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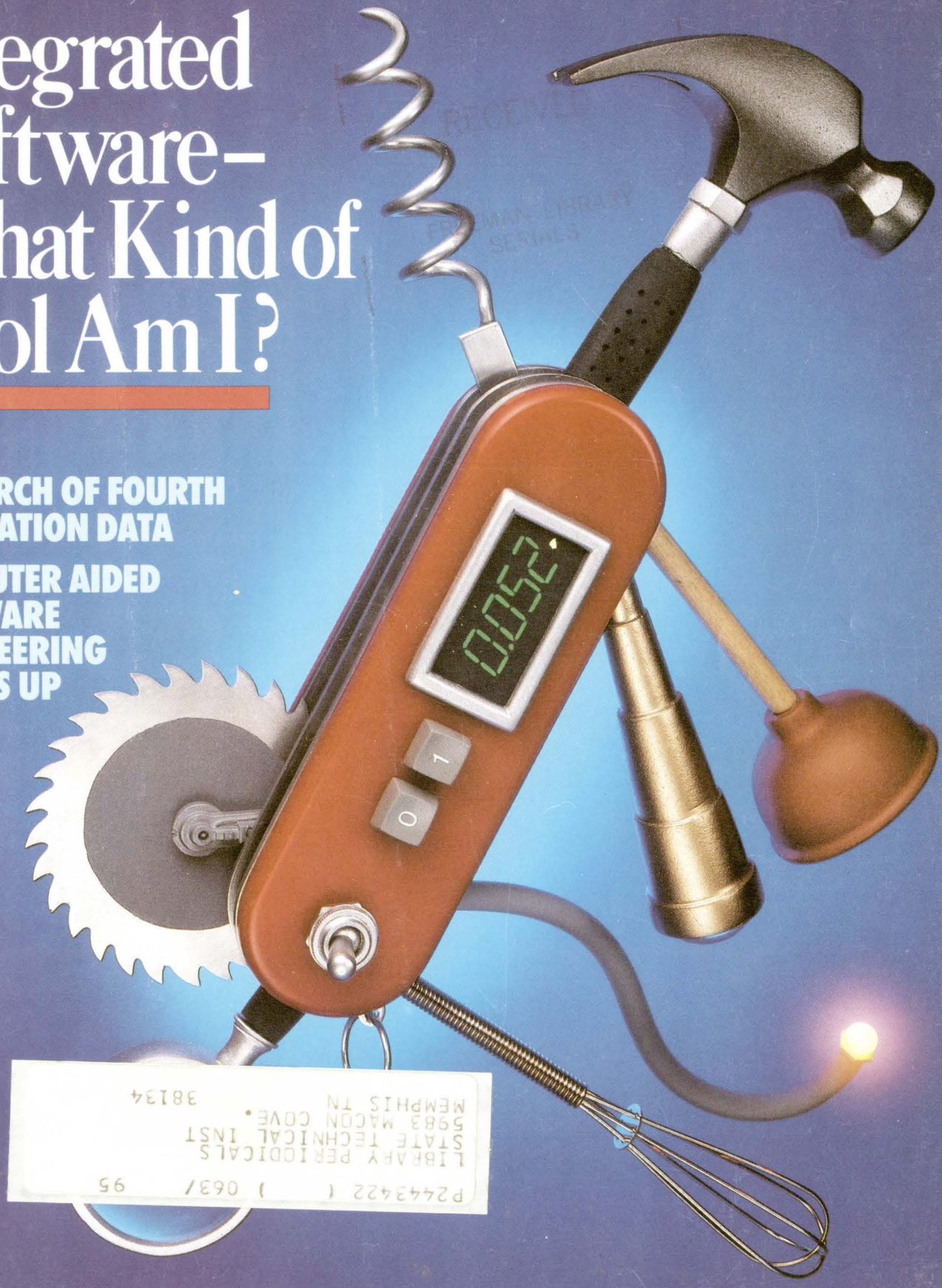

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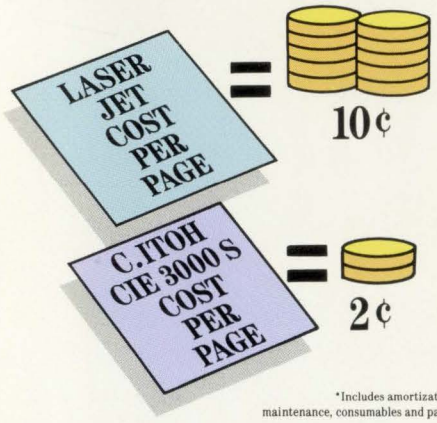

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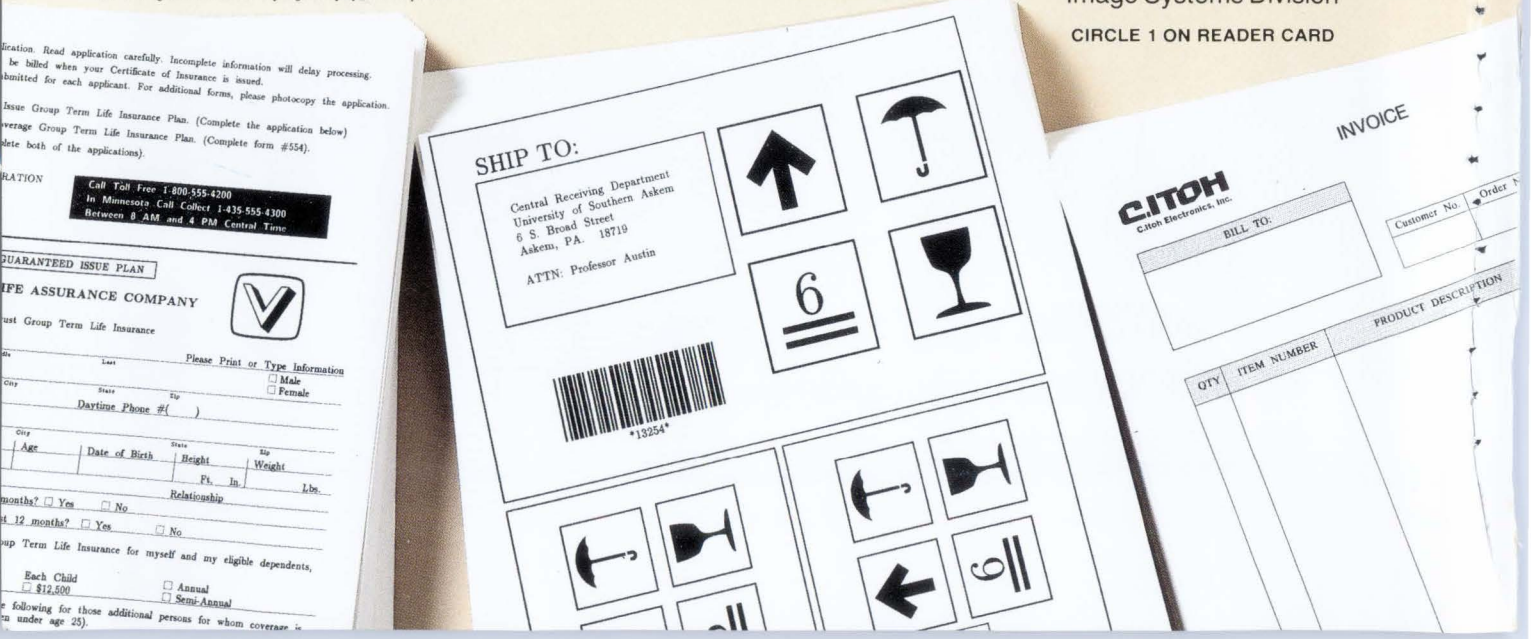
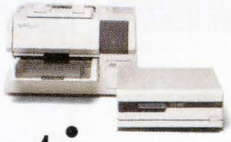


From LANs and Peripherals,  To Workstations and Network Servers, To 5250 and 3270 Gateways, And Now, To An Advanced Network Operating AST-Advanced NetWare System. All From AST.

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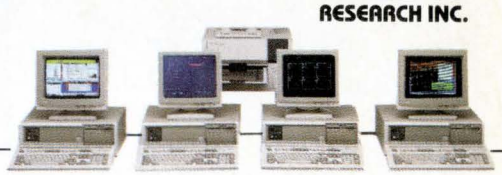

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DATAMATION

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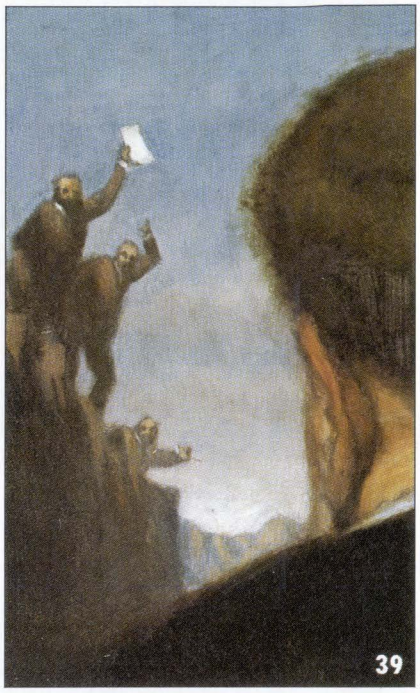

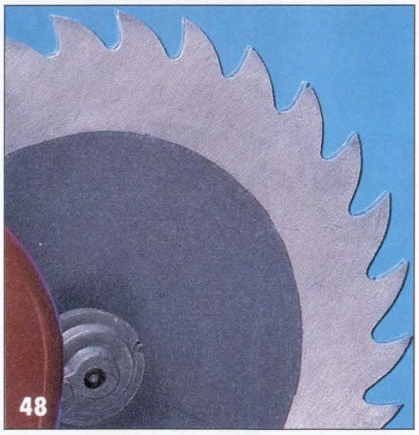

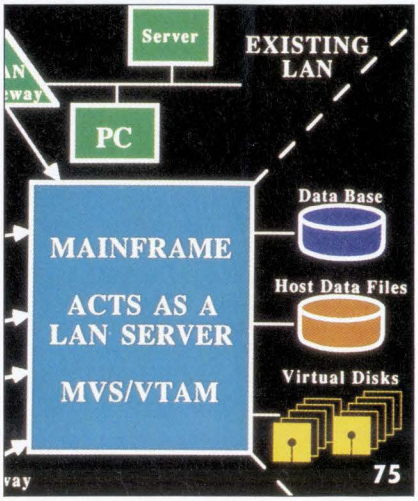

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1987 JESSE H. NEAL AWARD

Will an Old Word Make a Comeback?

I've noticed the return of a word not heard around here recently: antitrust. When Computer Associates recently announced it was buying Uccel, a few people actually speculated that the deal might be held up by . . . gasp . . . antitrust concerns. And as contributing editor Hesh Wiener demonstrates in this issue's Behind the News, "A Peek Behind the Scenes of the Refurb Business" (p. 39), IBM apparently still takes antitrust actions very seriously.

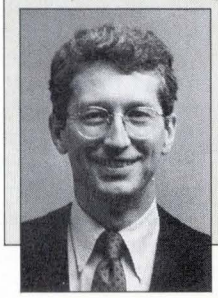
Five years after it skunked the U.S. government's antitrust action, Big Blue has launched a fleet of high-priced attorneys and high-powered executives into what may seem a very uneven battle against a suit brought by AMI, a Pennsylvania refurb house that has never grossed more than $15 million annually.

It's not just the vastly different sizes of the protagonists that is out of the ordinary about the lawsuit Wiener describes. Conventional wisdom has it that antitrust suits are too complex and expensive to be launched by a single, wronged litigating company. The preferred path is to get somebody else to do it for you. In the past, particularly when Democrats held the power of appointment in Washington, the ideal candidate to carry the banner against bigness was the federal government. (It is also rumored that one disgruntled U.S. vendor of IBM mainframe software is trying to get the European Economic Community to front some Continental antitrust action against IBM.)

With the arrival of the Reaganauts, however, bigness was no longer seen as wicked. Mergers are seen instead as making businesses more efficient and more in scale for international competition. In fact, trial balloons are even now rising in Washington about the creation of huge U.S. superbanks more easily able to go head-to-head with Japanese and European behemoths.

Then why the sudden murmurs of antitrust? Can Iranamok troubles and the constitutional denial of a third Reagan term have diminished the administration's ability to carry out all of its pro-business policies? Or has the raft of insider trading revelations shaken Main Street's faith that successful business pays off for everyone in society?

The answer is not clear. What does seem true is this: assumptions about what is okay in our society have a way of becoming very old hat, very fast.



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Letters

The Fatal Flaw

"Software Bugs: A Matter of Life and Liability" (May 15, p. 88) about the Therac 25 tragedy seemed to concentrate its attention on the role of the software bug in the accident. The article also states that attorney Bill Bird believes the case hinges on the software defect. However, although it may be more sensational to focus on the possible devastating effects of a "bug," and although bugs certainly can cause disasters, I would not assign the primary liability to the software in this particular case.

Speaking as a design engineer—familiar only with the facts as presented in the article—the machine definitely should have had a low-level hardware interlock, independent of software, to prevent it from operating in its high-intensity X-ray mode when the target was retracted. In fact, there probably should have been at least two such interlocks. These would have negated the effect of the software bug.

A reasonable designer simply must think ahead to possible malfunctions, and must distinguish minor ones (small dosage errors) from major ones (possibly fatal doses of radiation). Software is too complex, and the electronic circuits that execute it too vulnerable to interference (such as high-voltage arcing, in this case), to allow it the ability to make such a mistake. As a policy, designers should see to it that truly disastrous events, like a ferry sailing with its bow doors open, are prevented by multiple, ultrareliable low-level interlocks.

The true problem here was a poor basic hardware design, not that the software failed.

LAWRENCE J. KRAKAUER
Kronos Inc.
Waltham, Massachusetts

DATAMATION is to be congratulated for running Ed Joyce's "Software Bugs: A Matter of Life and Liability."

The main point, that software *is* a product and needs to be treated accordingly, is one that most in the software community would really rather not hear. But they ought to! Even if the consequences are unpleasant.

Witness 20 years' (or more) casual attitude toward software, in which users' needs are satisfied only over the long run after *they* debug the products they've already paid for, and one can truly begin to worry about the implications. When clients finally understand the true nature (and cost) of the unspoken "debugging tax," maybe they'll ask for something different. Not a minute too soon!

At Software Research, we deal head-on with these issues on a day-to-day basis, testing critical client software. So believe me when I say the kinds of errors you report in your article are hardly the exception. Big-ticket items (such as the Therac machine you highlight) get a lot of attention, but the same kind of defect resides in most every embedded software product.

Let's all hope that the consumers get wise, fast!

EDWARD F. MILLER JR.
Software Research Associates
San Francisco, California

Ed Joyce's article on the legal aspects of software raises some complex issues. Ms. Nycum's assertion that a defendant must show that everything possible was done to eliminate software errors does not clarify the issue. There is no way to show that a program (or any other designed system) does not have errors. It is clear that more testing can eliminate errors, but what is sufficient or adequate testing? Finally, at a cost, one can add fault tolerant structures, such as recovery blocks or N version programming. Must a vendor incorporate these or be considered not to have done "everything possible" to eliminate errors?

E.B. FERNANDEZ
Professor
College of Engineering
Florida Atlantic University
Boca Raton, Florida

Outstanding

Every so often, I see an article in a trade publication that is particularly outstanding, and deserves some special recognition. Susan Kerr's article on IBM's new OS/2 announcement, and its ramifications for the micro database industry ("OS/2 DBMS Sending Mixed Signals to Users and Vendors" May 15, p. 21) was not only well done and informative, but provided a fresh perspective that most other weeklies and monthlies had missed. What is more, the article was accurate, which is not always easy when dealing with this subject matter.

Other articles on PS/2 were also very well done, and I look forward to future coverage by your magazine.

RICHARD FINKELSTEIN
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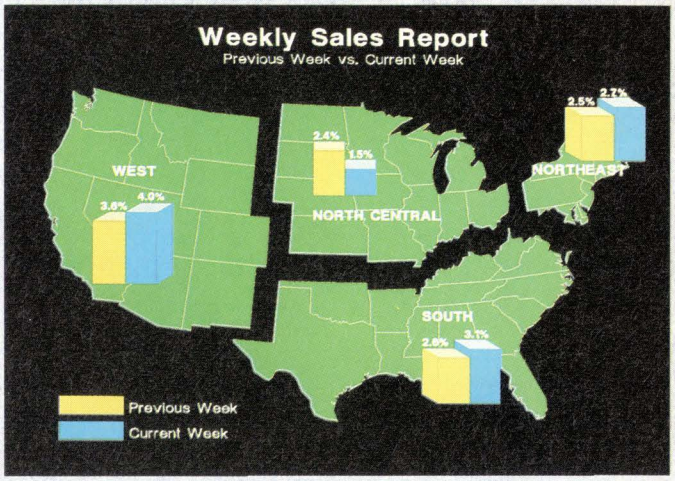

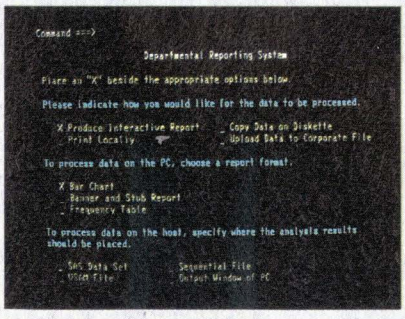

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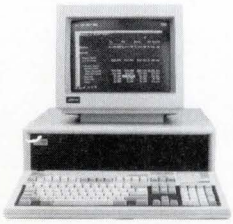

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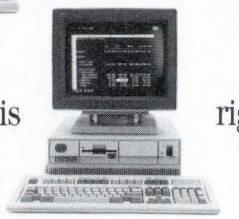

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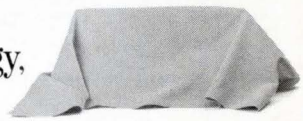
Recently, we revealed our plans for 1-2-3/G, breaking new ground in graphical-interface applications. Together with IBM® we'll bring new power to mainframe users, with 1-2-3/M. And a brand new SQL database family for work groups, code-named Lotus/DBMS. To tie our products together, Lotus introduced LEAF (Lotus Extended Applications Facility) which provides additional development tools for the programmer and Lotus user. As technology develops, Lotus will continue pushing the limits of new environments. Always supporting existing technology,  always protecting your investment in software, applications and user training. In an industry where it's always dawn. Lotus.

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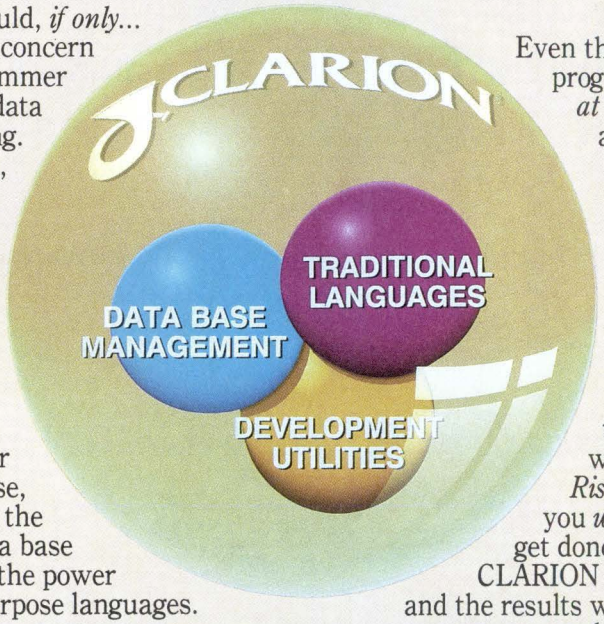

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CIRCLE 7 ON READER CARD

Look Ahead

THE TPS RACE GETS HOTTER

SAN JOSE -- Look out, Tandem. IBM is joining the great transactions-per-second (tps) benchmarking race. Apparently in response to Tandem's claim that its new NonStop SQL DBMS can support more than 200 debit/credit tps on 32 NonStop VLX processors, IBM recently revealed to users the results of some of its own tests performed at its San Jose benchmarking facility. IBM says a 3090 Model 400 mainframe running ACF VTAM, IMS, and Fastpath supported 1,012 credit tps and 885 debit tps. IBM called its benchmark "comparable" to the standard ET-1 benchmark. While IBM acknowledged that its benchmark, unlike Tandem's, was run on a hierarchical, nondistributed database, the results represent a significant improvement over the 88tps rate IBM had previously been quoting for a 3.081MB mainframe.

A DIFFICULT MIGRATION . . .

PALO ALTO -- As first shipment dates for Hewlett-Packard Co.'s new Spectrum minicomputers near, users report the company is struggling to complete the migration of older in-house applications programs written in SPL to the RISC-based architecture. One user claims that HP ran into trouble with the Materials Management 3000 application, and until it's ready his company won't take delivery of a Spectrum system. An HP spokesman replies that an updated version will be announced "in the next few months." Although a fair chunk of HP 3000 applications are written in SPL, some HP software groups are said to be using an SPL-to-C translation tool from Ottawa-based Cognos.

. . . AND A CHANGE IN PLANS

Meanwhile, HP earlier this year told potential users of Spectrum the good news--namely, that the company is working on what it calls a "turbo version" of its new Allbase DBMS. But in order to get the higher-performance version out, sources say HP transferred several software developers off a project to build a fully distributed Allbase. Now, sources say HP has no plans to develop the distributed product, but instead will offer remote database access features. HP declines to comment on the status of the distributed project. Separately, a native mode version of HP's Desk Manager application for Spectrum will ship at the end of 1988.

NOT SO MUSICAL CHAIRS AT X/OPEN

LONDON -- Ex-UniSoft chief Bob Ackerman has had a less than smooth time at the European-based X/Open, soon to become incorporated. In the spring he was appointed as a marketing consultant for the group that includes most of Europe's computer makers plus DEC, Unisys, AT&T, and Hewlett-Packard. Within the last few weeks, though, Ackerman knocked an elected AT&T rep out of

the chairman's seat in the X/Open's marketing committee and upset the other members with his approach. The committee got even during the first meeting with him in May and kept him waiting in the corridor two days while they discussed so-called internal matters. Ackerman couldn't be reached for comment.

THE RISING YEN'S EFFECT

TOKYO -- Look for Japanese manufacturers to increase procurement outside Japan as the yen continues to appreciate. Matsushita and Toshiba have already gone to India for components, obtaining disk drive stepper motors manufactured in a duty-free export zone near Bombay. To preserve the image of superior quality that Japanese products now have, however, the two say that the motors carry no sign of the country of origin.

B OF A TO EMPLOY KNOWLEDGE SYSTEM

SUNNYVALE, CALIF. -- This belongs in the "better late than never" file. Financially troubled BankAmerica recently sent 80 of its top executives to visit expert systems vendor Syntelligence Inc. where they had a week-long, hands-on session with that company's Lending Advisor system. B of A, which can trace many of its problems back to bad loans, is apparently considering installing a 2,000-terminal system to help its officers distinguish good risks from bad. Syntelligence worked with other banks, including Wells Fargo, in putting the Lending Advisor knowledge base together.

PRIME SYSTEM UPGRADES DUE THIS FALL

ATLANTA -- Prime Computer users in October will see significant speed and functionality improvements in Release 7.0 of Prime Information, a Pick-like database environment. National Prime User Group members say the proposed enhancements may achieve gains from 25% to 30% over the current release through use of a new dynamic file type. Prime Information support for alternate keys is included in the new release. Also, Prime is rumored to be planning a September release of a third-party package that enables Prime Information applications to run on the new Unix-based EXL 316.

FRENCH TO EASE TELECOM RULES

PARIS -- The French government will take a step toward deregulating telecommunications services next year. Effective Jan. 1, 1988, a new law will legalize value-added network (VAN) services that use the PTT's public network. Two Franco-American consortia--GEISCO with Bull; IBM with computer services company Sema Metra and French bank Paribas--have applied to the Direction Générale de Télécommunications for licenses to run VANs. They are now expected to get the go-ahead.

(continued on p. 12)

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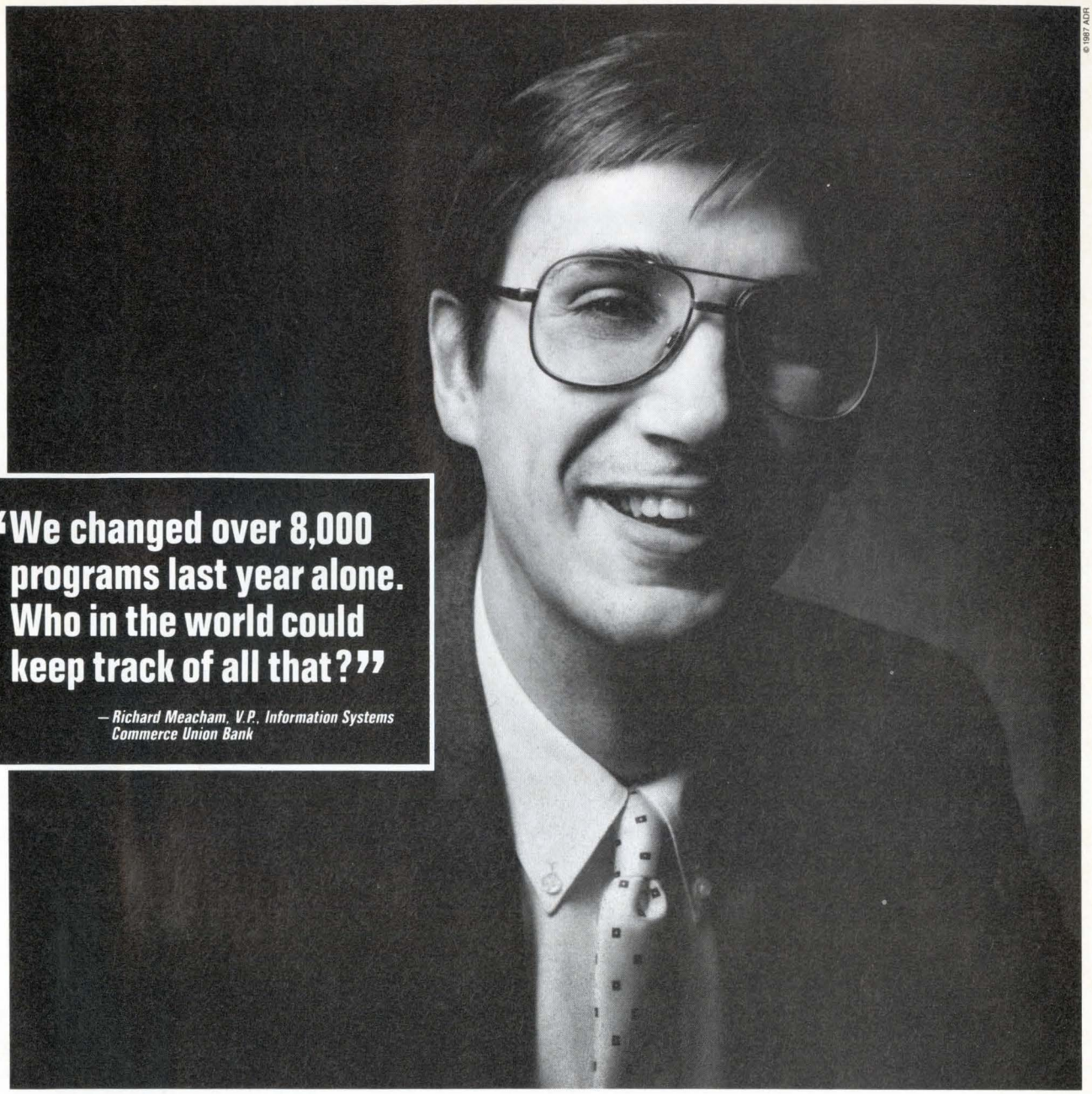

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CIRCLE 8 ON READER CARD

Look Ahead

UNISYS TO SELL FUJITSU DRIVES

DETROIT -- Sources say Unisys has decided to resell to its customers cartridge tape drives manufactured by Fujitsu. Unisys is said to have considered several oem vendors of the 3480-class cartridge tape devices, including Hitachi and IBM. Unisys would be Fujitsu's second known U.S. oem for the device. The other is Amdahl Corp. of Sunnyvale, Calif.

ADVISORY BODY IN BRITAIN TO CLOSE

LONDON -- The Technical Change Center (TCC), an adviser to U.K. industry and government on new technology, will close at the end of this month due to a withdrawal of funding by its two parent groups, which are partially state backed. Set up in 1981, TCC's recent work includes an evaluation of Japanese research methods. The abrupt decision to stop funding TCC, which has been receiving $660,000 a year, left the center with too little time to find new sources of funds. The TCC has appealed to the Secretary of State for Education and Science, but a reprieve is unlikely.

DEC SLATES SNA FIGHTERS

BOSTON -- Digital in September will spice its annual DECworld exhibit with an array of networking products and development pledges. Intended to position DECnet against SNA, DECworld will serve as the stage to introduce DECnet Phase V, support for high-speed HDLC circuits, and new OSI protocols, according to company sources. Through dedicated network routers and distributed naming and file services, the company also plans to position DECnet as a backbone network able to encompass other vendors' computers. Via its media independence, DECnet will be extended to run over twisted pair and fiber-optic media. DEC also plans to reveal future support for NetBIOS, X.21 protocols, and ISDN and FDDI technologies. More immediate examples of the positioning will be the ability in September for DEC users to exchange mail messages with SNA PROFS users.

RUMORS AND RAW RANDOM DATA

Information Builders Inc., New York, which says only about 100 users of its Focus 4GL employ the DB/2 interface that has been available for it since the first quarter of last year, is working on interfaces for two other relational DBMSs: Oracle, from Oracle Corp., Belmont, Calif., and Ingres from Relational Technology Inc., Alameda, Calif. . . . In Tokyo, AT&T has been singled out as the only overseas company to be allowed to participate in the construction of a new international airport near Osaka. The U.S. company has been invited to take part in the development of communications systems for the airport.

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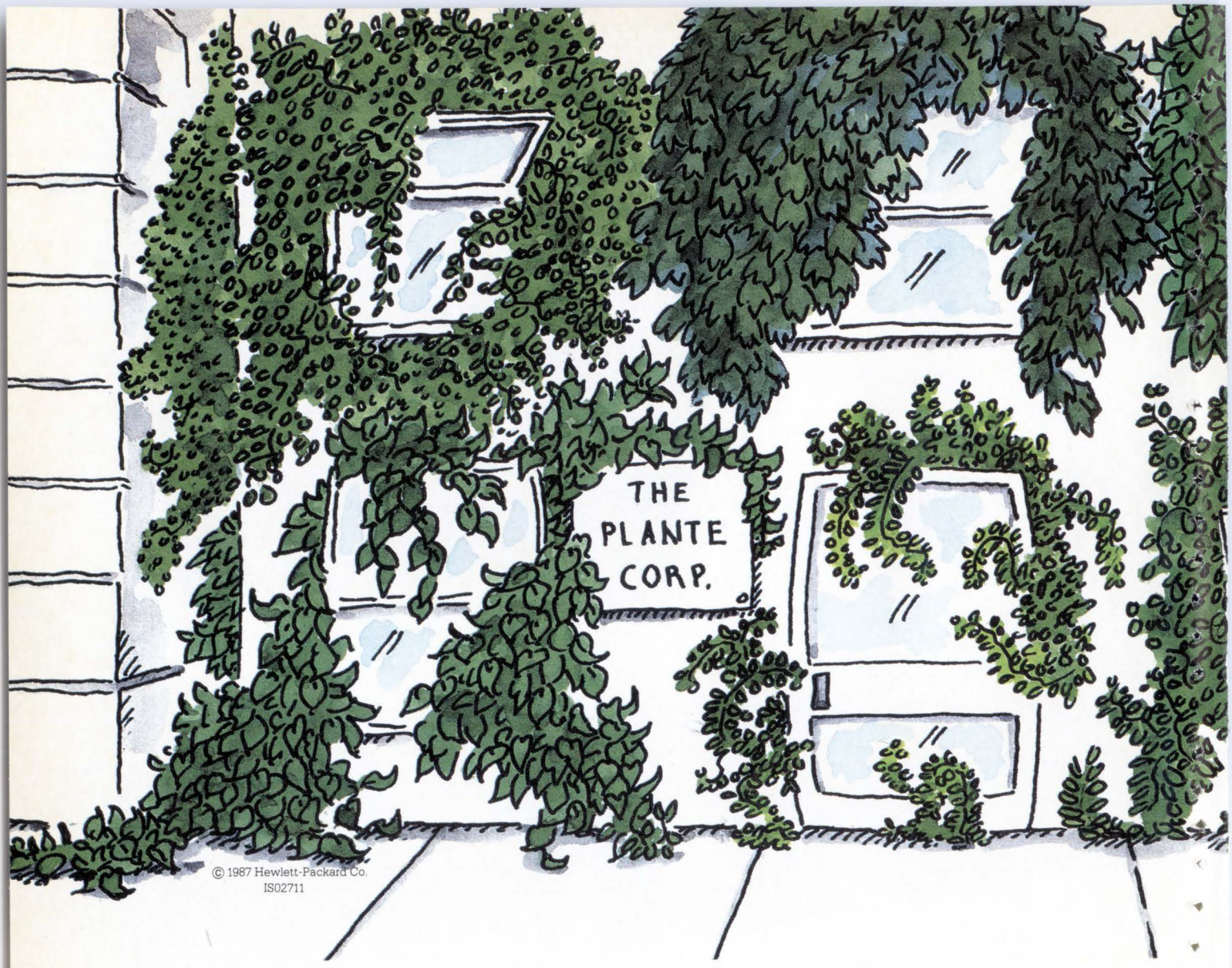

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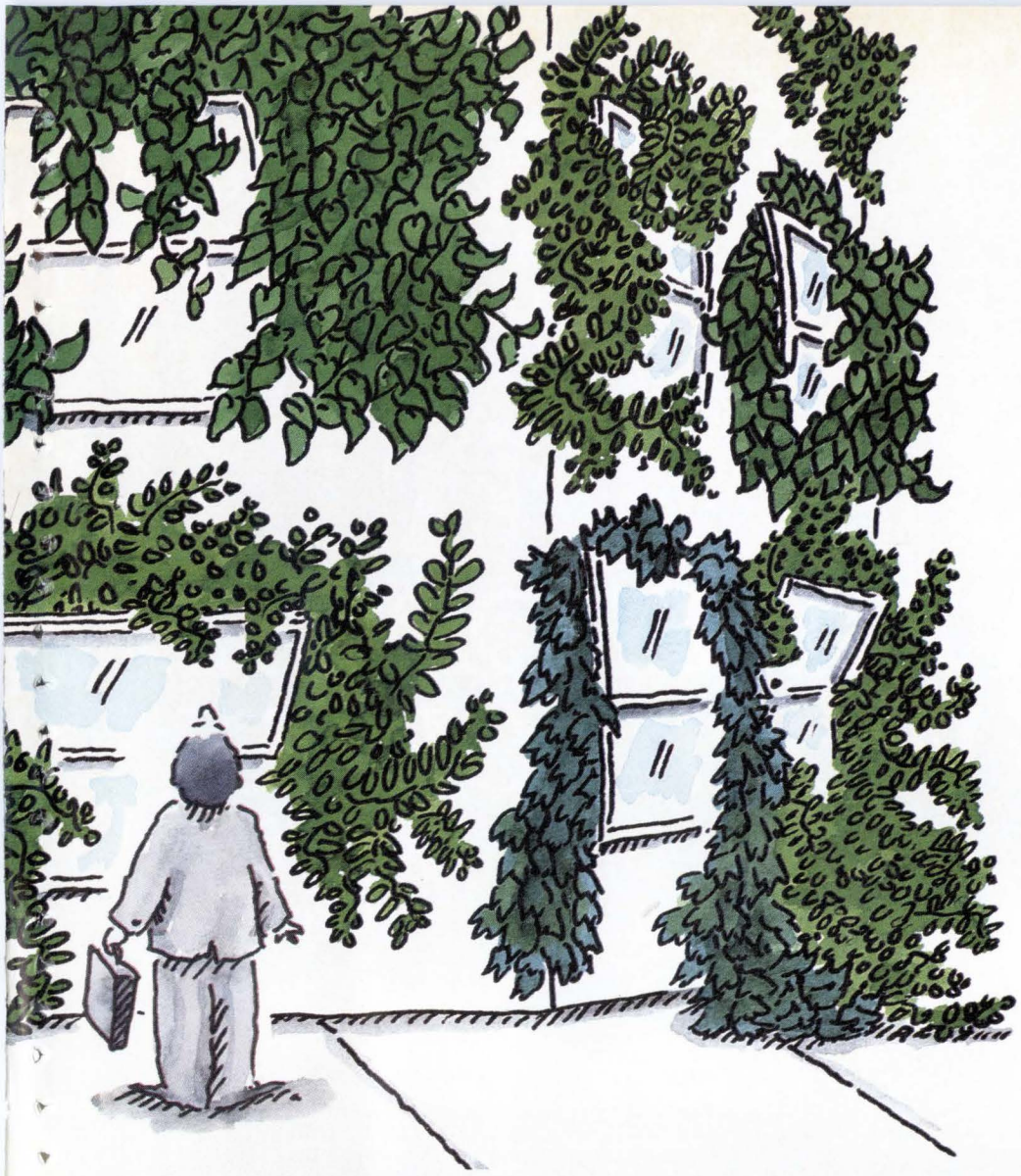

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CIRCLE 11 ON READER CARD

MIDRANGE SYSTEMS

IBM Says Silverlake Will Be An Easy Migration for Users

The S/36, 38 merge product may not appear until next year, but some users wonder about RPG support and changes to the S/38 DBMS to handle SQL and SAA.

BY JEFF MOAD

IBM is planning to announce an important new group of products that will expand the market for—and reinforce IBM's commitment to—the System/36 and 38 midrange architectures.

Sound familiar? If it does, maybe it's because IBM has been rumored to be planning such an S/3X product move several times in the last couple of years, and each time the predicted announcement has failed to materialize.

For example, there was the program code-named Fort Knox, reported to be a "hybrid" system capable of running S/370 mainframe and S/3X applications. Never happened. Then there was Sunrise, Sunray, and Sunlight, said to be a series of systems merging the S/36, 38, and 370 while also creating a new, aggressively priced low-end S/36 system. The "Sun systems" never saw the light of day either.

Now, speculation is once again rampant that IBM is planning a major S/3X product transition that will finally merge the S/36 and S/38 applications bases, spell out a long-term S/3X upgrade path, and tie the S/3X into IBM's new Systems Application Architecture (SAA).

This time, however, it looks like the rumored S/3X product plan—code-named Silverlake—is for real. In fact, Silverlake not only appears to represent a long-awaited IBM vote of confidence for the S/3X product line and its users, but also a major component—along with the 9370—of IBM's long-term plan to shore up the glaring weaknesses in its midrange.

The trick for IBM will be to make the migration to Silverlake easy on its 200,000 S/3X users and to make Silverlake competitive with midrange systems from Digital Equipment Corp. and others, while not confusing Silverlake with the low end of the 370 product line.

SCHWARTZ: IBM has discussed its Silverlake plans in private with users and analysts.

If IBM pulls it off, the rewards could be significant. According to Stephen B. Schwartz, president of IBM's Systems Products division, IBM figures that an upgrade to the S/3X that combines the ease of use and programmer productivity of the S/3X with near-mainframe performance levels will appeal to "a tremendous number" of small or first-time user companies. How many companies? "In the millions of companies worldwide," says Schwartz.

While Schwartz may be overstating the case just a bit, some observers seem to concur with his optimism. According to Kimball Brown, an analyst with San Jose-based Dataquest Inc., "IBM is realizing that with its mainframe market expanding only about 6% a year, much of its growth must come from the midrange and from smaller companies. Silverlake represents the first time in a long time that IBM has a chance to appeal to them and, at the same time, get into DEC's backyard and start actually gaining market share," says Brown. "This represents a much better chance for IBM to do that than the 9370."

While IBM officials decline to discuss the specifics of Silverlake publicly, Schwartz acknowledges that the company in recent months has been discussing its plans in private with users and industry analysts. As Schwartz explains it, "We've been trying to give our customers more long-range planning information."

As a result, the S/3X community has been full of reports on Silverlake for several months. The system, which analysts expect will start shipping in the first quarter of next year, is expected to be based on the S/38 virtual storage, integrated database architecture and to be capable of running S/36 and 38 applications, although S/36 software is expected to require some recompilation. The product is also expected to share peripherals, packaging, and much of the RISC-based logic technology used in the 9370.

While Silverlake is expected to be positioned initially as an upgrade to the current S/36 and 38, Silverlake is expected in the long term to lead to higher-performance systems and to tie into SAA by supporting such connectivity features as LU 6.2 and the Structured Query Language (SQL). Silverlake's developers at IBM's Rochester, Minn., operation are said to have been given corporate approval to build a system selling for up to $1.7 million, which is well in excess of the $500,000 top-end tag on the S/38 today. Some observers anticipate that the Silverlake group of systems ultimately will reach 20MIPS.

Schwartz cautions users not to expect a mainframe class S/3X system in the near future, however. In fact, he says, "I don't think a 3X product will get that big. I have no plan to use water-cooled technology."

But it's clear that Schwartz and his Rochester team have been given the charter to expand the role of the S/3X architecture in the interest of improving IBM's midrange competitiveness. First, however, Schwartz recognizes that IBM must keep its current S/3X users happy.

While IBM moves to spell

out a clear, long-range S/3X upgrade path, says Schwartz, "We want to assure 36 and 38 users that their applications investments will be preserved when we move to the next generation of 3X hardware.

"We plan to provide an easy way for users to migrate their applications and data."

User Migration Questions

Some S/36 and 38 users respond that while they are happy that IBM is investing in a new S/3X product, they are wondering what the company means when it talks about an easy migration to Silverlake. Specifically, they want to know what changes in the current S/38 integrated database will be required to make it compatible with SQL and SAA and whether their current programs written in the S/3X's RPG-II and RPG-III languages will be supported on Silverlake. So far, RPG has not been included in IBM's cursory description of SAA.

If the migration to Silverlake proves too complicated, say users, they may resist it or look on it as a complete hardware conversion. That could open the door to DEC or other midrange vendors. According to S/36 user Bill Yates, marketing applications director for Quaker State Oil in Oil City, Pa., "We're encouraged that IBM's planning to upgrade the 36, and we'll be interested in the new product eventually, as long as we can run what [applications] we've got."

So far, at least, the rampant Silverlake rumors don't seem to have prevented users from evaluating or purchasing current S/3X products. Says Schwartz, "Current product demand is strong."

That claim is borne out by a survey of potential S/36 and 38 users recently carried out by Computer Intelligence of La Jolla, Calif. The study showed that interest in S/36 products more than doubled between April and May, based on the number of users saying they were evaluating or planning to buy. S/38 products made a similar jump between April and May, although interest in the larger system currently lags behind that measured in February and March. Analysts attribute the strong S/3X interest in part to the widespread Silverlake reports and to the feeling among users that IBM has big plans for the S/3X.

NEWMAN: He's scaling back his var business because of competition from IBM's direct sales force.

The continuing strong interest in current products also contradicts reports of an imminent Silverlake introduction, although an interim memory and performance boost for the S/38 seems to be in the cards. "It [Silverlake] is not going to happen tomorrow, contrary to some reports," remarks Schwartz, who declines to comment on whether there will be any interim products.

Just knowing Silverlake is on the way is enough for some users. MIS officials at Dallas-based real estate developer Trammell-Crowe, for example, say IBM's Silverlake plans validate their 1985 decision to convert from an overburdened DEC 2060 system to multiple S/38s. The recently completed conversion was based on the availability of packaged applications for the S/38 and the assumption that the S/38 architecture had a long life expectancy. According to Trammell-Crowe director of information services David Thunderburk, "We won't be ready to migrate to it for a couple of years, but Silverlake shows the 38 remains a strategic product for IBM."

IBM is also hoping to use Silverlake and its expected price/performance, packaging, and other improvements to attract a broad base of new users interested in distributing applications or in developing new applications. Many such users currently are looking at DEC, Tandem, or low-priced Unix-based systems.

Resellers Will Be Critical

To reach those users, IBM is expected to rely heavily on its evolving reseller network, specifically on its Marketing Assistance Program and Industry Marketing Assistance Program (IMAP), through which IBM regional and national sales operations jointly market selected third-party applications on IBM hardware. Many current S/3X vars see the MAP replacing the existing var program, and they are eager to become participants in time to cash in on Silverlake.

One such reseller is J.D. Edwards & Co. of San Mateo, Calif. One of IBM's larger S/38 vars last year, with about $20 million in sales, J.D. Edwards is "getting out of the reseller business," says Bob Newman, vice president for customer service. Edwards is scaling back its IBM var-related business and applying to have its construction industry applications package selected for the IMAP program because, says Newman, competitive pressure from IBM's direct sales force in the S/38 market has increased dramatically in recent months. "We'd like to get back on IBM's team again, especially with Silverlake coming. But the way to do that now," says Newman, is to become a Marketing Assistance Program participant.

Others waiting anxiously for Silverlake include S/3X third-party software vendors. The largest S/3X third-party software vendor, Systems Software Associates of Chicago, recently reported a 40% first-quarter earnings increase, based in part on demand for its manufacturing and wholesale distribution software. "People have renewed confidence in the 3X," says SSA technology vp Larry Roches. "They're hearing about a new 3X system with new capabilities. We're banking on it to fuel our continued growth and significantly widen our market."

But what happens to demand for IBM's 370-based 9370, 4300, and 3090 systems when the easier to use, cheaper to operate S/3X architecture starts creeping higher up the performance scale? Isn't IBM worried about confusing its users by offering increasingly overlapping architectures? Not really, says IBM's Schwartz. "Our large users [current 370 users] know why they need the 370 archi-

tecture. They won't be confused by what we're doing with the S/3X."

Besides, Schwartz says, by the time the S/3X begins to push its way up in performance, IBM's 3090 mainframe and its successor will have moved up themselves. Observers, such as S/38 consultant David Andrews of Cheshire, Conn.-based ADM Inc., expect the higher-performance versions of Silverlake to hit the market around 1990.

While Schwartz is sure that large 370 users will know what to make of Silverlake, some smaller users seem unsure whether to go with the 9370 or wait for Silverlake. One such user is Brown and Sharp Inc., a Kingston, R.I., machine tools manufacturer that is just now completing a migration of its manufacturing applications from a 4341 to an S/38 Model 600. The company is due to make a decision in six months about what to do with its financial applications, and, says MIS manager Charles McKellar, Silverlake is making that decision more difficult.

"We were thinking about going to a 9370 for the financial applications, because we'd like to stay with the MSA [Management Science America, Atlanta] financial applications we are currently using," McKellar explains. "But we've been happy with the System/38, and we'll have to look at Silverlake if it's all it's cracked up to be."

Despite whatever temporary confusion Silverlake may cause smaller users, analysts say IBM is committed to its multiple-architecture strategy. Says Andrews, "Basically, IBM is going to offer users vanilla, chocolate, and strawberry solutions in most performance classes and not try to force one particular solution. IBM's not going to care particularly, as long as people buy from IBM." ■

STANDARDS

What's Behind Digital's Public Criticism of MAP?

Possible reasons include protection of the DECnet installed base and a sincere belief that Ethernet is better. But will the real rationale please stand up?

BY WILLIE SCHATZ

After four years and a dozen user group meetings, Digital Equipment Corp. and the Manufacturing Automation Protocol (MAP) community are still speaking without listening.

"MAP is no threat to DEC," says Don Jenkins, Digital's manager of CIM product marketing. But that's not exactly what Jenkins' boss, DEC president Ken Olsen, has been saying. He's frequently pounded MAP in the last few months, asking anyone who will listen why the world needs another network (besides Ethernet, of course). Users who want a multivendor environment have a ready answer for that one. Ethernet doesn't fill that bill on the factory floor.

"We're concerned because we see threats to our customers' satisfaction," Jenkins insists. "We're not trying to kill MAP. We believe in Open Systems Interconnection [OSI]. We don't want to slow MAP down. We just want to get the issues on the table now. That's a lot better than facing a lot of angry customers later because you didn't alert them to potential problems."

For Mike Kaminski, GM's MAP manager, these concerns have yet to be articulated. "I don't even know what the issue is," he says. "It's never been made clear. I don't even know what to argue about. Hundreds of users know MAP is on course.

"If DEC wants to come along, great. If they don't, that's their business. I'm sorry for that." Referring to Enterprise Networking '88 International, a trade show nicknamed the Event, which will showcase off-the-shelf 3.0 or final MAP version products, Kaminski says, "But if they're not at the Event there's nothing I can do."

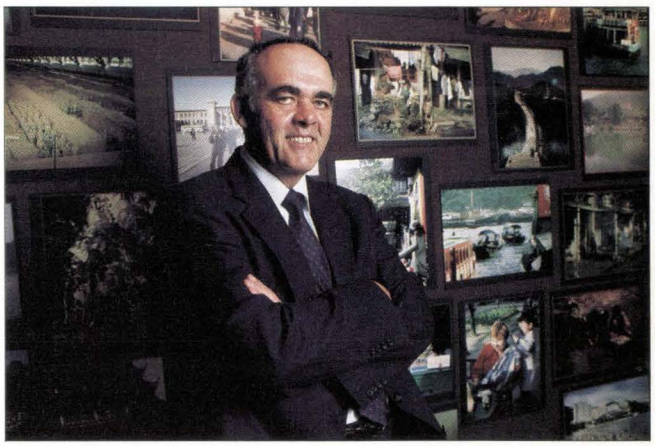
Maybe not. But there is something GM can do. Asked if GM would cease doing business with DEC if DEC did not support MAP to the extent GM deems appropriate, a GM official who requests anonymity says, "We already told them that. If they don't do what we ask them to, they can't participate in our future MAP implementations. That doesn't mean there won't be a buy here or there for a specific requirement."

Ambiguous Documents

The waters have been further roiled by the disclosure of certain documents DEC sent to its field sales force. Copies of the documents, which are called CIM-TEAM Bulletins #10 and #11, were obtained by DATAMATION. In them, DEC portrays itself as staying on the same MAP course it's always followed. But there are enough ambiguities within these documents to cast doubt on whether DEC really can find its direction. DEC did not respond to requests to discuss the bulletins by press time.

Bulletin #11 says that the company will continue to support the ongoing technical efforts in the standards committees; continue to introduce the best-engineered MAP products in the industry, such as the upcoming MicroVAX MAP product; keep customer satisfaction as the number one goal; and work with manufacturing customers to help them understand what can't be expected from a new and rapidly changing technology.

And what might that be? Well, how about the fact that, according to DEC, the MAP 3.0



GARDNER: Users desparately want OSI, but some standards won't be ready until 1992, and users can't wait that long.

specification is more than a year away from completion, which means it will take another two to three years to develop and demonstrate useful products? That, in turn, means that financially justifiable MAP installations in production environments are several years away.

For customers interested in MAP, CIMTEAM Bulletin #10 recommends funding an extensive MAP research project in a laboratory setting. The research goals would include interoperability, specification stability, migration and upgrade strategies, multivendor network management, and project cost. After looking into the area for 18 to 24 months, customers will have the expertise needed to plan a limited MAP pilot project. Then they can implement MAP in a production environment.

In other words, take three years to think about putting MAP in your place. All the while, of course, DEC customers will keep on truckin' on their Ethernet or DECnet.

Some See Market Turmoil

"That's nothing but a stall tactic," says the president of an industry company who asked not to be identified. "DEC's really been [messing] up the market. There's real turmoil out there.

"I think DEC's panicked. There's no other logical answer. Why would they antagonize their largest customer? The only possible explanation is that they're very worried about losing their Ethernet/DECnet base if MAP takes off."

MAP seems to be doing just that, although we're not talking a rocket ship here. The 3.0 products were originally scheduled to debut at next November's Autofact show in Detroit. But conformance testing difficulties and vendor resistance to making 3.0 products before the specifications were ready pushed back the coming-out party until the Event next June in Baltimore.

Even that may be too soon for DEC. It would like each layer of the MAP seven-layer OSI protocols sanctified before it exhibits any product conforming to the spec.

"This is a timing question," Jenkins says. "Technical excellence comes before anything else. We've got some concerns that getting ready for the Event may be traded for completely reviewing the specs."

DEC has nevertheless committed to the Corporation for Open Systems (COS) booth at a recent MAP meeting. At press time it had not yet committed to the MAP booth. Its absence would make it extremely difficult for DEC to display competitive 3.0 products. DEC publicly committed in Pittsburgh to supplying 3.0 products, but didn't volunteer a timetable.

The waiting time for OSI approval appears to have decreased considerably following recent interoperability OSI tests at the National Bureau of Standards (NBS). IBM, Wang, DEC, GM, Honeywell Bull, Boeing Computer Services (Bellevue, Wash.), and Retix (Santa Monica, Calif.) successfully completed a multivendor link using the OSI protocol. This was the first time vendors got together under NBS supervision and made the OSI protocols work.

But ISO approval still can't come soon enough for MAP users.

OSI Protocols Incomplete

"Despite what DEC says, we desperately want OSI," says Chuck Gardner, president of the MAP/TOP (Technical/Office Protocol) Steering Committee and MAP network manager for Eastman Kodak, Rochester, N.Y. "But the network management and directory services standards from ISO won't be ready until 1992. We can't possibly wait that long."

But DEC apparently can. The four-year time scale fits in nicely with the research, pilot, and implementation scheme outlined in CIMTEAM Bulletin #10. It also gives DEC more time to solidify DECnet/Ethernet's dominance on the factory floor.

"It's crystal clear that token bus has a very substantial performance advantage over Ethernet in the cell environment," says Bob Crowder, president of ShipStar, a major MAP consulting and educational firm in Newark, Del. "Token bus covers a much bigger area. It's clearly better in cell and backbone environments over a very large plant. Ethernet is clearly better in terminal or host-to-host environments."

DEC INSISTS IT'S NOT TRYING TO KILL MAP.

Nevertheless, the Ethernet-MAP technical dispute is unlikely to slow MAP's development. "DEC won't impede the MAP movement," says Paul Accompo, MAP manager for Hewlett-Packard. "The users are far too sophisticated for that. They know DEC is just trying to get as much mileage as possible out of its very large proprietary network."

"We do have a stake in MAP's success," DEC's Jenkins says. "We're not at all worried about MAP as a mass market threat. We certainly didn't need to do this to boost Ethernet sales. They're doing quite all right on their own."

But an extra selling point surely won't hurt. It's just that nobody's buying.

"This is one more step by DEC to gain a short-term market share," says Bharat Thacker, president of Universal Computer Applications, Southfield, Mich. "MAP is going to happen on ISO-based standards. Performance degrades much faster on Ethernet. When you absolutely need the best response, you need token bus.

"DECnet is the solution for some people in some environments who want to live with DEC only," Thacker continues. "It's not the solution for users who want a multivendor environment. Besides, if users wanted DECnet, it was there in 1980. DEC should have objected then. So this shouldn't be that big a problem. It will die of its own accord unless DEC brings it up at a another MAP users or task force meeting."

Following the fracas in Pittsburgh, it could be quite a while before DEC gives another keynote speech. And if GM puts its money where its mouth is and lets DEC know it won't be business as usual, can other MAP users be far behind?

"The MAP debate means that people who hadn't heard about it before surely have now," says Tony Helies, who is president of Marlboro, Mass.-based Concord Communications. "That's good. But the confusion in the marketplace is bad."

"This has probably been blown up beyond what's justified," ShipStar's Crowder adds. "For DEC to say MAP isn't compatible with OSI is a red herring. Those management standards are years off. So MAP will develop its own standards and stay very close.

"It's hard to see what DEC is doing other than protecting its market," he says. "But it's awfully hard to defend DEC's position." ■

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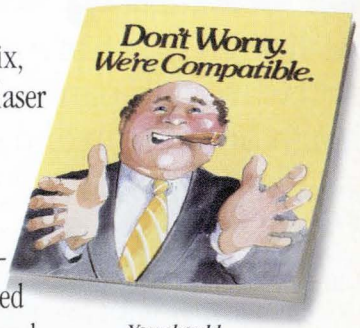

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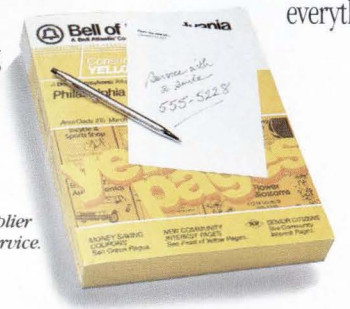

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SOFTWARE

IBM Source Code Policy Is Raising Cain with Vendors

Although there are no 'dead bodies,' some small software companies claim that Big Blue's stance will harm both them and the industry at large.

BY KAREN GULLO AND DAVID R. BROUSELL

Alarm among independent software vendors over IBM's Object Code Only (OCO) policy has resurfaced. Vendors say they are concerned now because the objections to the policy, which for the last four years they have been voicing privately and through industry groups such as SHARE and ADAPSO, seem to have fallen on deaf ears.

IBM announced the OCO policy in February 1983, stating that it was established to protect the company's programming and technology investments. Immediately, much discussion was generated about the possible ramifications for the independent software industry. The concern focused on what some independents perceived as a danger that without source code they would not be able to develop software products to compete with IBM software products.

But the IBM policy to withhold source code of its software products, which, ironically, is in line with what many of the independents do, did not have an immediate effect on those voicing concern, largely because the policy was and is apparently evolutionary; any effects could take time to surface.

Now, however, after years of "having a dialog" with IBM, small, independent companies concerned about OCO are making noise again. "We continue to talk to IBM, and they continue to be very polite and continue to say what their policy is," says John W. Myrna, president of VM Systems Group Inc., Arlington, Va. "Those of us who have had a dialog with IBM have a growing sense that what IBM is doing is being polite. The attitude is 'Explain again your problems with OCO and go back and write more letters and we'll go on backing our policy.' "

An IBM spokesperson told DATAMATION that "IBM understands the past use some customers have made of source materials for program modifications. Consequently, we are moving especially slow and are taking extensive action to ensure that the practice of providing only object code is implemented in a suitable manner." IBM estimates that at least 100 licensed programs have been made available without some or all source materials since it established the OCO policy.

VM Systems manufactures reliability and productivity systems software for the VM environment and had $6.6 million in sales last year, according to Myrna. "This is a battle we're fighting to keep open technical innovation and options for our company and our customers," says Myrna.

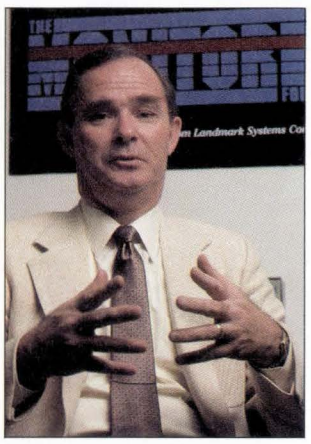
Another company, Landmark Systems Corp., Springfield, Va., contacted DATAMATION to express its dissatisfaction with the OCO policy and with the results of its dialog with IBM. Landmark is a developer of performance measurement software for IBM's CICS product.

Landmark's president, Patrick H. McGettigan, provided DATAMATION with copies of his correspondence with representatives of IBM dating from September 1985 to March of this year. In his letters, McGettigan, who notes that he also met with IBM industry relations representatives Ambrose A. Carr Jr. and Grant C. Leschin, grows increasingly frustrated with OCO and IBM's responses to his concerns.

Frustration Mounts

In a March 30 letter to Carr, McGettigan states, "... It is past time to wait and trust. From my point of view, my survival depends upon it. I believe IBM is wrong, dead wrong, in a total OCO implementation."

IBM believes that improved user documentation and extensions and enhancements of user exits and standard interfaces will satisfy vendor and user needs for program extensions.



MCGETTIGAN: "It is past time to wait and trust. From my point of view, my survival depends on [source code]."

Most vendors interviewed by DATAMATION claim that while the OCO policy has not yet affected their business, it well may in the future. McGettigan concedes that IBM's OCO policy has not prevented Landmark from developing any products. But he says he believes the policy will do so eventually because of what he claims is its evolution into product areas such as "CICS Temporary Storage and File Control nucleus components" that have no marketplace competition.

Ramifications Taking Effect

Stan Rintel, president of Syllogy Corp., formerly SRM Computers Inc., Hackensack, N.J., says the issue is already beginning to affect his company. Syllogy, with 22 employees and revenues expected to reach between $2 million and $3 million this year, manufactures a control system program for IBM's COBOL compiler called COBOL Express.

Last year, IBM released a new COBOL compiler, which embraces the features of the new standard for COBOL, COBOL 85, without source code. Although the acceptance and implementation of COBOL 85 among users is slow, Rintel says he needs the source code in order to update his product for those of his customers that will eventually use IBM's new compiler. "If I don't get the source code for the compiler, I'm down the drain," says Rintel. "I couldn't support my customers if they want to go to the new compiler."

Rintel says he's optimistic that he can persuade IBM to release the compiler source code to his company. He says he's aware of instances where IBM has worked out arrangements with individual companies, although he did not have specific information in that regard. If, however, IBM is unwilling to provide source code, Rintel says he will

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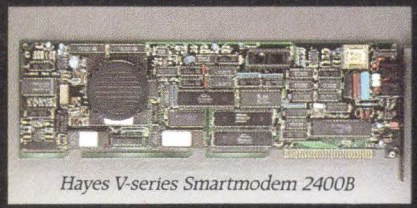

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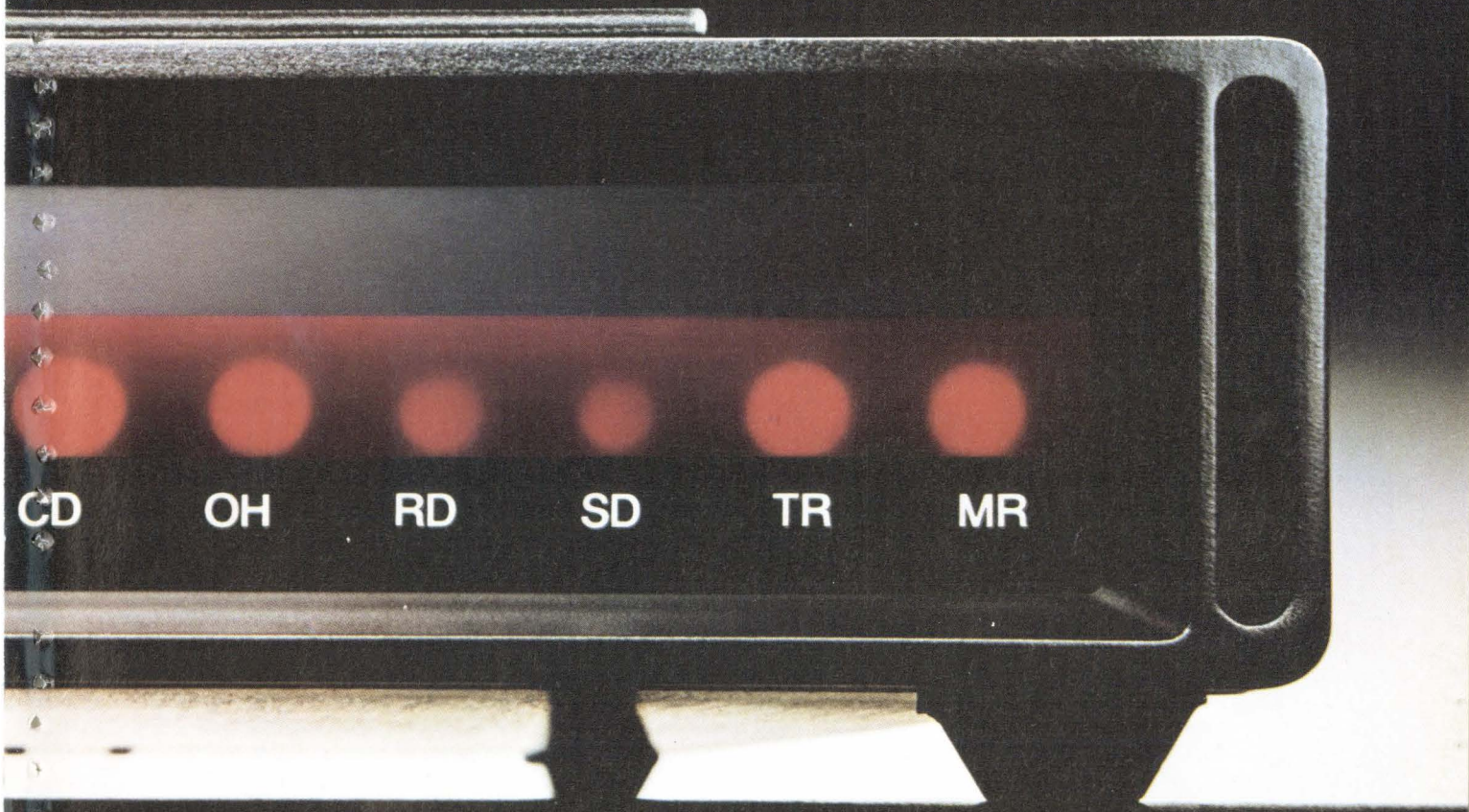

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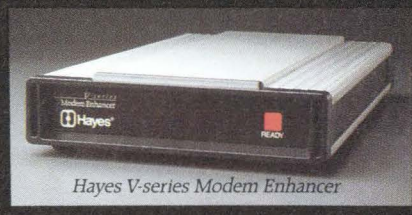

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RINTEL: He's optimistic that he can persuade IBM to release source code.

"have to talk to the Justice Department or do something. I hope it doesn't come to that."

Rintel, like others, is in the delicate position of having to stay on IBM's good side on the one hand, while on the other attempting to counter and, he hopes, change its policy. Most software vendors interviewed say they will continue to press the issue by writing letters to IBM and holding discussions with the computer giant.

Meanwhile, some of these small software companies are looking to groups like ADAPSO for support. Shortly after the OCO announcements, ADAPSO issued a white paper voicing its opposition to the policy and recommending that IBM make source code available in microfiche form. The group has had a vendor relations committee and an IBM interface committee looking into the issue.

Richard Crandall, president of Comshare Inc., Ann Arbor, Mich., and a member of the interface committee, says the source code issue is still being debated with IBM and says it has become a part of a larger issue—the Systems Application Architecture announcements. SAA will form an application implementation layer for common user and programming interfaces, according to IBM. Crandall says IBM intends software vendors to implement their products at the SAA level, thereby alleviating the need for source code.

"There's a number of problems with SAA," Crandall says. "First, it doesn't address the issue of performance. You get a higher level of performance for your products with source code. Second, most of SAA is unimplemented. It may take a number of years to implement. It seems like IBM is cutting the present method of interface and replacing it with a new method, but the new method is years away."

IBM says it will begin publishing information on SAA interfaces in the third quarter of this year.

Crandall says ADAPSO continues to have a dialog with IBM over these issues, but that its effectiveness is "hard to predict. There's no other tool available other than customer pressure. There's no legal means, in my personal opinion. I think IBM is preoccupied with other issues, like the plug compatibles and the Japanese clones. They are looking to regain lost revenues." Getting IBM to change or alter a policy is no easy task, he says. "It's like trying to change the course of an oil tanker." ■

STRATEGIES

Networks, Software Keys in DG's Plan

Alliances, acquisitions are the base of DG's new strategy, but can it set itself apart from DEC and IBM?

BY GARY McWILLIAMS

Six years ago, a development project named Eagle gave wings to a foundering Data General Corp., which had been slow in developing a new generation of 32-bit computers. The cure at that time was the Eagle, or Eclipse MV/8000 computer, which paved the way for a move into office systems, giving the company its first success in end-user markets.

But saddled anew by a me-too product line, the Westboro, Mass., company is again grounded. Sporadic earnings and stagnant equipment revenues have clipped its wings for the past two years. For the six months ended March 28, DG suffered a loss of $39.3 million, on revenues of $628.5 million; that's down from a profit of $3.1 million a year ago, on revenues of $612.5 million.

To distance itself from these problems, the company increasingly is turning to alliances. Data General is allying with developers and even users for scarce applications software. Moreover, a budding information network strategy is being built from acquisition.

It is the latter that analysts and insiders see as more important to the overall success of DG's plan. But Data General is focusing on the crowded departmental computer market. To win, it must do more than match the software of larger competitors. The route DG has selected is via a broad understanding of voice and data networks, T1 wide area networks, and network management.

Having little internal experience with such technologies to draw upon, acquisition has formed the cornerstone of DG's communications efforts. For a company that prides itself on strong engineering, the purchases represent a remarkable turn. The largest has been the $28 million purchase of Dama Telecommunications Inc., now DG Network Services Division, Rockville, Md.

Orchestrating the acquisitions is senior vice president Colin Crook, a former British Telecom executive. An energetic man with a ready grin, Crook manages the company's Communications Systems Group. He maintains that the purchases are critical to the company's long-term survival. "Our attitude is we're in it for the long haul. We're not going to blow away because we didn't do our strategic planning."

As for the series of losses at Dama that have so far marred his early efforts, Crook says, "It's only been after it emerged from Chapter 11 [in March] that we've exercised direct control." Since Dama's telephony business was sold and the remaining business was consolidated, "we've been rocking," he enthuses.

To say too little of the software efforts, however, would be a failing. Data General is heavily recruiting applications because the ground it has lost to competitors is in large part due to the software gap. For instance, long-time

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Data General user Williams Pipeline Co., Tulsa, Okla., recently chose DEC VAX computers for a multimillion-dollar supervisory control and data acquisition (SCADA) project. The software alliances are designed to forestall such losses. But not all attempts have borne fruit. Nevertheless, other efforts for such alliances are continuing on a broad scale.

To obtain insurance, international banking, and bank branch automation software, DG is in talks with Citicorp, New York; Life of Virginia, Richmond; Broadway & Seymour Co., Charlotte, Va. In recognition of the importance such software plays in his vision, Crook calls the information networks concept "the value-added approach."

But success with the information network strategy is by no means assured. Digital is preparing to mold its DECnet network into the services-oriented LAN of the future. Wang, with its purchase of Intecom Inc., and IBM with its Rolm Corp. already offer voice/data switches and are also targeting wide area network consulting and services on a broad scale.

A Reliance on Standards

Crook says a strict adherence to international standards will enable Data General to catch users' eyes. "Our view is Digital and IBM will interpret OSI in support of DECnet and SNA. Working behind OSI is a business policy. Theirs will be like Henry Ford's Model T: any color you want as long as it's black," says the florid-faced senior vice president. "We will support IEEE 802.3, 802.4, 802.5—everything."

Digital is on the record supporting OSI, saying that even where elements of DECnet are superior to OSI, OSI will still be offered as an option. IBM is saying that it will treat OSI as a gateway to SNA.

The contrasts will be evident in other ways, Crook says. For one, DG plans to blend voice and data on its LAN. A wide area node to link the LAN to high-speed digital T1 networks also is under development. A third contrast rests with the company's reputation for highly tuned computers.

Present users give Data General high marks for interconnecting Eclipse/MV computers and for ties to SNA. "As far as we're concerned, DG is on the leading edge in tying its own systems together," says Robert P. Bergdoll, general manager of information systems for Ore-Ida Foods Inc., Boise, Idaho. David L. Riffer, MIS vice president at RLC Corp., a transportation company in Wilmington, Del., adds, "We're on-line with 57 locations tied to the mainframe. We don't have the expertise for setting up and engineering the lines. That's an area we're interested in talking about with them," he says.

Despite the apparent enthusiasm, analysts see problems with the strategy. One is the time needed to fully implement Crook's vision of interconnected local and wide area networks. DG's timetable calls for complete OSI support—the first element of the strategy—to take two years. The second element, connecting local and wide area network services, will emerge in phases "to maintain credibility," says Crook.

Frank Dzubeck, president of Washington, D.C.-based consultancy Communications Network Architects Inc., says uniqueness may be short-lived. "I think at this moment they don't understand that this whole industry . . . is getting into it."

Another issue is the targeting of Fortune 500 users. "The only companies which can carry that [strategy] off will be IBM, Tymnet, and ITT," says Patricia B. Seybold, president of Office Computing Group, a Boston consulting company. "There are moderate- to small-sized companies that will be in need of suppliers, but that's not who they're talking about."

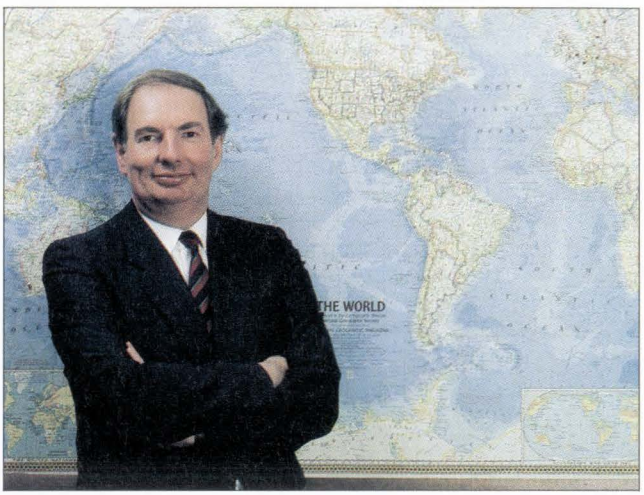
Dzubeck disagrees, saying the Fortune 500 strategy targets a sufficiently broad market. "The Fortune 500 thins out quickly as you get lower." The customer base is an issue because DG's end-user appeal is a recent phenomenon. Having started in oem markets, the company gained visibility largely via its CEO software. License sales in the first six months are up 8.5% compared with a 25% increase for last fiscal year. A spokesman says the growth rate translates to a 17% annual growth rate—close to that of last year's.

Where CEO has penetrated IBM's customer base, Data General by and large hasn't secured its position with business applications. Some say that is a problem in need of a solution. "My impression is that DG was brought in by way of the information center," says the technical center manager for a midwestern consumer products company.

One exception: Beneficial Corp. installed CEO in its Peapack, N.J., headquarters, but the $3 billion finance firm is now going on to develop loan and other business applications that will tie 1,100 branch office systems to its IBM mainframes over an SNA/SDLC network, according to Robert A. Hantak, vp of information services for Beneficial Data Processing Corp.

Crook insists the end users like Beneficial are in place. "A lot of our strength is in the Fortune 500," he says. "Companies in that range are very good customers for us." He refutes the idea that Data General is too small to serve as an information network vendor. "We can persuade the customers that we are one company small enough to get all the players in one room and hash the network out. He who understands networks, systems, databases, and network management will be in a premium position."

In Crook's view, information networks offer an opportunity as vast as the skies. In order to escape its bonds and soar again, Data General will have to strap on a new set of wings and test them in a zone in which it has little experience. Whether Data General soars like the Eagle or falls like Icarus to the sea will depend heavily on Crook's efforts. ■



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COMMUNICATIONS

T1 Networks Are Hot Now, But Could Cool Off By '89

Saturation among big users, the advent of ISDN, and successor T3 services are expected to shorten the life cycle of the 1.544Mbps transmission method.

BY SUSAN KERR

You have to spend money to make money. So goes the old, familiar adage, and a lot of telecommunications managers have been taking it to heart. By investing hundreds of thousands of dollars in T1 transmission services and equipment, many users are finding a payback in as little as six months, compared with the costs of multiple leased lines.

This means boom times for suppliers of T1 multiplexors, and many are riding high. The young market, which some analysts placed at little more than $125 million in 1986, is expected to grow by more than 60% this year. Bolstered partially by a new wave of more technically sophisticated products and by increased user familiarity with the technology, T1 network suppliers are storming their way past the early adopters.

But like any gold rush, this one has its limits. By 1989, market seers predict, sales of T1 multiplexors will be flat. Many of the big name customers who require T1 services will already have signed on. Additionally, new capabilities—most notably the Integrated Services Digital Network (ISDN)—and the advent of fiber optics, which in turn could boost T3 services, are expected to alter the demand for T1 devices.

For now, though, many users are willing to take their chances and sign up for the cost savings. T1 networks, which are digital communication links offering 1.544Mbps transmission rates, have a capacity equivalent to 24 voice-grade lines (T3s are 44.735Mbps, equivalent to 672 voice-grade lines). According to vendors, companies currently using 10 to 12 leased lines can see an ample payback by combining these multiple streams into a composite T1 stream.

Although T1 market figures are small, the users aren't. This has been enough to attract the attention of big-time computer and communications vendors who want a piece of T1 action but don't have the time to produce their own T1 multiplexor before the market window shuts.

But as Glenn Powers, a senior analyst with Northern Business Information Inc., New York, points out, "I wouldn't point at any one of the companies in the T1 market and say it's likely to be an independent, standalone company in five years."

Signs of Market Maturation

While many of the T1 multiplexor vendors in question pooh-pooh the notion of a complete takeover, they admit that signs of encroachment—some prefer to call it market maturation—are occurring. With an estimated 24 companies marketing T1 multiplexors and a general expectation of decreased product differentiation among them over the next year or two, strategic alliances are an attractive and often necessary differentiator.

Tellabs Inc., in Lisle, Ill., has had an oem agreement to provide AT&T with a point-to-point T1 multiplexor for the past few years. A more sophisticated multipoint product, codeveloped by AT&T and Tellabs and to be sold exclusively by AT&T to the end-user market, will become generally available this summer. Other interesting arrangements include the acquisition last September of Cohesive Network Corp., Los Gatos, Calif., by Digital Communications Associates Inc., Alpharetta, Ga.; the recent oem agreement between T1 startup StrataCom Inc., Campbell, Calif., and Motorola Inc.'s Codex Corp. subsidiary, and IBM's Rolm Corp. subsidiary's unofficial agreement to comarket a high-end T1 multiplexor from Network Equipment Technologies Inc. (NET), Redwood City, Calif.

HUGHES SAYS IT'S SAVING MILLIONS WITH T1.

But market analysts point to PBXs as the most likely alternative to T1 multiplexors. T1 multiplexor vendors counter that networks oriented heavily toward voice are well served by PBXs, but that when data become involved, PBXs fall short.

"Will PBX vendors be able to capitalize on the ability to integrate ISDN circuits and do all the switching that T1 multiplexors do now? Yes," says Steven Levy, Hambrecht & Quist Inc.'s communications analyst. Still, he warns, PBXs won't be as "specialized. They won't get all the sexy features of T1."

While emphasizing compatibility and upgradability to ISDN when it becomes commercially viable, T1 vendors say there'll always be a place for T1 multiplexors. T1 is similar in nature to ISDN's primary rate of 23B-plus-D, which consists of 23 separate 64Kbps B channels and a D signaling channel. But as NET product marketing director Lloyd Collins puts it, ISDN "will be providing the highways and we'll be providing the traffic lights."

Moreover, there is the whole issue of private versus public networks. "I still think," says Collins, "that for control reasons, people want private networks."

Price Competition from ISDN?

The answer may be somewhere in the middle. Hybrid networks, combining public and private network components, are already a reality, but they may gather more steam with ISDN. ISDN tariffs are not yet known, but some feel that, down the road, ISDN services could be priced to be competitive with private T1 services. In either case, the winner could be AT&T, which supplies both components. (In the T1 world, AT&T supplies not only its line of multiplexors but the Accunet T1.5 private network transmission service.)

"We'll allow private networks and public networks to coexist," says Allan Halperin, AT&T's Acculink multiplexor product manager. "I think that's the goal. People can put together a network that best suits their needs."

To get to those pie-in-the-sky ISDN services, com-

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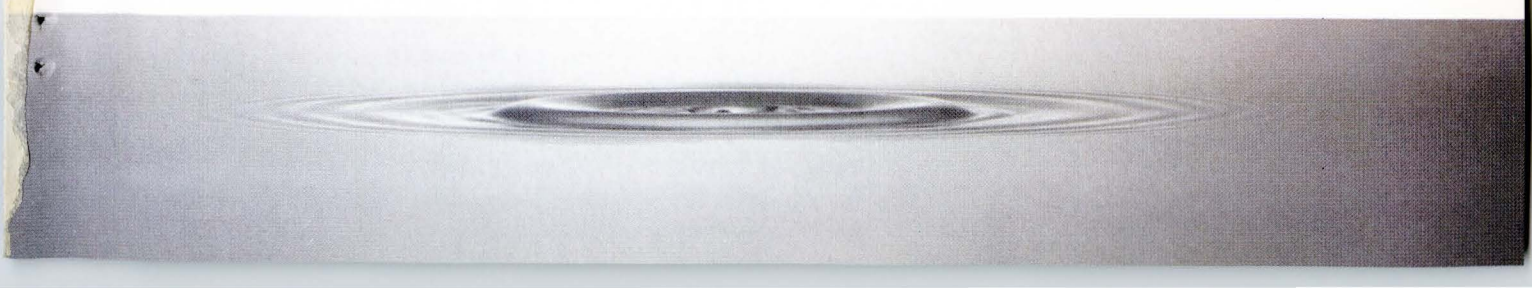

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patibility with the current crop of T1 multiplexors is an issue. Although most of the T1 multiplexor vendors are boasting about the ease with which their products will be upgradable, it may not be that simple.

Comments Tellabs' Jackman, "It's difficult to guarantee [total compatibility with ISDN] because of the lack of final standards. Still, enough is known that there's a good chance."

ISDN is a concern to today's T1 multiplexor buyers, vendors say. D.V. Taylor, a manager of Hughes Aircraft Co.'s corporate telecommunications operations, agrees. Long Beach, Calif.-based Hughes recently decided to purchase NET T1 equipment. A definite plus in Taylor's mind was the fact that NET gear is based on the Signaling System #7 standard, which is similar to ISDN.

Hughes is saving "millions of dollars a year" with its T1 equipment and that's a very acceptable payback, says Taylor. "Realistically, a lot of switches aren't ISDN compatible."

But ISDN as a market reality is at least five, and perhaps closer to 10, years away. Justifying T1 multiplexors today is becoming easier to do.

For example, Combustion Engineering Inc., Stamford, Conn., is in the process of picking a T1 multiplexor supplier this summer, according to the company's telecommunications director, Peter Pappas. Combustion Engineering is planning to use the T1 network for both voice and data, he says.

Dramatic Price Drops

On the low-end of the spectrum, prices of T1 multiplexors have been dropping dramatically. Prices have fallen by as much as 30% at the low end, with estimates of an additional 15% to 20% drop over the next year.

Conversely, at the high end of the market, where there are fewer manufacturers, prices have been stable for the past two years, reports Collins of NET, and they are expected to remain so. In some cases, prices at the high end may increase as more sophisticated products continue to enter the market. Hambrecht & Quist says the average price of a T1 multiplexor was $20,864 between 1984 and 1986, but rose to $26,229 in 1987. H&Q expects prices to remain at this level until 1989 when cheaper and more reliable manufacturing processes take hold.

At today's figures, however, not everyone is finding that they can justify the cost of T1 equipment. Bechtel Group Inc., with a large number of field operations, looked at T1, but found that it wasn't viable for the company, says O. Ray Pardo, telecommunications manager at Bechtel Eastern Power Corp. in Gaithersburg, Md. Bechtel will lease 56Kbps terrestrial facilities instead.

The dropping prices of fiber optics could conceivably help T3. Used today only by a few companies, T3 offers a capacity 28 times that of T1. And T3 is priced in the range of only three to six times that of T1. Collins of NET puts the number more in terms of 12 to 14 T1s equaling the price of a T3. But NET "is starting to see some demand," he says.

"People who two years ago didn't think T1 would become anything, think T3 isn't important today," according to Joseph Rosenthal, DCA's network communications group marketing vp. In the next two years, he predicts, T3 will move from being the domain of the Fortune 30 to the Fortune 300. "The requirement for bandwidth is up, up, and up," he says. "And that's fine, since the cost of bandwidth is going down, down, and down." ■

BENCHMARKS

Computer Associates To Acquire Uccel

The trend toward consolidation in the software industry continues as two companies—Dallas-based Uccel Corp. and New York-based Computer Associates International Inc. (CA)—have agreed to merge. The marriage, which is subject to shareholder and regulatory approvals and is scheduled to commence Aug. 15, calls for CA to pay $800 million in stock for all outstanding Uccel common shares. Charles B. Wang, Computer Associates' chairman and chief executive officer, says his company plans to support all Uccel products and will maintain two separate product lines, adding that certain Uccel technologies, such as graphics and microcomputer software, may be merged with CA's products. Uccel's chairman, Gregory J. Liemandt, says that CA may eventually eliminate products that overlap with CA offerings, particularly in the systems software area. Wang says layoffs at the two companies may occur as a result of the merger. The merged company will retain the name Computer Associates International, and Wang says he will continue as chairman. Liemandt says he will resign when the merger takes effect. Liemandt is credited with bringing much needed change to Uccel, focusing the firm on systems software and banking applications (see "Trimming the Fat," Dec. 15, 1986, p. 37). Last year, the company shed half its revenue producing businesses, underwent a major realignment of its systems software division, and intensified sales efforts in the banking arena. The company laid off 900 employees and sold divisions that accounted for $103 million in revenues.

DEC Contracts

Digital Equipment Corp. garnered two government contracts to supply the U.S. Census Bureau and Air Force with VAX 8000 series and MicroVAX II computers. In the former, the Maynard, Mass., company will deliver up to $80 million worth of systems and software under a Census Bureau modernization project over six years. The pact includes VAX computers, database, languages, and applications in preparation for the 1990 census. A separate multimillion-dollar contract will have Digital furnish the U.S. Air Force with MicroVAX II computers running its Unix-like Ultrix operating system.

Cullinet-Fujitsu Accord

Cullinet Software Inc. is teaming with Fujitsu Ltd. to guarantee compatibility of its database software on the Fujitsu MSP mainframe operating system. The three-year accord aims to insure that IDMS/R applications can operate on FACOM-M mainframes after revisions to the MVS-like operating system, a Cullinet spokesman says. The agreement includes exchange of technical data. Fujitsu is one of several plug-compatible vendors that have been attacked by IBM for allegedly violating protected features of IBM's operating system. The challenge is currently in arbitration.

Microsoft Invests in Natural Languages

Microsoft Corp., Bellevue, Wash., creator of PC/DOS and MS/DOS, has ventured into natural language waters by making a $1 million investment in Natural Language Inc., which is based in Berkeley, Calif. NLI's base product, DataTalker, interfaces to SQL-based relational database management systems. In addition to its investment in NLI, Microsoft has licensed the company's technology for use in future Microsoft products. ■

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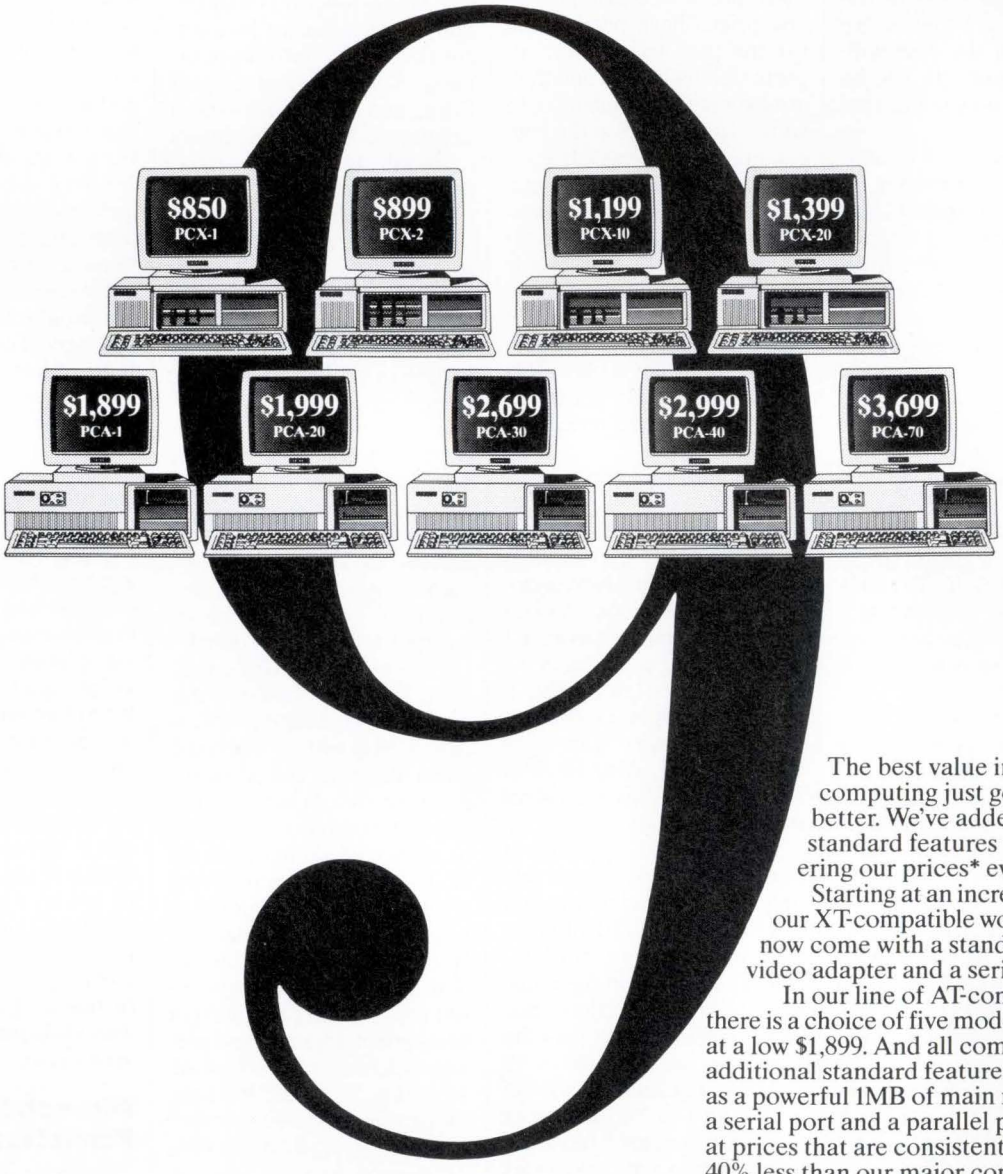

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Behind the News

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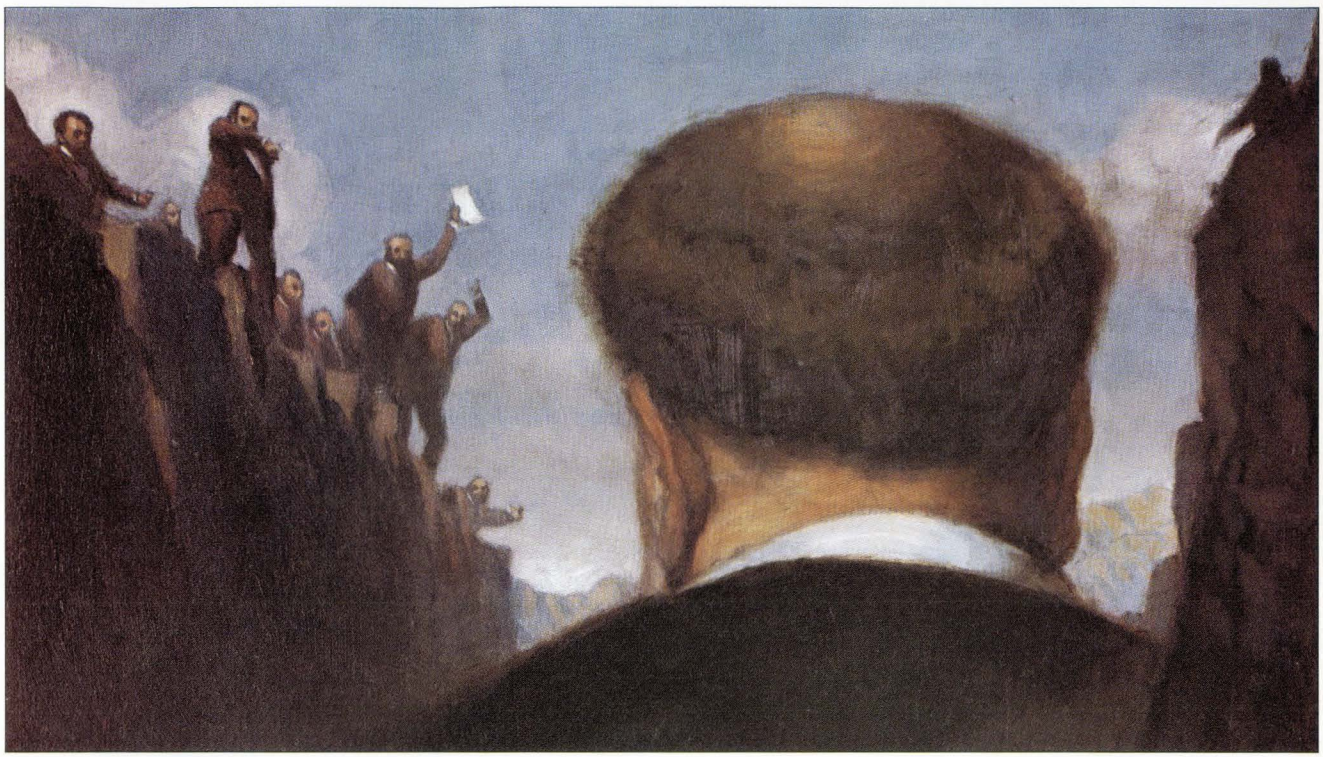

Illustration by Don Adel

A Peek Behind the Scenes Of the Refurb Business

A little-known lawsuit has charged IBM with illegally trying to block international traffic in mainframes by third-party companies.

BY HESH WIENER

The second most powerful person in the computer business sat in the witness chair on Feb. 12. Paul J. Rizzo, vice chairman of IBM, was not distracted by the snowstorm that was gathering over the Federal Courthouse in Philadelphia. Nor did it matter on that Thursday afternoon that it was Lincoln's Birthday. What occupied Rizzo's attention was the attorney before him, Robert G. Levy. Levy represented Allen-Myland Inc. (AMI), a small Pennsylvania company known in the computer business as a "refurb house."

AMI reconfigures and refurbishes IBM computers. Its immediate clients are mainly computer leasing companies; its indirect clients are users of IBM's largest machines. AMI had put IBM on trial—and Rizzo on the witness stand—for allegedly violating antitrust laws. The little-known lawsuit and trial has provided a rare glimpse, through court documents and testimony, into how IBM does business in the refurb market.

Exactly three months earlier, on Nov. 12, 1986, Levy had grilled Rizzo. As part of a deposition in preparation for the trial, Levy asked Rizzo about certain IBM practices and various materials from among the 350,000 pages of documents churned up during discovery. One of these items was a one-page handwritten memo known as Plaintiff's Exhibit 10. Levy realized it was important, but had not yet been able to place it into the context of his case.

He had shown the document to Rizzo, and in a moment of confusion, which would later prove to be embarrassing, Rizzo had said that the notes looked like his own handwriting.

Plaintiff's Exhibit 10 refers to one of IBM's pricing policies, a service surcharge placed on some mainframes when they were moved between countries. The policy was called the Installation and Warranty Service Charge (IWSC). At the top, the document said, "Objective." Some notes followed. On the last line of the page, Levy told the court, it said, "prevent the non-IBM export of machines." The Baltimore lawyer took this as proof that IBM had instituted the surcharge in order to block competitors.

Now, Rizzo was again facing the adversarial attorney across a courtroom, all because of a lawsuit brought by a company so small that all the money it took in during its best year came to about one half of one percent of what IBM takes in on an average working day.

IBM's response to the suit, filed on Oct. 25, 1985, was not so small. It brought in its top lawyers, made its executives available to testify, brought several computer users into the courtroom as witnesses, and fought the plaintiff tooth and nail at every point. During the course of its defense, IBM revealed in great detail the costs, pricing, and policies that govern its mainframe business. IBM showed, for the first time since it whipped the U.S. government in a 13-year antitrust battle, just what makes it tick.

There are several possible explanations for IBM's willingness to expose itself in the course of litigation, say antitrust lawyers who agreed to comment only on the condition that they remain anonymous. First, IBM does not take any lawsuit lightly. When the company cannot quickly end a dispute via a settlement, it fights to win. Second, IBM is particularly sensitive to antitrust suits, both as a matter of business policy and concern for its public image. Third, the AMI suit, if lost, could cost Big Blue a bundle of money. Using AMI's victory as a base, other parties might send in their lawyers, like sharks in a bloody sea, to attack a vulnerable IBM. Not only a handful of refurb houses, but dozens of leasing companies and hundreds of end users, could conceivably sue for damages if it were shown in court that the giant had unlawfully hurt tiny AMI—and that AMI's pain was theirs as well.

So the stakes were high, and Rizzo was fighting back. Part of that defense was admitting that his response, when he was first confronted with Plaintiff's Exhibit 10, was impulsive—and wrong. As he explained in court last Lincoln's Birthday, "I had absolutely no recollection of the document until [Levy] confronted me with the document at my deposition. I made the radical assumption that it came from my files." The author, IBM said, was Phillip Guthoff, a staffer at IBM and not, like Rizzo, a member of the elite Management Committee that guides the computer maker's most important policies.

The Courtroom Drama Goes On

Regardless of the actual meaning of the document, the courtroom drama over AMI's charges continued, as documents and testimony show. (Neither IBM nor AMI would agree to discuss the case with DATAMATION). According to AMI, IBM illegally tried to block international traffic in mainframes by third-party companies. The specific tactic cited by AMI is IBM's IWSC, instituted on July 1, 1980. At that time, there was a significant difference in 303X mainframe prices between the United States and Europe. Third-party dealers used AMI and other refurb houses to convert machines from American 60-cycle current to European 50-cycle current. Some of the machines were relatively new and still under IBM's one-year warranty when they were moved to different countries. As the pace of international shipments accelerated, IBM slapped the IWSC on its machines in return for extending its warranty coverage to mainframes that were shipped internationally. The charge came to roughly 10% of a computer's list price, enough to discourage further traffic and curtail AMI's cycle conversion business.

As the airlift of IBM 3033 mainframes by third parties dwindled during the second half of 1980, some lease rates in Europe rose slightly. End users who had been able to arrange leases based on the lower cost of the machines from other nations could no longer get the bargain mainframes. However, only a relative handful of systems, a few dozen by most experts' reckoning, actually jumped the Atlantic on the cheap before IBM's IWSC closed the window of economic opportunity. Much later, as used 3033s, which were no longer under warranty—and were therefore unaffected by the IWSC—came on the market, large price disparities between the American and foreign used computer markets led to flurries of international shipments. But there was never again a large and sustained economic opportunity, as there had been when the 3033 was new, so a flourishing trade did not develop.

A CENTRAL CHARACTER IN THE CASE WAS IBM'S IWSC.

AMI was not the only company that felt the IWSC was grossly unfair. In 1984, Comdisco, the largest independent lessor of IBM equipment, had discussed the IWSC with IBM. Any differences between the lessor and IBM were ironed out in discussions, and subsequent friction over the policy was halted when the IWSC was dropped on Jan. 1, 1985. IBM reverted to a provision in its sales contract that existed even before the IWSC was instituted and said that shipping machines to certain foreign countries was grounds for terminating its warranty.

AMI contends that until the imposition of the IWSC, IBM had, as a matter of practice, honored its warranties on the relative handful of mainframes shipped internationally by third parties, regardless of the wording in its sales contract. In any event, IBM says it now enforces the warranty provisions in its sales contract.

The IWSC was but one aspect of the suit brought by AMI in October 1985. A more dramatic charge leveled by the 30-employee refurbisher was its accusation that IBM had bullied a parts vendor into refusing to do business with AMI. In legal terms, AMI accused IBM of "unreasonable restraint of trade" and "tortious interference with business relationships and prospective business relationships."

The Pump's the Thing

AMI explained to the court that one vital part used in converting water-cooled IBM mainframes to different electric power systems is the coolant pump. It's not made by IBM, but by Marlow Pump Co. of Midland Park, N.J., a division of ITT. While IBM sells the pump to users or independent service companies for $12,500, Barrish Pump Co. of Bohemia, N.Y., an authorized Marlow distributor, sells an identical unit for $1,500. When AMI tried to buy some pumps from Barrish for use in mainframe cycle conversions, the refurbisher alleges, it was refused the merchandise. AMI says that IBM had induced the manufacturer or the distributor to block the sale. IBM says it has no idea what AMI is talking about and asserts that it never tried to restrain trade in the water pumps. Barrish, which is not a party in the suit, was not represented at the trial.

If it turns out that Barrish acted on its own in refusing to sell the pumps to AMI—even if it had done so because it was afraid of losing IBM's business—the refurb house does not have a claim against IBM. Generally speaking, say antitrust lawyers, in order to have a valid claim, AMI would have to show that IBM and Barrish conspired together in order to lock AMI out of the market. The trial record shows that AMI did not follow up in court on its accusation.

The heart of AMI's complaint, however, and the issue with the greatest complexity, surrounds IBM's pricing of upgrades for its 308X series. AMI has tried to show that IBM charged so much for the parts used in upgrades, and so little for the labor, that competition from AMI was unfairly suppressed.

In another aspect of its suit, AMI argued that IBM's complex formula for pricing parts made it nearly impossible for the refurb house to do business. The

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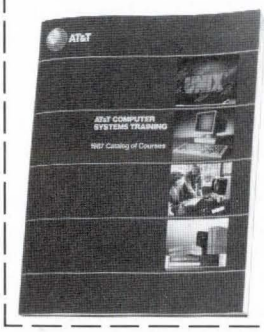

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plaintiff saw its revenues cut by two thirds to about $5 million in fiscal year 1985 from more than $15 million in their 1982 fiscal year. AMI blames its declining business in large measure on what it characterizes as IBM's deliberate acts. AMI's challenge was to show that IBM distorted its prices in certain ways that violate the law. For example, if IBM had charged an arm and a leg for upgrade parts, but had pretty much given away the labor—which is principally all AMI had to offer to its customers—AMI might have a legal claim.

The Changing Technology Defense

IBM, of course, has wide discretion in pricing its equipment. Its defense against AMI's suit was, in part, an assertion that AMI's problems in the upgrade business were the result of changing technology. IBM denies it is guilty of predatory pricing, and further says it has not practiced what AMI's advocates call "tying." To tie, under the law, is to bind the purchase of one good or service to another, thereby forcing the customer to take both when only one is wanted.

As AMI and IBM argued this aspect of the case, they gave the court quite an education in the workings of the computer business. A lot of users would be surprised at the facts entered as evidence, many of them referred to but not explicitly presented in the courtroom trial. But these users are unlikely to ever gain access to the inside information IBM and AMI presented to the court. Much of the material the lawyers dug up was sealed from view. One party or the other believed that potential injury could result from disclosure, and argued that this threat outweighed any public interest. Nevertheless, the documents left in the public record of the case shed new light on IBM and the way its competitors in the leasing and the refurb businesses conduct their affairs.

A good portion of the case revolves around the way IBM bundles bits and pieces of computers into kits for technicians to install. IBM calls such a kit an MES, which literally means Miscellaneous Equipment Specification. This is a misleading term, because an MES is a good deal more than a mere technical description; it is a complete set of parts and related documentation.

IBM sells an MES with or without labor charges, but the prices are nearly identical. IBM's installation fee for a 308X upgrade, for example, is only 2% of the hardware charge. This wasn't always the case. With the 308X line, IBM introduced what it calls thermal conduction modules (TCMs), metal cans about six inches square and a couple of inches deep that are crammed with logic. If a part fails, or a chunk of a computer must be replaced, changing a TCM requires a fraction of the effort it takes to swap an equivalent amount of IBM's prior generation of circuitry. IBM is very proud of its TCM, and its struggle to mass produce it.

According to Gerry Granito and G. Kenneth Williams of IBM's Poughkeepsie Laboratory, who both provided testimony or affidavits during the case, the company began to develop the TCM in 1967. It took IBM 14 years—until 1981—to get it out the door in a commercial product. Along the way, IBM invested over a billion dollars.

"The 308X computer didn't come out on time," said IBM's lawyer Evan Chesler, of the New York firm of Cravath, Swain and Moore, on the first day of the trial. "It was so difficult to make them [TCMs] in large volumes and get enough of them out at the end of the line that worked . . . that it took two years longer than IBM had thought to get it into the field. Meanwhile, the 3033 computer was . . . by computer industry standards an old machine."

IBM HAS DENIED IT IS GUILTY OF PREDATORY PRICING.

With the 308X way behind schedule, IBM needed to come up with a scheme that would keep 3033 orders rolling in. It had to promote the 3033 as a living system rather than the dying one it actually was. So IBM announced new versions of its flagship 3033-U. Called the 3033-N and 3033-S, these were actually downgraded versions of the faster machine. Simultaneously, IBM added features to all of the 3033s, which improved performance somewhat. As IBM flogged its renewed 3033s, its engineers were flailing away at the TCM's problems.

The smaller 3033s were distinctly different from the machines they succeeded, the 3032 and 3031. They embodied an idea that would be fully implemented on the 308X products. The 3033 models N and S could be upgraded in the field to versions with more MIPS.

The Last Generation

The labor involved in upgrading 3033s was considerable, and permitted third parties like AMI to successfully compete with IBM's service engineers. But these machines would be the last generation of mainframes that afforded independents like AMI such a golden opportunity. The 308X machines, like the late-model 3033s, can be upgraded on the customer's premises. But almost all of the price of a 308X upgrade represents parts.

When the 308X machines were first introduced, the upgrades were priced so that they cost the same as the price difference between successive models. This pricing strategy was continued as IBM announced mid-life kickers, the 308XX models and then the 3090s. IBM has since reduced prices on upgrades of its original 308X machines so that it could compete with used equipment sold by third parties.

Most upgrades that boost MIPS are net priced. Aside from labor, the net price is the price of the new parts less the value of the old parts, which IBM removes when it performs an upgrade. The returned TCMs are recycled through IBM's manufacturing operation at a cost to it of only about $4,000 apiece. According to IBM, they are then equivalent to new TCMs. When a service company gives IBM a defective TCM to recycle, it gets a good one (which may be secondhand) for $17,000.

In a Jan. 16 courtroom argument that preceded the actual trial, IBM's lawyer, Evan Chesler, explained this to Judge Clarence Newcomer (who turned the case over to Judge Thomas O'Neill before the trial began). Judge Newcomer's curiosity was piqued.

"You haven't run into the General Motors problem?" the court asked. "[The one] they ran into using Chevrolet engines in Cadillacs?"

"No, your Honor," Chesler replied, "because these are all Cadillacs."

Whether they are Chevys or Cadillacs, or Edsels for that matter, IBM keeps careful control of the parts in the engines. In the case of a 3083-E to 3083-B

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upgrade, for example, IBM replaces two TCMs and keeps the pair that has been removed. In July 1985, the upgrade of a 3083-E, which runs at roughly 4MIPS, to a 3083-B, which runs at roughly 6MIPS, was net priced at $420,000, of which $2,400 was IBM's labor charge, court documents show. This means IBM was paid more than $200,000 for each TCM that was swapped. This was pretty profitable for IBM, even if the returned parts were no good: the average direct cost of making a new TCM was only $12,000, say the documents.

When users want a model-to-model upgrade, they almost always call in IBM. But independent leasing companies are different. They don't always go to IBM for an upgrade. Lessors would rather hire companies like AMI because refurb houses get the job done faster than IBM—which can take months to schedule and complete an upgrade. Leasing companies can't afford to wait. It's very expensive for them to sit on a large mainframe, getting no rent, until IBM gets around to souping it up.

Upgrades are priced as kits, and IBM's over-the-counter prices on individual TCMs are substantially higher. For example, according to a sworn statement by Alan Ross, group director of finance for IBM's Information Systems Storage Group, the September 1985 net price IBM asked for upgrading a 3083-B to a 3083-J, including labor, was $365,000; the five TCMs, if purchased individually, listed for $805,000. These are the same TCMs that cost IBM an average of $12,000 each to manufacture.

If a third party orders a net priced MES and it doesn't return the parts it's supposed to, IBM will send it a whopping bill. That's just what happened to a large leasing company when it worked with AMI to perform an upgrade.

Exactly one week before Paul Rizzo testified in court, AMI's lawyer, Robert Levy, put a leasing expert on the stand. Robert van Hellemont, at the time a lease investment executive with the Wall Street firm of Thomson McKinnon Securities Inc., used to work for CMI Corp. CMI, headquartered outside of Detroit, is the second largest independent lessor of IBM mainframes in the country.

According to van Hellemont, AMI had come to CMI and told the lessor about a discovery its technicians had made. The parts that were used to upgrade IBM's smallest 3083, the model E, to its fastest 3081, the model K, and those used to upgrade a 3081-D to a K were the same!

This was in 1983, when IBM charged $400,000 to upgrade a D to a K during a special sale; the usual price of the upgrade was $600,000. And at the same time, IBM charged about $1.5 million to upgrade a 3083-E to a 3081-K. But these were net prices; different parts were returned to IBM in each case.

"AMI said," van Hellemont recalled, "that we could . . . supply [AMI] with an E and then also supply them with a D to K upgrade . . . give them those two pieces of equipment and they could produce a 3081-K, which was a machine that was clearly much more valuable to us than a 3083-E and a D to K upgrade."

CMI just happened to have such an upgrade, and a 3083-E, too. There may have been another TCM needed by AMI, according to the refurb house's cofounder Larry Allen, who recalls getting one additional can of circuitry from CMI.

IBM HAS OFFERED TO SETTLE BUT AMI HAS REFUSED.

"So we used the D to K upgrade," van Hellemont continued, "gave it to them, and they created a K out of them, and it was subsequently installed at Philadelphia Electric."

Certified for Maintenance

IBM inspected the 3081-K at AMI's plant in Broomall, Del., and certified it for maintenance. But IBM got wise to the situation. It asked CMI for parts back, the parts that should come out of a 3081-D when it is turned into a K. CMI, of course, didn't have them, and neither did AMI. How could they? There was never a D involved in this upgrade.

"When IBM demanded the parts back," van Hellemont went on, "and we said, you know, no . . . they insisted we pay for them. And we, of course, we insisted that we already paid for them.

"We paid them in full, the full $400,000. In any event, they insisted. They told us the purchase price of the parts would be approximately $4.5 million."

"For the parts you had used?" asked Levy.

"Right," van Hellemont responded, "which in our judgment was ludicrous, since . . . this was only an upgrade . . . . You could have bought a D for say three million; you could buy a K for three million six. They're charging us four-and-a-half million just for that upgrade."

In the end, CMI had to retreat. The lessor had another machine pulled apart so it could give IBM back the parts. Ironically, the 3081-D was not even in new production at this time; it had been succeeded by the 3081-G, a slightly faster version of the dyadic processor.

AMI, like its client CMI, may find itself in an untenable position. IBM has offered the refurb house chances to settle out of court, and, until the courtroom phase of the trial wound up, AMI had refused to accept a deal. Any settlement would have to get AMI off the hook on IBM's countercharges, for IBM not only sought to defend itself, but also to punish AMI for behavior IBM says was improper and illegal. Among other things, IBM says that AMI illegally copied IBM's microcode and manuals. IBM additionally claims that AMI induced IBM's customers to breach some agreements to protect IBM's copyrighted materials.

IBM's charges may serve more than one purpose. First, IBM feels it must protect its microcode and manuals. If AMI has abused IBM's rights, and IBM does not defend itself, the microcode and manuals could end up in the public domain. Second, AMI's antitrust allegations will never stand up in court if IBM can show that its adversary is seeking to defend an illegal business. Antitrust laws protect only lawful business from antitrust violations. When IBM countersued, AMI went to court pleading that AMI's suit and IBM's countersuit should be tried separately, but IBM prevailed, and the two suits were consolidated. If, in the course of defending itself, AMI can prove that IBM did not protect its microcode and manuals, old wounds from the IBM-Hitachi battles may be reopened.

In the meantime, the matter is before Judge O'Neill. There's no telling when he will render his judgment or what it might be. The two parties can still settle out of court. And even when a decision does get handed down, a lengthy appeals process could well ensue. ■

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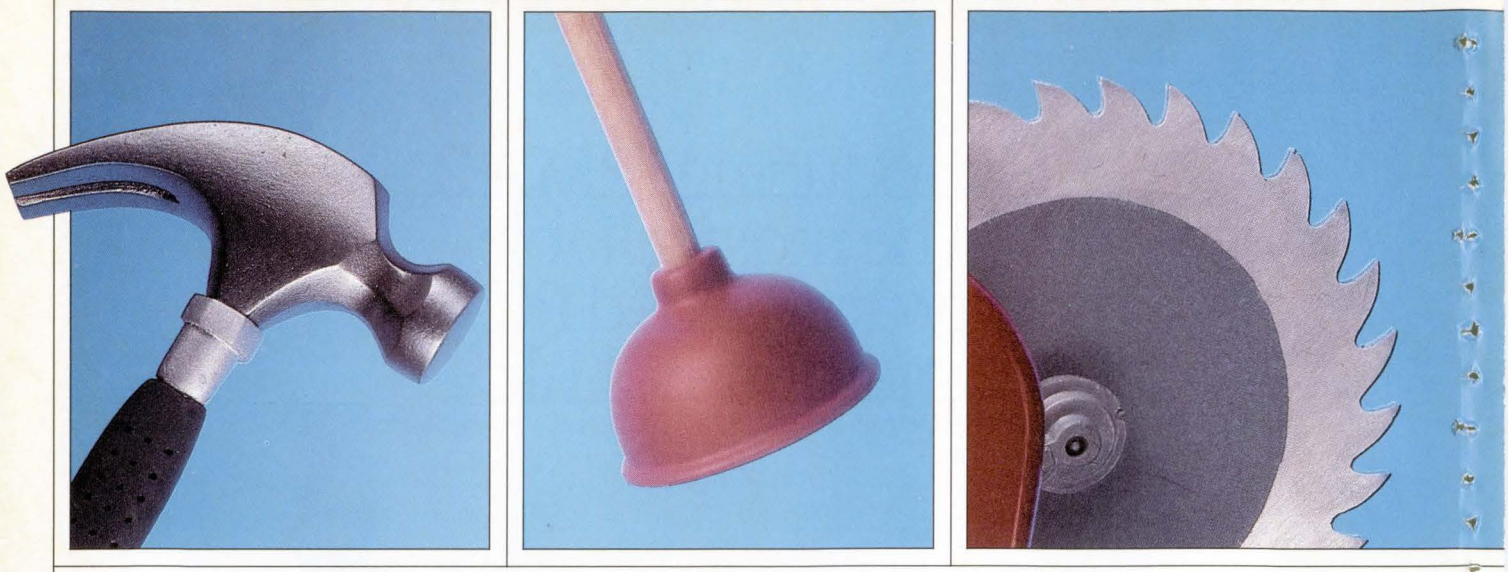


Integrated Software:

Integrated applications software promises tools that will tear down the formidable walls that compartmentalize mainframe-based accounting applications in an arbitrary fashion. Both users and systems developers want to be able to move from one application to another in a seamless and consistent fashion, and software vendors are helping them achieve that goal through integrated systems with facilities that provide feasible and flexible solutions for accounting chores. Users report this software is good in terms of actual usage, benefits, and vendor support.

BY DON LEAVITT

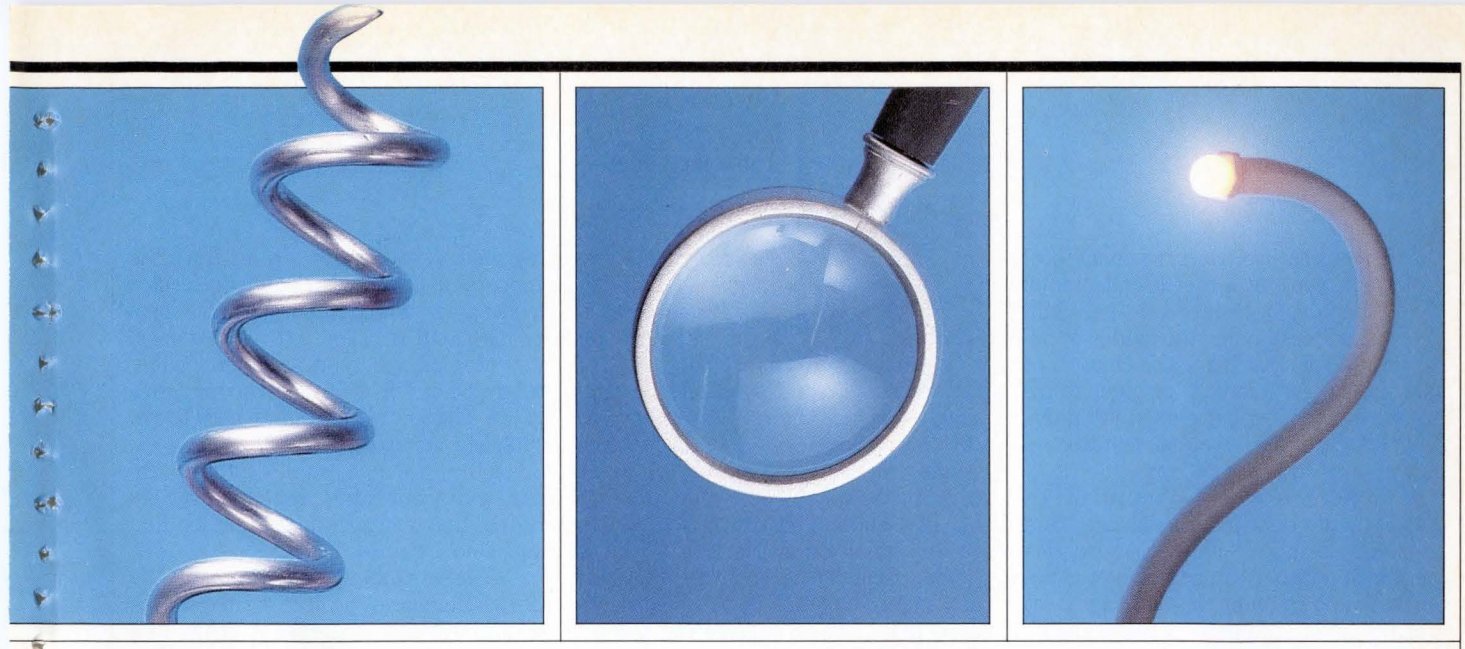
One of the main forces behind the drive for integrated application systems is the desire to demystify the computer. The pc, with its links to corporate or departmental mainframes, has changed the way people work. It's also changed the way they want their systems to work for them. Having seen how tools could be integrated at the micro level, users and systems developers alike have become frustrated by the arbitrary but formidable walls that compartmentalize mainframe-based accounting applications.

Striving to tear down those walls, users have pushed for the ability to copy and download information from files on a host machine to their pcs. They seek consistent ways to extract and enter information. They want to be able to move from one application to another without losing track of where they are in any of the suspended applications. They want the ability to reach data wherever the data are stored and to run their jobs free from hardware or processing mode restrictions. In essence, what today's users want are options—they want to have as much flexibility in information processing as they had when accounts were kept in ledgers that could be reviewed and then put aside without formal "opening" or "closing" protocols.

These longings have prompted a number of software vendors to offer integrated application packages. In one recent poll, users identified 25 different suppliers of integrated accounting systems. Software being software, the products differ one from another in many respects. But they also have a common thread in that they usually provide a choice of application modules surrounded by a separate collection of service modules. These modules are intended to handle a single common function such as security, on-line help, diagnostics, screen access and management, file access, cross-program navigation, query, and report writing.

That in effect is the basic architecture. But what are the benefits of that architecture to users? Vendors have various responses to that question. Mark Wasilko, vp of marketing at Computer Associates International, Garden City, N.Y., claims that well-designed integrated application systems should include the following characteristics:

- screens that can be modified by the user to satisfy different business requirements;
- help text and problem diagnoses that can be defined at multiple levels such as user, department, and division;



Tools for Today

- navigation between application modules;
- the ability to integrate external applications, such as related commercial or in-house systems, into the host environment;
- and portability across operating systems such as MVS and DOS/VSE in the IBM mainframe arena, and often Unix or VMS in the Digital Equipment Corp. world.

A different perspective is presented by David LaFleur, vp of banking architecture at Uccel Corp. in Dallas. (Ironically, Computer Associates agreed in May to acquire Uccel.) LaFleur maintains that in their most comprehensive form, these new application systems fulfill users' needs for operational, informational, and technical integration. Operational integration pertains to the way these systems extend automated control into manual areas. Informational integration refers to the orderly approach to resource utilization through such means as shared data. And technical integration encompasses such elements as reusable code.

USERS LIKE THE CONSISTENT APPROACH OF INTEGRATED APPLICATIONS SOFTWARE.

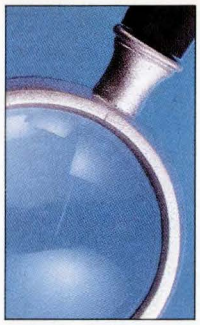
Some See Risks

These capabilities clearly appeal to a lot of buyers. In fact, integrated systems are often cited as the hottest products in the mainframe marketplace. All this heat has sparked some debate as well. The central question in that debate boils down to whether or not a commitment to an integrated system of applications is risky.

Those risks are very much on the minds of MIS managers, who worry that a decision to go with one particular vendor will lock them into that vendor's integrated system product and prevent them from going elsewhere when new technology comes along. They know that some suppliers have acquired individual applications from third parties and they wonder just how well integrated those applications really are. They are also nervous about the viability of some vendors and are worried that promised applications may never materialize.

Some users say they're afraid they'll have to give up all their currently functioning systems if they go the integrated route. Others are troubled by more specific issues. They've heard, for example, that the generic report writing facilities in these integrated packages can't move data directly to the screen or to the printer. Instead, report files have to be set up first.

Photographs by Chuck Carlton; 3-D illustration by Kathy Jeffers



Integrated Software: Tools for Today

There are also concerns about integrated software at a more fundamental level. There is, for instance, the possibility of misunderstanding the hidden application logic of a package. The chances of such misunderstanding occurring are made even greater because of the intertwined logic and ease-of-use features inherent in integrated systems.

Ed Kerr, vp of QED Information Sciences, the dp education, publishing, and consulting firm in Wellesley, Mass., has long believed that companies go for the quick solution of buying packages instead of taking the time to analyze what they really need their systems to do. Thus, if they don't take the time to sort out the logic of one application, they are even less likely, reasons Kerr, to track through the logic of several.

Tools provided by many of the integrated systems enable users to enter a transaction from almost anywhere. As a result, it's hard for users to know what has happened to the files they may have affected. There could also be glitches from packages that provide programming tools. Kerr in particular questions how well users or even MISers could audit changes made in one of the programs were problems to crop up somewhere down the road.

The vendor community addresses these user concerns in very predictable ways. Each of the major vendors that acquired part of its present system from a third party says reassuring—and probably accurate—things about having rebuilt the outside software from the ground up to match its new architecture.

User Response Is Good

Meanwhile, users have their own stories to tell about their early experiences with integrated applications software. Most of those stories, while still tentative appraisals, are generally positive. That generally positive assessment of integrated systems holds true in terms of installation and usage experience, as well as in terms of benefits and vendor support.

Gene Bauer, senior vice president of Horizon Financial N.A. in Pittsburgh, reports that his $2.5 billion savings and loan organization is now "dedicated" to the Financial Information System (FIS) from Hogan Systems in Dallas. He cites the recently announced IBM-Hogan marketing agreement as one reason for choosing the software.

Bauer is convinced that integration is the "way of the future" and that FIS will help Horizon in its effort to merge its two data centers in Pittsburgh and Philadelphia. Because installation is such an important part of that effort, the company, confirms Bauer, is determined to stay "pure vanilla—get the basic system in, and add features later when we're ready for them."

Installation and conversion chores are still going on at Horizon, which is planning to put FIS up on its IBM 4381 that runs under MVS/XA. The in-house installation team, which started the project with about eight workers, will ultimately include from 25 to 30 technicians.

Commonwealth Telephone in Wilkes Barre, Pa., was also able to do most of its installation work itself. The 100-year-old communications company, which needed to update its applications in the brave new world of deregulation, decided to go with the Masterpiece series from Software International (SI), which was acquired earlier this year by Computer Associates.

Assistant vp James Karney, who is manager of financial systems development at Commonwealth, found that SI's installation guides enabled the company to perform most of the chores on its own. "The longest 'install' took us two days," Karney recalls. "Three others were installed in another two-day stretch."

In San Diego, David Burns, director of financial management systems at Imperial Savings Association, is cautiously positive in his appraisal of his vendor, McCormack & Dodge of Natick, Mass. Imperial uses eight of M&D's Millennium packages and utilities, including payables, capital projects, human resources, fixed assets, general ledger, The PC Link, Management Report Writer, and Systems Development Tool.

Burns says the packages, which apparently satisfy the users, are "fairly consumptive" of computer resources. That is a minor concern, however. More important in Burns' opinion is the M&D support, which he describes as "really good in both quantity and quality. The long and the short of it is that we could give an awful lot of training to people all across the different applications without having to go through 'Now, here are the peculiarities of getting into general ledger' or 'Here's how to get into human resources.' "

The users interviewed mentioned repeatedly the consistent approach in such areas as program structures, screens, and menus offered by their integrated systems. As far as Burns is concerned, the consistent user interface means that when Imperial's data processing staff is called in to help a user, it is possible to determine immediately where he or she is in the executing program. The staff also knows how to respond to standardized error messages. Since they are able to pinpoint the location and scope of a problem, explains Burns, they can zero in on the solution much more quickly.

The same thoughts were echoed by Chris Hennifen, project manager for book business systems at Time-Life Books in Chicago. His systems, which run on an IBM 3093, produce roughly 2,000 accounts payable checks a month and support close to 250,000 ledger masters. With systems this busy, he explains, "it's nice to have very similar application architecture as well as common files and common JCL."

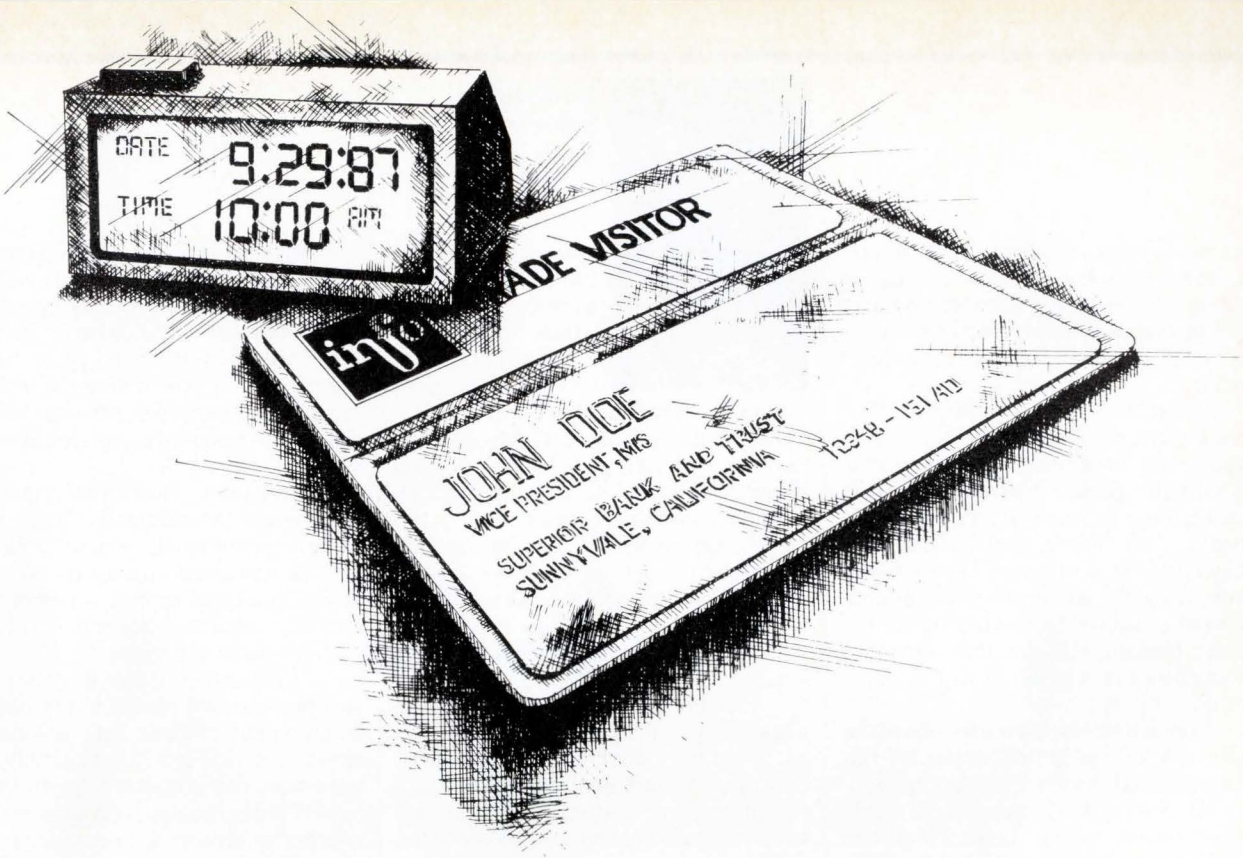
An SI customer, Time-Life Books moved to the Masterpiece environment "because it was sent to us as the next release of our system," explains Hennifen, who says that he was specifically involved in the selection of the accounts payable piece of that family. Users were also very involved in this selection process. "It was a user decision primarily because they were so happy with the ledger that they wanted to stay with the vendor," he explains.

Time-Life Books was also generally satisfied with the installation support it received. "Either we're dynamite installers or very lucky," quips Hennifen. "I've talked to quite a few other sites that have had problems when it came to bringing up the accounts payable system."

Hennifen also had kudos for Masterpiece on the technical side. "Masterpiece is as transparent as you want to make it. From our perspective," he sums up, "it's great having to go through only one installation procedure. Since [the general ledger and the accounts payable] come from the same vendor, we only have to alter one CICS region, not one for each system."

Programming Facilities Satisfy

The programming facilities offered by integrated packages are also satisfying those data processing centers using them. One of those satisfied customers is Jack Morganstein, senior systems manager at Merrill Lynch's data center in Princeton, N.J. Morganstein's crew is using the System Development Tool that goes with the Millennium software to build "some pretty sophisticated on-line



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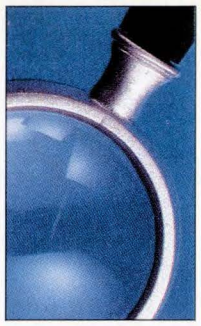

Integrated Software: Tools for Today

screens." They are also using it to create several on-line account translation routines to correlate account numbers used in regional ledgers with the numbers used on Merrill Lynch's centralized system.

BankOne, the Columbus, Ohio, bank holding company, uses Information Expert, the integrating facilities provided with the Expert software line from Management Science America (MSA) in Atlanta. That facility, explains BankOne financial services manager Terese Klein, came in handy when the financial conglomerate wanted to continue using the sundry banking systems that came into its inventory as a result of recent acquisitions.

Consistency is, of course, one of the hallmarks of integrated systems. But sometimes consistency can be misleading. At Sunmark Companies, a candy maker based in St. Louis, Maureen Fleishmann, manager of financial and administrative systems, learned early on to be wary of apparent similarities. She recalls that two of her previous MSA packages had identical names for report writers, but the facilities turned out to be wildly, distractingly different.

She points out, however, that there was an appealing similarity in the application structures. That similarity was carried even further once the Information Expert versions of the applications became available. Sunmark made the switch, signing up for both the common report writer and several MSA applications. The candy company also acquired the right to use the Information Expert with some of its packages from other vendors.

Fleishmann reports that the Information Expert installation, which runs on an IBM 4381 under DOS/VSE, required only one programmer and one user representative per system. She is pleased with the flexibility and ease-of-use of the new environment, which she says allows users to handle such things as "reports the way we want them" and "real verification of the numbers in the general ledger and the fixed assets books."

So, what kind of tool is the integrated application system? A good one for almost any of the conventional accounting areas. And that tool is destined to be tinkered with and improved upon. In fact, there's already talk in both the user and vendor camps of linking this kind of software to micro-based integrated packages such as Lotus 1-2-3.

Ultimately, integrated application systems are the culmination of the move from conventional, single-application files to database managers. Whether driven by a DBMS or by a series of interrelated VSAM files, integrated software requires dedicated support.

"Users must realize that they need real professional planning and ongoing management of their data resources," says Uccel's LaFleur. "Very simply, they need someone who can take on the responsibilities of a database administrator in order to protect their data from damage and from unauthorized access." ■

Don Leavitt, a freelance writer based in Southboro, Mass., has covered the software industry for the last 17 years.

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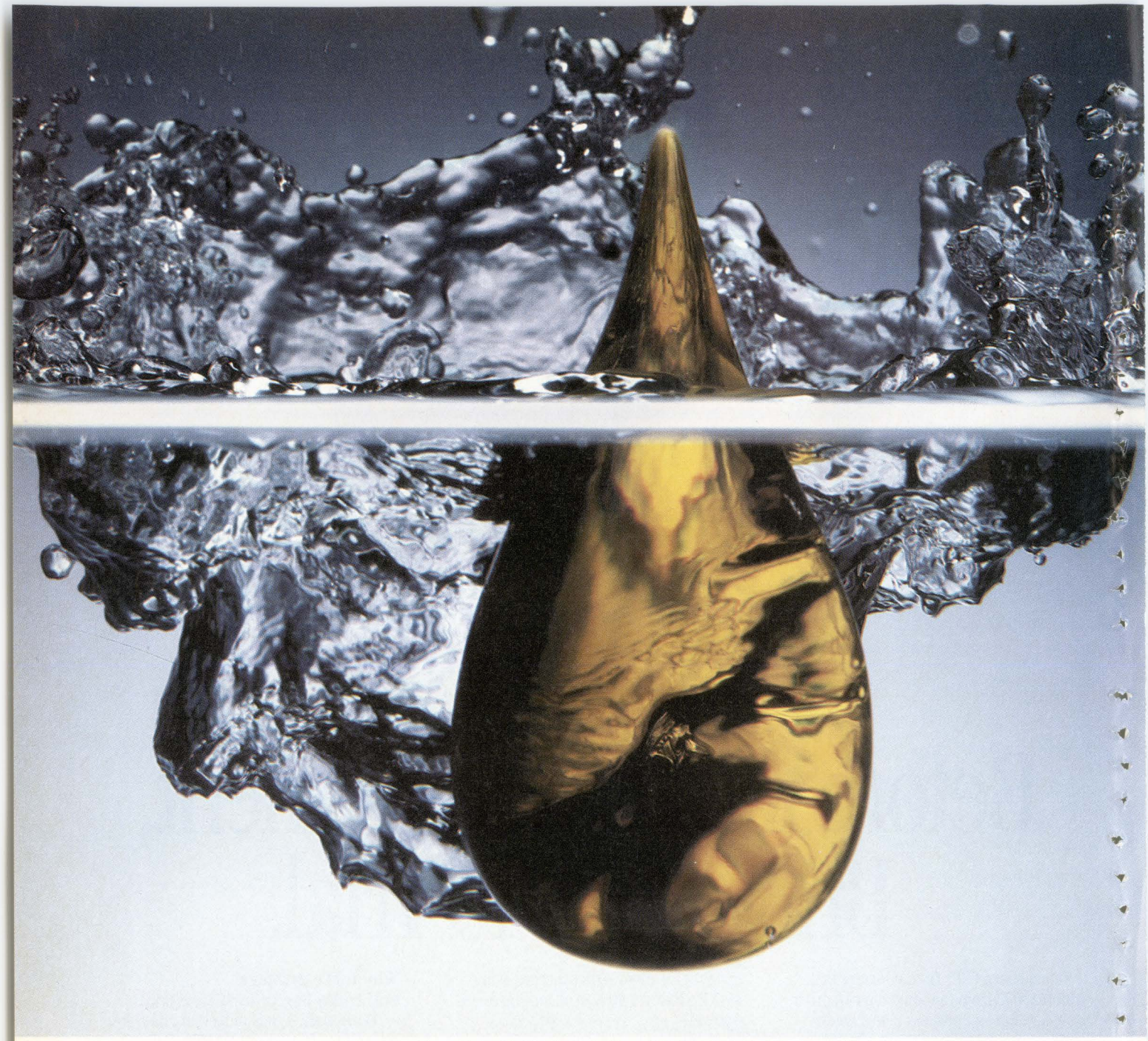

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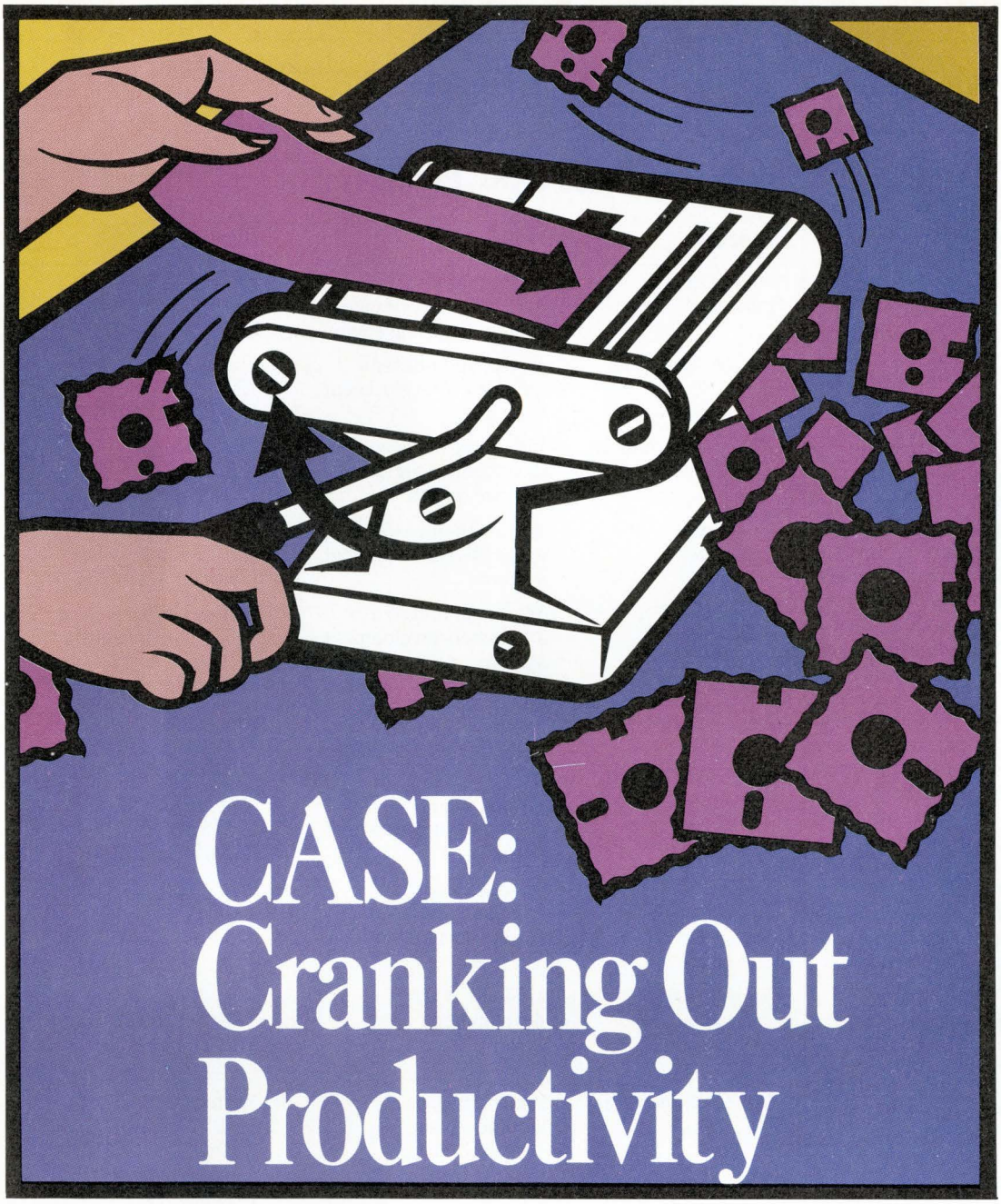

CASE: Cranking Out Productivity

The backlog of computer applications waiting to be developed has scarcely been dented by such promised panaceas as structured analysis and fourth generation languages. While the backlog has been worse at times in the past, about 30% of customers' applications are more than two years from implementation. Now, computer aided software engineering (CASE) promises to automate design and programming of applications and provide the long-awaited breakthrough. Early experiences with CASE products by some users show tremendous savings in cost, people power, and money. But what's still needed is a full-cycle product that takes a system from strategic planning to implementation to maintenance and also offers every possible interface along the way.

BY DAVID STAMPS

The backlog of computer applications, which stretches out as far as 30 months at some companies, stands as testimony to the software industry's inability to catch up with itself. Now, a new technology called CASE (computer aided software engineering) promises relief for systems analysts and programmers.

CASE is the generic acronym for a slew of software programs, mostly written for micros, that automate parts of the applications development process. Enthusiasm for CASE from users and vendors suggests it could be the tool that breaks through the applications logjam.

Although the 1987 DATAMATION/Cowen & Co. Computer and Telecommunications Survey shows that for most large systems users, the applications backlog is down somewhat for the third consecutive year, the survey also indicates that 30% of customers' applications are more than two years away from implementation. And that may be just the paper or visible backlog.

Some MIS professionals speak of an invisible backlog—made up of applications that never get formally requested because users are unable to wait two years. As the window of opportunity for strategic new applications narrows, this invisible backlog is likely to swell.

Measuring the productivity of applications developers is such a nebulous job that most companies don't attempt it. "We don't keep figures on our backlog anymore," says Denny Reiter, a data planning analyst at Deere & Co., Moline,

Illustration by Doug Taylor

Ill. "We just know development takes too long and costs too much money."

Bruce Holt, manager of technical systems at Babcock & Wilcox Co.'s Naval Nuclear Fuel Division in Lynchburg, Va., also has stopped keeping tabs on the unfinished applications. "Some of our larger projects take six to 12 months," he explains. "We know we need to be able to do twice the work in half the time. You don't need a yardstick to measure that."

He isn't surprised that management may not be eager to shell out $6,000 a shot for a CASE tool on the gut feeling that productivity will improve. "Management is going to want to have a pretty warm feeling in terms of the return on investment," he says. "That probably means that information systems will have to install some measurement tools. It's hard to allocate resources to do measurement when you don't have time to do what has to be done."

Although CASE faces something of a catch-22 in that no one has devised an accepted means of measuring the productivity of programmers and systems analysts, some users already testing the CASE waters cite impressive gains. Du Pont, headquartered in Wilmington, Del., was pleasantly surprised when a CASE product generated 90% of the code directly from design specifications for one application, a finishing area system for production of nylon stretch-wrap.

"Amazing" Productivity Increase

Using a product called Application Factory from Cortex Corp. of Waltham, Mass., Du Pont realized tremendous savings in cost, time, and people power. The application, which was originally expected to cost $268,000, was completed for a mere $30,000. Scheduled to take nine months with three full-time people, the application was finished in record time, reports Scott Shultz, Du Pont's manager of information engineering.

"We elected to use Application Factory for a 60-day trial and see what effect that would have on the overall project," explains Shultz. "We were surprised to find we could get the whole project done in the 60-day trial with just two people."

Du Pont has Application Factory installed at 11 sites and has used it on over 40 applications. "We found we can achieve a 600% productivity increase," says Shultz. Ironically, however, he believes the rate of systems development may be too fast. "At an increase rate of six to one, you end up with an implementation backlog," he says.

Despite this early success with Application Factory, Du Pont has not immersed itself in Cortex, though it has entered into a joint venture to help fund enhancements to the vendor's subsequent products. "We believe there's going to be a variety of tools to evaluate, and we'll be looking at all of them," says Shultz.

"For now," he continues,"Application Factory does seem to have an edge in a Digital Equipment Corp. environment. It's not perfect yet. We're still looking for more graphics. Picture programming will help us visualize our database before committing to it. We'd also like to see more compatibility between our factory data and other database products, such as Ingres and Oracle, to be able to use data from multiple sources."

Like Du Pont, Arbitron Ratings Co., Laurel, Md., has experienced a significant—though somewhat less dramatic—30% improvement in systems development using a CASE product called DesignAid, made by Nastec Corp., Southfield, Mich. MIS director Scott Miller attests to the advantages of DesignAid: "The increase is realized primarily in the requirements and design phases. Documentation is kept as current as possible,

FIGURE 1 Selected CASE Products

PRODUCT	TYPE	SUPPLIER
Aims Plus CIRCLE 266	Workstation-based automated development system for Wang equipment	Aims Plus Inc. 1001 S. Sherman Richardson, TX 75081
Analyst/Designer Toolkit CIRCLE 267	Workstation-based automated development system	Yourdon Inc. 1501 Broadway New York, NY 10036
Application Factory CIRCLE 268	Integrated application development and maintenance for DEC VAX	Cortex Corp. 138 Technology Dr. Waltham, MA 02154
CorVision CIRCLE 269	Workstation-based automated development system	Cortex Corp. 138 Technology Dr. Waltham, MA 02154
DesignAid CIRCLE 270	Workstation-based automated development system	Nastec Corp. 24681 Northwestern Hwy. Southfield, MI 48075
Design Machine CIRCLE 271	Workstation-based automated development system	Ken Orr & Associates 1725 Gage Blvd. Topeka, KS 66604
Developer Workstation CIRCLE 272	Workstation-based automated development system	DBMS Inc. 1717 Park St. Naperville, IL 60540
Excelerator CIRCLE 273 *Excelerator/RTS* CIRCLE 274	PC-based workbench for systems analysis, design, documentation	Index Technology Corp. 1 Main St. Cambridge, MA 02142
Information Engineering Workbench CIRCLE 275	AI-based expert development system	KnowledgeWare 3340 Peachtree Rd. NE Atlanta, GA 30326
Life Cycle Manager CIRCLE 276	Project manager workbench and analysis tool kit	Nastec Corp. 24681 Northwestern Hwy. Southfield, MI 48075
Life-cycle Productivity CIRCLE 277	A collection of tools for IBM PCs and mainframes	American Management Systems Inc. 1777 N. Kent St. Arlington, VA 22209

PRODUCT	TYPE	SUPPLIER
Maestro CIRCLE 278	Software engineering tools	Softlab Inc. 188 The Embarcadero San Francisco, CA 94105
*manager*VIEW CIRCLE 279	Workstation-based automated development system	Manager Software Products 131 Hartwell Ave. Lexington, MA 02173
micro-CAPS CIRCLE 280	COBOL development on Convergent Technologies equipment	Software Research Inc. 1991 Crocker Rd. Westlake, OH 44145
*Micro*CICS CIRCLE 240	Creates, tests CICS programs on AT	Unicorn Systems Co. 3807 Wilshire Blvd. Los Angeles, CA 90010
MultiPro CIRCLE 241	AT-, XT-based development project control	Cap Gemini Software 2350 Valley View Ln. Dallas, TX 75234
Pacbase CIRCLE 242	Generates production systems from specs	CGI Systems Inc. 1 Blue Hill Plaza P.O. Box 1645 Pearl River, NY 10965
PC/Hibol CIRCLE 243	Develops CICS programs for mainframes, pcs; downloads from mainframe to pc	Matterhorn Inc. 9615 Girard Ave. S. Bloomington, MN 55431
Progress CIRCLE 244	Automated development system/4GL for various micros	Data Language Corp. 47 Manning Rd. Billerica, MA 01821
ProMod CIRCLE 245	Integrated software development tool for DEC VAX, and IBM PCS	Promod Inc. 23685 Birtcher Dr. Lake Forest, CA 92630
Teamwork/SA CIRCLE 246	Automated development system for Apollo, DEC, IBM	Cadre Technologies Inc. 222 Richmond St. Providence, RI 02903
Multi/CAM CIRCLE 247	Workstation-based automated development system	AGS Mgt. Systems Inc. 880 First Ave. King of Prussia, PA 19406
Information Engineering Facility CIRCLE 248	Workstation-based automated development system	Texas Instruments Inc. P.O. Box 225474 Dallas, TX 75265

and the graphics and content of that documentation facilitates communication between designers and users. It's really true: a picture is worth a thousand words."

DesignAid also helps on the administrative side, says Miller. "It's much easier to go back and make changes—which frees designers from having to erase and draw new lines. They can concentrate on design."

Cost savings and productivity gains are not the only benefits of CASE. The need for quality in programming is stirring up interest in it. "An incredible amount of money is spent correcting defects in programs," complains William Perry, who is director of the Quality Assurance Institute (QAI), an Orlando, Fla., organization that hopes to help demystify systems development and "return it to an engineering discipline."

Perry says CASE could yield significant savings. "Our function is so poorly performed that the savings could be phenomenal. Companies pay lots of money to people who create defective products, and then they pay more money to fix them. The 50% of systems development time that goes to fixing programs is a nonproductive expenditure."

Perry says that most of QAI's 700 corporate members are just now looking into CASE. "They know things should be better, but they aren't sure where to start." This uncertainty stems in part from the fact that the backlog has no single bottleneck. Because there's no one pressure point at which to place the charge, the various CASE tools now on the market attack the problem at all the different phases of the applications development cycle. Many CASE products address the analysis phase, claiming that better analysis leads to better design, fewer mistakes in the implementation, and even reduced maintenance over the life of an application. Other CASE products focus on implementation phases, such as generation of COBOL code.

How To Think of CASE

The broadest definition of CASE—as the automation of anything a human does to software—includes products that impose order on old programs. This may be the right way to go since maintenance is currently chewing up as much as 70% of the total time spent on an application.

It may be helpful to think of CASE as CAD/CAM for code smiths. Early CAD was computer aided drafting more than computer aided design. Only today is CAD fulfilling its design potential by linking the geometric shapes on a workstation screen to the rules of engineering and physics that determine whether a part will survive testing as a prototype.

The scenario is similar for CASE. Three years ago, CASE products did little more than allow systems designers to create dataflow diagrams on a pc screen using computer graphics squares and ovals. Now, CASE tools are starting to link those squares and ovals to the logic of structured design methodologies. Not only can designers speed up the rote job of drawing diagrams, but they also can use CASE tools to perform basic error checking. Some of the more sophisticated CASE wares can check details, right down through tree diagrams in which each function is decomposed into more detailed elements.

Another evolutionary development in CASE is that most products now offer a central repository or data dictionary that stores the various functional elements of a design. Just as CAD/CAM data describing a machine part can now be transmitted to numerically controlled machine tools that cut the part out of metal, some CASE products—such as Cortex's Application Factory and Information Engineering

Workbench from Atlanta-based KnowledgeWare Inc.—can generate machine-readable code directly from the design elements and specifications in the data encyclopedia. (A data encyclopedia is a data dictionary with more design rules and more relationships between design elements.)

Chris Grejtak, vp of sales and marketing at Index Technology Corp., Cambridge, Mass., believes the future success of CASE hinges upon this seamless interface between design and code generation. "The question we get from customers," Grejtak explains, "most often centers on interfaces—how to interface from analysis and design to other tools. The key will be the data repository. It must be able to share data with a number of tools."

Vendor promises of a flexible data repository tomorrow are winning some customers today. According to Deere's Reiter, the tractor manufacturer chose KnowledgeWare's Information Engineering Workbench not because the company offered all the tools he wanted, but because "we like their long-term direction. We like what they have said about the tools they will develop to integrate into their data encyclopedia."

Tailor-Made Tools

Other companies may not be content to wait for any one CASE vendor to develop all the tools that interface to a central design dictionary. American Management Systems (AMS), a systems development shop in Arlington, Va., began looking into the CASE market several years ago. "Having done several hundred major systems in the last 14 years, we knew what sorts of tools we wanted," says Jerrold Grochow, vp of AMS's corporate technology group. "We figured if we found a good set, we'd buy it."

Instead, AMS developed a CASE product of its own, called the Life-cycle Productivity System, which combines Index Technology's pc-based workbench, Excelerator, with other CASE products and a raft of tools and interfaces that AMS developed itself. Writing a program that allows Excelerator to produce a business systems planning matrix, AMS added a COBOL record definition to allow Excelerator to produce complete COBOL code.

Undertaking this sort of integration and tool development is probably more than a dp shop at a typical user company is going to want to do. But the scenario does demonstrate what is needed to carry CASE technology through to what AMS's Grochow calls "a full-cycle product—one that takes a system from strategic planning to implementation to maintenance and offers every possible interface along the way.

"The best of everything today gets you to the level of a junior analyst," declares Grochow. "No CASE products have the ability to analyze a design and tell you where the holes are. None has experiential capability. They can't look at a design and say, 'The last 400 designs were done such and such a way, why are you departing from that method?' These capabilities are coming, but they are at least five years away." ■

A frequent contributor to DATAMATION, David Stamps is a Minneapolis-based freelance writer.

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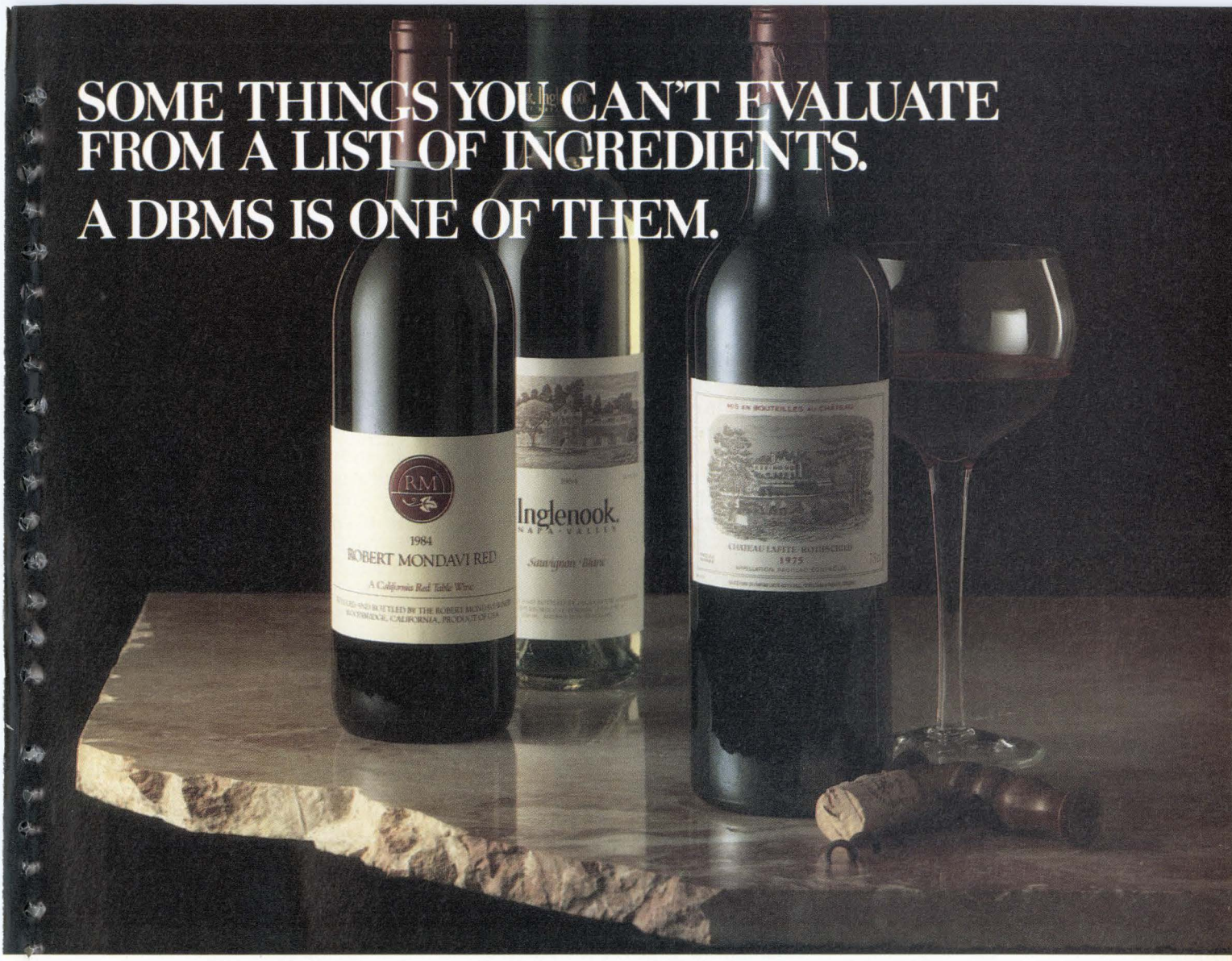

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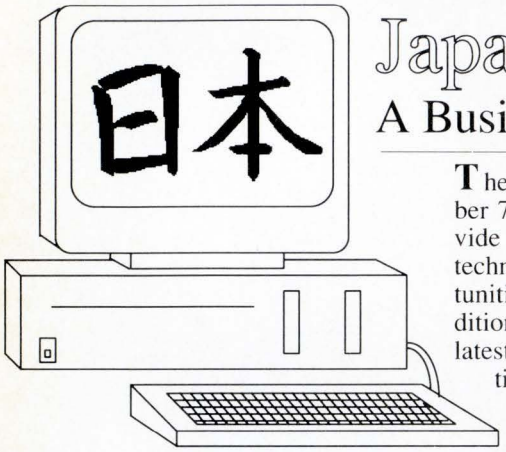

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The day-long seminar, which will be conducted entirely in English, will also allow you to meet and exchange ideas with other executives from the U.S., Canada and Europe who are attending the Japan Electronics Show in Osaka that week. Our confirmed list of speakers are all high-level executives from major Japanese and U.S. corporations in Japan, and there will be ample time for questions and answers and informal discussion. This seminar is intended both as an introduction to Japan for first-time visitors, as well as an update of Japanese business and technology for seasoned travelers to the Far East. If you buy from, compete with, or sell products to Japanese electronics companies, this seminar is for you.

The seminar, which also coincides with the AEA October Trade Mission to Japan, starts at 8 a.m. and ends at 5 p.m. A luncheon speaker will be named later. For more details about the Trade Mission, contact the AEA in Santa Clara, Calif.

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Chat Kelly, Publisher, Electronic Business
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CIRCLE 31 ON READER CARD

The potential productivity gains offered by fourth generation languages and relational database management systems are virtually precluded by the complexity of the data within the typical corporate database. Most of today's data are designed to take advantage of byte-oriented third generation languages. Users intent on installing advanced tools must realize that a transformation of their data to the fourth generation is required. The longer restructuring is put off, the more tangled and complex the corporate database jungle gets.

In Search of Fourth Generation Data

BY DAN TASKER

Today's corporate databases often resemble a patchwork jungle. The application of a fourth generation language or relational database system is commonly believed to be the machete that will cut through that jungle. Unfortunately, the simplicity and increased productivity promised by these tools usually can't be achieved if the data they must cope with remain complex.

The solution is not to "improve" the ability of 4GLs and DBMSs to deal with such data. This would simply make them less productive and allow problems with today's data to be perpetuated. The real answer is to work toward establishing fourth generation data.

CONVERTING DATA TO THE FOURTH GENERATION ISN'T SIMPLE.

The conversion of data to the fourth generation is no simple task. There is always resistance or opposition to new concepts. End users have become comfortable and secure with the data they have come to know. Programmers and analysts have become equally comfortable with the tools and design techniques that have served them for years. They should understand that clever eventually translates to costly.

Fourth generation data has several important characteristics, but the single guiding principle should be "one fact per field." There are several advantages to defining data this way. Each field can appear with its own label or heading on reports and screens, providing better identification and requiring less user training. Input editing logic is greatly simplified, and clearer error messages and more specific help facilities can be provided for users.

Several factors have combined to make today's data so complex. Throughout most of the history of computer programming, the focus has been on optimizing both application code and data in order to minimize program size, execution time, storage requirements, and number of I/Os. Data created with second generation languages very often took advantage of the ability to manipulate data at the bit level. This caused problems when third generation languages arrived and attempted to deal with data on a byte level.

Third generation languages allowed programmers to group several related fields together under a group level name. It became common to create identifiers using this feature. A side effect was that such fields provided clues as to what the data represented.

The whole promise of relational DBMSs is incompatible with code that takes advantage of the complexities of third generation data. If a 4GL does provide for this complexity to be defined, any use of it by applications or queries requires complex, third generation-type logic. Creation of such logic is prone to errors, increases maintenance, and sacrifices productivity gains. In fact, a common 4GL solution is to have the programmer develop the required complex code using a 3GL accessed through an exit.

Nearly all dp installations can benefit from the concept of fourth generation data. The transition can be difficult, requiring almost a cultural change. Once all of the extra facts are removed from fields like *part number* or *customer number,* what remains is a meaningless number.

There are often concerns raised about this type of field, such as, "We can't tell anything about it by looking at just a number," or "If everything is identified by meaningless numbers, how will we ever remember all of the numbers we use?"

The first concern can be ameliorated by designing systems that provide all required facts. Fields that formerly were part of a group are not lost, but defined individually. Those that are of interest to a particular set of users should be displayed. In many cases, they can be presented in a more understandable way, e.g., a part category name can be given instead of just a part category code.

The second concern is also resolved by proper system design. An example of this is provided by the banking industry. An automated teller access card contains a number that gives the customer access to several accounts. The desired account is selected by a menu or by predefined buttons. None of the actual account numbers need to be entered by the customer. Even the initial number on the access card is captured automatically. Thus, the need for dealing with a lot of meaningless numbers has been eliminated.

As more integrated applications come into existence, the necessity to enter, validate, and reenter much data can be greatly reduced.

Fourth generation data also require that a distinction be made between the concept of a key and an identifier. Although these terms are often used interchangeably, keys usually have closer ties to the physical storage of data. Identifiers can be thought of more as search arguments or selection criteria.

Many Ways To Locate Data

Data can be located in any number of ways. They can be accessed directly by their primary keys, indirectly via an index, or even by searching an entire file. The query "Display all customers who are married" could involve a field called *marital status*. Such a field would probably not be a key nor would it have an index. Nonetheless, it acts as an identifier in this situation. Virtually any field or combination of fields can be used for data retrieval.

Fields contain facts (data) and most often facts are changeable. When the contents of a key field change, there can be undesirable effects. If a customer transfers an account to a different branch, and *branch number* is part of the key, what becomes of data that were stored using the former branch? All data physically stored based on the key must be moved. All references to that data must also be changed. When some of these data have been archived, this strategy becomes completely impractical.

Because a fourth generation key field is reduced to a meaningless number, there is no reason to ever change its value. It therefore serves as a proper, stable mechanism for both identifying and tying together all related data.

Relational DBMSs and 4GLs offer new functionality through their catalogs or dictionaries. New types of attributes can be defined for fields such as default report headings, edit masks, and domains (value sets). These attributes are often actively used directly by the system at the appropriate time.

Special data-type functionality is also available with these new tools. Awkward types of data such as dates and names can be formatted, converted, and displayed automatically.

The catalogs and data dictionaries are also used in place of such static, redundantly stored information required by COBOL in the "Data Division" of a program. They therefore provide the potential for a single, accurate source of information about corporate data.

Most 4GLs and RDBMSs are used in a limited number of production applications in any given shop. Only a small percentage of corporate data is defined to them. As the performance of these tools improves and old systems are replaced, the opportunity to take full advantage of their features will increase. New applications should not just incorporate the new software creation methods, but fourth generation data concepts as well.

Converting data into the fourth generation mode is no easy task. Millions of lines of code and billions of bytes of storage are in production today based on old-style data. None of them will magically untangle overnight. ■

Dan Tasker, a 17-year veteran of the dp field, is currently consulting with Westpack Banking Corp. in Sydney.

Characteristics of Fourth Generation Data

These are some of the characteristics that fourth generation data should have:

- One fact per field: the smallest unit of data accessible by the software contains a single type of information, for example, no logic is required to separate facts from within a field.
- One field per fact: repeating groups should be normalized resulting in a single, named field for each type of fact, for example, a *commission* field that occurs 12 times actually contains a second fact, like commission month, that is implied and referenced with a subscript.
- Corporate in scope: data have been identified as required by the organization to carry out business. This justifies the effort and expense to define, capture, and maintain them.
- Business definition: created and maintained by users who deal directly with the field. This definition should be available at the time of use through a help function facility by lookup on field name or subject category.
- Single-validation criteria: valid value set for a field (its domain) should be established and all add or change activity should use the same validation logic.
- Structured to serve the enterprise: fields grouped (normalized) to satisfy overall business needs rather than an individual application requirement.

These are some characteristics that are nice to have:

- Default heading/label: defined once in a dictionary and automatically used by report generators and screen painters. This implies that a single name has been established throughout the enterprise, which has distinct advantages over the "alias" alternative.
- Default edit masks: defined once in a dictionary and automatically used by report generators and screen painters. This establishes uniform data entry rules reducing training time and input errors.
- Special data types: support for common complex fields:

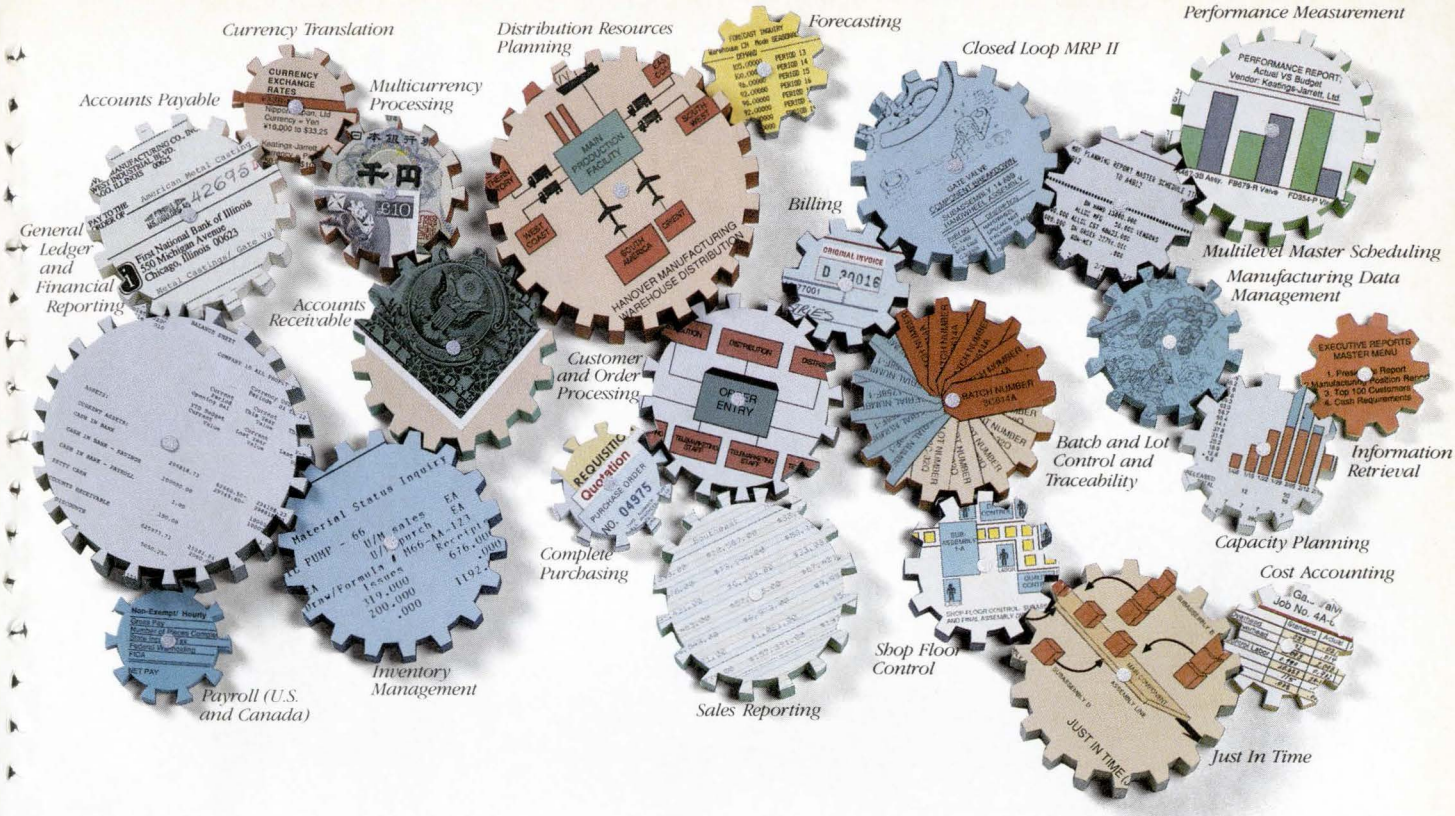
Date: a uniform corporate format for entry and display that is transformed for manipulation and internal storage into a relative date (# of days since YY/MM/DD).

Time: automatically transformed for storage and manipulation.

Name: a uniform treatment of title, first, middle, and last names.

Address: a uniform corporate format (definable by enterprise).

Text: word processing type of editing and scrolling that can be invoked directly by applications.



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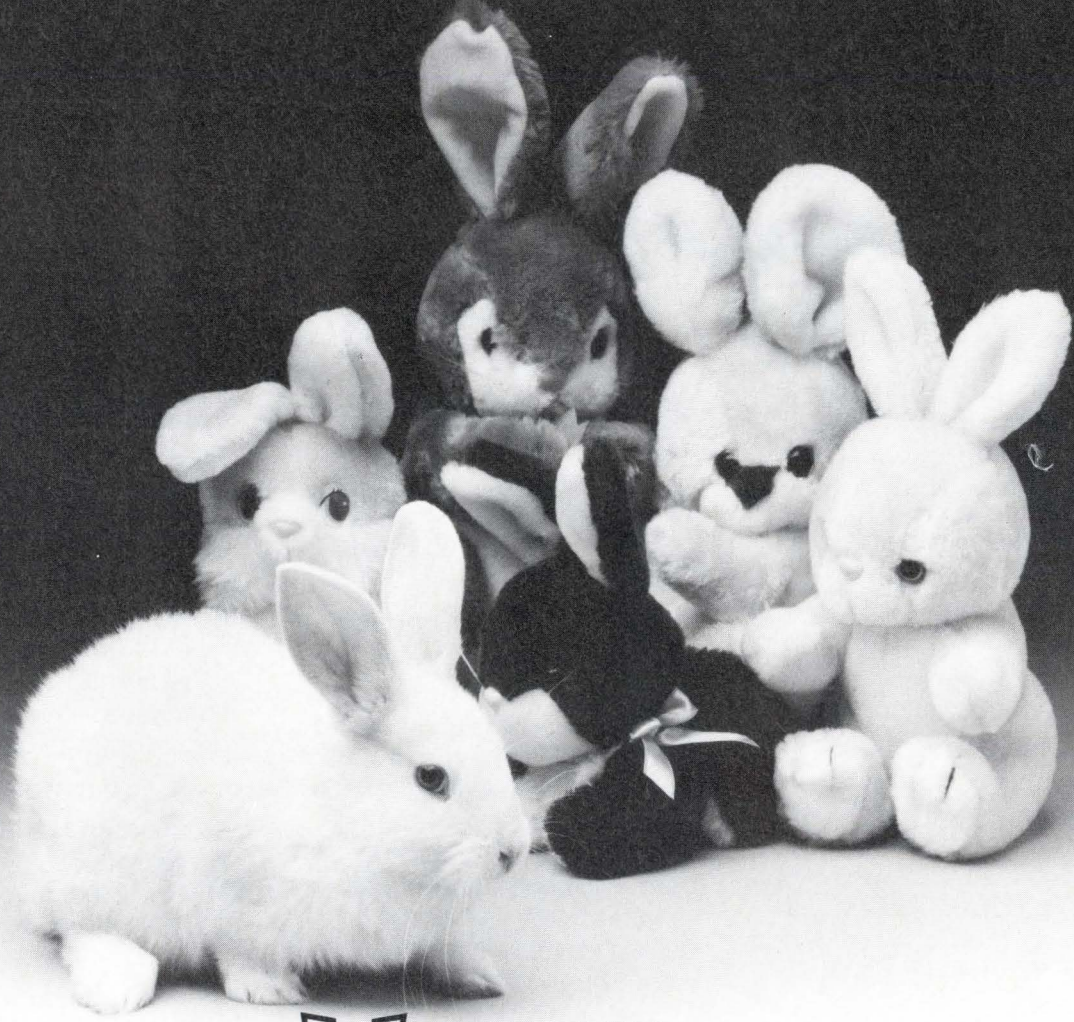

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CIRCLE 33 ON READER CARD

The quest for an alternative to the MVS operating system goes on despite formidable obstacles. Crusading the hardest is Gene Amdahl, who has invested in Key Logic, a startup with a product promising more OLTP functionality and more economic use of IBM hardware. Some question Key Logic's staying power and its ability to support IBM customers. Others feel that IBM users won't commit to an MVS alternative until portable software is available.

An Alternative to MVS

BY RALPH EMMETT CARLYLE

"MVS is this incredible mass that tries to be all things to all people but almost never satisfies any special application well, especially in the high-volume on-line transaction processing (OLTP) market." This pragmatic assessment of IBM's 12-year-old mainframe operating system by Mark Butline, an analyst with the Gartner Group research house in Stamford, Conn., zeros in on the specialty application niche that some MVS challengers are attempting to enter. One would-be rival, intent on keeping the competitive dream alive, even envisions a full-fledged pcm alternative to IBM's flagship operating system.

That quest for an alternative to MVS faces formidable challenges. The king of operating systems, MVS has reigned supreme in the commercial mainframe computing domain for more than a decade. IBM's own financial statements attest to the software's strength. Its figures show that the company chalked up a staggering 72.5% gross profit margin on its software sales in 1986. Some experts estimate that the revenue from MVS in the U.S. accounted for one third of IBM's total software take. In fact, for many 309X customers, MVS now represents close to 10% of their three-year operating costs, and some users are predicting that that could grow to 20% or even 30% in the next five years as IBM replaces its former hardware rental revenue with software fees.

"COMPETITION FOR MVS DOESN'T EXIST."

Gene Amdahl, the father of the plug-compatible movement, recognizes the potency of IBM's MVS operating system. "Competition [to MVS] simply doesn't exist," declares Amdahl, adding, "What other area of the business can you say that about?"

The soft-spoken IBM mainframe designer says he had hoped at one time that his former company, Amdahl Corp. of Sunnyvale, Calif., would have marketed its alternative to MVS by now. That alternative, an MVS look-alike called Aspen, is currently described by company officials as an "ongoing development project." Amdahl himself thinks that the pcm firm may be holding back because of the threat of legal action from IBM.

In the meantime, Amdahl has placed big bets for an MVS alternative on one tiny company, Key Logic, which aims to sell a product that could keep his free-market dreams alive. The Santa Clara startup has a new operating system, called KeyKOS, for the 370 architecture that offers users a way to get out from under IBM's punitive pricing policies. The software, according to some IBM customers, would also provide the functionality that MVS currently lacks in the burgeoning OLTP arena. Seeing the opportunities here, Unisys has acquired a "perpetual license" for the technology, with which it hopes to mount a major campaign against Big Blue in the OLTP market.

The fact that KeyKOS has even made it to the starting gate is a real surprise given the odds against it. "Operating systems are notoriously difficult to do," points out Dean Fitzbag, division manager of the Technical Services Group at EDS in Richardson, Texas, a major beta test site for the Aspen software. "Even assuming you can get the right team together—a big if—the costs alone might kill you. An IBM operating system

would require a minimum of $40 million and six years of effort to even begin to be viable," Fitzbag says. Others contend the requirement for such a major undertaking is more like $80 million. On top of these monumental costs are the difficulties of staying compatible with MVS and its subsystems, moving targets that are forever shifting, according to Fitzbag.

Were KeyKOS simply a cleverly conceived paper tiger waiting for development funds from the venture community, it would have zero chance of success against IBM. But this is not the case. The product originated in the mid-1970s within Tymshare (now owned by McDonnell Douglas) where it received funding and fine-tuning. The nine KeyKOS developers, using money supplied by Gene Amdahl and a Japanese associate, bought the software from McDonnell Douglas. They then went on to form Key Logic using every penny they could scrape together.

The KeyKOS sale was not a tough decision for McDonnell Douglas because the company "didn't perceive itself as being in the IBM operating systems business," explains Key Logic president and ceo Ann Hardy, who was a vice president at Tymshare. Hardy says that the software was created as a result of Tymshare's efforts to improve technical support for its transaction businesses. "The lack of functionality and the increasing price of MVS began to impact our profitability and responsiveness to customers," she recounts, adding, "What we've discovered since founding Key Logic is that you don't have to be a large timesharing company to feel those same pressures today."

MVS pricing is perhaps the most visible pressure. It's a key reason why an MVS alternative has such appeal to IBM customers. "IBM clearly has carte blanche to continue to increase MVS prices when it wants," sighs Dale Schaub, manager of information systems services at Morton Thiokol Inc. in Chicago. "We just sign the checks."

Like Schaub, Richard Koeller, vp of information systems services for TRW Inc. in Cleveland, recently migrated to the MVS extended architecture, MVS/XA. He says he's "only too aware of IBM's rising software fees," which he claims will probably fuel the emergence of specialty operating systems. "The only pressure IBM has ever responded to has been competitive," Koeller argues.

But pricing "isn't the real question," according to the Gartner Group's Butline, who recently hosted a seminar where he asked 500 MIS managers whether they would be interested in an Aspen that offers twice the performance of MVS at half its price. "Two hands went up," says Butline, "and we went on to determine that the market for IBM operating systems is not price elastic, but function elastic."

Key Logic's Hardy agrees, adding, "IBM's customers are obviously frustrated by its pricing. But infinitely worse is not getting extra function for the added price. Those customers whose businesses are creating more transactions per second [TPS] than MVS [with IMS and CICS] can support are the ones that really need an alternative operating system."

Key Logic describes MVS as 1960s software on 1980s hardware. "Our strategy," explains Hardy, "is to provide a 1980s solution that runs on all of IBM's 370-based processors [9370, 4300, 308X, and 309X] and in addition hosts both real and emulated IBM operating systems and environments." Hardy then proceeds to tick off the following claims for KeyKOS: that it was designed to take advantage of the large multigigabyte main memories that are now becoming standard on IBM mainframes, that it eliminates all disk I/O bottlenecks, that it provides a persistent virtual memory and single-level store, and that it offers complete fault tolerance and other benefits such as object programming and support for all 370 programming languages.

KEYKOS IS CLOSER TO BEING A COMPLETE PCM ALTERNATIVE TO MVS.

In an exclusive interview with DATAMATION, a spokesperson at Key Logic's beta site, the Australia and New Zealand Bank in Melbourne, Australia, supported claims that the product can deliver performance in the 500TPS range on IBM mainframes. That's faster than speeds offered by industry leaders such as Tandem and Stratus that require moving to non-IBM environments.

The Australia and New Zealand Bank, one of the world's largest, has been using KeyKOS for a credit authorization switch that supports many hundreds of transactions per second. "We've been benchmarking the software for nine months and hope to go into production in October," reports the bank's KeyKOS project manager, John Earle. He describes the software as rugged and reliable—"nothing like a monolithic program. It's easy to use and always works." (At some 20 million lines of code, MVS is perhaps 40 times bigger than the KeyKOS program.)

One of the most appealing things about KeyKOS, according to Earle, is that customers can get power from the operating system, instead of paying for it in the hardware. "It treats DASD well, but the real savings are in cpu costs. Here we estimate we save better than 50% of the mainframe cpu cost and cpus are about 80% of our hardware budget," he notes.

Earle also believes the KeyKOS will come in handy whenever transaction volumes stretch the performance of a processor. Indeed, the software's efficient use of the 370 hardware could make a 9370 perform as though it were a larger 4300. Likewise, a 4300, Earle claims, would appear to have the capacity of a 308X big mainframe.

Back in the U.S., Key Logic is hoping soon to end up with a solid customer out of its list of "10 to 15 good prospects." The MIS managers polled by DATAMATION expressed cautious interest. Summing up the consensus view of KeyKOS was John Singleton, chairman and president of Los Angeles-based Security Pacific Automation Co.: "It seems like an interesting, well-positioned product, but you have to question the company's size, staying power, and ability to support IBM customers. We've embraced Tandem and our centers are also looking at Digital Equipment Corp. and NCR Corp. for OLTP. So MVS clearly isn't coming up with the goods. But we'd prefer KeyKOS to come from an established service company like an EDS or a Boeing. Then we would probably buy it."

Key Logic, which currently employs only 20 people, is certainly conscious of the size issue. It's also well aware of the string of startups that, loaded with venture capital, had made unsuccessful beelines for IBM customers. In January, the company received its first injection of outside funding, some $3 million. On that investor roster were two of the biggest venture capital pools in the

country, the State of Michigan and financial consulting firm Hambrecht & Quist.

Barry Weinman of New Tech Ventures, Menlo Park, Calif., which got the package together, reveals that as much as $20 million could soon follow as new communications technology and features like CICS emulation are added to KeyKOS. "The single biggest thing we invested in," says Weinman, "was a core group of nine people that have been together for over a decade—a seasoned team that will see the project through. That's very rare in high-tech ventures."

While EDS's Fitzbag says he'd like nothing more than to see Aspen or KeyKOS succeed, he feels that the vital ingredient for that success is still missing. "What we need are new portable applications generators—what I call four-and-a-half generation languages—that will work with either the IBM or pcm operating systems and IBM's CICS and IMS subsystems." Until this portable software is developed, he reasons, IBM's customers will continue to pay lip service to the need for MVS alternatives, but won't invest in any because of the risks involved.

Until such products emerge, perhaps with IBM's support, John Earle of Australia and New Zealand Bank advises Key Logic to concentrate on customers with isolated high-volume applications such as airline reservations, switching, and credit authorizations. Key Logic "lacks the broad range of tools and support for the SQL marketplace that is a feature of Tandem's business," he explains.

Such a tight focus, though wise, is far from the original intent of KeyKOS's principal architect, Norman Hardy, who worked with Amdahl in IBM's Advanced Computer Systems group. (Hardy went on to become the chief designer of Tymshare's celebrated Tymnet network.) KeyKOS, with its batch and interactive capabilities, high performance, and assured security, was originally known as the "universal operating system" within Key Logic. As a result, it comes much closer to being a complete pcm alternative to MVS.

Nevertheless, says Gene Amdahl, "the dream lives on." In his own gentle but determined way, he insists, "You should think of KeyKOS as a complete operating system targeted at the OLTP market, not merely an OLTP operating system." He is looking forward to a full flowering of the KeyKOS software in the years ahead, and hopes that entrepreneurs, lured by the scent of a free marketplace, will flock to what promises to be a true pcm product. ■

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CIRCLE 39 ON READER CARD

Real Time

OFF-LINE

IBM'S PERSONAL SYSTEM/2 provides users with graphics capabilities far superior to those available on its previous PCs. With the PS/2, users can display up to 256 colors simultaneously from a palette of more than 256,000 colors; monochrome graphics allow up to 64 shades of gray. In order to accommodate such a broad spectrum of colors, IBM incorporated a specially designed Inmos chip that provides the hues without significantly increasing memory.

The INM G171 color lookup table (CLUT), as the chip is called, is part of a family of chips that U.K.-based Inmos introduced to the market in 1984. The G170 was the first CLUT that Inmos produced, and it caught the eye of Big Blue, among other computer manufacturers, in mid-1984. According to Peter Cavill, Inmos's director of technology, IBM came to Inmos then and requested some "minor changes" in the product. IBM covered the engineering costs involved in the redesign process and the new chip, the G171, is incorporated into the PS/2 architecture. The G171 was sold only to IBM until the PS/2 was announced, but it's now available to other manufacturers. Inmos says the chip requires only 1 watt of power and allows computer manufacturers to incorporate fewer components into their designs. Says Cavill, "We provide a cost-effective way of getting high-resolution graphics." A lot of 1,000 G171s is priced at $42.85.

Cavill adds that through IBM's input into the G171 design, Inmos has expanded its CLUT offering. The family now includes seven chips, providing color graphics for applications ranging from desktop publishing to solids modeling. An eighth CLUT, the G180, will be available in the fourth quarter, says Cavill. It will combine on one chip the graphics capabilities, a screen refresh controller, and a timing generator.

IBM's scientists have also been hard at work on chip-related technology. They recently revealed a technique for spray painting superconductor material onto computer chips. Plasma spraying, as the technique is called, is inexpensive and can be done as simply and rapidly as spray painting a car, says IBM. It claims to have fabricated thin lines on ceramic chips and to have coated tiny holes in them. Strung together, many of these chips could form the basis for a small, powerful computer, which would operate without electrical resistance.

HARDWARE

Thinking Machines Unveils New Connection Machine

CM-2 exploits massive parallelism for data-intensive applications.

BY THERESA BARRY

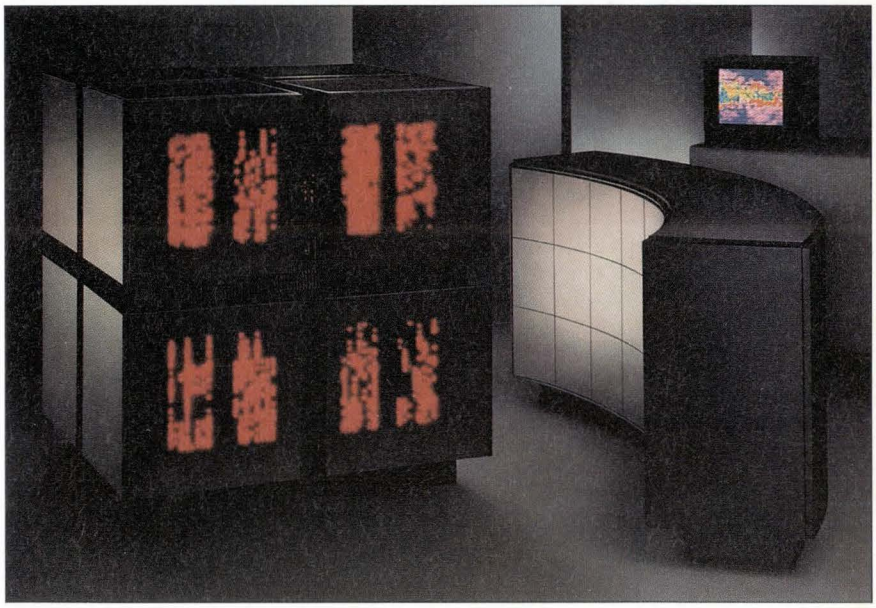
Thinking Machines Corp. has introduced the Connection Machine Model CM-2, which it says operates at 2.5GFLOPS and 2.5BIPS. The CM-2, like the first Connection Machine (the CM-1, which was introduced in April 1986), utilizes "massive parallelism," a design that uses thousands of small processors for computing instead of a handful of superfast processors.

The system can contain 64KB, 32KB, or 16KB data processors. The high-end 64,000 processor CM-2 supports eight I/O channels operating at 40MBps per channel. System memory totals 512MB. When the 64,000 processors are operating in parallel, each performing a 32-bit integer addition, the CM-2 parallel processing unit operates at about 2.5BIPS, according to the vendor. Single- or double-precision floating point is offered. The single-precision option operates at 3.5GFLOPS, and the double-precision operates at 2.5GFLOPS. The systems will be shipped in the third quarter of 1987. The single-precision option will also ship then; the double-precision option will be shipped in the first quarter of 1988.

The 10GB DataVault mass storage unit holds 5GB of data, expandable to 10GB. It transfers data at 40MBps. Eight DataVaults operating in parallel transfer data at 320MBps and hold up to 80GB of data. Each unit stores its data redundantly in an array of 39 individual disk drives to prevent data loss. The DataVault will be available in the third quarter of this year.

The DataVault also includes a FORTRAN 8x compiler and a high-resolution color graphics monitor.

Prices for a complete CM-2 system range from $1 million to $5 million. THINKING MACHINES CORP., Cambridge, Mass. CIRCLE **250**



The Connection Machine Model CM-2 operates at 2.5GFLOPS.

Desktop Mini

Qantel rolls out low-end system for up to 15 users.

MDS Qantel has added its second entry into the low-end of its line of business computer systems. The System 43 is de-

signed for entry-level users and as an upgrade from the AT-based multiuser System 15, announced earlier this year.

The System 43 runs the Qantel Best/AOS operating system and supports all the multiuser application software developed by Qantel and its value-added dealers. Qantel says it operates three times faster than the System 15 and supports up to 15 users, compared with four to eight on the System 15. Single disk capacity can be as high as 160MB, compared with 75MB on the System 15. The System 43 can contain up to 1MB of main memory. The unit is housed in an enclosure measuring 22 by 14.7 by 6.4 inches, and can stand either horizontally next to a desk or vertically on a desktop. It comes with a ¼-inch streaming tape drive and an open I/O slot. Disk capacities of 45MB, 75MB, or 160MB are available.

With a 45MB drive and one terminal, the System 43 is priced at $14,740. It's available now.

Qantel has also discontinued its System 45 and replaced it with the 45xp, which employs the more powerful Qantel processor of the System 43. It supports up to 15 users and offers disk capacities from 45MB to 600MB. Prices start at $22,240 for a system with a 75MB disk drive and one terminal. MDS QANTEL, Hayward, Calif. CIRCLE **251**

Laptops

Datavue rolls out two new computers.

Datavue's new Snap 1+1 is a 10-pound unit that can be separated into two parts. The front module is a self-contained five-pound computer that's available with up to 512KB of CMOS RAM, part of which can be set aside to create a fast RAM disk. It includes a choice of three screens, a four-hour battery, and an 83-key keyboard. An optional internal 300/1,200-baud modem can download information into the rear expansion module. The expansion module is available in two versions, one with a 20MB hard disk drive and a 3½-inch floppy drive, the other with dual 3½-inch floppy disk drives. Both include up to 640KB DRAM, a long-life battery, and a half-card expansion slot.

Prices for Snap 1+1 start at $2,095 for 640KB and a blue-colored super-twisted crystal LCD screen. The 20MB hard drive version is priced at $3,695.

The Datavue Spark computer is designed to run IBM PC software. The machine weighs in at nine pounds and employs a NEC V20 microprocessor, which can run at 4.77MHz or 9.54MHz, a 3½-inch 720KB floppy disk drive, up to 512KB of RAM, and a liquid crystal display 80 columns by 25 lines.

The Datavue Spark's internal NiCad battery is claimed to run the machine for up to eight hours. A Hayes-compatible internal modem, a 256KB add-in RAM card, an additional floppy drive, and a backlit screen are optional. Support is provided for MS/DOS release 2.0 and higher, with release 2.11 supplied as standard. Prices start at $995. DATAVUE CORP., Norcross, Ga. CIRCLE **254**

UPS for PCs

Keeps a full-featured AT running for seven minutes.

Liebert Corp. has unveiled the Liebert PC-ET, an uninterruptible power supply for IBM PCs and compatibles. The 23-pound unit measures two inches high and it fits under the monitor or processor of a PC system. Incoming AC is continuously regulated and laundered to eliminate sags, surges, noise, and transients, claims Liebert. Brief outages are bridged with internal battery power and circuitry constructing a sine-wave 120-volt output for the computer and peripherals. PC-ET keeps a fully configured AT running for seven minutes.

The AC power is supplied to the computer through three UPS protected outlets and two conditioned outlets located on the back of the unit. A standard 120-volt outlet is needed for incoming power. The front panel indicates the presence of AC and alerts the user to loss of power and other critical conditions.

The Liebert PC-ET is available now for $995. LIEBERT CORP., Columbus, Ohio. CIRCLE **256**

386 Add-In Board for PCs

HummingBoard now supports conventional languages.

The 386 HummingBoard, initially introduced last November for the Lisp environment, is now available for full 32-bit 386 development environments in FORTRAN, C, Pascal, and assembler programming languages. The board is designed to add the 32-bit processing power of the 80386 microprocessor to standard AT- and XT-type computers. It provides up to 24MB of parity-protected RAM, a programmable cache memory, as well as an optional 80387 math coprocessor. The board is controlled by the vendor's OS/386 extension to MS/DOS. The board's processor clock speed can be 16MHz or 20MHz, and wait states can be eliminated for performance of as much as 5MIPS.

Prices for the HummingBoard, with 1MB of RAM, begin at less than $3,000, ranging upward to about $15,000 for a 24MB version. AI ARCHITECTS, Cambridge, Mass. CIRCLE **255**

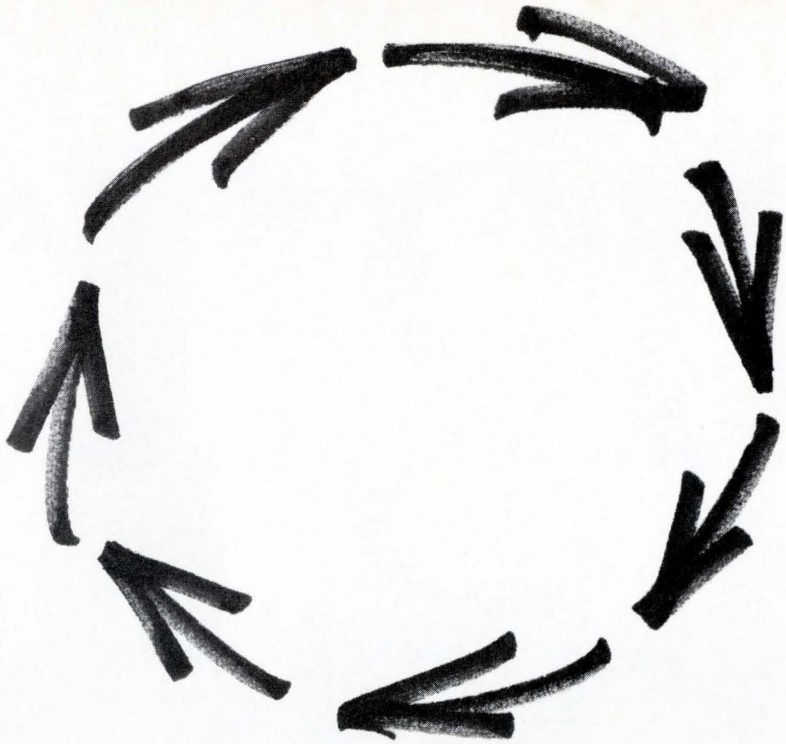
VT-Compatible Terminal

Provides DEC VT220-type terminals with windowing capability.

The Opus 220 from Esprit Systems is a Digital Equipment Corp.-compatible terminal that provides windowing for DEC VMS, ANSI, Unix, Ultrix, and Xenix users. The keyboard layout relocates the return, backspace, escape, and shift keys in positions different from, and, the vendor claims, more efficient than, the DEC VT220s. Further enhancements include three-position tilt, 36 programmable function keys, and Rolodex-like, flip-strip design for function key labeling. It supports two asynchronous EIA RS232 communications ports, and current loop or RS422 interface.

Terminal emulation includes DEC VT52, VT100, VT101, VT102, and VT220 with a 256 character set that supports uppercase and lowercase, 32 control codes, special graphics, multinational symbols, and certain national typewriter layouts. Both the host and auxiliary ports support 38,400bps transmission speeds.

The Opus 220 is available now at a price of $559. ESPRIT SYSTEMS, Melville, N.Y. CIRCLE **259**



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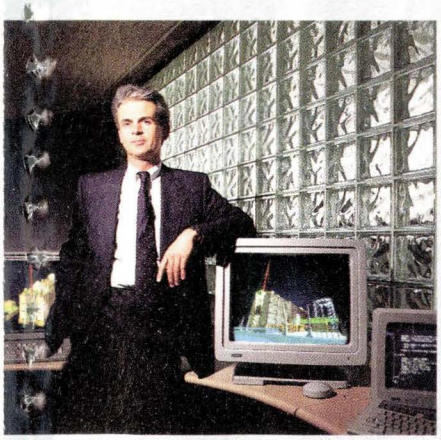
In Mr. Curry's view, Digital's ability to network, plus compatibility from individual workstations to huge processors are ideal for the architectural community. "For any building project to progress smoothly, there has to be a coordinated effort. The group working on lighting, for example, needs to share information



"With Digital's networked desk, McDonnell Douglas is giving architectural engineers a more productive way to build."

with those designing heating and ventilation. In the Digital environment, that's exactly what they do."

"In our own marketing efforts," adds Mr. Curry, "Digital offers two enormous competitive advantages. Planning for the future is easier because of Digital's commitment to compatibility. And we do very little selling of Digital to our customers – engineers are already sold." To get your competitive advantage now, write: Digital Equipment Corporation, 200 Baker Avenue, West Concord, Massachusetts 01742. Or call your local Digital sales office.

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UPDATES

COMPANY EXECUTIVES, for one reason or another, seem to be the last people in an organization to have computer terminals on their desks. According to MIT's Center for Information Systems Research (CISR), only about 10% of the executives in Fortune 1000 firms presently have direct access to computers. CISR believes that that total will grow to more than 25% in the next five years and up to 50% in 10 years.

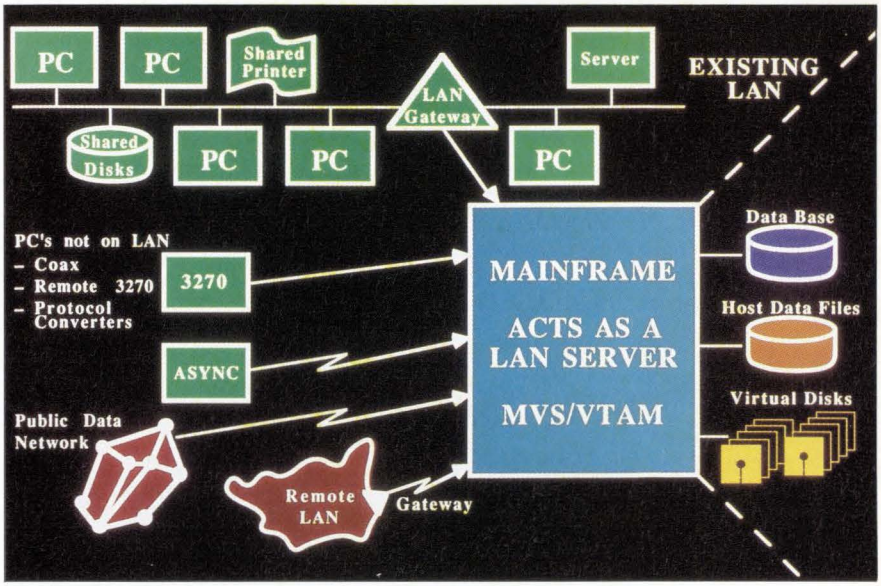
John De Long, a research associate at CISR, says there are a few factors that will contribute to growth in this area. As middle managers are promoted to upper management, he says, they will bring computer literacy skills with them. A "top management squeeze" will mean fewer people covering more territory and they will need access to corporate database information. In addition, "hardware and software are just getting better," says De Long. "More of it is being designed specifically for the executive."

The term executive support systems (ESS) is one to watch for. ESS is software that gives an executive access to mainframe information at his or her desktop. The systems are designed for extreme ease of use and are streamlined to the specific needs of a time-conscious executive. The products on the market are geared toward very large companies and tend to be very expensive—$100,000 and up. "ESS is very expensive technology," says De Long, "but we're dealing here with people whose decision-making has a major impact on their companies. It's almost a 'money is no object' situation. Virtually none of the existing installations is cost-justifying these systems."

One pioneer in this area is David Friend, founder of Pilot Executive Software Inc., Boston. The company's first product, Command Center, was introduced in January 1985. Friend says he developed the program based on his own needs when he held a management position. Pilot's second product, Advantage, is a streamlined version of Command Center. Friend claims Advantage allows MIS to set up the program in two to four weeks as opposed to six to nine months for Command Center.

Other companies in this market are Comshare, Ann Arbor, Mich., and Metaphor, San Francisco. CISR's De Long says we'll see DSS (decision support systems) vendors repositioning old DSS products as EIS products by adding some "bells and whistles."

SOFTWARE



Tempus-Share allows an IBM mainframe to act as a NetBIOS file server.

Micro Tempus Unveils Micro-to-Mainframe Link

New and upgraded communications products for IBM environment.

BY THERESA BARRY

Micro Tempus has introduced a new micro-to-mainframe product, as well as some upgrades to, and new capabilities for, its existing product line.

Tempus-Share 1.0 is a new micro-to-mainframe link designed to work with the multiuser capabilities of PC/DOS 3.1. It supports the NetBIOS LAN protocol. Features include a full-function file transfer package, concurrent file accesses between any number of on-line users and batch programs, unlimited virtual disk sizes, and simultaneous access to any number of virtual disk libraries. Tempus-Share provides Micro Tempus's proprietary host application programming interface (HAPI) in the VTAM environment, allowing application-to-application communication. It also provides full support of the proprietary Tempus-Link and Tempus-Access products. Micro Tempus says these capabilities enable an IBM mainframe to be used as a NetBIOS-compatible file server. Tempus-Share is available this month at $45,000. Maintenance is $5,900 per month.

Tempus-Link 3.2, an enhancement of the Tempus-Link micro-to-mainframe link, features the addition of a virtual disk attribute, called SHare, which allows mainframe and micro tasks to compete for writing on a shared virtual disk; a new host utility program, TLUTIL, for managing virtual disks; a cache facility; and new PC utilities for listing virtual disk information and for facilitating the use of Tempus-Link with protocol converters in 3101 mode. An MVS/TSO version is available now and is priced at about $20,000 for 25 users. MVS/CICS, MVS/IMS, DOS/CICS, and VM/CMS host environments will be available by the third quarter.

Micro Tempus has also made its Tempus-Access software package, which is designed for extracting mainframe data, available for the DOS/VSE/CICS environment. It was originally released in November 1986 for MVS/TSO and MVS/CICS. It ranges in price from $6,900 to $13,900. HAPI has also been upgraded and is available in VTAM. This communication interface, an integral part of Tempus-Link and Tempus-Share, is

common across the product line. MICRO TEMPUS, Montreal. CIRCLE **261**

Data Transfer

Digital announces VAX-to-SNA package.

DECnet/SNA Data Transfer Facility (DTF) is layered software that allows users to move information between a Digital VAX-based system and an IBM 370-based system in an SNA environment, using either VMS/SNA software or the DECnet/SNA Gateway as the link. Digital has also enhanced its Advanced Peer-to-Peer Communications (APPC) software to include the latest features of LU 6.2.

DTF allows for the transfer of files interactively as well as in batch mode. Also featured is a directory command capability, which provides a directory on files residing on an SNA system, and security devices, which allow only users with privileged access control to view SNA files. DTF is available now. The price for server software is $2,100 for the MicroVAX 2000 and $21,000 for the VAX 8800; client software ranges from $900 to $9,000. DTF that resides on a host running MVS is $20,000.

The new release of DECnet/SNA VMS APPC allows a programmer in an SNA environment to access data on a Digital network without having to ask a programmer on the Digital side to initiate the session. VMS-based applications for VAXs and SNA host applications can communicate bidirectionally using it. Security enhancements are also featured. The product is available now and ranges from $900 for the MicroVAX 2000 to $9,000 for the VAX 8800. DIGITAL EQUIPMENT CORP., Maynard, Mass. CIRCLE **262**

Multiuser Database

Ansa adds multiuser capabilities to Paradox DBMS.

Paradox 2.0 from Ansa Software provides multiuser database management capabilities for users of IBM PCs and compatibles. The company has addressed what it feels are the shortcomings of the first-generation multiuser products currently on the market, such as limited concurrent access, inadequate data protection, and slow performance. Paradox 2.0 works on major networks like 3Com 3Plus, Novell Advanced Netware, IBM Token Ring and PC Network, AT&T Starlan, and Torus Tapestry.

The new release of Paradox allows unlimited, simultaneous access to all records in the database for transparent data sharing. A user can browse through a file while another user is editing it. If a record is being used, Paradox displays the name of the user. Auto refresh automatically updates information on the screen as it's revised by other users. Automatic table and record locking for data integrity, and deadly embrace protection, which prevents crashing when more than one user seeks access to a record simultaneously, are featured. A query-by-example capability is also featured.

An enhanced edition of the Paradox Personal Programmer application generator, which is rewritten in C, is included. Both EMS and EEMS extended memory protocols are supported, and record capacity is expanded from 65,000 per file to over 2 billion. Ansa is in the process of developing a multiuser capability for the SQL environment.

Paradox 2.0 is priced at $725, which includes both a 5¼-inch and 3½-inch disk. A package that can support six users is $995. Paradox 1.1 is still available, and the price has been dropped to $495 from $695. ANSA SOFTWARE, Belmont, Calif. CIRCLE **263**

Project Management

PC-based system integrates spreadsheet and graphics.

InstaPlan Corp. recently unveiled its InstaPlan and InstaPlan Tracker project planning and presentation software packages. InstaPlan developed the products jointly with Wipro System Ltd., a minicomputer maker in India. The packages run on IBM PCs, XTs, ATs, and compatibles and support dot matrix and laser printers.

InstaPlan features an outline-based activity scheduler, which lays out projects from the top down in a list-making format. As a project develops, the plan can be evolved without having to undo details already entered. A spreadsheet-based work assignment feature allows users to assign and shift work to and among people. The spreadsheet also provides a mechanism for variance analysis and control. InstaPlan's multilevel precedence diagram network has a capacity for over 600 activities in a 640KB PC. Individual working calendars—with capacity adjustable on a daily basis—are also featured. The package provides presentation graphics, which allow the creation of overhead slides, proposals, and handouts on ordinary printers.

Tracker is an option that features a reference plan system, which allows users to compare progress from the individual work-assignment level to the total project level for schedule, manpower, budget, and cash-flow control.

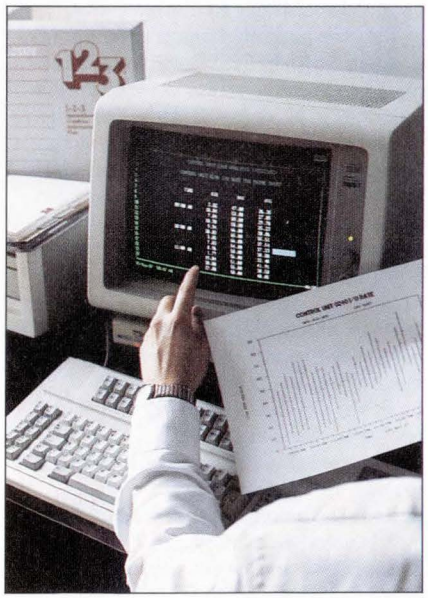
InstaPlan is available now and is priced at $99; Tracker is $50. INSTAPLAN CORP., Mill Valley, Calif. CIRCLE **264**

VM Performance Monitor

Provides both real-time and historical reporting.

BlueLine Software has announced its newest product, Vital Signs, a VM performance monitor.

Vital Signs has a modeling feature, which allows for what-if analyses of different storage devices, channel loads,



file block sizes, and I/O loads. The program also integrates both real-time and historical reports and presents them in tabular and graphic display formats. This accommodates both short-term and long-term analyses. Vital Signs' data extraction facility has the ability to transport data into external analytical software like Lotus 1-2-3. The product is menu-driven and includes an on-line help facility.

BlueLine claims that Vital Signs' critical data-gathering routines require 1% of the system's processing power. Vital Signs, sold on a site-license basis and priced at $8,000 for a one-time license, is available now. BLUELINE SOFTWARE, Minneapolis. CIRCLE **265**

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PEOPLE

Leaving Something To Be Remembered By

Former ADAPSO chairman George Raymond says that with age comes the desire to give something back to society.

BY WILLIE SCHATZ

Last year, George Raymond had two full-time jobs. One was owning Automatic Business Centers (ABC), a Morristown, N.J., computer service for payroll processing. The other was being chairman of ADAPSO.

These days, the livin' is easy for George Raymond. He has only one full-time job. With the expiration of his term at ADAPSO last November, ABC became Raymond's working life—again. He reacquired the firm last September from CIGNA, a large holding company, to which he had sold it in 1983, after founding the company and acting as its president for 15 years.

He made the seemingly contradictory moves, he says, because in each case it was an offer he couldn't refuse.

"I've got a totally different attitude about the company today than when I sold it," the 50-year-old Raymond says. "Today, I'm the owner, and I worry about things I didn't worry about when CIGNA owned it. It's the difference between owning a car and leasing it. The subtleties in there are very different.

"Before I sold it there was always a burning feeling in the pit of my stomach that I wouldn't be able to meet the next payroll. Now, I'm not worried about whether the damn thing's going to make it."

No wonder. The book on ABC showed $6 million in revenue when he sold it. This year it will do $21 million, and upward is the only direction in sight. Because business was booming and his second job was history, Raymond took the next logical step—for him, that is. He found another job.

Raymond hadn't had one since last November, when his term as ADAPSO chairman expired at the organization's 25th anniversary meeting.

Many people would have gone gently into wherever it is chairmen go when they become chairmen emeritus. But Raymond wasn't finished with ADAPSO. Just because they took the boy out of ADAPSO doesn't mean they took ADAPSO out of the boy.

RAYMOND: "I realized I wanted to find a way to leave something behind."

Enter his new passion. The ADAPSO Foundation had been sitting around as an empty shell since it was formed two years ago as a public service venture by former ADAPSO president Jerry Dreyer. It was a perfect vehicle for Raymond to accomplish his goal of giving something back to society.

"I've never thought of myself as benevolent or charitable," Raymond confesses. "But I've been in the industry forever, and it's been very good to me. So I wanted to find a way for the industry to come together and make life better for those less fortunate."

"I'm getting to the time in my life when you have a chance to reflect," Raymond says. "When people get to 60, they start thinking about retirement. That's a little old to start doing new things. The more I thought about it, the more I realized I wanted to find a way to leave something behind for the part of the world that's been good for me. That's more than starting a couple of companies and processing a few payrolls.

"When I began to rationalize the concept of an industry payback, the foundation was sitting there waiting. I'm fortunate I had the power to make it happen, though. If I hadn't been chairman of ADAPSO, this wouldn't have happened."

But he was, so it did. As president of the foundation, Raymond convinced Bernie Goldstein, president of Broadview Associates, Fort Lee, N.J., and an ADAPSO legend, to become chairman of the foundation's board of trustees. Thus far, the foundation has funded the Wolf computer project, which is teaching severely handicapped children in Michigan's Wayne County school district how to communicate without speaking. The foundation will also provide talent to develop software that can be used as teaching aids at Gallaudet College, a school for the deaf in Washington, D.C.

"The foundation is no grand design," Raymond says. "I'm not that much of a visionary. It's been an evolutionary process. When I was 40, this was the furthest thing from my mind. But at 50, you have more free time to think about other things. I guess it's the aging process."

Raymond fell into the computer business accidentally while working for a small accounting firm in Philadelphia in the early '60s. We're not talking computer freak, here, but the machines were part of the office's management services business, so Raymond learned them as he went along. When the office became the Philadelphia branch of Touche Ross, a Big Eight accounting firm, Raymond cut out to start a service bureau doing traditional accounting for small businesses. He sold that company in 1969, took the money, and three years later ABC was born. The rest is history.

Building a successful business is no small shakes, but Raymond says he wants to be remembered as having done more than that.

"I'm convinced it's the right thing to do," he says of his involvement in the foundation. "Encouraging the industry to hire the handicapped is a tremendous opportunity to step forward. This isn't a conduit for money. The real payoff is doing things like Gallaudet. And if I'm going to be remembered for anything, I want it to be that the foundation was a significant force in helping people, not because I built a company." ■

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BOOKS

You Want It When?

CRUNCH MODE: BUILDING EFFECTIVE SYSTEMS ON A TIGHT SCHEDULE
by John Boddie, Yourdon Press/ Prentice-Hall, Englewood Cliffs, N.J. (1987, 192 pp., $26.67).

BY ANDREW MALAKOFF

"Crunch mode"—the pace at which a team is driven when it has to produce six months' worth of work in three months—is a dp folk idiom whose symbolism is double-edged. The phrase conveys either the image of an efficient and relentless team on a blitz, or that of a monstrous project on the loose, devouring the hapless programmers in its path. Independent consultant John Boddie has written a guide for "anyone who must manage a crunch-mode project or happens to be caught up in the middle of one," with the intention of demonstrating that crunch mode can be survived and that "quality and short development times are not mutually exclusive."

Boddie emphasizes that any project is the result of a business decision, and an accelerated schedule is instituted because of market constraints, not as an exercise in character building. The skeleton on which Boddie hangs his body of experiences, judgments, and truisms is the development of an on-track telephone account betting system for a fictional racetrack called Louisville Downs. Scattered throughout the discussions of design implementation and personnel management are vignettes following the progress of project leader "Ben" and his team as they labor over the "Dynatote Call-a-Bet" system.

As Boddie notes in the first chapter, "It is not a formula approach. It's a collection of observations and practices gathered from successful crunch-mode projects—not all of them will apply to your situation." Nor will they necessarily be useful, informative, or entertaining.

The initial chapters, which cover the design process, skim over material that should already be familiar to anyone involved in systems development. The techniques of top-down design, dataflow diagrams, and structured code have been well known for some time, and although their prescriptions may be honored more in the breach than in the observance, few experienced professionals have not heard of them. They have been shown to form the general basis of sound project design and implementation. Project leaders or programmers who are unfamiliar with them are in well over their heads and Boddie would have axed them from his team in short order.

Boddie's treatment of several worthwhile topics is cursory or inconclusive. Given the bad reputation of software estimating and the exceptional nature of on-time deliveries in many sectors of the computer industry, one would have expected Boddie's treatment of estimating to consist of more than a few rules of thumb, hedged with caveats, and glorified with the label "heuristics." A section on "recent developments" is a balloonist's-eye view of code generators and fourth generation languages. A description of micro-based design packages is essentially a commercial for the Analyst Toolkit software from Boddie's publisher, Yourdon Inc., New York.

The book's later chapters, covering the programming team and the coding and testing phase of the project, are equally superficial. Useful observations on the tasks the project manager and leader should reserve for themselves (system testing, library management) coexist with banal truisms concerning leadership, motivation, and the care and feeding of programmers. Boddie can't pad this discussion with multiple examples of data diagrams, so vignettes from the Call-a-Bet system project and passages quoted at length from other books become more prominent.

Crunch Mode is written in a breezy, chatty style and reads like an oral presentation. The snappy sentences and punchy paragraphs occasionally suffer from choppiness and a lack of continuity. The book is padded with illustrations, charts, and examples that tell us very little or far more than we want to know.

One has the impression that Boddie wanted to turn his life experience into a book when he should have been satisfied with a magazine article. He found a sexy title and a hot topic but didn't give much thought to his audience. The experienced project leader has no need of the generalities dispensed here, and the novice would not have the time to read this book under crunch-mode conditions. ■

Andrew Malakoff, a New York-based software engineer, has survived crunch mode and other natural disasters.

CALENDAR

AUGUST

1987 International Congress on Planning and Design Theory.
Aug. 17-20, Boston. Contact the American Society of Mechanical Engineers (ASME), 345 E. 47th St., New York, NY 10017, (212) 705-7722.

Second Annual Comdex/Australia.
Aug. 19-21, Sydney. Contact the Interface Group Inc., 300 First Ave., Needham, MA 02194, (617) 449-6600.

First Conference on Speech Technology in Health Care.
Aug. 26-27, San Francisco. Contact the Institute for Medical Record Economics Inc., 121 Mt. Vernon St., Boston, MA 02108, (617) 523-4449.

AIME '87 (Artificial Intelligence in Medicine Europe).
Aug. 31-Sept. 3, Marseilles, France. Contact IIRIAM (Institut Internationale Robotique et Intelligence Artificielle de Marseille), 2 rue Henri Barbusse, 13241 Marseille Cedex 1, France.

SEPTEMBER

PC Expo.
Sept. 1-3, New York. Contact PC Expo, 333 Sylvan Ave., Englewood Cliffs, NJ 07632, (201) 569-8542.

Telecomp China '87.
Sept. 8-13, Beijing. Contact Kallman Associates, 5 Maple Ct., Ridgewood, NJ 07450-4431, (201) 652-7070.

DGC '87 (Fifth Annual Conference and Exhibition on Computer Graphics in Defense and Government).
Sept. 29-Oct. 1, Washington, D.C. Contact World Computer Graphics Association Inc., 2001 M St. NW, Suite 399, Washington, DC 20036-8446, (202) 775-9556.

Federal Computer Conference.
Sept. 29-Oct. 1, Washington, D.C. Contact Registration Director, Federal Computer Conference, P.O. Box N, Wayland MA 01778, (800) 343-6944 or (617) 358-5356.

Info '87 (14th Annual Information Management Exposition & Conference).
Sept. 29-Oct. 2, New York. Contact Info '87, 999 Summer St., Stamford, CT 06905, (203) 964-0000.

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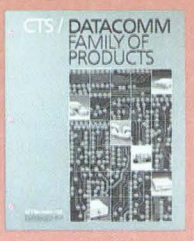

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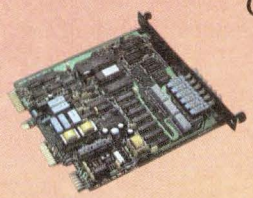

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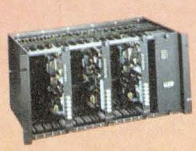

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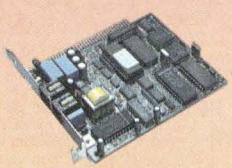

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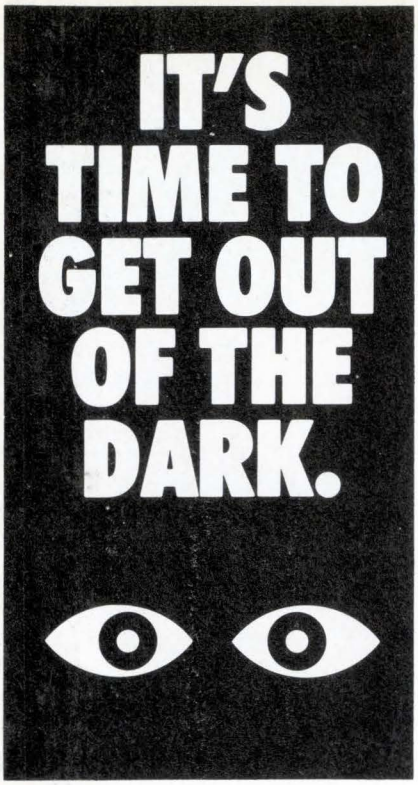

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READERS' FORUM

The 'Competitive Edge' Argument For New Systems: Overused?

The dp/MIS function finally may have come out of the back room and into the upper echelon of corporate management. The experiences of companies such as Merrill Lynch, United Airlines, American Airlines, American Hospital Supply, and others have helped spread the idea that computer systems can be used to gain a competitive business advantage. Even publications like *Business Week*, which only a year or so ago had characterized the chief information officer (CIO) as a figment of academics' and consultants' imaginations, have now christened the CIO as "management's newest star."

However, there is evidence that the "competitive advantage rationale" is beginning to be used excessively—primarily to rationalize projects that cannot be otherwise justified. If this is so, the notion will probably lose its credibility with upper management just as rapidly as it has been accepted.

A number of MIS execs have confided to me that "there is no way to get a major project approved these days unless it is backed by a competitive advantage rationale." They also suggest that "just as we used to fudge the numbers to project cost savings that we didn't really believe, now we feel we must come up with a similarly fudged rationale based on competitive advantage."

This anecdotal evidence, coupled with the results of a recent survey of 84 companies that we conducted at the University of Pittsburgh, suggests that even in large sophisticated firms, decisions about strategic applications are not generally derived from or supported by formal business planning or policies. So, we have the anomaly of potentially important MIS projects that might produce strategic advantage being dealt with on a rather casual basis, while the competitive advantage rationale is being used to justify projects that have little potential for producing such results.

For the strategic role of MIS to come into its proper perspective, top management and MIS people must recognize that not all firms will find it useful, or practical, to embark on a strategy in which MIS plays an important role. Just as not all firms can compete on the basis of any single business factor, be it price, or quality, or product differentiation, only some will find it desirable to use MIS as a major element of their business strategy. Even companies in rust belt industries have found that they can create competitive advantages on bases such as superior cost information; information-intensive strategies, however, should not be force-fit in situations with little potential for achieving sustainable advantages.

Firms reviewing MIS projects should require that their potential for achieving a sustainable competitive advantage be thoroughly justified. It is not necessary that this be solely a "numbers game." Indeed, there may be some advantages to keeping it qualitative. But the project champions should be able to argue just *how* a competitive advantage will be achieved, *why* the advantage will be a significant one, *how* it may be sustained once it is achieved, and *why* competition will not be able to quickly respond and match, or improve on, the functionality being provided. Top management should insist that the relationship between the proposed computer component and the other elements of business strategy be carefully spelled out. Is the overall business strategy internally consistent? Does the MIS component of the overall strategy fit in with the other elements? Are they mutually reinforcing? Are there synergies? This is the key element in sustaining a competitive advantage because competitors generally find it more difficult to integrate an application into their business strategy than to simply reproduce the development of a system.

The evaluation of the potential of information as a strategic resource should be incorporated as a routine element of the *business* planning process so that all managers become used to thinking in these new terms. Indeed, the distinction between strategic MIS planning and strategic business planning is on the verge of breaking down, so that for many firms it is probably no longer useful to have these two planning processes carried on independently.

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