Texas 75006 214-900-4000

General Datacomm, Inc. has added a file and print management product to its dial-up modem family that reportedly feature five-speed capability, multiple dialing options and compliance with a range of Bell and CCIT standards.

The Datacomm 596 and V.32E models are designed for high-density, central-site installations, the vendor said. Desktop 596 and V.32E are said to be compact, stand-alone versions of their Datacomm counterparts.

According to the company, the 596 model supports the North American user, and the V.32E models support international operation.

The Datacomm models are each priced at $1,055; desktop versions sell for $1,075.

General Datacomm 1579 Struiks Turnpike Middlebury, Conn. 06762 203-574-1118

New products

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NOVEMBER 27, 1989

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NETWORKING
Case/Datatel, Inc. has announced a modem control unit that provides on-line Netview management as well as control of the company's line of DCM4000 diagnostic modems.

The NVI4160 uses the LPDA 2 network management protocol to communicate with the host system, the firm said, and no user programming is required. The IBM mainframe operator can change configuration parameters, perform tests and monitor status. Modem-generated diagnostic information is sent to the host in the appropriate format when requested by Netview.

The product is priced from $2,195.

Case/Datatel
7200 Riverwood Drive
Columbia, Md. 21046
800-227-3134

Network Interface Corp. has expanded its hub series of products with the announcement of intelligent diagnostic hubs designed to prevent network failure.

The hubs may be intermixed with all existing Arcnet-compatible hubs and are available in coaxial, twisted-pair and fiber-optic topologies. No additional cabling is required. They include intelligent interface software and are reportedly capable of disconnecting a problem-causing node and protecting the network from duplicate node identifications.

In a standard eight-port configuration, the product is priced at $725 for a coaxial cable version and at $895 for a twisted-pair version. Fiber optics require a custom configuration, and pricing will vary.

Network Interface
15019 W. 95th St.
Lenexa, Kan. 66215
913-894-2277

Electronic data interchange

ACS Network Systems has announced Release 4.0 of its EDI/38 and Application System/400 software.

The latest release supports the Electronic Data Interchange for Administration, Commerce and Trade (EDIFACT) and the EDIFACT/Odette international standards for electronic data interchange transmissions.

The product allows ANSI documents to be wrapped in an EDIFACT envelope and vice versa, the vendor said, and all elements within an envelope are easily definable.

Pricing starts at $9,000 for IBM System/38 users and $7,000 for users of IBM's AS/400 computers.

ACS Network Systems
Suite 1200
1485 Enea Court
Concord, Calif. 94520
415-827-3820

Stratus Computer, Inc. in Marlboro, Mass., and EDI Solutions, Inc., based in Minneapolis, have announced a marketing agreement that will make EDI's Editrans software available on the Stratus XA 2000 Continuous Processing System.

The partnership was formed to target emerging markets for electronic data interchange systems in retail, distribution and manufacturing industries. Pricing will vary according to individual integration project.

Stratus Computer
55 Fairbanks Blvd.
Marlboro, Mass. 01752
508-460-2000

Network Software Associates, Inc. has announced a mainframe-like print spooling software package that runs in conjunction with the company's AdaptSNA family of micro-to-host links for IBM Personal Computers and compatibles.

AdaptSNA Printspool was designed for applications that require remote printing of large files that have been downloaded from a mainframe, the vendor said. The connection can be used with a variety of configurations, including a remote Synchronous Data Link Control link or a Netbios local-area network gateway. The package is priced at $95.

NSA
39 Argonaut
Laguna Hills, Calif. 92656
714-768-4013

Unisys Corp. has announced OSI Transport Services, communications and networking software designed for its DCP line of communications processors.

The product was developed to support common Open Systems Interconnection (OSI) application services on the company's 1100/2200 series systems in host-to-host implementations. The Unisys DCP OSI Transport Services product is available under a five-year license for $9,900.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
215-542-5367

Micro-to-host

Emerald Technologies, Inc. has announced a combination hardware and software product designed to provide IBM Corp. 80286- and 80386-based workstation users running AT&T Unix with IBM midrange terminal emulation and file transfer capabilities.

Handshake-Alliance consists of an adapter card and workstation and host-based software. Pricing ranges from $2,495 to $3,445.

Emerald Technologies
Suite 103
18012 N. Creek Pkwy.
Bothell, Wash. 98011
206-485-8200

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**EXECUTIVE TRACK**

Ed Severs has been appointed MIS director at the International Association of Hewlett-Packard Computer Users, known as Interex, in Sunnyvale, Calif. Interex is a 15-year-old user group with over 10,000 members.

Before joining Interex, Severs was MIS director at Versatec for six years, where he was responsible for all information systems and communications functions. He was previously director of finance and administration at Datapoint Corp., where he managed the MIS department and finance department.

Severs holds undergraduate degrees in economics and computer science and an MBA from Golden Gate University.

Terrie Gulden has been named president of the new company in Greenwich, Conn. The unit, Berkshire Information Services, Inc. (BIS), is based in Luverne, Minn. BIS provides software services to Berkley's subsidiaries.

Gulden was previously senior vice-president of data processing at Tri-State Information Systems of Minnetonka, a Berkley subsidiary.

Other newly elected officers of BIS are Jack Bennett, vice-president of systems design and development; Dwight Bremer, vice-president of Micro System Division; and Gary Oehlerks, vice-president of applications development.

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**Delivering data to the deal makers**

*Warner's Winski has the communication tools for life in the entertainment fast lane*

**BY CLINTON WILDER CP STAFF**

It has been the year of *Batman*, the Rolling Stones tour and the blockbuster $13 billion merger of Warner Communications, Inc. with Time, Inc. More than ever, the entertainment industry is driven by big hits, big bucks and big deals.

As with any business, information systems play an increasingly important role in the fast-moving world of movie moguls and millionaire rock musicians.

But Don Winski, executive director of corporate information services at Warner Communications, knows that strategic systems are sometimes no substitute for power lunches or conference calls on cellular car phones.

"Information is not just what's on a computer screen or on paper," Winski says. "Voice is information and is usually more important in closing a deal than classic hard data. It's hard to predict when a deal will click, but we [in IS] have to be ready."

Winski's personal accessibility is evident in his strong handshake, hearty laugh and the pile of comic books on his office coffee table. His speech flows quickly with a slight tinge of his Brooklyn birthplace, a style that he likes to call "a New York corporate accent."

Originally trained as a chemical engineer, Winski moved into operations research and has had a varied computer technology career with stints as a consultant, entrepreneur and IS executive. He and those who know him agree that his broad business background is essential for success in the entertainment industry's fast lane, particularly in a culture led by deal-making specialists.

"It's a tough, take-no-prisoners business," says Jerry Mayfield, principal at the EMA Group, a telecommunications consultancy that has worked closely with Warner. "Most guys would last about 15 microseconds in a job like that unless they can communicate at the business level."

Mayfield describes Winski as "forceful but subtle" in working with Warner's diverse business cultures, which range from the blue jeans of acquired small record companies to the tailored suits of buyout financiers. "It was like hand-to-hand combat getting some business units onto the corporate network," Mayfield says. "Don was like an orchestra conductor bringing order to it."

At Warner, Winski forcefully advocates centralized network management and equipment purchasing for significant vendor discounts but is equally insistent on decentralized IS tailored for top management.

PROFILE: Don Winski

**Position:** Executive director of corporate information services, Warner Communications, Inc.

**Mission:** Providing central IS and telecommunications policy leadership for a decentralized organization

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**High-tech firms: Do as they say, not . . .**

**BY ALAN J. RYAN CP STAFF**

There are certain things people take for granted: the price of roses and the use of high technology. The price of roses will double around Valentine's Day, they believe, and high technology companies are probably the most effective users of information technology.

Wrong.

Flower prices aside, a recent study that while New England high-tech companies rated customer information as the most important aspect of running their companies, a majority of them rated their current customer information systems as operating at below average to average.

The survey focused on four areas: strategic business planning, executive reporting, IS effectiveness and systems development success. And although 97% of respondents perform strategic business planning as frequently as every year, only 11% believe the process is effective. In fact, two in 10 said it is not at all effective.

**Few engage in IS planning**

The survey of more than 350 CEOs and top executives at high-tech companies in New England also found that fewer than half of the companies engage in IS planning as part of their overall strategic business planning process.

The top executives also said they want IS personnel to perform more effectively, particularly in understanding systems implications of the companies' business plans, and in planning and completing systems projects on time and within budget.

The companies polled have revenues ranging from $10 million to more than $1 billion. Of those, 47% of the companies with medium or high growth rates were found to have an executive reporting system specifically tailored for top management.

That figure potentially indicates that high-growth companies gain competitive advantage through timely access to strategic information found in such systems.

Overall, only 31% of the companies surveyed had any executive reporting system that provides information characterized as unique and focused.
Les Gilliam

How to survive techno-shock

Joe Hurry, the MIS manager at the Daylight Beverage and Loan Co., is on his second cup of coffee and is trying to finish the budget justification report due today. Suey the secretary walks by his desk, leaving a note from his boss, Microbrain Johnson. The boss has just read in his latest issue of PWS-Week that Jimmy the Guru says a repository is the key to a successful computer-aided software engineering strategy. So the boss wants to know if they have a repository, and why they need a strategy for their cases.

Not being exactly sure what a repository is, Joe quickly grabs his well-worn copy of old Noah’s New World Dictionary. Noah says that a repository is “a box, chest, closet or room in which things may be placed for safekeeping; a burial vault or sepulcher.” Not having an electronic mail system, Joe sends a hand-written note to the boss stating that all the nightly backup tapes are taken daily to the vault at the Last National Bank. In regard to strategy, Joe

OW CAN THE IS manager hope to stay abreast of new developments, while meeting current work load commitments?

states that the new inventory control system will keep track of their beverage cases and it is expected that significant cost reductions will be achieved. But deep down, Joe suspects the Guru isn’t talking about vaults and beverage storage and wonders how he will be able to stay up to date on all the new ideas and products hitting him from all sides.

He wanted to initiate a project to study the feasibility of an executive information system and a tape robot for the computer room, but the budget squeeze put a stop to those ideas. He is still on the spot to prove the value of the local-area network he was allowed to install.

Joe is encountering the technology introduction shock that faces many throughout the information technology community. The press is having a heyday writing about all the new concepts and scenarios, overwhelming us with client/server architectures, entity relationships, interenterprise systems and object management. Seminars on a myriad of new subjects abound.

There are probably countless IS managers who are developing an inferiority complex. Not only have they not implemented all these new ideas, but many do not even understand the terminology. We are being told that the rate of change in technology is increasing. Some have said we should expect as much technology change in the next five years as we have seen during the previous 10. If so, how can the IS manager hope to stay abreast of new developments, while meeting current work load commitments?

The two primary keys to survival are time management and discernment.

The IS manager’s time should be allocated to three areas — current projects, quality improvement and future technology. The highest priority, of course, is to meet the current IS needs of the business and carry out the commitments already made. This includes the necessary planning, budgeting and management time to succeed with the technology being used now.

Next, the IS manager must continually evaluate the quality of people and resources being applied to the needs of the business. If the quality is not adequate, the use of new technology may be a mistake. In other words, advanced technology applied to a mess will only make it worse. Time must be allocated to quality improvement to prepare to take advantage of new technology.

In most cases there is such a demand on the IS manager’s time that it is easy to let the study of new technology be pushed aside. The solution here is to set aside a certain time each day or week to devote exclusively to reading, research or planning. In addition, seminars and conferences should be a part of every manager’s annual schedule and budget. The IS manager should be selective as to which technology subjects receive more than a perusal. Sound judgment is needed to decide which new ideas and products are worthy of sizable amounts of time, attention and funds. This should be limited to only those that offer potential value to the IS manager’s company.

Lastly, some managers are successful in delegating the task of keeping up to date with new technology developments. Care should be taken, however, to keep upward communications active, so the manager can maintain a general knowledge of the applicable topics and be able to properly delegate the details.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.
Helping executives keep on their management toes

WHEN GIANTS LEARN TO DANCE
By Rosabeth Moss Kanter
Simon and Schuster, $21.95

While plenty of self-styled business gurus straddle the academic and consulting worlds, Rosabeth Moss Kanter stands out from that crowd in her ability to mesh hard research numbers and corporate case studies into useful, highly readable business strategy.

Kanter's close observations of 25 large corporations — "corporacies," as Kanter calls them — Giants is the fruit of Kanter's close observations of 25 large corporations, which she began just after her best-selling Change Masters was published in 1983. The new work's central message is that innovation and competition have accelerated to such a pitch that the old-style corporacies must in effect learn to be more flexible and innovation-oriented — to dance rather than lumber lest they become next year's dinosaurs.

The meat of the book is Kanter's recommendations on how businesses can learn "post-entrepreneurial" skills with the most gain and least pain. Far from recommending that corporations take on the rough-and-ready style of start-ups, her new work blends the discipline and cooperativeness of a corporacy with the flexibility and responsiveness of an entrepreneurial firm.

For over a decade, Kanter has used her passport into dozens of major corporations to put together a picture of how U.S. corporations are coping with an increasingly volatile, complex and globally competitive market.

It used to be that buying a mainframe was a simple case of adding more of what you already had.

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Elisabeth Horwitt
Horwitt is a Computerworld senior editor, networking.

IBM SYSTEMS REQUIRED
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FULL-TIME STAFF
THAN UNISYS SYSTEMS.*
Deal makers
FROM PAGE 53

decision making at the business
headquarters
does not have a monopoly on in-
telligence," he says. He defers
explaining any innovative or
strategic IS projects in Warner's
business units. "I don't want to steal
their thunder."

From his corporate office in
New York's Rockefeller Center,
Winski feels he has the neces-
sary overview of Warner's com-
puter and communications infra-
sstructure to suggest synergies
and strategic opportunities. "We
try to be a catalyst and a facili-
tator but not take control," he
says. "That can be hard for per-
son from a traditional data center
memory."

Winski's mentality is any-
thing but that, and his resume
reveals why. Armed with a mas-
ter's degree and doctoral work in
operations research at Brooklyn
Polytechnic University, he

joined Price Waterhouse as an
electronic data processing con-
sultant. His IS career continued
at Royal Dutch Shell and Inger-
soll-Rand Co., but he says, "In
my heart, I'm always a user."

After heading MIS strategic
planning at Ingersoll-Rand for
two years, he joined and later
became chief executive officer of
a cellular telephone services busi-
ness owned by Atlantic Corp. He
joined Warner in his present
position in 1986 "by sheer accident" when a head-
hunter called.

Although he was new to the
entertainment business when he
joined Warner, Winski says his IS
background with user, vendor
and consulting firms has given
him the requisite people skills for
a company such as Warner.

"I've worked with strategic
planners, entrepreneurs and
now with deal makers," he says. "The
level of people are more highly
sensitive people and after
enough years in the business,
you build up a sensitivity in your
fingertips in dealing with them.
You get away from hard data —
it's more personal."

Winski admits that is fun liv-
ing in a corporate world in which
sharing an elevator ride with
Robert Redford is not uncom-
mon. "It makes me more inter-
esting at cocktail parties," he
says. "Seriously, it is nice to be
in a place where you can see the
products enjoyed by the average
citizen. I'm a consumer, too."

All those movies, records and
cable television shows add up to
$5 billion company with an IS
budget of a hefty $100 million.
And Warner will soon swell to
$11 billion when it completes its
merger with Time — whose of-
fices are ironically connected to
Warner's through a subterra-

ean shopping concourse below
midtown Manhattan.

Winski is mum on the details
of how the two huge IS opera-
tions will be merged but admits
he would like to see Warner's
philosophy of a tight marriage
between computers and tele-
communications continue.

"The information infrastruc-
ture is ineffective if you separate
the two," he says. He has con-
tracted with MCI Communica-
tions Corp. for Warner's net-
work management, an area
where he believes that central-
ization yields vendor discount

savings that can be shared
among the business units.

It is at the business unit level
that Winski believes the strate-
gic systems must be developed
to better serve Warner's stable
of producers and performers.
Computer systems may not find
the next Tracy Chapman, but
they can help keep her as a
Warner artist after the talent
scouts do. One system, for
example, now provides clients with
more detailed information about
where their royalty payments are
derived.

"Our philosophy is that the
artist is always right," Winski
says. "The creative artist is the
lifeblood of this company."
to believe what you read.

NetWare 386 is Shipping Netware 386 3.0 Earlier Than Expected

BY JOSH MARSHBURN

San Francisco—The waiting and anticipation are over. Novell has revealed NetWare 386 v3.0 and v3.1, the company's server platform for the '90s.

"NetWare 386 is a major milestone of the NetWare operating system that takes advantage of 386 architecture," said Richard King, vice president of software engineering for Novell's NetWare Products Division. "It is a 32-bit operating system, so it fully exploits the capabilities of the 386 chip and improves performance."

LOADABLE MODULERS
"NetWare 386 is not just another file server," King said. "It's designed as a network server platform for the '90s."

LOADABLE MODULERS
"NetWare 386 is not just another file server," King said. "It's designed as a network server platform for the '90s."

LAN TIMES

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PRODUCT SPOTLIGHT

Speed and dexterity take top billing

MODEMS

BY BRUCE PAGE

There's a lot of talk these days about the demise of the analog modem; it is not all idle chatter. Digital networks are already being used by both large and medium-size businesses to achieve lower costs and higher data transmission speeds. When Integrated Services Digital Network (ISDN) achieves widespread availability in the 1990s, ordinary personal computer users will be able to avail themselves of more point-to-point transmission capacity than today's most advanced corporate networks, using high-speed digital interfaces instead of modems.

That said, however, it will still be a long time before analog modems disappear entirely.

Page is president of Magnetic Press, Inc., a New York-based research firm specializing in communications technologies.

MULTIPLEXERS

BY SANFORD BINGHAM

In recent years, network building has become a major corporate activity. Large and even not-so-large companies can create their own networks out of transmission facilities bought, rented or leased piecemeal from the common carriers. In the interest of both economy and self-determination, many are doing just that.

In this world of do-it-yourself construction and management, the multiplexer occupies a key spot. With this equipment, companies can concentrate their telecommunications traffic onto a minimum of long-haul lines and manage their own facilities rather than leasing or buying that service from the carrier.

Choosing the right piece of multiplexer equipment to handle those jobs can be tricky, however. The purchasing landscape is marked by few domestic and even fewer international standards for transmission or performance management. The standards that do exist are frequently altered and augmented by individual multiplexer manufacturers, creating a world of proprietary hardware.

What this means in practice is that a network manager must purchase all multiplexing equipment from one vendor or be prepared to tackle tasks such as

Continued on page 64

Bingham is editor of "The Bit," a Magnetic Press journal on communications.

A survey of 18,000 medium and large U.S. companies by Computer Intelligence in La Jolla, Calif., shows that higher speed modems are becoming increasingly popular. According to the firm's research, some 11% of all dial-up modems today support transmission speeds of 9.6K bit/sec. and greater, up from 7% just one year ago. On leased lines, 70% of all modems now transmit at 9.6K bit/sec. and greater, up from 62% a year ago.

For the future, International Data Corp., a market research

Continued on next page

Bingham is editor of "The Bit," a Magnetic Press journal on communications.
**MODEMS & MULTIPLEXERS**

**PRODUCT SPOTLIGHT**

Modems

FROM PREVIOUS PAGE

firm in Framingham, Mass., forecasts that, while total sales of analog modems will decline slightly for each of the next five years, that same time period will see increased use of dial-up and higher speed modems, particularly 9.6K bit/sec modems that incorporate the CCITT V.32 standard.

V.32 on fire

V.32-standard modems are the hottest products in today's high-speed modem market, and that is a trend that is likely to continue for some time. IDC, for example, forecasts strong growth in the V.32 market segment through 1993, with cumulative annual growth rates in the 44% range.

There are a number of reasons for the explosion of interest. Price is one of them. Prices on V.32 modems running at 9.6K bit/sec. have now fallen below $1,000 from a starting high of $3,495 in January 1986, according to IDC.

An even more important consideration for many buyers, however, is the fact that V.32 provides a standard for interworking among 9.6K bit/sec. modems made by competing vendors.

With this technology, users may choose V.32 modems from a variety of manufacturers with full confidence that they may all work together. Care should be taken, however, that all of the modem manufacturers in a specific network have implemented V.32 fully; several companies offer subsets of the technology that compromise their modems' interoperability with those of other manufacturers.

Second, when V.32 support of 9.6K bit/sec. transmission was extended from leased lines to dial-up in 1988, new and useful combinations started to appear. For example, many V.32 modems that are used in the leased-line environment now have "automatic dial backup" capabilities, which allow the modem to automatically switch into dial-up mode if line quality on the leased circuit drops below a defined threshold.

V.32 is being used extensively in the dial-up market. In that arena, a new high-speed standard called V.22bis is currently available for 2,400 bit/sec. transmission. With the growing importance of data communications and users' needs for higher speeds to transmit desktop publishing and graphics files, V.32 fits the bill perfectly.

In fact, because 9.6K bit/sec. modems are now widely available for dial-up use, some former leased-line users whose transmission needs depend more on speed than on constant communication are finding that dial-up communications can take care of all of their networking needs quite handily.

Such a switchover makes a great deal of economic sense, says Frank Dzubeck of Communications Network Architects, a consulting firm in Washington, D.C. "The cost of private-line networks is exorbitant today, largely because of local-loop installation charges," Dzubeck says. "The installation cost of a local leased line can approach $1,400, and this installation expense must be incurred on each end of a point-to-point link."

Between two points where dial-up charges are not likely to be prohibitive — within a city or state, say — dial-up 9.6K bit/sec. communications is quite likely a better economic choice today than a leased line. Of course, if you were communicating long-distance, charges would rack up quickly. But in local calling areas, you can pay $50 per month and be on-line most of the time, compared with paying that amount per day on leased lines. Dial-up is also more cost-efficient when data transfer requirements are sporadic.

Technology trends

Aside from V.32, today's high-speed modems incorporate other important features and technologies, including network management functions, error correction and data compression.

Modems that support network management are connected to a central network management site by means of a special signaling side channel (or, in the case of IBM's Netview, an in-band signaling method). Either way, the link has been made, network managers can access the modem, monitor the traffic moving through it, diagnose problems that may have occurred and even change the configuration of a given modem remotely. To facilitate network analysis, many network-managed modems also automatically collect data (at the local side) about their own operations and dump it periodically to the central management site for analysis.

Network management may be done on either leased-line or dial-up modems. Today, it is most common on leased lines, but by next year, most dial-up modem manufacturers should be including network management capabilities as a standard feature on their modems.

Six vendors currently offer network management software designed to be used with their dial-up modem products. One of the most ambitious implementations is the standard called V.42bis. Data Systems, Inc., a network diagnostic and control system that provides a Microsoft Corp. Windows graphical interface for monitoring, diagnosing and reconfiguring up to 512 remote devices from a single management workstation.

Cost reductions have also been made in the provision of built-in error correction for high-speed modems. Unlike software-oriented error-correction protocols, which typically act only in file-transfer operations, error-correcting modems verify all elements of a terminal session, even keyboard input. With built-in error correction, users may be assured that what they send is received exactly the same way.

The V.42 error-correction protocol, standardized last year by the CCITT, brings a much-needed standard to modem-based error correction that can be used in modems of any speed, and some analysts say it will eventually be included in almost all asynchronous modems.

**Influence building**

V.32 modems are expected to more than double their current market standing over the next three years.

<table>
<thead>
<tr>
<th>Year</th>
<th>V.32 modems: percent of units shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>15%</td>
</tr>
<tr>
<td>1992</td>
<td>Total: 2,385,000</td>
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</table>

**MODEM & MULTIPLEXER DISTRIBUTION NETWORK**

*Computerworld* November 27, 1989

*CW CHART: JOHN YORK*
transmitted, MNP Class 5 will compress data on the fly at anywhere from 1.3-to-1 to 2-to-1. With a 9.6K bit/sec. V.32 modem, therefore, MNP Class 5 can deliver effective data throughput rates of over 19K bit/sec. MNP Class 7 extends the real-time transmission capacity to 2.4-to-1, giving a 9.6K bit/sec. modem potential data throughput of over 20K bit/sec.

Data compression is not the only way to wring more data transmission capacity out of a telephone line. Another technique is called "continual line analysis," which divides a telephone circuit into several channels, each of which may be used to carry a part of the data to be transmitted. Using this technique, the Trailblazer modem from Cupertino, Calif.-based Telebit Corp. achieves communication rates of 18K bit/sec. over dial-up telephone lines — almost as quickly as the fastest leased-line modems allow.

Both data compression and continual line analysis decrease transmission time. Whereas continual line analysis virtually increases bandwidth on a line, data compression reduces the size of the file. The better overall choice of the two techniques is a 9.6K bit/sec. modem with data compression, because continual line analysis can actually slow down transmission if the phone line is dirty. For instance, after splitting the line into 80 channels, the modem may find only 20 of those to be clean enough to use. Although high speed seems to be the watchword for the next few years, that term is relative; the outlook is not nearly as rosy for very high speed modems as it is for those in the 9.6K-bit/sec. category. The highest speed modems today achieve rates of 14.4K and 19.2K bit/sec. Despite the obvious speed advantage, however, these modems are so costly and relatively inflexible that many users are looking very closely at their needs before buying one of these instead of considering a move to digital. For one thing, they are able to run only over leased lines.

Further, these modems are relatively unsuited to industry standards, and attention to creating any will likely be superseded by the growing interest in finalizing such digital standards as ISDN. 14.4K bit/sec. is the highest speed for which there is an industry standard — V.33, the highest existing bit-rate standard for transmitting over leased lines. Rates of 14.4K bit/sec. can be reached on dial-up lines; US Robotics, Inc. and BT Datacom have shown this with their modem offerings in this class, which run on leased or dial-up lines. But the protocol applied to this speed is V.32 Extended, which has not been approved by the CCITT.

End-user prices of 14.4K bit/sec. modems are in the $1,300 to $5,000 range. Most of the 14.4K bit/sec. modems shipped in 1988 offered built-in network management capability. 19.2K bit/sec. is the highest speed that analog networks can support without the use of data compression. Among 19.2K bit/sec. modems, end-user costs are in the $2,500 to $6,000 range. The use of these high-speed modems will most likely be restricted to niche markets and to those users with huge analog networks who are unwilling to move to digital but have a dire need to add on transmission speed.

All in all, these high-speed modems are something of a waystation between 9.6K bit/sec. analog transmission and digital, at which few users will stop. For the vast majority of users, the leading edge of modem technology is 9.6K bit/sec. V.32 modems, particularly those with built-in V.42 data compression. In all likelihood, this segment will own the frontier until the arrival of generally available digital service. At that point, today's leading edge will become tomorrow's commodity — and then all the maps will have to be redrawn.

---

**ASK THE VENDOR**

I am investigating the possibility of ISDN. We are now using analog 14.4K bit/sec. modems from BT Datacom. When digital service is available, how can we use these in backup situations, as opposed to current on-line situations? Also, we now have dialing and call-out capabilities. What and why are we continuing having these with ISDN?

Dave Hickman
Data Processing Manager
International Speedway Corp.
Daytona Beach, Fla.

BT DATACOM: The 4142TCX V.32/V.33 extended modem that International Speedway is already using allow full-duplex, single backup at 14.4K bit/sec. They are the highest speed dial backup modems available today and are ideal for backup to digital services. Therefore, they can be used in ISDN situations. In fact, BT Datacom presently has users who are using the 4142TCX modems exclusively for backup to digital services.

The flexibility of the 4142TCX allows it to be used for a number of data communications applications, including over international circuits. It provides extended V.32 and V.33 functionality using Trellis coded modulation. On single dial-up lines, it provides 4.8K, 7.2K, 9K, 12K and 14K bit/sec. data transmissions. On two- or four-wire leased lines, the 4142TCX transmits data at 4.8K, 7.2K, 9.6K, 12K and 14.4K bit/sec.

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As well as transmitting data error-free at a lightning-fast 19,200 bps with Telebit's PEP modulation, the T2500 also adds V.32 to its modulation list. This means that you can automatically use the CCITT V.32 standard for synchronous or asynchronous connections.

So, for large-volume or interactive transmissions, you won't find a better modem than the T2500. It supports all major modem standards, and is ideal for connecting micros to LANs or mainframes. It is easy to use with ISDN. And it speaks fluently with more dial-up modems than any other.

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**MODEMS & MULTIPLEXERS**

**PRODUCT SPOTLIGHT**

reconciling incompatible code and framing formats, as well as node management. The job is further complicated by a continuous stream of new offerings at both ends from one vendor to another.

“Over the next several years, with frame relay, fast-packet switching (FPS) and a lot of new protocols,” says Robert Follett, senior vice-president at The DMG Group, Inc., a telecommunications consulting firm in Ann Arbor, Mich.

Simply sorting out the many varieties of long-haul multiplexers is a challenge for the uninstructed. There are really only three basic types—frequency division multiplexers, time division multiplexers and statistical time division multiplexers—but these subdivide and multiply based on the type of transmission media and techniques for bandwidth optimization.

The oldest-established multiplexing technology is frequency division multiplexing (FDM). The technology that displaced FDM is time division multiplexing (TDM). Instead of stacking the signals by frequency bands, TDM slices them by time, giving each of the 24 signals a precisely defined time slot for transmission.

TDM has become the standard. Multiplexers of this type are being sold to carriers and is the main engine offered by the largest multiplexer manufacturers. TDM now comes in a variety of forms, one of which is statistical TDM that has become important enough to assume the dimensions of an entirely new category.

**Statistical multiplexers**

Statistical multiplexers, which dynamically allocate bandwidth so that only active devices receive a share, are effectively taken over the low-speed end of the TDM market (56 Kbit/sec. and below).

At a time or so earlier, TDM is finding new applications in sub-T1 transmission, usually referred to as fractional T1. Fractional T1 is a service offered by common carriers that allows users to buy bandwidth in increments greater than 56 Kbit/sec. but less than the 1.544 Mbit/sec. of full T1. The advantage of fractional T1 to the carriers is that they can cut up a T1 and sell the parts for more than the whole. The advantage to the user is that it “allows you to extend all those small facilities down to smaller locations. Up to this point, you needed a full T1. With fractional T1 you can justify the thing; now you can justify it at smaller bit rates,” says Michael Finneran, president of DBRN Associates, Inc., a telecommunications consulting firm in Hewlett Neck, N.Y.

Most of the multiplexers of T1 multiplexers either offer or plan to offer fractional T1 capability. But the task of retrofitting equipment to handle the new service is “some serious work,” Finneran says.

“There’s been a lag in [re-fitting] the hardware, but they’ll all get there eventually. They should all have [fractional T1 capability] by the end of 1990,” he says.

Nevertheless, he says, purchasers should still be on the lookout for a T1 multiplexer with fractional capability: “That’s a general rule. Fractional T1 should be on the mandatory list.”

**T3 for me . . . and you**

While fractional T1 has allowed smaller users to build networks and existing T1 users to extend theirs, there has been a push to develop hardware for larger signals—T3 transmission.

T3 is the term used by phone companies to describe their DS-3 rate of 44.74 Mbit/sec., which is equivalent to 28 T1 lines. Until recently, the demand for T3 outside of the phone companies themselves has been negligible. But with the ever-increasing use of telecommunications, a crossover to T3 is becoming a more realistic consideration for many T1 users, Follett says.

“Where do you as an end user need a lot of bandwidth? You may want to do videoconferencing, or you want to have that new sense of voice traffic. Most T3 is justified for voice, but there are other ways to use the bandwidth,” he says.

Finneran suggests that, given their current pace of expansion, local-area networks may soon present another argument in favor of private use of T3. “There aren’t that many users with eight T1 facilities running in parallel between two locations right now,” he says.

“If you keep putting in bridges between LANs, or even terminals, that’s going to need the T3 to operate. A few of those, plus normal data traffic, and then you’re getting close to a T3.”

T3 can be provided by conventional TDM systems, typically at $350 to $500 per voice channel. The most advanced versions, which use a common technology called Adaptive Differential Pulse Code Modulation (ADPCM), sometimes carry twice that number. But fast packet can deliver up to 96 voice channels per T1.

**Vocal advantage**

Fast packet has two advantages over existing multiplexing technologies: It not only carries voice but also carries twice as much as many conversations on the same channel as TDM.

The most rudimentary T1 multiplexer—a channel bank—will carry 24 voice trunks on the T1 circuit as TDM. High-speed time division multiplexers are more efficient than statistical multiplexers, Watkins explains. According to Finneran, however, that rule may soon change. “Now,” he says, “we’re seeing the potential of high-speed dynamic allocation systems, specifically fast packet.”

**Three-act performance**

**Market value by sales revenue (in millions)**

<table>
<thead>
<tr>
<th>Tier 1</th>
<th>1988</th>
<th>1989*</th>
<th>1993*</th>
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<tbody>
<tr>
<td></td>
<td>$653</td>
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**Market value by sales revenue (in millions)**

<table>
<thead>
<tr>
<th>Tier 2</th>
<th>1988</th>
<th>1989*</th>
<th>1993*</th>
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<tbody>
<tr>
<td></td>
<td>$277</td>
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**Market value by sales revenue (in millions)**

<table>
<thead>
<tr>
<th>Tier 3</th>
<th>1988</th>
<th>1989*</th>
<th>1993*</th>
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<tbody>
<tr>
<td></td>
<td>$277</td>
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**Market research firm Frost & Sullivan, Inc. in New York divides the fast-growing T1 multiplexer market into three categories, based on functionality.**

- Tier 1 consists of high-speed systems capable of handling both analog and digital voice interfaces, with a potential T1 line capacity of 256 links. These systems offer the ability to manage a network in a way that permits essentially transparent transmission to voice, data and image devices connecting to the T1.

- Tier 2 market value by sales revenue (in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (in millions)</th>
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<tbody>
<tr>
<td>1988</td>
<td>$277</td>
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<td>1989*</td>
<td>$277</td>
</tr>
<tr>
<td>1993*</td>
<td>$277</td>
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- Tier 3 market value by sales revenue (in millions)

<table>
<thead>
<tr>
<th>Year</th>
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T3 is the term used by phone companies to describe their DS-3 rate of 44.74 Mbit/sec., which is equivalent to 28 T1 lines. Until recently, the demand for T3 outside of the phone companies themselves has been negligible. But with the ever-increasing use of telecommunications, a crossover to T3 is becoming a more realistic consideration for many T1 users, Follett says.

“Where do you as an end user need a lot of bandwidth? You may want to do videoconferencing, or you want to have that new sense of voice traffic. Most T3 is justified for voice, but there are other ways to use the bandwidth,” he says.

Finneran suggests that, given their current pace of expansion, local-area networks may soon present another argument in favor of private use of T3. “There aren’t that many users with eight T1 facilities running in parallel between two locations right now,” he says.

“If you keep putting in bridges between LANs, or even terminals, that’s going to need the T3 to operate. A few of those, plus normal data traffic, and then you’re getting close to a T3.”

T3 can be provided by conventional TDM systems typically at $350 to $500 per voice channel. The most advanced versions, which use a common technology called Adaptive Differential Pulse Code Modulation (ADPCM), sometimes carry twice that number. But fast packet can deliver up to 96 voice channels per T1.

**Vocal advantage**

Fast packet has two advantages over existing multiplexing technologies: It not only carries voice but also carries twice as much as many conversations on the same circuit as TDM.

The most rudimentary T1 multiplexer—a channel bank—will carry 24 voice trunks on the T1 circuit as TDM. High-speed time division multiplexers are more efficient than statistical multiplexers, Watkins explains. According to Finneran, however, that rule may soon change. “Now,” he says, “we’re seeing the potential of high-speed dynamic allocation systems, specifically fast packet.”

**Three-act performance**

**Market research firm Frost & Sullivan, Inc. in New York divides the fast-growing T1 multiplexer market into three categories, based on functionality.**

- Tier 1 consists of high-speed systems capable of handling both analog and digital voice interfaces, with a potential T1 line capacity of 256 links. These systems offer the ability to manage a network in a way that permits essentially transparent transmission to voice, data and image devices connecting to the T1.

- Tier 2 market value by sales revenue (in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>$277</td>
</tr>
<tr>
<td>1989*</td>
<td>$277</td>
</tr>
<tr>
<td>1993*</td>
<td>$277</td>
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</table>

- Tier 3 market value by sales revenue (in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>$277</td>
</tr>
<tr>
<td>1989*</td>
<td>$277</td>
</tr>
<tr>
<td>1993*</td>
<td>$277</td>
</tr>
</tbody>
</table>
which was originally developed for use in large X.25 networks to reduce the error correction done in intermediate nodes.

Traditionally, an X.25 intermediate node has been required to buffer the incoming signal, perform an error correction known as cyclical redundancy check (CRC) and then pass the signal on.

However, Follett says, "The thought was that as networks become digital and we migrate toward fiber, we will have fewer transmission errors. So why do all that error checking in the middle of the network? Frame relay does the error checking only at the end nodes, so the intermediate nodes can pass data much faster."

The extra speed of frame relay, according to Finneran, creates the potential for "a dynamically allocatable, high-speed transmission service to interconnect geographically dispersed LANs. Instead of putting a great big pipe, such as a T1 bridge or router, between two LANs, you could provide a 1.5M bit/sec. connection to the fast-packet gadget. This way when I'm not transferring data between the LANs, I could use the pipe to transfer voice or data from other LANs."

Until recently, it was impractical to make a T1-rate dynamic allocation device, but there are now two on the market: the Stratocon ITX and the AT&T Integrated Access and Cross Connect (IACS). The Stratocon ITX was available first and is beginning to cut a niche in the T1 multiplexing market. It remains unclear whether AT&T will sell the IACS outside of the phone companies.

No other vendors have announced product intentions. Thus, users must face a choice between going with an established vendor offering that may soon be an outdated technology or an upstart vendor with a nonstandard box. "The question," Finneran says, "is whether it's worth the risk of using a vendor that's been around for under five years and has less than 5% market share."

Even the market leaders have built their domains on proprietary technologies. Indeed, there will always be proprietary architectures in the multiplexer market, Vertical Systems' Cochran says, because even if standards are developed, the vendors will want to add bells and whistles to their products.

"The hope is that there will be some common ground and some interoperability, but in reality that's a long time coming," he says.

### Statistical Multiplexers Made Simple.

Central costs, eliminate errors and increase security. Simplify your asynch communications with a pair of MultiMux statistical multiplexers. By replacing your dial-up lines with one or two leased lines, you'll save money and improve your network integrity.

**Simply more intelligent...**

A 4, 8, 16 or 32 channel MultiMux gives you full command control, with statistical reporting, remote configuration and test, 9600 and/or 14,400 bps link modems, and much more.

**...and easy to use**

With your MultiMuxes' easy installation, you'll be up and running quickly. Then you'll forget they're even there, except once a month when you get your smaller phone bill.
### MODEMS & MULTIPLEXERS

#### PRODUCT SPOTLIGHT

**T1 multiplexers**

<table>
<thead>
<tr>
<th>VENDOR</th>
<th>PRODUCT</th>
<th>PORTS THROUGH DIRECT INTERFACE</th>
<th>T1 LINES SUPPORTED</th>
<th>POIN-TO-POINT OR MULTIPORT</th>
<th>ASYNCHRONOUS SPEED (bit/sec.)</th>
<th>SYNCHRONOUS SPEED (bit/sec.)</th>
<th>INTERFACES SUPPORTED</th>
<th>TRAINING OPTIONS SUPPORTED</th>
<th>DROPPING OR INSERTING SUPPORTED</th>
<th>INDEXING / AUTOMATIC NUMBERING SUPPORTED</th>
<th>TYPE OF TRANSMISSION</th>
<th>BIT OR BYTE INTERVALIZED</th>
<th>DROP AND INSERT CAPABILITIES</th>
<th>AUTOMATIC ERROR CORRECTING</th>
<th>PRICE</th>
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<tr>
<td>Advanced Compression Technology, Inc.</td>
<td>T1 Compression Data Multiplexer</td>
<td>No</td>
<td>None</td>
<td>Point-to-point</td>
<td>NA</td>
<td>Up to 18.2M</td>
<td>RS-252, 2.4-MHz E&amp;M signaling</td>
<td>Proprietary</td>
<td>None</td>
<td>Yes</td>
<td>None</td>
<td>Yes</td>
<td>Data, voice</td>
<td>Adaptive preprocessing</td>
<td>Yes</td>
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<td>AEG-Telecom, Inc.</td>
<td>T1 Omniplexer</td>
<td>Yes</td>
<td>2</td>
<td>Multipoint</td>
<td>150-1.28K</td>
<td>2.4-4.6K</td>
<td>RS-252, G.704, 56K</td>
<td>D, E1</td>
<td>ESP</td>
<td>D, E1</td>
<td>No</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
<td>Yes</td>
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<tr>
<td>Appliance Co.</td>
<td>1030-309 Resource Manager</td>
<td>No</td>
<td>48</td>
<td>Multipoint</td>
<td>300-32.3K</td>
<td>2.4-5.4M</td>
<td>CO2P V.35, V.24, 2-port, 8-in-8 out</td>
<td>Proprietary</td>
<td>None</td>
<td>No</td>
<td>Common control, data, voice, power supply</td>
<td>Data, voice</td>
<td>NHDCP, PC, MAC</td>
<td>Yes</td>
<td>Yes</td>
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<td>Applied Spectrum Technologies, Inc.</td>
<td>T1 Multiplexer</td>
<td>No</td>
<td>Multipoint</td>
<td>Up to 10.2K</td>
<td>4.4-8.1M</td>
<td>3.5, 4-D, 7-E, 8-F, 9-S</td>
<td>D, E1, RS-252, RS-532, V.15</td>
<td>D, E1</td>
<td>Error rate, power</td>
<td>No</td>
<td>Common control, data, voice, power supply</td>
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<td>PC, MAC</td>
<td>Yes</td>
<td>No</td>
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<td>Avantek Inc.</td>
<td>1030-477-8651</td>
<td>Yes</td>
<td>1</td>
<td>Point-to-point</td>
<td>NA</td>
<td>560-64X</td>
<td>RS-422, V.25</td>
<td>D, E1</td>
<td>None</td>
<td>No</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
<td>Yes</td>
<td>Yes</td>
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<td>AT&amp;T Paradyne</td>
<td>Avocold T1 Multiplexer</td>
<td>No</td>
<td>Multipoint</td>
<td>50-19.2K</td>
<td>1.25-1.5M</td>
<td>51, 64K, T1, 80-256, 1.544, 1544</td>
<td>D, auto framing</td>
<td>Proprietary</td>
<td>Local and remote troubleshooting, access to 100-ft, and test, an agating line, a ne rating of an on-line, common control, data, voice, power supply</td>
<td>Data, voice, video</td>
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<td>Yes</td>
<td>Yes</td>
<td>$6,000</td>
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<td>Open Network Communication</td>
<td>No</td>
<td>Up to 2</td>
<td>12</td>
<td>Multipoint</td>
<td>1.84-4.0K</td>
<td>RS-252, 2.5-4.0M, 3.5-4.5M</td>
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<td>Proprietary</td>
<td>Common, control, power, data, voice, power supply</td>
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<td>2.0-4.0M</td>
<td>D, aut</td>
<td>Background diagnosis, access to 100-ft, and test, an agating line, a ne rating of an on-line, common control, data, voice, power supply</td>
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<td>NHDCP, PC, MAC</td>
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<td>NHDCP, PC, MAC</td>
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<td>Multipoint</td>
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<td>2.9-3.5M</td>
<td>RS-252, 2.9-3.5M</td>
<td>D, auto framing</td>
<td>Proprietary</td>
<td>Common, control, power, data, voice, power supply</td>
<td>Data, voice, video</td>
<td>NHDCP, PC, MAC</td>
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<td>Yes</td>
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<tr>
<td>Avanti Communications</td>
<td>Open Network Communication</td>
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<td>Proprietary</td>
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<td>Data, voice, video</td>
<td>NHDCP, PC, MAC</td>
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<td>BBN Communications</td>
<td>SuperCOM 1000</td>
<td>Up to 30</td>
<td>Multipoint</td>
<td>50-64X, 50-768K</td>
<td>D, E1, G.952, 56K, 3-8</td>
<td>D, E1, RS-232, RS-532, V.15</td>
<td>D, auto framing</td>
<td>Proprietary</td>
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<td>$5,000-$135,000</td>
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<td>Case Controls</td>
<td>T1 multiplexer</td>
<td>Yes</td>
<td>3</td>
<td>2</td>
<td>Point-to-point</td>
<td>10-45</td>
<td>56</td>
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<td>None</td>
<td>No</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
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<td>CIR/Real 50</td>
<td>T1 Multiplexer</td>
<td>No</td>
<td>Up to 40</td>
<td>B Field</td>
<td>350-56.6K</td>
<td>1.544, 1.544</td>
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<td>D, E1</td>
<td>Proprietary</td>
<td>None</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
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<td>Yes</td>
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<tr>
<td>Computer Products Corp.</td>
<td>T1 Multiplexer</td>
<td>No</td>
<td>2</td>
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<td>150-1.28K</td>
<td>2.4-5.4M</td>
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<td>None</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Computer Products Corp.</td>
<td>T1 Multiplexer</td>
<td>No</td>
<td>1</td>
<td>Multipoint</td>
<td>50-1.28K</td>
<td>1.544-1.544</td>
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<td>D, auto framing</td>
<td>Proprietary</td>
<td>None</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Data Switch Corp.</td>
<td>T1 Switch Link</td>
<td>No</td>
<td>30</td>
<td>Multipoint</td>
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<td>1.544-1.544</td>
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<td>Proprietary</td>
<td>None</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Digital Communications Corp.</td>
<td>System 9100</td>
<td>No</td>
<td>1-16</td>
<td>Multipoint</td>
<td>50-1.28K</td>
<td>1.544-1.544</td>
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<td>D, auto framing</td>
<td>Proprietary</td>
<td>None</td>
<td>Bypass</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
<td>Yes</td>
<td>Yes</td>
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<td>Digital Link Corp.</td>
<td>DL6000 PT</td>
<td>No</td>
<td>1</td>
<td>Multipoint</td>
<td>566-1.5M</td>
<td>RS-449, V.55</td>
<td>D, auto framing</td>
<td>Proprietary</td>
<td>None</td>
<td>No</td>
<td>None</td>
<td>Data, voice</td>
<td>NHDCP, PC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Electrical and mechanical**
- Extended self-framing
- Adaptive differential pulse code modulation
- Bit error rate test
- Pulse code modulation
- Military standard

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.

NOVEMBER 27, 1989
<table>
<thead>
<tr>
<th>VENDOR</th>
<th>SUPPORTS 1 THROUGH 8 MULTIPLEXERS</th>
<th>POINT-TO-POINT OR MULTIPLEXED</th>
<th>ASTRONOMOUS SPEED (bit/sec.)</th>
<th>SYNCHRONOUS SPEED (bit/sec.)</th>
<th>INTERFACES SUPPORTED</th>
<th>DIAGNOSTIC/ALARM FEATURES SUPPORTED</th>
<th>LINES OF REDUNDANCY SUPPORTED</th>
<th>TYPE OF TRANSMISSION METHODS</th>
<th>DROP AND INSERT CAPABILITIES</th>
<th>DROP AND INSERT ELECTRICAL</th>
<th>AUTOMATION/PROTOCOL SUPPORTING</th>
<th>PRICE</th>
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<tbody>
<tr>
<td>NCI Communications Corp.</td>
<td>No</td>
<td>20</td>
<td>Yes</td>
<td>0-50</td>
<td>0-100</td>
<td>RS-449, V.35</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Magnes F5460</td>
<td>Yes</td>
<td>16</td>
<td>Multipoint</td>
<td>Up to 47MHz</td>
<td>Up to 47MHz</td>
<td>RS-232, RS-422, V.35, V.21</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Gendall Sign Limited</td>
<td>No</td>
<td>14</td>
<td>Multipoint</td>
<td>50-19.2K</td>
<td>2.485-1.5MHz</td>
<td>2-ESF, T1, V.35, V.32</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>General Dynamics Corp.</td>
<td>No</td>
<td>32</td>
<td>Multipoint</td>
<td>Up to 1.5MHz</td>
<td>Up to 1.5MHz</td>
<td>RS-422, RS-485, V.35, V.21</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Magnes SMS</td>
<td>No</td>
<td>4</td>
<td>Multipoint</td>
<td>Up to 1.5MHz</td>
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<td>EPS, 2-ESF, 2-T1, V.35, V.21</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>IBM</td>
<td>256/400</td>
<td>15</td>
<td>Multipoint</td>
<td>75-19.2K</td>
<td>1.25-1.5MHz</td>
<td>RS-232, V.35, T1, V.21, T1, V.25</td>
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<td>Yes</td>
<td>Yes</td>
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<td>IBM</td>
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<td>15</td>
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<td>75-19.2K</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Silicon Systems Corp.</td>
<td>328/400</td>
<td>4</td>
<td>Multipoint</td>
<td>50-19.2K</td>
<td>2.485-1.5MHz</td>
<td>G.920, MIL-188-114, RELM, MIL-338, V.35, V.21, V.25, V.32</td>
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<td>Yes</td>
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<td>Yes</td>
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<td>2.485-1.5MHz</td>
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<td>Yes</td>
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<td>Yes</td>
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<td>Integrated Telecommunications Corp.</td>
<td>2000/2000</td>
<td>16</td>
<td>Multipoint</td>
<td>Up to 1.5MHz</td>
<td>Up to 1.5MHz</td>
<td>RS-222, RS-422, V.35</td>
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<td>RS-232, RS-422, V.35</td>
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<td>RS-48</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>

NOVEMBER 27, 1989 COMPUTERWORLD
I thought I was hearing things when they said, 'It's not our equipment, but we'll take care of it anyway.'

The last time something went wrong with my system, the computer company blamed everybody's equipment except their own.

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The Solution: With just one call, IBM will take full responsibility for every piece of computer equipment you've got. No matter whose name is on it. All you need is a telephone, and our simplified service agreement. It's just one more example of IBM listening to your needs, and bringing you the best solutions.
<table>
<thead>
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<th>VENDOR</th>
<th>PRODUCT</th>
<th>SUPPORTED THROUGH A DIRECT INTERFACE</th>
<th>POINT-TO-POINT OR MULTIPONT</th>
<th>ASTRONOMIC SPEED (bit/sec.)</th>
<th>SYNCHRONOUS SPEED (bit/sec.)</th>
<th>INTERFACES SUPPORTED</th>
<th>FRAMING OPTIONS SUPPORTED</th>
<th>DIAGNOSTIC/ALARM FEATURES SUPPORTED</th>
<th>LEVEL OF REdundancy NETWORK CONTROL</th>
<th>TYPE OF TRANSMISSION</th>
<th>VOICE-COMPRESSION METHODS</th>
<th>BY OR BY INTERFACED CAPABILITIES</th>
<th>DROP AND INSERT CAPABILITIES</th>
<th>COST</th>
<th>DROiNT TERM</th>
<th>COMMENTS</th>
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<tr>
<td>Newbridge Networks, Inc.</td>
<td>3900 Backpacks</td>
<td>No</td>
<td>16-32</td>
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<td>75-18.2K</td>
<td>1.56-1.536</td>
<td>No</td>
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<td>449/423, V.35, X.21</td>
<td>No</td>
<td>39.3K</td>
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<td>100-500, 3.5 Kbps</td>
<td>No</td>
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<td>Pacemex, Div. of Hakedt, Inc.</td>
<td>T1/Business Bank</td>
<td>No</td>
<td>10 to 2</td>
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<td>15-22.5K</td>
<td>1.536</td>
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<td>ADPCM, BISDN, E1, SF</td>
<td>No</td>
<td>Data, voice</td>
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<td>RAD Data Communication Systems</td>
<td>50-105K</td>
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<td>No</td>
<td>Full support of E1 features</td>
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<td>Salisbury Communications</td>
<td>CSW, AT&amp;T 2401</td>
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<td>No</td>
<td>Major and minor alarms</td>
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<td></td>
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<td>Siemens, Inc. (800) 753-2363</td>
<td>48 Kbps/19.2 Kbps</td>
<td>No</td>
<td>16</td>
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<td>1.536-1.536</td>
<td>No</td>
<td>AT&amp;T 2641B, T1, E1, T1-A, T1-B, V.34, 4-wire E&amp;M</td>
<td>Yes</td>
<td>Data, voice</td>
<td>$7,500</td>
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<td>Route 24</td>
<td>No</td>
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<td>Point-to-point</td>
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<td>No</td>
<td>Digital 1.5 Mbps data rate operation, full interface</td>
<td>None</td>
<td>None</td>
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<td>1.536-1.536</td>
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<td>No</td>
<td>No</td>
<td>$20,000</td>
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</table>
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When a modem isn’t really a modem

ADC/Kentrox, INC and Case/Datatel serve digital networks with DSUs

BY RICHARD THOMA

What comes after the modem? The logical successor is the digital service unit/channel service unit (DSU/CSU). When, as eventually will happen, all networks become digital, the need for modulation and demodulation will disappear altogether and everyone will be able to make use of simpler and cheaper digital interfaces. That day is not quite here, but one type of DSU/CSU that promises immediate benefits is the 56K bit/sec. unit.

What these units offer to a corporate user is the ability to make large data transfers at voice prices. They accomplish this by using a T1 or Digital Data Service (DDS) line for connection to the data services offered by interexchange carriers over their existing voice networks. Equipped with built-in autodial capability, the DSU/CSU generates a 2,100-Hz clearing tone that alerts the carriers to move the echo suppression they have in place for voice equipment and route the transmission away from any analog lines.

To get an idea of the economics involved, consider that 56K bit/sec., which is the lowest DSU/CSU capacity available and corresponds to the data-handling capacity of the carriers' digital voice channels, is 10 times faster in terms of absolute throughput than the fastest standard analog modems (9.6K bit/sec.). Savings will never come even more pronounced with the arrival of more innovations. For instance, vendors are promising to enhance DSU/CSUs so that they can work with a two-wire instead of a four-wire digital interface. This would eliminate the need to invest in a DDS line if T1 service does not terminate in the user's facility; it would also help to prepare the ground for connection to carrier networks through central office local-area networks. Fractional T1 services, offered by a number of interexchange carriers and promised by all of the Bell operating companies, can also eliminate the need to invest in a T1 line.

The three leading providers of this new class of DSU/CSU equipment are ADC/Kentrox, with its Kentrox Desktop Link 56, and Case/Datatel, Inc., with its DCP3056 Switched 56 Terminal Interface Unit.

The price leader is Kentrox's Desktop Tie Link 56, which sells for $1,795. This product, an autodial/answer DSU/CSU for four-wire switched 56K bit/sec. services, includes all the features of Kentrox's rack-mounted model in a desktop package for applications such as PC-to-PC transfer, Group 4 facsimile, video teleconferencing, encrypted voice and data, bulk data transfer and computer-aided engineering, design and manufacturing.

Tie Link 56 includes an industry-standard AT command set, as used in all Hayes-compatible modems, and provides a backlit display for easy reading. A patented 2,100-Hz tone turns off echo cancellers and maximizes synchronization through incremental shifts of tonal range. Built-in diagnostics perform tests without external equipment, and call-progress displays provide data on call status.

The one area where Tie Link 56 falls short of the competition is in its lack of an A/B switch and -autoanswer facilities, which limits its ability to perform specific port configurations.

INC's 1056E Switched Data Service Unit, priced at $2,250, provides high-speed 56K bit/sec. data transmission in either switched or dedicated mode. If the DDS line fails, the equipment can automatically convert to switched operation. It also offers powerful operational and diagnostic features.

The DCP3056 has combined DSU/CSU and dialing functions and an A/B switch for automatic dial backup on dedicated-line applications. An echo canceler is available for use on networks that carry voice and data. The front panel includes a 40-character, two-line multilingual LCD and eight LED status indicators. Remote operation is also possible via a control port.

Automatic drop and retry is provided for unanswered calls. The INC 1056E offers extensive diagnostic capabilities, such as a test generator, error checker and bit-error tests, six loopback tests and three user- and network-initiated tests.

Memory dialing is available for 25 numbers; the 1056E offers both last-number redial and nonvolatile storage for phone numbers. It is compatible with U.S. Sprint Communications Co.'s TS-046 specification, which has become the de facto standard for data services over voice lines.

For an additional $395, INC offers a subrate data converter capable of providing synchronous and asynchronous data terminal equipment speeds up to 19.2K bit/sec., speed selection and loopback test initiation. Two units per connection are required, but this equipment will operate with either vendor's switched 56K bit/sec. unit.

Both units provide an adequate solution. Neither product, however, offers the command interface versatility or the auto-speed conversion of Case/Datatel's DCP3056 Switched 56 Terminal Interface Unit.

The DCP3056 has a 100-number dialing capability and a speed-conversion facility for line rates of 2,400, 4.8K, 9.6K and 19.2K bit/sec. in its 56K bit/sec. channel. It has complete call-monitoring and diagnostic capability and complies with Sprint's TS-048. Sprint has also certified the product's compliance.

Case/Datatel was the first of the three companies to provide an A/B switch capability. It supports both front-panel programming and a console-to-CRT interface. The DCP3056 has a seven-position shift in the 2,100-Hz data stream to ensure the removal of echo cancellation.

The DCP3056 Switched 56 Terminal Interface Unit, which sells for $1,950, provides an RS-232 and V.35 interface on both sides of the A/B switch, RS-366 and RS-232 command interfaces and a printer interface.

These products represent just the first wave. All three vendors plan to introduce new models in the first quarter of 1990, and others are jumping in with offerings of their own. In fact, Northern Telecom reports that it has licensed its two-wire technology to 18 vendors.
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☐ MNP® - The Industry Standard
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Microcom gives you the most complete selection of high performance modems available from any vendor. Microcom is also the company that invented MNP® - Microcom Networking Protocol - the industry standard for protocol modems.

If you need full V.32 compatibility, the QX/3296c has it, along with a throughput of 19,200 bps and UNIX protocol support.

We also offer the world's fastest modem: the QX/V.32c. At over 30,000 bps, it's the modem to buy when speed is crucial. Our new QX/2400t is fast, features new MNP Class 10 and is very economical at $699.

The bottom line? We can give you the right modem at the right price for any application. All with powerful remote access for configuring and troubleshooting distant sites, plus 100% error-free transmission. We set the standard for the industry. And now we're setting standards for price and performance too.

The Microcom High Performance Modem Buyer's Guide

<table>
<thead>
<tr>
<th></th>
<th>QX/V.32c</th>
<th>QX/3296c</th>
<th>QX/2400t</th>
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* FREE GUIDE

No company is better suited to give you the facts on modems than Microcom — the inventor of the industry standard. Get your free copy of "The Modem Buyer's Guide." Call toll free 1-800-822-8224 today.
A dial-up plan battens down the hatches
BY BARBARA SEHR

Fiserv, Inc. probably felt pretty secure when this fall’s wave of disasters struck.
The Milwaukee-based company, a data processing service bureau with 20 data
centers that serve financial institutions across the country, had tested a disaster-
recovery scheme based on backup dial-up transmission and a high-end modem long
before the first winds of Hurricane Hugo began to blow.

It had to be ready. In July, the U.S. Of-
fice of Regulatory Activities established
guidelines for contingency planning at fi-
nancial institutions. The guidelines are in-
tended to minimize financial loss and dis-
ruption of service and ensure timely resumption of operations in the event of a
natural disaster, technical failure or hu-
man disruption, such as sabotage.

Since many savings and loans rely heav-
ily on service bureaus for data pro-
cessing, the bureaus are required to com-
ply with the guidelines as well.

Although Fiserv has had recovery
plans in place since its inception, “To re-
main in compliance with the updated and
revised guidelines, the company has
strengthened and formalized its plan,” ac-
cording to Michael Rigney, vice-president
of operations at the company’s Tampa,
Fla., data center.

Fiserv handles records for 19 million
accounts at over 800 credit unions, sav-
ings and loans and commercial banks.

When conditions are normal, each client
location’s terminal equipment interfaces
with the host front-end processor and
mainframe via multidrop leased lines.

The data centers employ a variety of
mainframes, including machines from

IBM, Uni sys Corp, and NCR Corp.

In formalizing its contingency plan, Fi-
serv had two requirements besides satis-
fying federal regulators. One was cost
containment.

“The disaster-recovery process must
remain as affordable as possible so that
both the client and the data center can af-
ford to implement the plan properly,”
Rigney says.

Planning for obsolescence
In addition, Rigney says he believes that
any technology selected is likely to be ob-
solete in three years. “So, your best bet is
for the best business-resumption tech-
ique for the least dollar investment so you’re in a position to adapt to new
technology as it comes along,” he ex-

In the data business,
sometimes it’s better
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the data communications systems integrator.

THE POWER IS ON

MICH AEL RIGN EY
FISERV

Obstacle course
Fiserv had to overcome two complica-
tions before the plan would work. Once
transmission went from multidrop leased
to dial-up lines, each location on the multi-
drop circuit became point-to-point ser-
vice.

That is, instead of having one front-end
processor line interface accept transmis-
sion from all the locations on the multi-
drop line, it needed one line interface for
each client on the line. If there were five
locations on one multidrop line, this could
turn into a lot of front-end processor
boards.

Networks, Inc., a systems integrator
in Miami Lakes, Fla., helped Fiserv locate
its solution. A programmable digital
bridge reconcentrates the point-to-
point dial-up circuits into a balanced

Sehr is a free-lance writer based in Hayward, Calif.
configuration of simulated multidrop circuits, minimizing the number of front-end processor interfaces. Suddenly, dial-up transmission was practical for what is a very large network configuration.

The right modem for the job was one from NEC Corp. — its 9631 V.32 model. At $1,095, the 9631 was the only single-call, multispeed dial-up modem available at the time of the spring 1989 implementation. Two others were in development at the time, but they were not available.

The NEC modem accommodates any line speed from 1,200 to 9.6K bit/sec. in synchronous, asynchronous or isochronous mode. In other words, it accepts any type of signal and can also be reconfigured to accommodate changes in the client's setup. More importantly, the 9631 was the only modem at the time that could pass the control signal used with digital bridging.

Load 'em with modems
Fiervy purchased a 9631 modem to be placed at each client site. For each site served by the data center, there is a corresponding modem available at the recovery center.

Another advantage of the modem's flexibility is that because it can accept such a wide range of transmission types, the number of modems the hot site needs equals the maximum number of clients served by a particular data center. Each recovery site serves more than one primary data center, and the modems that accept transmission from one data center's clients can be configured to accept transmission from another.

Four data centers besides the Tampa site — San Antonio, Los Angeles, Seattle and Fiserv's headquarters in Milwaukee — are using this system. All five are Unisys sites. Two recovery centers — in Milwaukee and Warmminster, Pa. — serve all five locations. The hot sites are located far enough away from the data centers that no single disruption could threaten both the hot site and a given data center.

As for the other 15, corporate policy mandates that each data center have a backup plan in existence that meets federal regulations. But because of the diversification of systems, each is given the freedom to come up with its own plan. Currently, all have a plan under evaluation.

By using dial-up lines, the 9631 modem and a digital bridge, Fiserv kept the cost of implementing the system to $1 million. Furthermore, there is little risk of obsolescence. "Dial-up offers a ramped solution," Rigney says. "And we have not compromised in cost or in effectiveness."

Rigney says he believes the multi-speed, single-call dial-up concept employed in the NEC modem will become more common as other institutions prepare disaster recovery plans. Because of its flexibility and minor investment, he says, "I believe it will play a major role in disaster recovery."

"I've got twisted pair in Administration. Some of the older buildings are still wired with baseband. And there's broadband running over three separate plants.

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Shaping the 1990s

A new way of looking at the future helps industry participants develop their visions of the next five years

BY JAMES HERMAN, PATRICIA SEYBOLD and ROBERT WEBER

All of us in the computer industry, leaders of giant corporations or garage-shop inventors work with a vision of how we think people will use computers and communications in the 1990s. Will end-user computing dominate? Will mainframes stage a comeback? Herman is principal of Northeast Consulting Resources, Inc. Seybold is president of the Seybold Office Computing Group. Weber is a senior consultant at Harvard University.

Some of us worry about which technologies will succeed. Is broadband Integrated Services Digital Network the wave of the future? Will desktop video be commonplace? Others worry about how to make money in an industry increasingly ruled by standards. Will consolidation lead us to an end game with only a few big players? Will users be able to integrate technology from multiple vendors or will they keep buying from a few strategic vendors? Everyone wants to know what will happen and how to best take advantage of the way things turn out.

As the decade turns, it is a good time to start thinking differently about the future. Calvin was wrong. The future is not predetermined; it is shaped by the choices and actions of industry participants.

Five visions of tomorrow

In defining a vision of tomorrow, many people construct a "most-likely" scenario or assign probabilities of success to particular companies or strategies. Unfortunately, there is an increasing danger of being blinded by an unexpected turn of events — which is often more important in the computer industry than the statistically valid forecasts of research firms. It is much more useful to work with a number of alternative future industry configurations, each of which is technologically plausible and makes good business sense.

A new way of learning about the future flows from working with five alternative visions or "end states" of what the computer and communications industry will look like by the middle of the new decade: A future dominated by standards, a future driven by a new technology, a future belonging to networking, an affordable future and a future owned by big players (see story page 79).

These visions are not mutually exclusive; they share many common characteristics. But each clearly depicts a radically different competitive environment for the middle of the decade. Vendors, users and government would behave differently in each. Which vision is right or most likely to occur? That may be the wrong question to ask. A better approach may be to determine how actions and choices by industry players can influence the evolution of the industry, so that it moves toward one of the end states.

Events vs. trends

This new approach to working with the future provides a very different focus from "sustainable competitive advantages" and similar strategic planning concepts. There is no sustainable competitive advantage, but rather, a never-ending series of challenges. The goal for executives, managers, inventors and planners, then, is to stay one or more steps ahead of their competitors at all times. Doing so requires knowing what is important and what is not, what should be changed and what should not, and perhaps most important, when to make changes.

The key questions to be explored are those that suggest the
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way your organization can influence the outcome. Such questions can be best addressed in several ways: by focusing on events rather than trends, by underscoring the many possibilities rather than considering a few trends and outcomes and by identifying which key events must happen if a particular vision is to be achieved.

The goal for executives, managers, inventors and planners, then, is to stay one or more steps ahead of their competitors at all times.

In order to succeed, you must find the key points of leverage that will push the industry down one pathway or another. By looking at a full set of alternative future scenarios, you can track the trajectory of the industry toward one end state or another and over time, refine the set of assumptions that guides your planning.

Most successful managers and executives work within a mental context founded on two visions. The first is a complete, holistic view of the industry and its dynamics, which lets them communicate a vision of how company or project team activities fit into the bigger picture. The second is a detailed mental model for planning key tasks and tracking external developments. This structure provides a framework for making decisions and redirecting effort.

You can establish your goals and objectives against a complete set of alternatives and more accurately target the actions necessary to create a climate favorable to your strategy. The result can be a very robust foundation for planning and strategy that can encompass, rather than avoid, the true complexity of your industry. Decision makers can then use this information with company missions, resources, goals and strategies to develop more realistic and attainable technology and business objectives.

Players in the information technology industry divide into two types: The first waits to work with whatever develops, while the second deliberately chooses a particular outcome for the industry and works skillfully to ensure it develops that way. It is this second group — those with a coherent image of the computer and communications industry future — whose dreams and reasoning can tell a lot about the evolution of the industry during the early 1990s.

Future by objectives

During the past 1½ years, we have led diverse groups of industry thinkers and doers through two-day programs and exercises that let them consider divergent possible futures and how to make them happen. The program is multidisciplinary and draws on diverse participants from all sectors of industry, including technology, business, government and education. We have begun to record and preserve some visions of the future:

- A future dominated by standards. Proprietary standards have faded, replaced by practical and more popular, uniform, multivendor solutions. The need for compatibility with installed base slows technological advances, though. Open market prices are lower, with keen competition in application software. Biggest advantages go to small, responsive firms or large, volume producers. Far East gains world momentum at the expense of IBM.
- A future driven by new technology. Advances continue into seventh year. Flat screens, speech recognition, image processing, superb color, expert assistants and multimedia documents redefine user interaction. Fiber-optic speeds image transmission, while parallel processing and new architectures sharply boost performance. Aggressive start-ups fuel innovation; big vendors bog down supporting existing base.
- A future belonging to networking. Use of discrete computers fades, as networked machines become distributed parallel processors. Location-independent data access and cooperative processing are major software paradigms. Groupware is popular. Small firms use global marketplace for IS.
- An affordable future. Technology spending rethink investments. Economic logic of moving to inexpensive distributed platforms is inescapable. End-user applications are the most popular new applications. Economies of scale and good distribution are keys to success. Global stagnation fuels fierce nationalistic pride.
- A future owned by big players. Intense consolidation narrows number of broad-line information suppliers to six large multinational giants. Need for high return on R&D investment fuels proprietary approaches, yielding better technology, integration and functionality. Users prefer systems. Vendors have power over suppliers and customers and raise high barriers to entry.

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of these visions and the elements of a structure that can support planning to reach the vision (see stories at right and on page 83).

This study is valuable for two reasons: First, the results show what a highly intelligent cross-section of professionals think the computer and communications industry will look like in 1995. Second and more important, the structured process they used to arrive at their conclusions suggests a powerful new way for all industry participants to take a more active role in shaping the last decade of the 20th century.

One way to look at this future-shaping process is to compare it to a time-tested business concept: management by objective. The process of industry participants actively shaping tomorrow's industry may be thought of as "future by objective." The best way to understand the whole process by which this is accomplished is to understand the individual steps and terms.

Many approaches to strategic planning or forecasting are based on informed guesses about existing trends that will play out in the future. Trend-based forecasting is often wrong, especially more than one or two quarters ahead, let alone five years into the future. The reason is that most forecasters and their clients are not interested in (or able to grasp) key events and their sequences.

End states are brief snapshots of the industry in 1995, a useful time horizon that can be grasped now. They are not random guesses about the future of technology but instead reflect a rigorous approach to the problem of forecasting the state of technology several years into the future. These possible futures are not mutually exclusive: the industry in 1995 is likely to reflect some mix of these end states rather than just one. Still, it is useful to think of end states as separate and distinct outcomes.

These end states seem very familiar.

Establish your goals and objectives against a complete set of alternatives and more accurately target the actions necessary to create a climate favorable to your strategy.

The reason is that they reflect popular mental models, images and beliefs often heard in discussions of the future of the industry. What we have done is to make these widely held visions more precise and internally consistent.

End states develop as a consequence of many individual events. (The term "event" is used in a special way here. In this context, an event has three main components: a title or brief summary, a date by which the event is to have happened and a more detailed description.) Events were chosen that capture possible

How the exercise works

- Teams are formed. Each team is asked to review the event set and determine which of the 200 or so events were highly likely to occur by 1995. Participants see the five end states before the seminar but not individual events.
- "Highly likely/unlikely" events are chosen. Participants are asked to identify events they believe are highly unlikely to happen. There are three reasons for this: the first is to familiarize the participants with the universe of choices. The second is to promote the exchange of opinions and ideas. The third is to explicate the assumptions or biases of the players. The selections reflect what each group predicts will and will not happen.
- "Must happen/must not happen" events are chosen. Now that the team members know each other's opinions, teams begin the first of two primary tasks: reviewing the entire set and deciding which events must occur for their end state to actually happen. Teams are then asked to decide which events must not happen if their end state is to become reality.
- A scenario is developed. In this second main task, teams link the events that must or must not happen to achieve the final end state. A scenario is a story or narrative that describes sequences of events. The scenario explains the group's judgment and thus also explains why other end states are less likely to occur.
- Ideas are presented to other groups. The exercise ends with presentations to the entire seminar by each group. Teams describe events key to their end state and present their narrative. Hearing five reasoned — and passionately defended — scenarios gives everyone a wider view of the possibilities.
- Key events are tabulated. During presentations, team votes on key events are quickly tabulated. Afterward, players are shown this list of critical events. "Must and must not" events are shown separately. Interestingly, most events have an application or technology user focus. For example, two of the events are concerned with multi-vendor, heterogeneous platforms for distributed database applications. The signposts of change in this industry are the things that are done with information technology. By paying attention to the evolution of applications and uses of technology, industry directions become clearer.
- Key events are compared. A key advantage of working with distinct events rather than trends is that besides being stories with actors and outcomes, scenarios become sequences of events. This means that lists can be compared and key-event sequences developed by each team using a "cross-futures" analysis.

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turning points in technology, industry structure, government regulation and socioeconomic context.

Another important aspect of events is that they can be influenced by industry participants, including senior executives, managers, inventors and planners.

One example of an event is IBM breaking into four companies — clearly an industry-shaking possibility. Events are logical possibilities, not forecasts about the future. Events are also discrete; they are not processes or trends.

For example, the "declining cost of computing power" is well known and indisputable. However, better price/performance is a trend, not an event. But the existence of "100 million instruction set computing workstations on the desktop" in 1992 is an event that reflects this trend.

The discussions and choices of team members can be used in several ways:
- Identifying critical events. The simplest comparison is of events selected by several teams. Because a majority of teams found these events pivotal to their scenarios, they represent a broad consensus on what the critical developments will be over the next few years.
- Tracking progress toward end states. One way that planners and analysts can use events is to monitor progress toward particular end states. A good real-life example occurred recently.
- Identifying critical events. The simplest comparison is of events selected by several teams. Because a majority of teams found these events pivotal to their scenarios, they represent a broad consensus on what the critical developments will be over the next few years.
- Tracking progress toward end states. One way that planners and analysts can use events is to monitor progress toward particular end states. A good real-life example occurred recently.

UCERS APPEAR to be awakening to find themselves with new options because of standards and a huge, under-utilized installed base that allows them to defer new purchases.

The results...

<table>
<thead>
<tr>
<th>Year</th>
<th>Likely Events</th>
<th>Unlikely Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>Highly likely: Minicomputers used as servers, Reusable optical discs common, Merger of Unix International and OSF, Increased government R&amp;D, IBM reduces mainframe margins by 40%</td>
<td>Highly unlikely:</td>
</tr>
<tr>
<td>1990</td>
<td>Likely: Mainframes still key in database management, European Postal Telephone and Telegraph restrictions lifted, Scrutiny tightened on corporate IS purchases</td>
<td>Unlikely: Unions oppose more automation, DEC buys Wang and DG</td>
</tr>
<tr>
<td>1991</td>
<td>Likely: Critical shortage of clerical workers, Interoperable products clarified, OS/2 too expensive</td>
<td>Unlikely:</td>
</tr>
<tr>
<td>1992</td>
<td>Likely: Proliferation of distributed, object-oriented tools</td>
<td>Unlikely:</td>
</tr>
<tr>
<td>1993</td>
<td>Likely: Low-cost, high-resolution flat-color screens appear, Fiber-optic cable cheaper than copper wire</td>
<td>Unlikely: Large vendors stop charging for hardware</td>
</tr>
<tr>
<td>1994</td>
<td>Likely: Embedded computers common</td>
<td>Unlikely:</td>
</tr>
<tr>
<td>1995</td>
<td>Likely: Digital libraries catch on, Integrated voice/data terminals replace computers</td>
<td>Unlikely:</td>
</tr>
<tr>
<td>1996</td>
<td>Likely: A&amp;T re-regulated, IBM broken into four firms</td>
<td>Unlikely:</td>
</tr>
</tbody>
</table>

"This system just can't process claims fast enough. And that makes for a lot of dissatisfied customers."
Having enjoyed 40 per cent growth the past couple of years, cfSOFTWARE has found its niche marketing two unique communications solutions in the IBM and IBM-compatible arena. Across-the-Boards, a standard application programming interface, and pcMAINFRAME, a file transfer system, both enable mainframes and microcomputers to talk to one another. According to Rogers Faden, President of this Chicago-based company, targeting users whose applications require this type of cross-communication is key to their continued success.

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Identifying popular topic areas. Another way to work with the results of the scenario-building effort is to identify topics that got the highest reaction from teams. Our results showed the importance of data communications technology and standards.

User decision-making events also attracted many votes. During the seminars, there was much discussion of what the users wanted and what they would do. The exercises provided a focus group in which vendors and users could exchange views. Users appear to be awakening to find themselves with new options because of standards and a huge, underutilized installed base that allows them to defer new purchases.

Examine specific issues. Participants receive a full listing of the voting on all events as part of a results package that is sent a few days after the seminar. Working with a detailed event list allows them to examine specific issues.

Establish a monitoring system. Some participants in past seminars have used the event set to set up a monitoring system, which they use to track the occurrence of real events against the assessments made during the exercises. This early warning system can show when the industry is taking a turn toward a specific end state or when events are happening that were not foreseen in the exercise. The latter may signal a need to re-evaluate strategies.

Examining one critical event in detail shows how team information can be used. Let's start with the event entitled "Multi-vendor Distributed Applications Platforms Realized." This event has made it to the critical list ever since it was first introduced. It states that distributed applications that cross multi-vendor platforms become real by, say, 1991.

Every team saw this event as a requirement for its end state — with one exception. The team building a vision in which "Big Players Own the Future" decided this must not happen. Doing so would be a threat, even an admission of failure, to the single-vendor solution purchase. Given this knowledge, what actions can be taken? If you are not one of the few major vendors, quick and deep involvement in the multivendor distributed application movement is crucial. If you are one of the major vendors, your decision is more difficult.

Can you derail the development of multivendor standards for distributed applications? Can you accelerate the introduction of proprietary alternatives and gain market share before the industry standard is ready?

Having considered possible futures and alternative paths to achieving them, is there any consensus about key issues and actions or activities that can be done now? Our research shows that computing and communications technology is evolving — and key. As some problems get resolved temporarily, others become more prominent. The uniformity of answers suggests that having invested extensively in computers of all sizes and in local-area networks, the key issues in the market today concern enterprise networking.

Specifically, there seem to be four critical problems: network management, higher bandwidth on wide-area networks, network security and interoperable distributed applications.

There seem to be four critical problems: network management, higher bandwidth on wide-area networks, network security and interoperable distributed applications.

This evolutionary nature of technology change — investment in computers and the lower layers of the International Standards Organization stack, then resolving problems and investing in higher layers — is not apparent from the end states, event set or scenarios. Instead, research suggests that it is only one outcome of two days of intense effort by leading experts using these techniques.

Studying research in different environments shows an evolution in thinking in the computer industry. Not long ago, for example, people gave little consideration to networks. "Networks" is no longer a gratuitous buzzword. Now, participants spend significant time on the issues raised by networks.

What will networks be used for? How should distributed applications and databases work? What standards are absolutely required for functional systems? How will these networks be managed — technically, legally, financially? These are key issues that need to be explored further by the industry.

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spreadsheet once.

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```plaintext
/* MSG IKJ574 */ /* Reduce broadcast dataset full messages */
/* INIT SECTION */
prevtime = TIME(M) - 5
/* PROC SECTION */
IF (TIME(M) - prevtime - 5) * (TIME(M) - prevtime - 0) THEN DO
  prevtime = TIME(M)
  msg. user = 'DISPLAY' /* Done for another Rule */
END
/* Here when an IKJ574I displayed in the last 5 minutes */
msg. user =
RETURN DISPLAY
```

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R1: MSGID(IKJ574I), SUPPRESS
R2: MSGID(IKJ574I), EVERY (5 MINUTES), DISPLAY

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Sunburst strikes home automation horizon

"I had no background, no history and no wealthy family, but I did have confidence," Lee said. Four decades after those terrible years, the seeds that Mao cast abroad somewhere in the choppy South China Sea have germinated in Silicon Valley.

Last May, Lee formed Sunburst Systems, Inc., an energetic startup that revolves around one simple tenet: For computers to become a useful tool for everyday life, they need to achieve everyday status, like a television or home stereo.

Parks, a principal at the Parks Associates consumer research firm in Dallas, says that the smart home has a "huge potential to reshape the home electronics market," and that "the industry is technologically ready to support it. Although the quest to provide a smart home is a complex one, there are companies making strides towards making it a reality."

Home, smart home

Anyone who has ever watched The Jetsons is familiar with the concept of the smart home — sophisticated electronics taking over the mundane chores of running the household.

Sunburst is one of the many companies that are working towards making the smart home a reality. Their system, called "Home, Home, Smart Home," is designed to be easy to use and affordable.

The system includes a central control unit that can be controlled through a smartphone app or a voice command system. It can control lighting, heating, cooling, and security systems, as well as entertainment devices.

Sunburst's system is designed to be scalable, so people can start with a few components and add more as they see fit. The company is also working on integrating the system with other smart home devices, such as thermostats and security cameras.

Lee, the founder of Sunburst, is optimistic about the future of the smart home market. "People are becoming more aware of the benefits of smart homes, and the technology is improving all the time," he says. "We're just scratching the surface of what's possible."

As the technology不断发展, the smart home market is expected to grow significantly in the next few years. It's an exciting time for innovators like Sunburst, who are pushing the boundaries of what is possible in the world of home automation.
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people said wasn’t available" — a product that could re-engineer Cobol process code, Hoffman said. "And they had a technical lead on the market." Errico Technologies, spearheaded by software developer Steve Errico, who spent a decade refining his CASE tool kit but questioned whether the start-up firm, a new kid on what was already a hotly contested block, could market its way to solo survival. The question became moot with the September 1989 Price Waterhouse purchase.

Arrae takes existing programs, converts them to data objects stored in a data dictionary and then allows new programs to be generated from the data objects. The firm will make Arrae available to Price Waterhouse systems integrators, but it also intends to market the tool directly to customers for their own use. Hoffman pointed out that there is very little competition in this conversion niche. "IBM has several national business units that do conversions to DB2, but they are not competing with us in the tools business," he said.

Hoffman added that IBM's AD/Cycle announcement did not include a re-engineering tool, "leaving that role open for us to fill." In fact, Hoffman hopes for an agreement with IBM in which the firm recommends Price’s services to its AD/Cycle conversion customers. Currently, "We are making IBM aware that we can do this for their customers," he said. Acy is doubtful that Price will get any help from IBM. "IBM is developing re-pository migration tools" and forging its own vendor relationships, he said.

Hoffman said Price Waterhouse's failed merger attempt with fellow Big Sixer Arthur Andersen & Co. earlier this year had no bearing on the formation of Price Waterhouse Technologies. If the merger had come off, the firms' CASE tools would have been complementary because Andersen lacks a software reengineering product. "There would have been no conflict between our re-engineering unit and Andersen's offerings," Hoffman said.

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IN BRIEF

Another epoch
Computer entrepreneur Chris Robert is leaving Computer Software Technologies, the company he co-founded, presided over and helped take beyond the $100 million mark in six years. Computer Software Chairman and Chief Executive Officer Morton Rosenthal will add president to his titles.

Robert, meanwhile, is not putting his career in cold storage — hot storage is more like it as he takes the reins as president and CEO of optical-disc file server start-up Epoch Systems, which he hopes to turn into another $100 million firm.

Tymnet born again
British Telecom signed and sealed its Tymnet acquisition from McDonnell Douglas Corp. last week. The San Jose, Calif., incarnation will be called BT Tymnet, Inc. and will be headed by former BT International marketing director Mark Baker. The new company will support all the Tymnet network products and services, including Onyx and Dialcom electronic mail services and EDI/Pet net electronic data interchange systems.

Ripe for picking
Northern California-based computer dealer ERA Computera earlier this month snatched retailer Computer Plus, one of Silicon Valley's oldest independent Apple Computer, Inc. dealers. The retailers' combined 1989 sales are projected to be $17 million.

Good influences
IBM Chairman John Akers and Compaq Computer Corp. Chairman Rod Canion were chosen the No. 1 and No. 2 most influential industry executives, respectively, by Computer Reseller News. Akers was lauded for his participation in reviving reseller awareness and customer responsiveness at IBM. Canion was cited for his success in competing with IBM. Rounding out the top five were John Sculley, chairman of Apple; Bill Gates, chairman of Microsoft Corp.; and Scott McNealy, chairman of Sun Microsystems, Inc.

Consulting interest
Howard Charney, vice-president and general manager of 3Com Corp.'s Central Manufacturing Division will not leave the post to act as a consultant for the firm. Charney's desire to pursue outside interests precipitated the role change, the company said. "I look forward to continuing to work with the company on strategic projects in a consulting role," Charney said.
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**DOC mulls ‘super’ definition**

**BY ELLIS BOOKER CW STAFF**

Trying to balance legitimate security concerns with the desire to make the export process easier on U.S. vendors, the Department of Commerce is carefully drafting a new definition of a "supercomputer.”

"It’s very difficult to pick a number and say everything above this is subject to security [procedurals],” said William Fish- er, an export administration specialist with the DOC’s bureau of export administration, office of technology and policy analysis. The efforts to draft new guidelines continue, as controversy swirls around the issue of what constitutes a "supercomputer" and how to protect it.

"It is not about what any of these justifiably skittish folks would have said if, asking them what they thought of Miller’s chances to turn Wang around, I had added, ‘And, oh, hey, listen to this, guys: He’s go- ing to center his strategy on pleasing the customer.”

Nevertheless, early this month, when Miller announced just that, the dirge-like tempo that had surrounded Wang for months turned noticeably upbeat. "Isn’t it a pleasure to listen to a pro for a change?” sighed a local reporter who is hardly known for puff pieces and can sling the sarcasm with the best.

"If he can’t do it, no one can,” said a user. The last time I heard that line, it was in the mouths of college football cheerleaders...

"It isn’t easy, but yes, I believe that he’ll do it,” an anal- yst said.

All of which might be dandy for the man but irrelevant to the company if Wang’s troubles were rooted principally in its corporate leadership, however. Wang’s woes have been laid at the doors of marketing and management. "I think our Wang computers — we just hate having to deal with the company,” a user said last spring.

"Management, marketing and morale problems, even when grave, are ill that can be cured by a cooperative leadership wardship- py — if, in Dorothy’s words, "the wizard is a wizard who will serve.” Will Miller? It’s too early to know...

Typically, short-term operating leases are on the rise, ana- lysts said. One reason, they explained, is that many of IBM’s major products — the 3090 mainframe and 3380 disk drive, for instance — are near the end of their life cycles. In particular, the so-called Technology Ex- change Option, an operating lease allowing a trade-in of a short period of time, proved to be very popular with customers who need to make do with a 3380 while waiting for the de- layed 3390 disk drive earlier this month (CW, Nov. 2).

Cliff Friedman, an analyst at CJ Lawrence, Morgan Grenfell, Inc., estimated that between $200 million and $300 million of IBM’s overall $870 million in operat- ing leases can be attributed to the 3380.

**Long-term profits**

The operating profit pheno- menon may hurt IBM in the short term, analysts said, and at the very least make it more diffi- cult for them to analyze the com- pany’s performance. But most agreed that in the long run IBM will realize the profits as well as a steady income stream from leasing. Analysts noted IBM’s 17% return on equity (ROE) compared to an aver- age of 14% ROE for IBM as a whole. And IBM was able to dis- tribute a $748 million dividend to IBM’s bottom line in the first nine months of this year.

Meanwhile, IBM’s growth is far outpacing that of the overall leasing market, and it is growing largely at the expense of its inde- pendent leasing competitors, ac- cording to industry observers.

Bill Day, vice-president at Technology Investment Corp., in Greenwich, Conn., said that ICC has taken $1 billion worth of business away from the rest of the leasing industry so far this year. “IBM Credit Corp. is start- ing to take so much market share that it might be considered a monopo- ly now in the computer-leasing market,” he maintained.

Day said that IBM has made a major effort to expand its leasing business and is using its other two lines of business — reseller financing and financing of IBM employee mortgages — essentially to foot the low rates it is able to provide to end users.

Friedman agreed that IBM has a "huge bank of capital” than any independent leasing company and is therefore able to under- cut its competitors. “Leasing is a competitive business,” he said. “IBM is using its balance sheet as a marketing tool.”

IBM, meanwhile, has contributed the increased business to a more flexible and responsive — and therefore more competitive — operation. One of the reasons, he said, greater certainty in the leasing busi- ness has allowed IBM to use the cash rather than borrow it, thereby, bor- rowed money — to keep financ- ing rates down.
Continued from Page 89

Basic systems will cost around $20,000, according to Lee.

Additionally, Sunburst is selling a series of high-performance workstations specifically targeted at business use, so the company can cover the office as well as the home market. The Sunburst 386 systems run on Intel Corp.'s 80386 or 80486 microprocessors.

Providing a machine that is convenient for both home and office use puts Sunburst at the crest of a rapidly forming wave. More than 14 million people now derive at least part of their income from working at home, according to CAP International, a market research firm in Norwell, Mass.

Another 14 million, CAP said, routinely shuttle work between their homes and offices. If Lee's far-reaching plans sound like he's shooting at the moon, that's understandable. At 54, Lee has a history of keeping his feet on the ground and the cosmos in his cross hairs. Twenty years ago, he worked as an engineer for Palo Alto, Calif.-based General Precision, Inc., helping to create a radar simulator for moon-bound astronauts. Before that, he worked for Lockheed Corp. in Sunnyvale, Calif., on the Poseidon project, which designed the prototype for the current generation of nuclear-powered U.S. Navy submarines.

In 1977, he formed Advanced Technical Services, Inc. (ATS), an electronic assembly house. ATS began at a time when many Silicon Valley firms were cutting back on staff by farming out assembly work to such firms. By its fourth year, the company had 300 workers and was doing assembly work for such industry heavyweights as IBM, Apple Computer, Inc. and Atari Corp.

However, when the dramatic growth curve of the computer industry suddenly flattened a few years back, so did ATS. A series of setbacks — including customers who defaulted on $2 million in receivables — clipped ATS at a time when the company was trying aggressively to expand. The money dried up, and in 1987 Lee was forced to close the doors on ATS.

Earlier this year, he bounced back with Sunburst. Financing has been kept close to the vest; Lee claims that the company, less than six months from inception, is already nearing a break-even point.

For now, a two-man parts-and-labor group is being hand-assembled at headquarters. Lee said he will soon begin investigating manufacturing resources in both Taiwan and Hong Kong.

Meanwhile, he hopes to entice custom- ers with free local installation and training classes.

Nikon

"We've now got all our pieces in place," Lee said. "Now it's up to us to keep our eyes on the road and step on the gas."

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Arms and the IS manager

Weapons makers learn to wield systems to counter slackening demand

BY DAVID A. LUDLUM CW STAFF

The peace offensive of Soviet President Michael Gorbachev and Uncle Sam's efforts to rein in spending don't bode well for U.S. manufacturers of big-ticket military hardware and the thousands of information systems managers they employ.

Furthermore, recent years have seen a narrowing of the technological gap between U.S. defense contractors and their counterparts in other countries, particularly Japan. That development means U.S. companies like-ly will see slower sales to foreign markets concerned with getting the best deal available and encouraging team-work among suppliers.

However, aerospace companies and other weapons makers have already moved to address slackening demands for their wares, in some cases in an executive way they do not expect a dramatic industry contraction. Also, as restructuring in other fields, aerospace firms are beginning to realize that their IS people will be supplying the European airframe makers, "There's a sense that because someone has a technological bent, somehow they don't know what's going on in the world and the business. I don't accept that," he says.

A growing globalization of the aerospace industry brings for managers comfortable with foreign people and governments. "The executives echo each other in describing the type of IS manager they value: one who understands the breadth of the company's business, including its strategic goals, such as cutting costs, boosting revenue or gaining market share. Allen says IS managers must be effective leaders capable of "forward thinking" — people who can anticipate events and technologies and develop strategies and plans to prepare a company for the future.

Those qualities, along with understanding the business, do not necessarily require an MBA; any manager should have them, Allen says. "You have a different environment in the world than in the business. I don't accept that," he says.

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Ludlum is a Computerworld senior writer.
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IBM Professional with management and system experience in COBOL is needed to generate a 1-yr. level system programmer for an IBM company. Experience must include 3+ yrs. CICS experience and support and development of new product, and knowledge of CICS systems. Process control and interprocess communication is also required. Send resume to: Emerald Systems, 820 Washington Street, Bidg. E, Norwell, MA 02061. (617) 878-1070 or (617) 878-4712 (FAX).

**Computer Careers Network**

Now you can recruit the best qualified and communicating professionals regionally, nationally and weekly.

How?

With IDG Communications new Computer Careers Network. Choose from the Network's five computer-related newspapers and tailor your recruitment message to the type of talented professional you need to reach -- professionals that read Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week. Then target your audience by region. Or blanket the entire nation.

Call your local sales representative today for more information about Computer Careers Network's regional, national and weekly reach.

**COMPUTER CAREERS NETWORK**

**Systems**

**Engineers**

Emerald Systems is located in sunny San Diego, where a moderate yearround climate provides an ideal business environment. We offer competitive salaries and benefits in a progressive, professional environment. Please send your resume, indicating appropriate Dept.: Emerald Systems, Human Resources, 4575 Mission Blvd., San Diego, CA 92107. We are an equal opportunity employer.

**Computer Systems for Hi-Tech is the largest San Francisco-based PR agency, and growing fast...we're looking for topflight people to serve our clients.**

**Senior Account Executive**

San Francisco

**#5757180. Ad paid**

**Senior Account Executive**

San Francisco

**#5757180. Ad paid**

**NETWORK**

**Data Systems & Applications**

Join the team at ADABAS/Natural, a leading computer services and software company. Our network myths are performance and technological leaders in the database world. We are looking for a Network Manager to join this team. This position is responsible for setting and maintaining system standards, as well as providing technical support to the users of the network system. We offer competitive salaries, benefits, and opportunities for career advancement. Send resume with salary expectations to: Emerald Systems, 820 Washington Street, Bidg. E, Norwell, MA 02061. (617) 878-1070 or (617) 878-4712 (FAX).

**Programmer Analyst**

Southern Baptist Hopkin's Information Systems Department is seeking a Programmer Analyst for a position in COBOL, programming to performance and documentation. This position is responsible for the analysis, design, coding, testing and documentation of COBOL programs. Experience must include at least two years experience and a consistent, verified resume and salary history for SA. Send resume to: Emerald Systems, 820 Washington Street, Bidg. E, Norwell, MA 02061. (617) 878-1070 or (617) 878-4712 (FAX).

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AS/400 S/38
THE PROFESSIONAL'S CHOICE...

Sunbelt & Atlanta
$25,300 to $95,000
IDMS/Oracle/DEMOS/IDMS/DB2
VAX/Mapics/Focus Sys 38/AS 400
Techwriters/DPS Sales/IDMS
Best Programmers/Programmer Analysts for Full-Time Positions at Sunbelt & Atlanta. Write for free IDMS, Revision Experiment File send resume to Jim Heidt, EGP Consultants, Inc. 3047 Bunkers Hill Road, Suite 202 Marietta, Georgia 30062 Phone: (404) 971-8552

Computerworld
November 27, 1989
Keane employees enjoy what all technical professionals want: the stability of full-time consulting work. State-of-the-art technologies including fourth-generation languages, databases and productivity tools. The opportunity to apply their application expertise at Fortune 1000 manufacturers, insurance companies, banks, services companies and government agencies. The chance to work for the premier project-oriented consulting company in the industry. Technical, management and project management training. Competitive salaries, comprehensive benefits, 401K plan, tuition reimbursement, and vacation condominiums. For one career offering endless possibilities, consult with Keane.

PROGRAMMERS/PROGRAMMER ANALYSTS

If you're a computer programmer with 2.5 years' experience in the following areas, we want to hear from you:

- IMS
- TELON
- IDMS
- COBOL
- ADABAS
- MSA
- DB2
- System 38
- CICS
- AS 400
- Focus
- WANG
- PL/1
- Assembler/C/UNIX
- ORACLE
- MARSHAL & ISLEY

For more information, call Renee Southard at 1-800-36-KEANE or send your resume to her attention at Keane, Inc., 10 City Square, Boston, MA 02129. An equal opportunity employer.

NEW YORK VERMONT FLORIDA EXPLORE YOUR POTENTIAL!

Programming Analysts

We offer the following positions:

- Challenging Projects
- Experienced Trainers
- Diverse Technical Environments
- Systems Analyst

Interested candidates should send resume or contact the office nearest you:

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Consulting Services Since 1969

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Leominster, MA 01453
(978) 562-9500
Fax: (978) 562-5991

7 Burlington Square
Burlington, VT 05401
(802) 860-7565

P.O. Box 4103
Boca Raton, FL 33427
(954) 261-1311

MEMPHIS/MID-SOUTH

Centrally located to National clients and an environment of professional growth and advancement for both staff and clients. Attracting the finest talent in the industry, we would like to invite you to join our team.

COMPUTER PROGRESS CORPORATION

Computer Systems Analysts work with consulting and programming services. No higher degree required. Production, data processing and system analysis or development, or a related field.

NATURAL LANGUAGE INTERPRETER

Send resume or call Computer Progress Corp., 12730 Paseo de Norte, Suite 2400, McLean, VA 22102, toll free: (800) 246-8603.

Every week Computerworld delivers more qualified job candidates than any other newspaper. That's why more companies place more recruitment advertising in Computerworld than in any other specialized business newspaper.

To place your ad, call Lisa McGrath today at 800-343-6474 (in MA, 508-879-0700).

PROGRAMMER ANALYST want ed. Duties: Develop design and implement new systems and support existing systems. Requirements: 3+ yrs. exp. in systems development, operation and maintenance. Experience in data base management systems, with knowledge of PL/I, COBOL, and C programming languages preferred. Applications in the area of life insurance and annuities. Good people skills and communication abilities necessary. We are an equal opportunity employer.

Data Processing

SENIOR ANALYST

DB2 DATABASE ADMINISTRATOR

Large oil and gas company is looking for a strong DB2 database administrator with experience in high performance database management. Must have a strong understanding of DB2 and related technologies. IBM, S/390 and MVS knowledge strongly preferred. Must have strong problem-solving skills and be willing to work under pressure. Send resume to: Frolic Personnel, 1201 E. 38th Street, Kalamazoo, Michigan 49006.

SYSTEMS ANALYST

Western Michigan University invites applications for the position of Director of Administrative Data Processing. The ideal candidate must demonstrate administrative responsibility for the development, implementation, operation and maintenance of computer systems. Responsibilities include: directing the systems development and support of application programs used by administrative and academic units; selecting, planning, installing, and maintaining hardware and software to support the University's needs; directing the work of a 17-person Systems Development Unit; and directing the work of a 41-person computer systems staff. Minimum qualifications include a Bachelor's degree in computer science or related field, five years of professional experience in systems development and a working knowledge of large IBM mainframe systems.

Data Processing

CYBORG SYSTEMS, We're looking for a known software house professional to fill a key position for a skilled professional who can handle coding and testing jobs such as Cyber, X:one, and VMS systems. Requires min. 5 yrs. Cy- borg experience (besides a plus). Knowledge of multiple platform mainframes. Midranges, PC's, etc. Desirable. Must be able to learn very quickly new technical and applications concepts and processes. Written updates and regulatory bulletins for client base. Growing firm. Competitive salary. FEE paid. Send resume to: Cyborg Systems, 155 Riverside Plaza, Chicago, IL 60607-0669.

CYBORG SYSTEMS

equal opportunity employer only

Computer Systems Analyst

Computer Systems Analyst required to work on a large government contract for the Long Island Rail Road, focusing on systems requirements, design, development, implementation, and operation of systems support. Duties include performing system analysis, presenting and training, and developing and documenting system specifications. Must have experience in computer-based decision-making and problem solving techniques. Must have at least a B.S. degree in MIS, Computer Science, or related field with at least 3 years of related experience in the development of computer systems. Must have strong written and oral communications skills. Must have the ability to work well as part of a team. M/L and some travel required. Must have excellent communication skills. Salary to be competitive. Send resume to: MSUSA, 1418 South State Street, Indianapolis, IN 46202.

Public Service Indiana, largest retailer of electric and gas utility services in the state of Indiana, seeking a high level professional to manage a systems security software programmer. The candidate will have responsibilities in the area of mainframe security software, mid-range security software, and recommending security safeguards on the technical environment of the data communications network. Our environment includes IBM mainframes, VMS mainframes, CA Top Secret, FOCUS, DB2, OCS, TSO, RODOS and IMS. We are seeking an individual with a Bachelors degree in Computer Science or related field plus 1 - 2 years related work experience. Qualified applicants should respond with resume and cover letter to: Suzanne Bradley, Supervisor, Career Development & Employment, Public Service Indiana, 1418 S. Belmont Avenue, Indianapolis, IN 46202. Equal Opportunity Employer, M/F/H/V.

The successful candidate will have responsibilities in the area of mainframe security software, mid-range security software, recommending security safeguards on the technical environment of the data communications network. Our environment includes IBM mainframes, VMS mainframes, CA Top Secret, FOCUS, DB2, OCS, TSO, RODOS and IMS. We are seeking an individual with a Bachelors degree in Computer Science or related field plus 1 - 2 years related work experience. Qualified applicants should respond with resume and cover letter to: Suzanne Bradley, Supervisor, Career Development & Employment, Public Service Indiana, 1418 S. Belmont Avenue, Indianapolis, IN 46202. Equal Opportunity Employer, M/F/H/V.

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SENIOR ANALYST

Take charge position managing all financial applications development. Must have a minimum of 3+ years experience with relational database management. IBM and/or VMS experience a plus. Send resume to: Cy Rappport, CYBORG SYSTEMS, INC., 101 North, Riverside Plaza, Chicago, IL 60607-0669.

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COMPUTER CAREERS MID-WEST

Assistant Director of Information Services

Just a few of the highlights awaiting our new Assistant Director of Information Services. Your 3-5 years of management experience will enable you to direct the activities of all technical and systems personnel in our major health care organization.

We currently utilize a state-of-the-art AS/400 and feel that midrange systems are essential for heavy user interface in a deadline oriented environment.

If you’re well organized, can take projects from start to finish, delegate well and are waiting for your next career challenge, we’re interested in you.

Starting salary is exceptional, benefits complete. Location is in a major Midwest city.

Please send your resume in confidence to:

CW-18197, Computerworld, Box 9171, Framingham, MA 01701-9171

equal opportunity employer m/f

It’s the efficient way to recruit qualified computer professionals.

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 IDG Communications 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 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:

BOSTON: 375 Coddituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700

NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350

WASHINGTON: 8304 Professional Hill Drive, Fairfax, VA 22031, (703) 573-4115

CHICAGO: 10400 West Roosevelt Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

LOUIS ANGELES: 1804 Sky Park Circle, Suite 100, Irvine, CA 92744, (714) 250-0164

SAN FRANCISCO: 18008 Sky Park Circle, Suite 145, Irvine, CA 92744, (714) 250-0164

MISSOPPORTINES

Western Publishing Company, Inc., largest creator, manufacturer, and marketer of children’s books, magazines, and educational products, has immediate openings at its Milwaukee, Wisconsin headquarters. Western maintains a highly educated and motivated staff supporting technology including Unix 110/21 mainframe and Windows 3.1 personal computer systems.

Senior Software Programmer - Min. 5 yrs. in OS/1100 environment.

Programmer - Min. 3 yrs. DB design. Relational background preferred.

Applications Programmer/Analyst - Min. 2 yrs. in Unix 1100 and/or IBM S/38 or AS/400 environment.

A Bachelor’s degree, good communications skills and ability to work independently are also necessary. Send resume and salary requirements in confidence to:

WESTERN PUBLISHING COMPANY, INC.

10000 West Bluemound Road

Milwaukee, WI 53226

An Equal Opportunity Employer MF/HV

PROGRAMMER/ANALYST

Our information systems department is growing! We are looking for an experienced Programmer/Analyst to join our team. If you have a Bachelor’s degree, communications skills and 3-5 years of management experience, please send your resume in confidence to:

CW-17993

Computerworld, Box 9171

Framingham, MA 01701-9171

October 27, 1989

COMPUTER CAREERS NETWORK

Now you can reach the qualified computer professionals you are looking for with Computer Career Network.

Every week, the new IDG Communications Computer Career Network of five leading computer and communications newspapers delivers your recruitment advertising to an audience of highly qualified computer and communications professionals. When you put the proven, weekly authority of Computerworld and specialized readerships of InfoWorld, Network World, Digital News, Federal Computer Week to work for you, get the best chance ever to target the qualified professionals you need to reach.

Sales Offices: John Corrigan, Classified Advertising Director, 508-879-0700;

BOSTON: Nancy Pericelli, Andrew Rowe, 800-343-6474, (In Mass. 508-879-0700);

NEW YORK: Warren Koliber, 201-967-1350;

WASHINGTON, D.C.: Patricia Powers, 312-927-4433, Ellen Casey, 800-343-6474;

LOS ANGELES: Barbara Murphy, 714-250-0164;

SAN FRANCISCO: Barbara Murphy, 800-343-6474.

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 IDG Communications Computer Careers Network. Here’s how it can work for you:

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SAN FRANCISCO: 18008 Sky Park Circle, Suite 145, Irvine, CA 92744, (714) 250-0164;
ANALYSTS, PROGRAMMERS, DESIGNERS
If You Have The Right Stuff...

2 years minimum professional experience, stable work history, good technical references, U.S. citizenship or green card, and competence in at least one of the following:

• UNIX, VM/VMS, MVS/400
• System/370 + Fortran + Ada + RPG II + DB2
• BCA, COBOL/400, CICS, IMS, DB2, ORACLE
• IMS/400, DB2, IMS/400
• ORACLE, INFORMIX, SYBASE, PACBASE, FOCUS
• Advanced DB Administration

...We Have the Right Service...
 Thousands of placements of computer professionals since 1966. Over 1000 client companies and 200 affiliates nationwide: resume preparation and selective distribution: no cost or obligation to you: no sales pressure.

TO APPLY: Mail or FAX resume or call Howard Levin.

RSVP SERVICES
Box 8544, 7200 W. Cypreas Creek Rd. Pl. Lauderdale, FL 33309
305-771-8805

CAREER INDEX

Computer recruitment advertising activity*

National

PERCENT OF SPACE PLACED FOR SELECTED POSITIONS

<table>
<thead>
<tr>
<th>Month</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 1989</td>
<td>25%</td>
</tr>
<tr>
<td>May 1989</td>
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<tr>
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<tr>
<td>August 1989</td>
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<tr>
<td>September 1989</td>
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Western region

PERCENT OF SPACE PLACED FOR SELECTED POSITIONS

<table>
<thead>
<tr>
<th>Month</th>
<th>Western region</th>
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</thead>
<tbody>
<tr>
<td>April 1989</td>
<td>30%</td>
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<tr>
<td>May 1989</td>
<td>25%</td>
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<tr>
<td>June 1989</td>
<td>20%</td>
</tr>
<tr>
<td>July 1989</td>
<td>15%</td>
</tr>
<tr>
<td>August 1989</td>
<td>10%</td>
</tr>
<tr>
<td>September 1989</td>
<td>5%</td>
</tr>
</tbody>
</table>

Midwestern region

PERCENT OF SPACE PLACED FOR SELECTED POSITIONS

<table>
<thead>
<tr>
<th>Month</th>
<th>Midwestern region</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 1989</td>
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<tr>
<td>May 1989</td>
<td>20%</td>
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<tr>
<td>June 1989</td>
<td>15%</td>
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<td>July 1989</td>
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<td>August 1989</td>
<td>5%</td>
</tr>
<tr>
<td>September 1989</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Analysis of computer recruitment advertising space in Computerworld and selected major U.S. newspapers.
It's easy
to place your recruitment ad
in Computerworld!

All the information you need is right here. Just call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700). Or, if you want, you can send us the form below via mail or to our FAX machine. You can reach our FAX at ext. 739 or 740 at either of the above numbers.

The following information will help you determine the size ad you'd like to run when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

<table>
<thead>
<tr>
<th>NUMBER OF COLUMNS</th>
<th>WIDTH</th>
<th>MINIMUM DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 column</td>
<td>1-1/4&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>2 columns</td>
<td>2-5/8&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>3 columns</td>
<td>4-1/16&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>4 columns</td>
<td>5-9/16&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>5 columns</td>
<td>6-15/16&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>6 columns</td>
<td>8-3/8&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>7 columns</td>
<td>9-3/4&quot;</td>
<td>7&quot;</td>
</tr>
</tbody>
</table>

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $13.50 per line or $162.40 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4" wide by 2" deep) and costs $378.00 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $94.50 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

<table>
<thead>
<tr>
<th>Column Width</th>
<th>One Region (East/West)</th>
<th>Two Regions (East/West or Midwest/West)</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 column x 2&quot;</td>
<td>$252.00</td>
<td>$324.80</td>
<td>$378.00</td>
</tr>
<tr>
<td>2 columns x 2&quot;</td>
<td>$504.00</td>
<td>$649.60</td>
<td>$756.00</td>
</tr>
<tr>
<td>3 columns x 3&quot;</td>
<td>$1,134.00</td>
<td>$1,461.60</td>
<td>$1,701.00</td>
</tr>
<tr>
<td>4 columns x 5&quot;</td>
<td>$2,520.00</td>
<td>$3,248.00</td>
<td>$3,780.00</td>
</tr>
<tr>
<td>5 columns x 7&quot;</td>
<td>$4,410.00</td>
<td>$5,684.00</td>
<td>$6,615.00</td>
</tr>
</tbody>
</table>

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

Countering connect charges

Training, software and bulk buying can cut the costs of on-line services

BY JANET RUH
SPECIAL TO CW

or many smaller information systems organizations, the problem-solving advice that is available through the special interest groups of on-line information services can provide a cost-effective alternative to maintaining an in-house technical support staff.

Major on-line services, such as those offered by Compuserve, Genie, BIX and Delphi, provide a meeting place — available 24 hours a day — where IBM Personal Computer and Apple Computer, Inc. Macintosh specialists swap fixes, post patches and explore creative solutions to the most obscure computer problems.

However, many businesses shy away from using these services as a problem-solving resource because they have had confusing and frustrating experiences with them, such as getting steep monthly bills for what they see as unsatisfactory explorations.

Businesses that want to make the most of this resource need to do three things:

• Invest in brief training programs for users before sending them on-line.
• Buy special-purpose software that automates and simplifies the use of a particular on-line service.
• Investigate special rates and other options available to corporate buyers who can purchase on-line services in bulk.

If you are serious about getting the most for your on-line dollar, you should invest in some training for your users before allowing them to log on. The cost of such classes should be more than made up for in the hours that users do not waste trying to orient themselves on-line at rates of 25 cents or more a minute.

A good on-line training class should give users an overview of the service they plan to use; the trainer should introduce them to specific services available, show how to use them, explain their costs and provide useful reference material that they can rely on later.

This kind training is available from a number of sources. One company that specializes in it is Mentor Technologies in Columbus, Ohio, which provides courses that are targeted at Compuserve users. The courses are available in a number of major cities and can be bought in a self-study form.

By far the best cost-cutting step a business can take is investing in one of the software packages for automating use of on-line services. Reading and writing messages on-line gets expensive very quickly at typical per-minute rates. All these software packages permit users to read and write bulletin-board messages off-line using copies downloaded to their disks. The software programs only use expensive on-line connect time to upload and download messages or message descriptors using preprogrammed scripts at the highest modem speed the hardware will support.

With such software and a 2,400 bit/sec. modem, it is possible to keep up with the message traffic for three or four special interest areas on a regular basis with an investment of only five minutes of connect time a day. It usually takes only 10 minutes of connect time to post a message describing a problem and, over a few days, retrieve a string of replies.

Corporate users seeking such software for the PC can get the shareware product TAPCIS from Omni Information Resources or the public domain program Autosig Macintosh users can try Compuserve's own Navigator product.

TAPCIS not only streamlines the use of Compuserve's special interest areas, called forums, but it also integrates Compuserve's Easyplex electronic mail service.

Users who learn their way through the simple screen interface of TAPCIS need to know little else about how to navigate Compuserve's often complex menus and commands.

On-line ordering

All these products can be downloaded or, in the case of Navigator, ordered on-line through Compuserve. Similar products are available for other services. Aladdin is designed for use with Genie and distributed by the operators of the service's PC roundtable. Users can try Scamaster from J and L Consulting in Bowling Green, Ky., which can be downloaded from BIX.

Finally, corporate users should investigate whether an on-line service offers special rates or corporate billing options. Compuserve and BIX allow corporate users to bill all of their accounts on one invoice, which makes tracking overall usage much easier. Genie plans to add this service in the future.

Special corporate rates may be available to companies that maintain a large number of accounts. BIX, which offers users a flat rate for its service, is willing to negotiate discounts with corporations that maintain a large number of accounts.

Corporate buyers who use a packet-switching network to access on-line information services may also be able to negotiate discounted rates with the network. And do not forget that local telephone companies are getting into the information network business, too. Some of them may be able to offer cheaper access to packet-switching networks, as does Southern New England Telephone's Connecticut-based Conn-Net. Others are introducing intelligent gateways of their own and may be willing to negotiate rates with large corporate customers.


The BoCoEx index on used computers

Closing prices for the week ending November 17, 1989

<table>
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<tr>
<th>Computer Type</th>
<th>Closing Price</th>
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<tr>
<td>IBM PC Model 176</td>
<td>$530</td>
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CSFs for the training program

Some important factors must be considered when planning for training

BY MARK DUNCAN SPECIAL TO CW

There is no complete list of critical success factors that will guarantee the viability of a training program. What works for one organization may well doom another. However, there are some fundamental factors that bear consideration for most training programs. As they identify needs and arrange training, managers may want to consider the issues that follow.

Realistic needs analysis. An authentic needs analysis is the logical starting point for any training program. That is not to say that it cannot be repeated at appropriate intervals. To be authentic, the needs analysis must combine a balanced mixture of needs and desires. The former ensure the knowledge and skills for planned projects; the latter provide the personal and professional growth for the staff. 

Integrated, cohesive curriculum. Having an inappropriate training curriculum, or no curriculum at all, will undoubtedly weaken a training program and reduce its chances of success and survival. A training curriculum is the next logical step after a needs analysis. Integration in a curriculum reflects how easily staff members can acquire appropriate and adequate training, both to meet specific job demands and fulfill personal-growth needs.

Each departmental curriculum should have a core comprising the training required by all staff members, no matter what their function. This core should be surrounded by other training to satisfy individual requirements.

Timeliness. Delivering training at the right time means, first, that the student is ready to receive the training and, second, that he will have an immediate or early opportunity to apply it. The longer the time between acquiring and applying a skill, the more likely some of it will be forgotten. The passing of time also blunts a student’s enthusiasm: Zeal can quickly be followed by disappointment when training is not put to work in a timely manner.

 Appropriateness and pertinence. These two characteristics apply to different aspects of training—the appropriateness of a training medium, for example. Whereas one target audience may be best suited for computer-based training or interactive video instruction, another group may require instructor-led classes.

 Appropriateness may also apply to the student mix in a class. The effectiveness of training may diminish if technicians mix with other students or if senior-level people rub shoulders with entry-level students. Pertinence means pertinence to one’s job. Being given training that has little or no relevance to one’s current job can be a strong demotivating force.

 Adequacy. Adequacy implies that the training is neither too much nor too little. Being deluged with information that one does not really need negates the quality of the whole program. If a student has to struggle too hard to work out what he needs and does not need, the effort may encourage an inclination to discard all of it.

 Verifiable knowledge and skill acquisition. The most common method of verifying that a student has learned what he was supposed to learn is simple classroom-style testing. However, this is probably not appropriate for the professional staff. The test for these system developers comes in how successfully they apply their knowledge on the job. Observation by peers and superiors and achievement of specific performance objectives are more conventional metrics.

 While some form of verification is necessary, care must be taken to conduct it in a non-threatening and subjective fashion. There must be acknowledgment of variations in learning ability and of plateauing, whereby staff members simply cannot absorb any more information.

 Training-based corporate culture. The importance of training should be endorsed by the highest management levels. Training itself should not be restricted to job-related skills. Without exception, all staff members should be taught about the business of the company. They should be able to relate individual effort to companywide achievement.

 Funding. Money, as always, plays a vital part in the success of training. Furthermore, it is another indication of management’s commitment to fostering improvement and effectiveness through training. In times of austerity, training budgets are most susceptible to cuts. While it is not feasible for them to be untouched, they should at least be treated fairly, accommodating only part of a budget reduction.

 These success factors are by no means exhaustive. Rather, they are those that should be considered by default. Others might include effective follow-up training, usable feedback mechanisms, creative course packaging or customizing and training for trainers. Such critical success factors will favor the success of a training program and prevent it from becoming simply a haphazard activity.

 Duncun is a quality assurance consultant at a large Dallas bank.

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Good buy

Patience pays off for MSA; it passed one deal for a better one

A promising deal can do wonders for your financial outlook. Management Science America, Inc. investors seemed to like what they heard about The Dun & Bradstreet Corp.'s acquisition of the application software maker (see story page 1). MSA, which last year rejected a lower offer from Computer Associates International, Inc., shot up 6 points to close at 99. Hewlett-Packard Co. reported that its fourth-quarter earnings would be up 44%, down ¥ of a point. Digital Equipment Corp. closed at 18%. IBM inched up ¥ of a point. Lotus reported a factory tool for use with its 1-2-3 mainstay software package. Lotus in turn added 1% points to close at 32%.

Compaq Computer Corp. Chairman Ben Rosen told analysts that he expects the personal computer market to remain strong despite the recent sales slowdown. Compaq climbed 1% points to close at 92%. Lotus Development Corp. announced a factory-floor tool for use with its 1-2-3 mainstay software package. Lotus in turn added ¾ points to finish at 94%.

MCI Communications Corp., which recently won a $150 million contract with the International Carrier Group, four smaller long-distance companies, ended at 45%, up 1¾ points. Digital Equipment Corp. closed at 88¾, up ¾ of a point. IBM inched up ¾ of a point to 59¾. Hewlett-Packard Co. reported that its fourth-quarter earnings would be up slightly, despite costs incurred by its acquisition of Apollo Computer, Inc. HP finished at 44½, down ½ of a point.

JOSEPH J. FATTON
Investors warm to D&B's tune

In July 1988, when shareholders in droves begged Management Science America, Inc.'s refusal to entertain a takeover bid from competitor Computer Associates International, Inc. (CA), MSA Chairman John P. Imlay Jr. chalked it up as "a very clear indication that our shareholders value their independence" and an unmistakable demonstration "that our shareholders have a common belief in the bright future of MSA."

Last week, with information giant The Dun & Bradstreet Corp. (D&B) offering $18.50 a share for MSA stock, which traded a week earlier at $10 to $11, at least 40% of those stockholders — including IBM, which bought a 5% stake in MSA last spring, and Imlay, who owns some 2.9 million shares — decided that MSA's brightest future lies in ownership by D&B. The deal could prove a rich one for both companies’ users as well as for investors, according to analysts, who said they saw fertile opportunities for synergy between companies whose resources might be better deployed attacking the need for IBM Systems Application Architecture-compatible software than attacking each other.

However, several analysts said last week that the benefit to users, while real, might be slower to kick in than the investors’ immediate cash premiums. "Some of the customers are going to freeze," predicted Mark Finley, an analyst at Soundview Financial Corp. Both MSA and McCormack & Dodge customer rolls include companies that also have products made by Cullinane Software, Inc., which was acquired by CA in September.

In the wake of that deal’s closing, the fate of several Cullinane products is reportedly in abeyance. In last week’s announcement, D&B pledged to continue and enhance all extant M&D division and MSA products. However, Finley said, CA made similar promises. Moreover, newly so- phisticated in a merger-mad market, users are all too aware that any corporate recombination might mean a temporary disruption of services and support.

Users and analysts also questioned MSA and D&B products that would be no layoffs stemming from the merger. "That’s just standard verbiage," noted The Travelers Corp.'s Director of Financial Services Michael Crotty, on the no-layoffs claim. "I have never seen a buyout without some cuts."

NEIL MARGOLIS AND AMY CORTESE

Gillette

FROM PAGE 1

They designed the new razor and cartridge, some 50 others were using CAD to design all of the new factory-floor machines to produce the Sensor.

"Not everyone was up to speed at first, and some engineers resisted using CAD," Val- orz said. "But once they got moving, it was like a freight train."

Valorz said that without three-dimensional CAD, the time from concept to finished design is three years, rather than 18 months. To meet its deadline without CAD, Gillette would have had to pay many more designers to do it.

With intense deadline pressures, Gillette’s ability to modify designs on screen and share drawings electronically paid off in unanticipated ways. At one point, Valorz was working with a Canadian design firm on a die tool.

"In the past, if I tried to mail drawings or tapes to Canada, they always got stuck in Customs for three days," he said. "Twice, the magnetic tapes were mistakenly x-rayed by Customs, and the data was destroyed. [With CAD,] we transmitted the designs over the telephone and resolved the issues within an hour."

On the factory floor at Gillette’s Boston head- quarters, Sensor pre- served a daunting information management challenge. Each razor is the product of 157 raw materials, 39 finished components and 34 assembly processes — 230 discrete items to be managed, normally all of them different from Gillette’s other razor lines.

"The only common thing is the raw steel for the blade," said Herbert Bonmengen, di- vision manager of mate- rial management at Gillette’s Shaving Division.

AMAPS, running on an IBM 3090 Model 200, in its present form, is the nucleus of a completely revamped product system brought on-line in early 1988 to support all of the company’s North American shaving products manufac- turing. The system also includes factory-floor collection, with programmable logic con- trollers transmitting data to the host VAX computer parameters, such as the proper angle of the blades in the cartridge.

Bonmengen headed the team charged with implementing AMAPS. The team was a cross- functional group with represen- tatives from accounting, pur- chasing and production as well as IS management.

“These types of large proj- ects are always headed by a per- son from the user organization," said Systems Manager Joseph Egan, the IS representative.

“Our organizational philosophy is well established — we work for the users. The IS people act as consultants or advisors, help- ing the users define the needs."

User-project teams are one of the reasons why Gillette was rated the most effective user of IS in the consumer prod- ucts industry in the 1989 Com- puterworld President 100.

“We’re seeing more and more clients making a line man- ager responsible for the overall IS project," said Herbert W. Perkins III, a principal at Lexington, Mass.-based IS con- sultant Nolan, Norton & Co. "The technology is important, but the organizational change is probably more important.”
TRENDS

Business school computer usage

A survey of business schools conducted by the School of Management at UCLA shows what tomorrow's executives are learning today.

Computer requirements and expectations upon graduation

- Microcomputer use: 76%
- Information systems course: 75%
- Spreadsheet use: 72%
- Word processing use: 51%
- Database use: 41%
- Mini/mainframe use: 38%
- Programming language: 19%

About three quarters of the MBA programs require that students graduate with knowledge of microcomputers and some of the more fundamental applications.

PC software used for instruction and principal packages used

- Spreadsheet use: 91%
- Word processing use: 74%
- DBMS use: 83%
- Communications software use: 60%
- Programming language use: 73%
- Expert system use: 31%

Most of the schools indicated that their instruction includes the use of some of the day's core business applications.

NEXT WEEK

Robert G. Wallace, the recently retired president of Phillips 66 Co. and executive vice-president of its parent company, Phillips Petroleum Co., is one of the most tireless advocates of computer use by top executives and the impact it can have on business operations.

Headache time. That technical guru you hired to consult on your big project talks more like a musty old textbook than the clear, expert voice you need. How do you get him to talk English to the right folks? How do you get your money's worth without offending a valuable resource? Look for some relief in In Depth.

INSIDE LINES

What's the definition of 'immediate'? Well, one potential IBM 3090 J model customer was unhappy last week when he checked on his delivery date and discovered the best IBM could offer him was frames next year. Engelhard Corp., in Iselin, N.J., had a 3090 S model on order, which was supposed to be automatically rolled over to a J. It was. But the catch is it will not be coming anytime soon. "I'm running around in circles trying to get a delivery date," said information systems director Steven Poik. The J models, announced last month, had been scheduled for immediate availability.

Disk drive start-up — sort of

Unisys is preparing to sell its 1,800-employee Santa Clara, Calif., disk-drive operation to a group of its plant managers. The leveraged buyout would result in a new company, called Sequel, Inc., and help Unisys achieve its goal of cutting about 8% of its 93,000-person work force.

Hey, they're only numbers

San Microsystems claims that more than 1,400 Sparcware applications are now available. Funny thing is, in its annual report issued last month, the company said 750 Sparcware applications were available and expected to see new ones emerging at the rate of one a day through the rest of 1989. Imagine its surprise when almost 16 times that amount began arriving.

A trend in the making

An outsourcing users group? Why not? Several clients of Genicx Enterprises, the Pittsburgh-based provider of outsourcing services, have been discussing the possibility of forming one. Among the issues of common concern is the pricing structure when a particular software application on the vendor's CPU is shared among several IS customers.

Will it be just in time?

Network Application Services, DEC's multivendor interoperability panacea, is being extended to the factory floor as well. One of the vehicles will be Basestar, a suite of applications for coordinating information among various shop-floor devices in the discrete manufacturing sector, which will be expanded to include other (i.e., process) sectors and enhanced to include NAS services such as common document architecture and the Motif user interface, a DEC spokesperson claims.

The yin and the yang

There's good news and bad news on the AS/400 front. Apparently, IBM is hitting its revenue projections for the year on its flagship midrange line. But unit shipments are way off, according to ADM, a market research firm in Cheshire, Conn. Dave Andrews, president of ADM, says IBM will miss its unit target by as much as a third because it's just not moving the low-end boxes like it thought it would. However, it also sold far more high-end units than expected, which is what it is saving it when it comes to revenue goals. ADM says IBM was expecting to ship between 20,000 and 25,000 units in the U.S. this year but will likely ship about 15,000.

Just when was that deal locked up?

(We keep a file of quotables for instances such as this.) Microsoft, with a push from IBM and Presentation Manager developers, these days is clearly telling users when and where to use Windows and when to go up to the next generation, but it's not always that way. The November/December issue of Aldus Magazine includes a September interview with Steve Balmer, Microsoft's vice-president of systems development, that shows Microsoft was thinking a bit differently just two months ago. He predicted that business users will migrate to OS/2 over time and added that he wants the users to decide when it makes sense for them to move. "Not any more.

If you want to win some money in Vegas, just let Mark Eppley know what happened to Mo. It seems that Mo — a life-size Superman inflatable adorned with a mohawk wig — was kidnapped from Travelling Software's post-Comdex "burn-out" party. Company President Eppley wants Mo back in his office. If you know Mo and his location, call the helpline at 800-343-6474 and we'll act as an intermediary in the negotiations.
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