

# DATA MATION

OCTOBER 1, 1988  
A CAHNERS PUBLICATION  
INTERNATIONAL EDITION

## CHOP! IS Trims Down



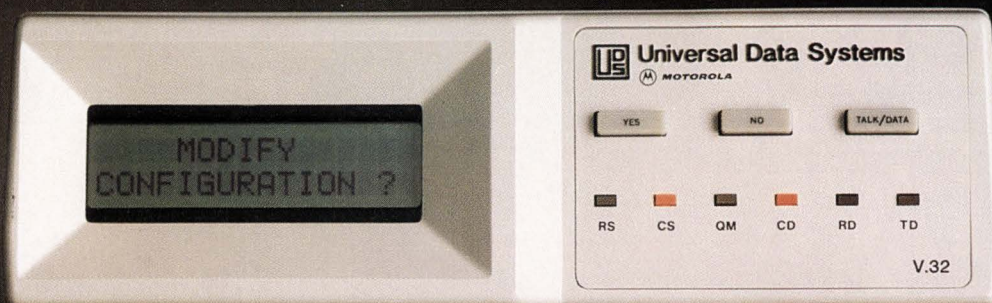
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### Also in this Issue:

- Salary Survey: What Are You Worth In '88?
- The Myths and Realities of Competitive Advantage
  - Who Manages Distributed Systems?
  - Blue Cross Takes the IS Cure



# Some Datacomm Standards Should Be Carved in Stone



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BY SUSAN KERR

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A DATAMATION REPORT DATAMATION's annual salary survey shows that IS specialists are still better paid than the average American.

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BY MICHAEL MIRON, JOHN CECIL, KEVIN BRADICICH, AND GENE HALL

The first of a series prepared by consultant firm McKinsey & Co. exploring when, why, and how information technology should be employed to change business strategy or improve performance. With:

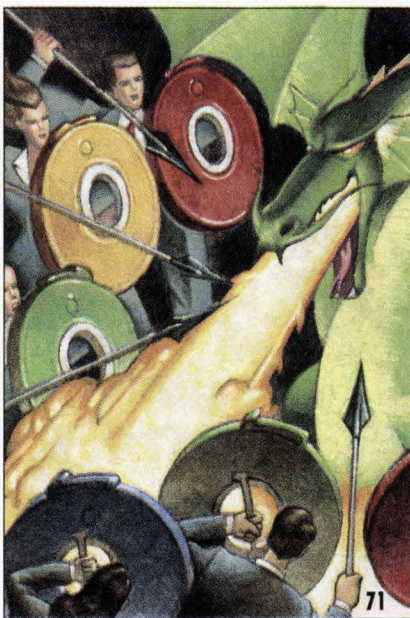
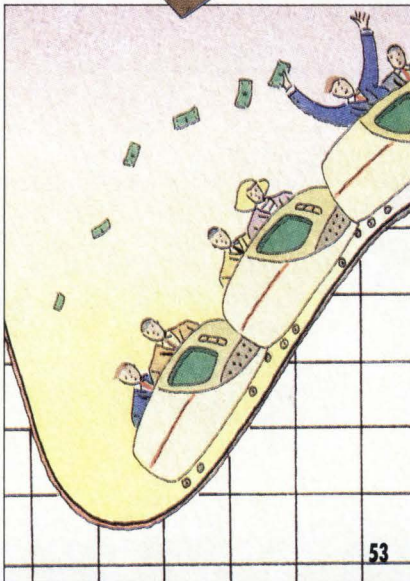
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BY DAVID STAMPS

Who should be responsible for the support of departmental systems? Today, a user department can snatch the coordinating and control functions over applications and data traditionally housed with central IS.





# ION

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### -1 **Shifts In Global IS Trade**

A study of international informatics policy shows that the strength of the Far East in global IS, combined with technological change, has forged new world trading patterns that are forcing governments to alter industrial policies and strategies.

### -15 **EDI In Europe**

BY JAMES ETHERIDGE

The plan to abolish national trade restrictions in Europe is turning corporate heads in the direction of electronic data interchange. European industries are concentrating on setting EDI standards cooperatively for their particular sectors.

Cover photograph by  
Raeanne Giovanni Inoue

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## Editorial

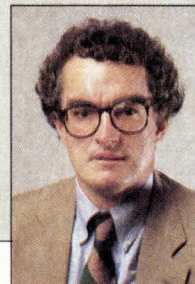
# Managing Change: IS's Biggest Challenge

Among the many job requirements for IS pros, one is quickly emerging as preeminent: the ability to manage change. It's not only technological changes that have to be mastered; all IS pros—from corporate MIS directors to data entry operators—must be able to cope with the organizational changes wrought by new information technologies and business trends.

"IS Trims Down" (p. 46) reveals that major user organizations are scrutinizing centralized IS investments as never before, often with an eye toward cutting them or at least limiting their growth. They're motivated by technological change, namely, the decentralization of IS applications afforded by pc/workstation and networking advances, and by business considerations, such as earnings performance and merger mania. IS managers who don't understand these issues and who resist change put their careers, and perhaps those of their subordinates, at risk.

DATAMATION's salary survey (p. 53) reveals that several small shifts are under way in the IS ranks. Although overall raises are nearly on a par with last year, individuals with database, telecom, and IS auditing skills (the right stuff in today's global business environment) are beginning to command greater increases than their colleagues elsewhere in IS. Similarly, those who can communicate the value of information technology to their business-unit peers are in greater demand.

Finally, McKinsey & Co., in "The Myths and Realities of Competitive Advantage" (p. 71), advises top executives to change their attitudes toward IS. The consulting firm argues that technology alone cannot create sustainable advantages—an opinion that has long prevailed among some Fortune 1000 companies—and urges users to integrate technology into their line operations and to use IS to leverage unique institutional skills and strengths. Just how prepared IS pros are to meet the dual challenges of technological and organizational change is questionable. While some organizations seem willing to invest in training their IS employees, we question whether it's enough training and the right kind. When was the last time you heard of an applications programmer taking an employer-sponsored seminar on new organizational dynamics? The burden, no doubt, falls on IS pros themselves. They had better become savvy in the ways of new technology and, more important, new business.



A handwritten signature in cursive that reads "Tim Mead".

TIM MEAD  
EDITOR-IN-CHIEF



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# Letters

## A New Gateway

Brad Schultz's article "The Evolution of ARPANET" (August 1, p. 71) incorrectly states "BITNET can only exchange data with the Internet via a special gateway at the University of Wisconsin." The BITNET-Internet gateway ceased to exist on Dec. 15, 1987. The default gateway is at the City University of New York, but many sites—this university included—have private gateways.

BITNET comprises a large and rapidly growing network. Presently, over 2,500 mainframes and minis provide BITNET services directly to an estimated 500,000 users and to hundreds of thousands more via Internet, USEnet, and CSnet. Between 20 and 50 new nodes come on-line each month. Connections are planned to the People's Republic of China and to "Iron Curtain" countries. BITNET reaches the Far East, Southeast Asia, the Middle East (Israel and Turkey), Europe, North America, and Brazil.

Further, David Farber mistakenly asserts that BITNET mainly serves academic administrators: the largest service demand is for software, data, and mail transmission to Europe and Israel. Servers automatically store and distribute public domain software, data, and publications. Relay services provide interactive networkwide teleconferencing.

BITNET does not employ the latest and greatest technology and hardware, but succeeds because it relies on off-the-shelf parts. Nearly every IBM mainframe site connected can afford a leased or dial-up phone line and a 37 x 5 binary synchronous communication port. IBM's internal VNET network uses the same facilities, although there is some direction toward SNA and TCP/IP.

KARL GEIGER

University of Southern California  
University Computing Services  
Los Angeles

## Open and Shut

Since the Open Systems campaign is a move toward an industrywide standard, it should be no surprise that Eastern Bloc governments, with their philosophy of one-size-fits-all, are interested in joining (see Look Ahead, August 1, p. 9).

Even more important than the Open System itself is that the standard remain "open," defining a norm without prohibiting innovation by those who choose to go their own way. If we had computer standards in the same sense that we have building codes, consumers could be as-

sured of buying computers made with only the very best of vacuum tubes.

CAROL PRUITT

Libertarian Futurist Society  
Rochester, N.Y.

## Smooth Transition

I'd like to comment on the final sentence of David R. Brousell's Unix editorial (April 15, p. 3). The Dannon Co., America's largest yogurt manufacturing company, has been successfully using Xenix as the mainstay operating system for seven distribution centers across the U.S. Dannon uses the Progress RDBMS (ported from MS/DOS) and uses Unix (Xenix) as a platform for running Order Entry, Inventory Management, Sales Reporting, On-line Inquiry and 3780 Data Communications to the host in White Plains, N.Y. All applications are concurrent and multiuser. By using Unix as a software platform for portability, we've been able to preserve our applications across multiple hardware platforms. In fact, Unix has allowed us a smooth transition from PC-based Xenix systems to larger Unix-based minicomputers without application code change. This is a cost-effective solution that could not have been achieved using proprietary operating systems.

DAVID J. BERRY

Director of MIS  
The Dannon Co. Inc.  
White Plains, N.Y.

## Just In Case

In "A Guide To Selecting CASE Tools" (July 1, p. 65), Michael Gibson states in his introductory paragraph, "The following questions constitute a comprehensive set of CASE tool selection criteria."

I take issue with this statement. Gibson has fallen into the all-too-common trap of including in the CASE tool menu only those tools that bear on development/maintenance issues. He makes no reference to software testing tools. One could infer from his article that testing is not considered to be a part of software engineering. I would suggest that CASE and software engineering both embrace the testing discipline.

Testers are integral to software engineering, and test tools should be considered a part of any CASE suite.

RODGER DRABICK, CQA  
Manager, Quality Management Services  
Eastman Kodak Co.  
Software Systems Div.  
Rochester, N.Y.



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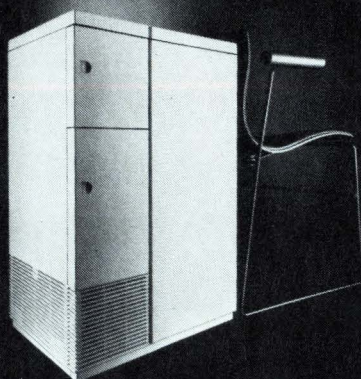
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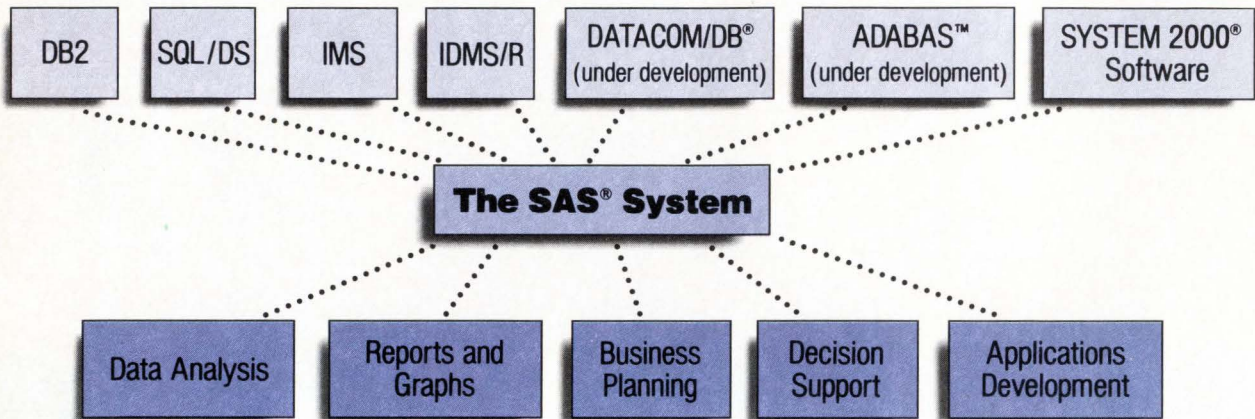
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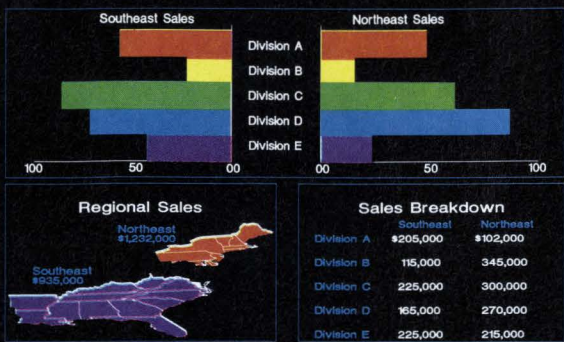


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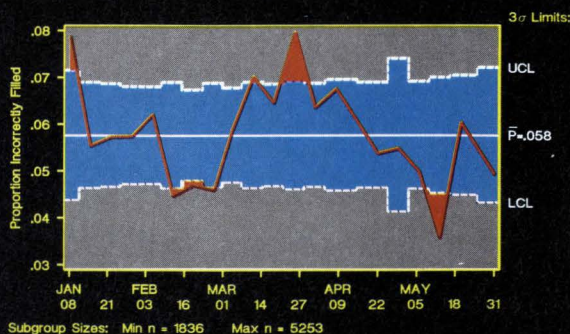


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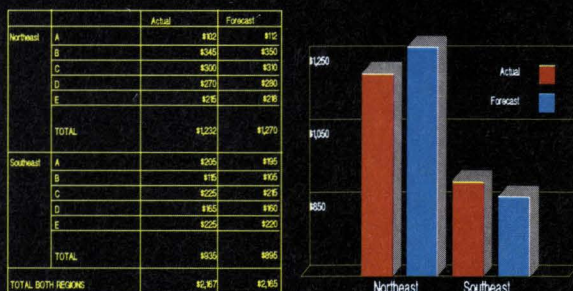
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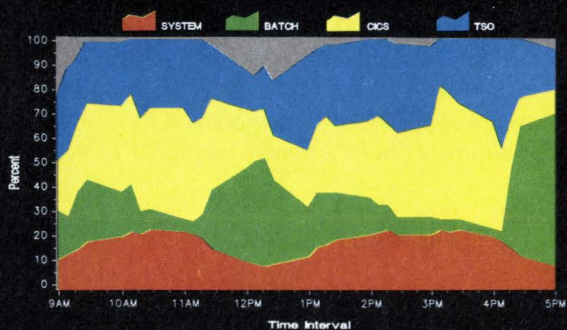
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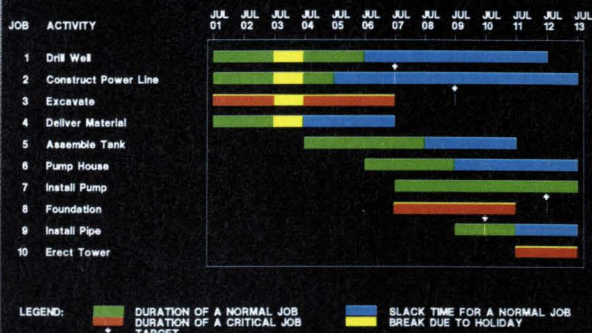
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DA



# Look Ahead

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## **MSA HEADS TOWARD SAA...**

ATLANTA -- Upon reassuming operating control of Management Science America Inc. from Bill Graves, one of the first things John Imlay decreed was that product development would henceforth aim to comply with IBM's Systems Application Architecture. Imlay appears to be following through. Sources say that MSA is negotiating with IBM to license Cross System Product (CSP), the IBM 4GL and applications generator interface that is a key part of SAA. MSA would build interfaces from its development tools and applications to CSP.

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## **... AS CULLINET PAVES THE WAY TO DB2**

WESTWOOD, MASS. -- This week, Cullinet Software Inc. is expected to detail plans for unbundling its Application Development System (ADS) 4GL from its IDMS/R mainframe database. New versions of ADS will become full partners with pcs and IBM's CICS, according to user sources. The DBMS vendor is expected to disclose a pc package, called ADS+PC, that can generate applications code in Cullinet's ADS 4GL when linked to a host. Cullinet is also expected to disclose an ADS interface to CICS. Referred to as ADS+CICS, the package enables applications written in ADS to run using only the facilities of CICS and VSAM files--without requiring IDMS/R. The development paves the way for the eventual use of ADS applications with IBM's DB2.

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## **NASA AMES GIVES ETA A CHANCE**

PALO ALTO -- So, why is that ETA 10-Q just hanging out in a corner of the Numerical Aerospace Science Systems Div. at NASA Ames? Because it flunked its acceptance test. That put the machine several orders of magnitude behind the Cray-2, which breezed through its test. ETA's failure originally meant the company did not have a shot at the projected job, which is to analyze results from projects run on NASA's larger supercomputers. But, after begging and pleading for NASA's sympathy, ETA will be given another chance this month in return for "price considerations" should NASA decide to buy the 10-Q.

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## **UNISYS TOUTS NEW UNIX PRODUCTS**

BLUE BELL, PA. -- Is Unisys really serious about its Unix product line and open systems? Sources report the company is beginning to tout to potential customers new, multiprocessor versions of its U 6000 Unix-based products, which could rival its established proprietary mainframes for performance as well as price. One potential user said to be evaluating the as-yet-unannounced multiprocessor system is the State of Florida Department of Motor Vehicles, which reportedly has been told the line eventually will include two- to 30-processor versions. Unisys is competing for the Flor-



# Look Ahead

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## **DEC WOOS ON WALL STREET**

ida business with DEC and NCR, among others.

NEW YORK -- The word on Wall Street is that DEC has targeted 25 key securities trading users and is aggressively pricing VAX minis and workstations to keep or lure those traders into the DEC camp. The move is apparently in reaction to efforts by Sun Microsystems, linking with minicomputer vendors such as Stratus, to become a force in workstation-based trading systems. The latest skirmish reportedly occurred at Bear Stearns, which recently decided to stick with a DEC-based system rather than switch to a Sun network.

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## **METAPHOR WORKS WITH INVESTORS**

MOUNTAIN VIEW, CALIF. -- Metaphor Computer Systems Inc., maker of data interpretation systems, is busy working with its two latest investors, IBM and Nielsen Marketing Research USA (which is owned by Dun & Bradstreet Corp.). Although IBM and Metaphor are doing some sales calls together, IBM won't hit the market with its own Metaphor product--a 386-based version--until the second half of next year. By the first quarter of 1989, Metaphor and Nielsen separately will reap the results of work on such merchandising applications as coupon redemption and trade-in evaluations.

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## **AIR FORCE IS FLYING HIGH**

WASHINGTON, D.C. -- These may be lean and mean times, but don't tell it to the Air Force. It has just completed a supercomputer plan in which the machines would be installed at about nine air force bases and then networked together. All it's going to take is money--\$20 million in fiscal year '89 and \$20 million increments in each succeeding fiscal year. So what's a few bucks between friends? Surely not enough to convince the House Appropriations Committee to hang up the dollars. Unless it does so, the Air Force procurement will be on the street in the first quarter of '89.

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## **RECLARIFYING NETVIEW PLANS**

WHITE PLAINS, N.Y. -- IBM has reclarified its plans for its NetView Network Definer product, originally scheduled to ship by the end of 1987 (see Look Ahead, Aug. 1, p. 9). Release 1 is now scheduled for a December debut and will create definitions for multiple VM/SP systems. Release 2 is planned for March 1990, and will feature a full-screen interface to release 1 functions, thus allowing less-skilled personnel to work with the networks.

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## **RUMORS AND RAW RANDOM DATA**

Look for Fujitsu America Inc. to continue its communications drive in the U.S. by forming a brand-new Private Network Div.



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6. Identify plan	
7. Rebind plan	
8. Inform CICS	
9. Test	

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WORD  
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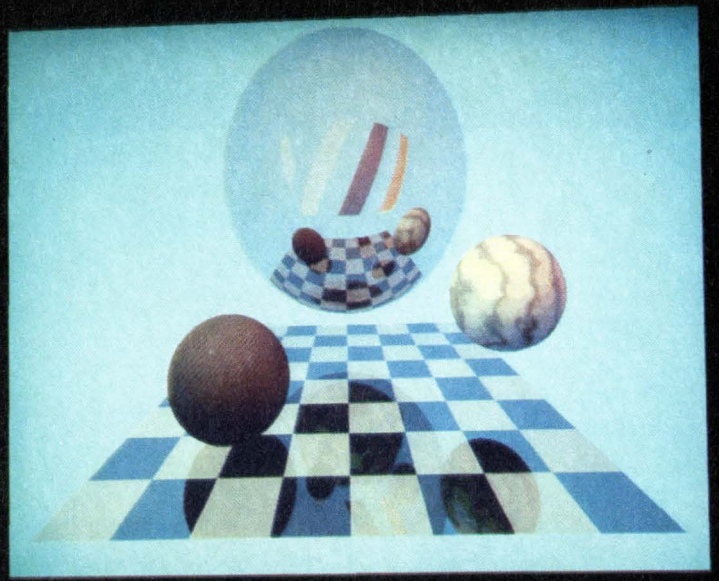
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### DATA COMPRESSION

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20 to 50% DASD SPACE**

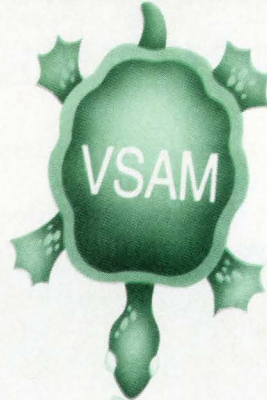
IAM optionally compresses data records. Most files contain records with unused fields or repeating sets of characters. When IAM applies its proprietary compression techniques, the result is an additional 20 to 50% reduction in file size.

IAM's CPU time is dramatically less than competing compression products. In fact, since IAM's CPU time is normally much less than VSAM, IAM with data compression takes less CPU time than normal VSAM processing.

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OF UNUSED SPACE**

IAM takes the guessing game out of VSAM space allocation. Large amounts of disk space are wasted when users over-estimate how much space VSAM requires or how many records a file will contain. VSAM cannot release overallocated space.



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VSAM files account for the lion's share of disk space used in most installations. Online systems (CICS), BATCH jobs, TSO, SMP/E and other applications make extensive use of keyed index VSAM (KSDS) files.

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#### VSAM SIZE REPORT

DATA SET NAME	ALLOC TRKS	TOTAL EXCPS
BIG.CLUSTER	37155	2507803
BIG.CLUSTER.DATA	37100	2105001
BIG.CLUSTER.INDEX	55	402802
A.FILE.SMALLER	16540	679216
A.FILE.SMALLER.DATA	16500	270501
A.FILE.SMALLER.INDEX	40	408715
SMPE.TDFP223.CSI	12315	3880211
SMPE.TDFP223.DATA	12300	3075021
SMPE.TDFP223.INDEX	15	805190

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# News in Perspective

## SOFTWARE

### ADAPSO Withdraws Opposition To IBM's Object Code Stance

Big Blue has agreed to continue working with independents, but some of them feel it's a hollow victory and fear that they could lose control of their destinies.

BY WILLIE SCHATZ

It may seem that the IBM-ADAPSO object code only (OCO) dispute has been going on for 10,000 years, but the recent announcement that the two parties have kissed and made up apparently means it's all over now.

The agreement calls for IBM to continue to work closely with independent software companies that have problems related to source code, in return for ADAPSO's withdrawing its position on OCO as an industrywide topic.

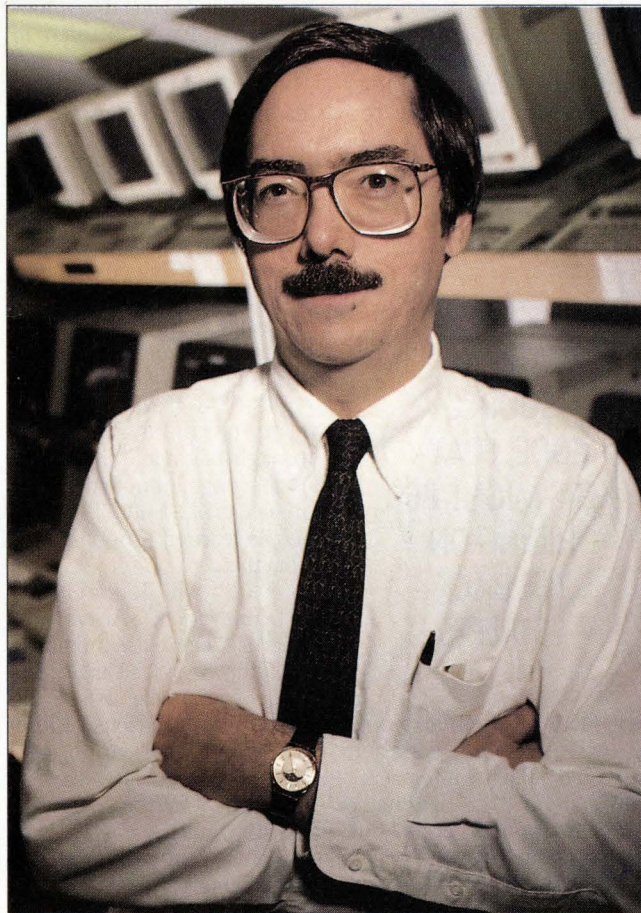
Appearances, however, can be deceiving.

#### Concerns About VM In OCO

"I'm not too thrilled about getting VM in the OCO mode," says Neil Ferri, vp of systems software at Merrill Lynch in New York. Ferri has two 600-class machines running 90MIPS of VM/SP-HPO-4.2 for about 500 users in Merrill Lynch's capital markets division.

Ferri has always had the necessary source code to do his thing with VM, and his staff has become so proficient at fixing problems that Big Blue has placed them on its customer distribution tapes. But those days may be dwindling following the agreement.

"If we don't have the source code, we won't be able to use the standard IBM interfaces," Ferri says. "We may have to dramatically re-engineer our operating system. We'll have to take the standard exit points and re-engineer all our applications. It may also [have an impact on]



MERRILL LYNCH'S FERRI: "I'm not going to mess with MVS."

our operating system quality control process. And it'll be a major staffing effort to regroup.

"I will be very, very upset if they go OCO."

Ferri won't be the only one. Vendors aren't exactly jumping for joy, either.

"IBM is doing more than they have in the past, but it's still not enough to make me comfortable," explains Pat McGettigan, president of

Landmark Systems, Reston, Va. "And they've still got some questions to answer, such as how the OCO policy will allow third-party systems software people to maintain their creativity and how users are going to retain their independence."

"The ADAPSO software products board wanted peace and so did IBM," says Martin Goetz, ceo of Sylogy Corp., Hackensack, N.J., and a vocif-

erous OCO opponent. "This never was a broad-based issue for ADAPSO, and most of the members wanted to stop fighting and go on to the next thing. So that's what they're doing. But we still have to watch IBM to see if they mean what they say."

An IBM spokeswoman contacted by DATAMATION said IBM is "pleased to see ADAPSO's statement and we look forward to continuing a productive working relationship with both ADAPSO and its individual members."

When IBM announced in February 1983 that source code was no longer going to be ripe for everyone's picking—to protect IBM's programming and technology investments—it didn't seem to be a capital offense. OCO didn't become a life-and-death issue until last fall, when then-ADAPSO chairman Jay Goldberg ripped IBM for sharing its source code with Fujitsu as part of an arbitration settlement while withholding source code from U.S. companies in general and ADAPSO members in particular. Until then, the sporadic sparring between the parties had been much sound and fury signifying very little (see "Software Firms Plan Campaign To Obtain IBM Source Code," Nov. 1, 1987, p. 19).

#### How Much Did IBM Give Up?

Once Goldberg lit the fire, however, even IBM began to feel the heat. ADAPSO apparently made all the right moves, including presenting its case to Congress, the European Economic Community, the Department of Justice, and several state Attorneys General. So, Big Blue, which did whip the government after 13 years of one-on-one, decided it would rather switch than fight.

And what exactly did IBM give up in this deal? According to the companies most affected by it, not much.



"I can't say this is any kind of victory" for users, says Goetz. "IBM may be responsive to companies, but it's at [IBM's] discretion and how it fits their priorities. They'll play, but by their rules."

Gabe Goldberg, director of technology for VM Systems Group, Arlington, Va., contends that "IBM is foolish for withdrawing source code. Its reasons make no sense. It hurts the industry. Companies have to be able to make their own decisions on whether to use source code. IBM doesn't see the universe the way people outside IBM see it. They don't understand that source code requirements are moving targets. For some leading-edge customers, it's totally unreasonable to put their fate in IBM's hands. They've got to be able to control their own destiny."

They often can with source code, which is at a higher level than object code and comes in languages that many software developers can speak. Source code also allows programs to be tied directly into IBM code.

Without source code, the vast majority of third-party players might be hiding on the back streets.

"If the industry had grown up without source code," Goetz contends, "a lot of software would have never been built."

The same can't be said for object code, which severely limits a developer's options. The only way to attach a program into IBM code is through the interfaces that IBM provides with object code.

## Fearing a Loss of Control

"You do lose your flexibility and control over your destiny," Ferri says. "If you're using OCO, you've got to wait for IBM to fix your problem. You can't research it and fix it yourself. Why

should I have to wait for them to show up when I've got the talent I need on my staff? That also means you'll suffer reliability problems."

That's life. When Syllogy was seeking two interfaces for CICSort, even Goetz thought it might be wise to seek IBM's assistance. He did, and IBM gave it graciously. But when Syllogy sought additional assistance for COBOL-Express, IBM shut it down. Big Blue contended that COBOL-Express would involve too many changes to IBM's VS compiler and would be too difficult to stabilize.

## WITHOUT SOURCE CODE, PLAYERS MIGHT BE HIDING ON THE BACK STREETS.

"The alternative would be to give us source code and we would build the interface," Goetz says. "We originally asked for source code, but IBM refused. Now we can't build the interface for COBOL-Express because we don't have the source code. So we can't have the product. We're still discussing the issue with IBM, but it doesn't look good. In that sense, they're shutting us out of a potential market. I think they have legitimate reasons not to do [the COBOL-Express interface]," he adds, in one of the more astonishing statements of this little war. "I'm somewhat sympathetic to their position. It's not unreasonable. We're not happy they're taking that position, but we'll live with it."

As will the rest of the independents. They don't have much choice.

The continued OCO confusion may have its cost in the user community, though. There's no question that the days when source code seekers could leaf through the material at their leisure are gone. Even eternal opponents such as Goetz and McGettigan concede that IBM is justified in preventing that luxury.

Yet, that practice is at least partially responsible for creating much of the software that's running much of today's hardware. The longer IBM goes one-on-one with source code seekers, the less the supply of that commodity within the general computing community. But, as the supply curve is dropping, the demand curve is rising.

"It's a great loss to industry not to be able to leaf through IBM code," says Mike Armstrong, immediate past president of SHARE. "A lot of people learned programming from that."

"OCO will definitely affect innovation," Armstrong asserts. "There are modifications that won't be made. In any circumstance where information is restricted, there are things that won't get done. That's going to have a major effect on the computer industry, but the energy that would have gone into those modifications will be redirected elsewhere, so the users may benefit in the long run."

## A Marathon for Users

It probably will be a very long run before users derive any benefit from OCO. But where is the benefit to a shop such as Ferri's? It often fixes IBM's code better than IBM does. Ferri's folks won't even have the joy of screwing up, as they did when they used source code to modify a VM HPO-3 program on the way to HPO-4.2. The modifications didn't migrate to 4.2, so the

program crashed. Ferri and friends then had to remove them permanently from the program before they could move cleanly to 4.2.

"I could see how IBM wouldn't like that," Ferri admits. "They wouldn't look very good in the eyes of upper management if word got out that there was trouble with the new operating system when it was actually our patches to the source code that were wrong." •

As long as IBM continues to support the source code for HPO-4.2, Ferri will hang in there. But, just to cover all contingencies, he's going into a test mode with VM XA-SP1. That's his first test with OCO, and he thinks he's got about a year before the OCO window closes on his fingers.

"I'm not going to mess with MVS," Ferri says. "That's too complex. I want IBM to handle that. But if we're talking VM, I want that to remain mine. I'm going to stay with it unless IBM drops its support for the source code. If they do that, I won't go with it. I won't take that risk."

So, what can he do now? "I'm not about to take my operating system to Armonk and trash it on the front steps," Ferri says. "We already belong to all the anti-OCO groups and we're very vocal at SHARE. We're going to scream and yell at IBM not to go OCO."

"I'm sure their reason for going OCO isn't bootlegging VM," Ferri states. "It's that they don't want their name dragged through the mud with top management. And if they do go OCO, the guys who are really going to suck wind are the big time-sharing companies. They bastardize VM all over the place."

"I don't think it's going to be anything insurmountable for me. But I'm sure as hell not thrilled."

Who would be? ■



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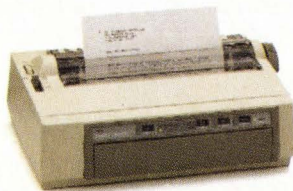
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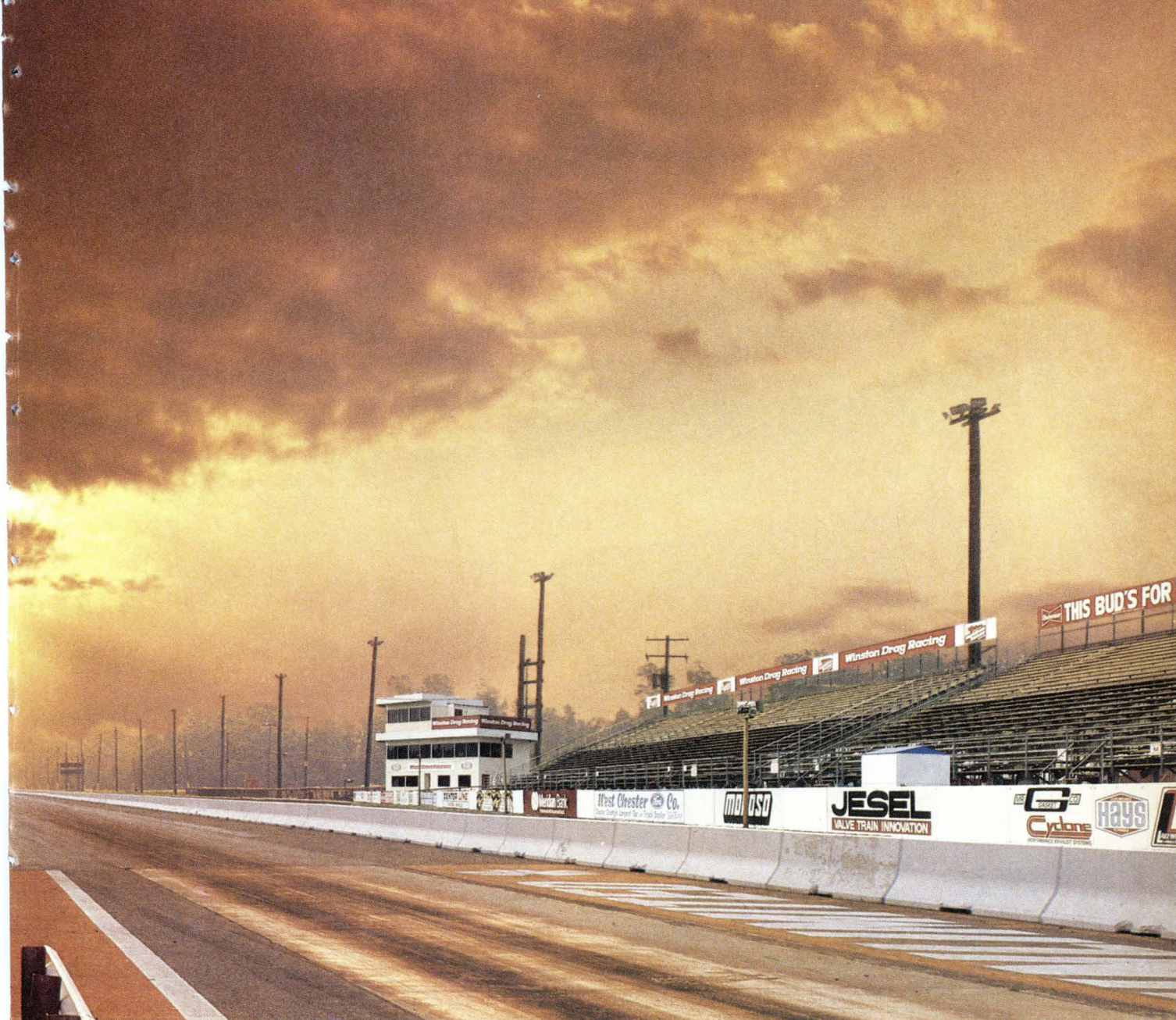
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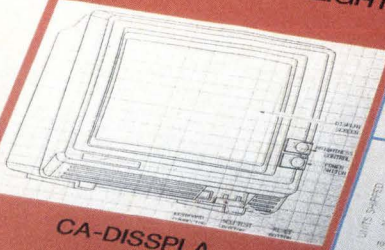
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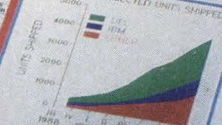
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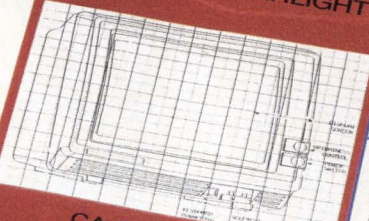


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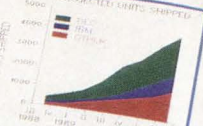
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### OPTICAL SYSTEMS

# IBM, Customers Continue Work On Document Image Processor

Although two MVS/ESA- and System/36-based ImagePlus systems are installed at pilot sites, the legwork continues as IBM enters an emerging market.

BY MARSHA J. FISHER

The software code for managing image data on IBM's ImagePlus system has been completed following two pilot programs, but it will be the first quarter of 1989 before users will know when they can acquire the component of MVS needed for the system.

The pilot programs for the MVS/ESA- and System/36-based systems were conducted at USAA Information Services in San Antonio and at Citibank in New York. The case management-style work flow software written for the System/36 ImagePlus system is still being modified to run on the new Application System/400 processors.

ImagePlus was announced in June, and it is IBM's entry into the emerging multimillion-dollar document image processing market (see *Software*, Aug. 1, p. 80). Some questions exist concerning the number of terminal users that a midrange System/36 or AS/400 ImagePlus system can support. IBM confirms that users who choose those systems will not be able to migrate later to the MVS/ESA ImagePlus environment.

#### Compromises Were Necessary

"We felt it was important to bring to the marketplace in mid-'88 all of the information they [users] would need to plan for a complete, workable system," says IBM's Dave Liddell, manager of marketing programs, image application systems.

IBM has said that its image workstations, which will be

based on the Personal System/2 Micro Channel architecture, will not be available until the first quarter of 1989.

For the next six months or so, the ImagePlus systems will be available only through a Controlled Systems Installation Program (CSIP), which IBM has set up specifically for the new product. An IBM spokesperson says that although "demand is outstripping supply," IBM plans to

work "actively" to install System/36 ImagePlus systems in the fourth quarter of 1988, AS/400-based systems in the first quarter of 1989, and MVS/ESA-based systems in the second quarter of 1989.

#### Waiting for IBM Systems

It's no surprise that the list of companies interested in the IBM system is mushrooming, despite the existence of more readily available image

processing systems from Wang Laboratories Inc., Plexus Computers Inc., FileNet Corp., and 3M Corp.

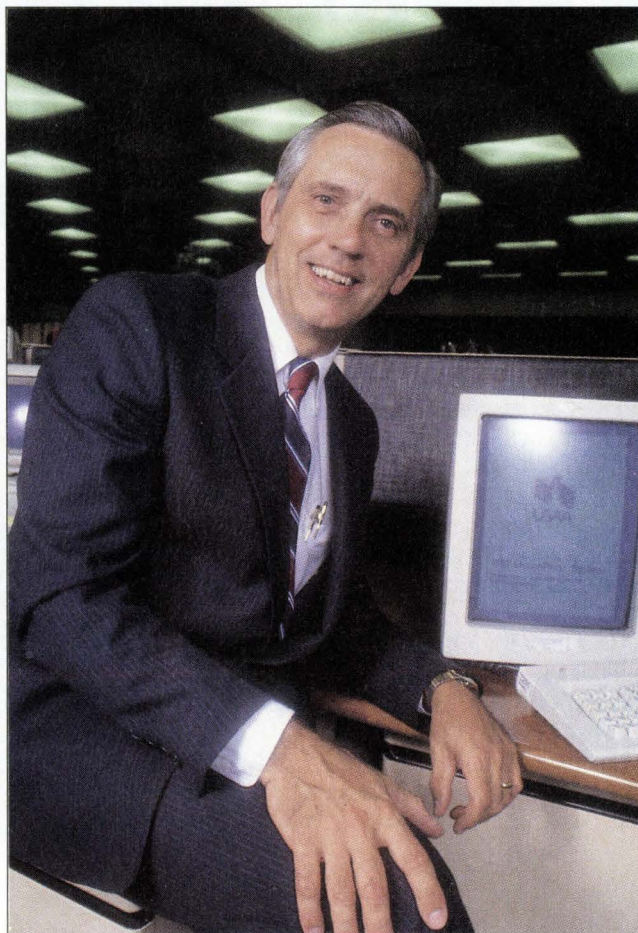
Some IBM users are interested in ImagePlus, but remain cautious. Bob Langlois, senior systems consultant at the Blue Cross/Blue Shield Association, Chicago, says, "IBM is going to be given serious consideration because we have a number of IBM mainframes in place. But we're not going to jump on it just because it's IBM," says Langlois.

One user, responsible for introducing image processing to a large life insurance company, says, "ImagePlus is to image what CICS is to on-line; you don't buy CICS, put it up, and say, 'Let me see my on-line transaction register.' It doesn't work that way." The insurance company is expecting a proposal from IBM for a \$5 million to \$10 million ImagePlus system by the end of this month.

"Conceptually," continues the user, "what they've sent you in ImagePlus is IMS DBDC [Information Management System, Database Data Communications], a backbone on which to lay out a database, populate it with information, describe what the workstations look like, write the application tasks, and crank the thing up."

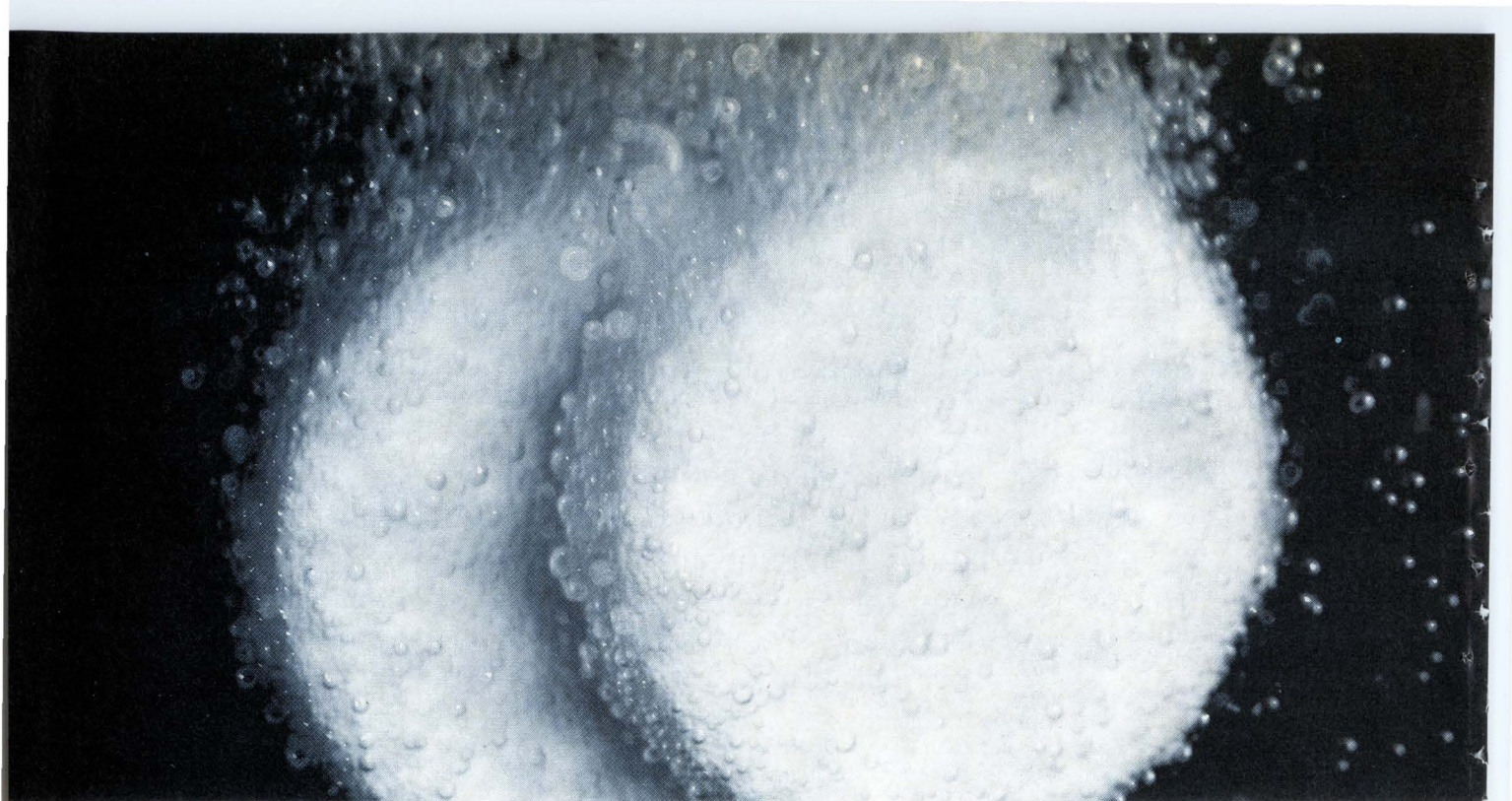
Scott McCready of CAP International, in Norwell, Mass., agrees, and adds that "the ability to manage the documents on a storage basis—that portion of the problem is well solved [in ImagePlus]. The key question IBM has recognized is that the work flow software has to sit on top of the operating system and the users shouldn't have to be aware what environment they are in."

In choosing an ImagePlus environment from IBM, however, users must be acutely aware of what their ultimate image processing system need will be, as no migra-



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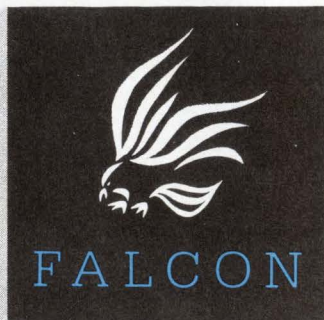
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tion path exists between the AS/400 and System/36 and the MVS system.

Specifically, according to two independent sources in the image processing market, the AS/400 and System/36 systems are based on a single local area network. Both sources estimate that a single AS/400 or System/36 ImagePlus network could handle "10 to 20 very active terminals or 40 or 50 moderately active terminals."

## Customer Letters Captured

At Citibank, two token rings, with four System/36s, are supporting 70 workstations, between five and 10 scanners, and an optical library. The system is being used at Citibank to capture and retrieve letters sent in by customers regarding their credit card accounts.

Liddell says, "The number of 36s [required] is dependent on the [required] amount of magnetic storage and CICS transactions. A single S/36 being able to support 15 to 20 workstations, running an application similar to Citibank's, is a reasonable expectation. The AS/400 provides a lot more magnetic storage; that's one of the things that will make it attractive for image."


Bob Wintermeier, an IBM senior market development administrator, adds, "Where you have two S/36s, you might be able to get by with one AS/400."

IBM says that the number of terminals that can be connected to a single AS/400 network depends on the application. According to an IBM spokesperson, IBM has "constructed the AS/400 system for up to 100 workstations. Over that, you would need an MVS system."

Still, according to sources, users that want to start with 50 terminals and expand from there should "seriously consider" the MVS/ESA system, because they see no

end to the growth on that system. "You can't take any of the [AS/400] documents across [to the MVS/ESA system] because the documents are formatted differently and stored differently," says one industry source.

To set up ImagePlus in an MVS/ESA environment, users must have the Data Facility Product (DFP) version 3. It is DFP version 3 availability that IBM will announce in the



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first quarter of 1989.

Another difference between the two environments, as they are set up at Citibank and USAA, is the way image and data are handled on the network.

With the Citibank system, says Liddell, coded data and images are run on the same token ring network. However, with large MVS/ESA systems such as USAA's, which is expected to have 1,000 terminals when complete, Wintermeier says, "We try to separate the two types into separate lines, to allow response times to be maintained."

Wintermeier points out that "if 1,000 [image] workstations are asking for a megabyte of information each—that's a billion bytes of information—and if you're trying to squeeze a [request for a] 100-byte [coded data] record in between," it could cause chaos.

Charles Plesums, USAA's manager of image systems, says, "At first, our communi-

cations planners said, 'We will integrate image and data on the same network,' but as we got to the details, it turned out to be more economical to run them on separate networks within the building. But, long distance, we run them on the same communications controller and T1 line."

IBM's planned PS/2-based high-resolution, large-screen monochrome landscape and portrait monitors will handle image and coded data, but IBM expects that many ImagePlus customers with lots of 3270 terminals will choose a two-monitor configuration. The systems in operation at USAA and Citibank both feature two-monitor configurations, with 3270s and modified ATs.

Another seeming technical anomaly is that the PS/2 workstations will run under PC/DOS, because it is "what we have available right now," Liddell says.

Still, IBM sees OS/2 as the operating system of the future for imaging applications because, as Wintermeier says, it offers multiple sessions that you can't get easily from PC/DOS.

## Four Key Industries in CSIP

The users asking to participate in the CSIP, according to Wintermeier, include members of the finance, insurance, public sector, and transportation industries.

Insurance provider USAA, which along with Citibank developed the framework of the system, expects its MVS-based ImagePlus system to eliminate all of its mail traffic, initially in its Property and Casualty Policy Services group. "Once we have the full population of terminals, the mail will never leave the mail room," Plesums says.

USAA, Plesums says, is seeing two major kinds of savings: one in support staff costs and the other in the efficiency of the staff using the system. USAA anticipates that

it will save over \$4 million per year in mail handling. Most firms he has talked to expect to save between \$2,500 and \$4,000 per user per year, Plesums says. While USAA doesn't yet have a good measure of improved staff efficiency, it expects a 2% to 10% improvement in productivity.

Plesums adds that USAA expects to store recorded voice statements from customers in the second application of the system.

Wintermeier says that one airline wants an ImagePlus system to catalog the "tons of tickets they keep in a warehouse somewhere." Often, the tickets have to be retrieved for "strange" reasons, says Wintermeier, for example, for court cases in which someone claims that he or she was not on a flight, and the court needs the ticket as evidence.

## The Biggest Pile of Paper

An image processing system being proposed by IBM and TRW Financial Services at the life insurance company will be targeted at automating TRW's central records office, says a user close to the decision-making process. "When I began looking at image, central records was the Holy Grail, because it's the biggest pile of paper in the company. And this is a technology that can not only solve the [paper] storage problem, but gives us access to the documents. Central records had been looking at ways to solve the file handling problem, so it was open to ideas."

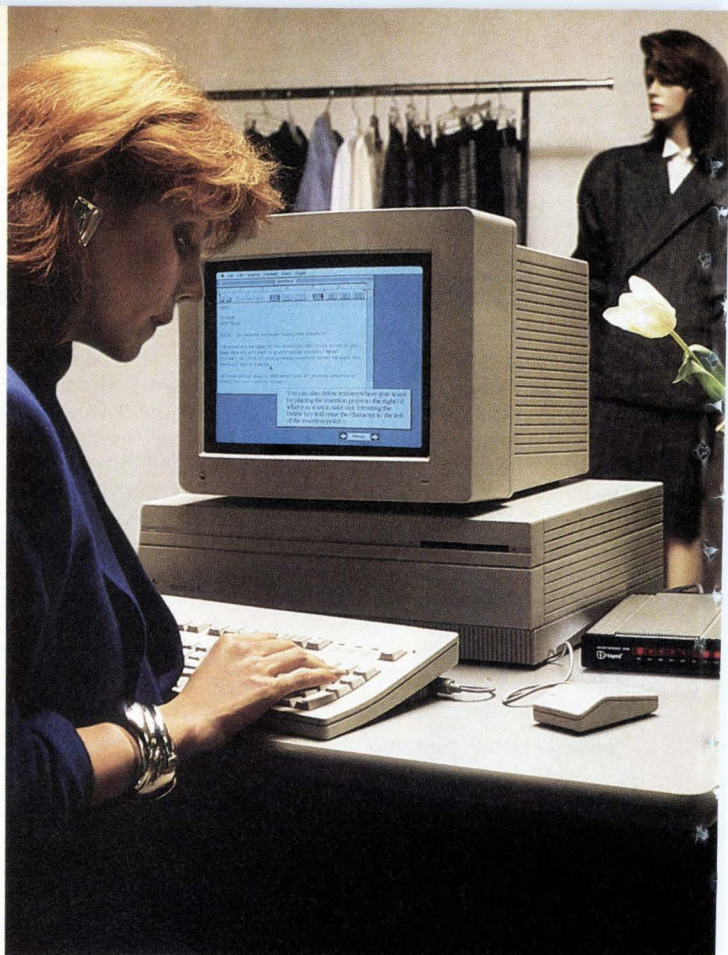
The insurance user expects IBM to propose an MVS/ESA system because "we're looking toward a single service center, and we have been upgrading our mainframes for reasons entirely irrelevant to image. So I think ImagePlus could fit on the unused MIPS on our collection of 3090s. We've got heavy-duty MVS software." ■





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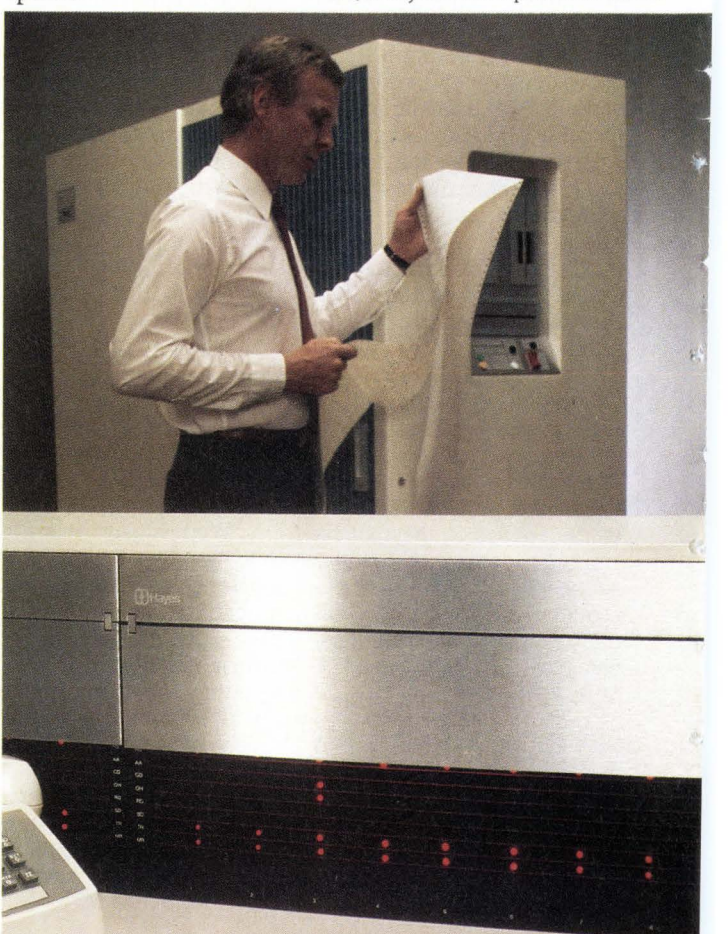
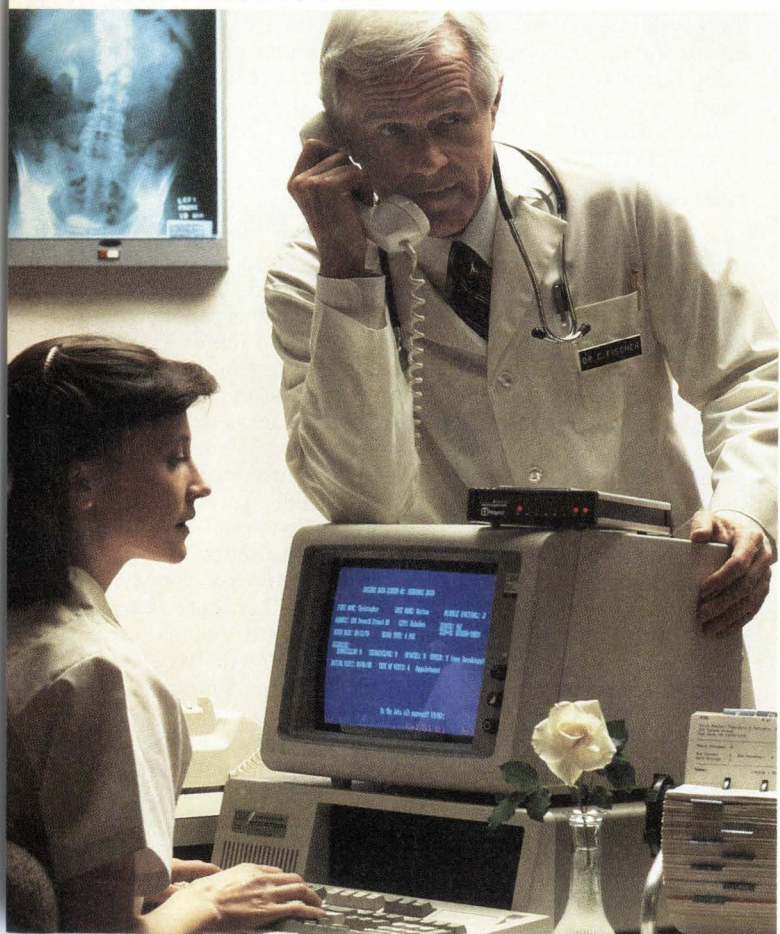
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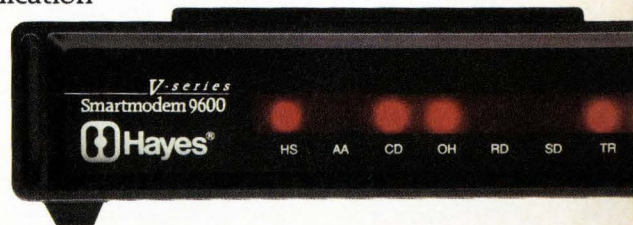
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## OPERATING SYSTEMS

# Hewlett-Packard Spectrum Users Migrate Slowly to New OS

The long-awaited MPE-XL 1.1 release has some users moving smoothly to HP's newer line of RISC machines while others adopt a wait-and-see attitude.

BY SUSAN KERR

Conjuring up memories of the great cola wars, Hewlett-Packard customers are calling their non-RISC line of minicomputers "Classic 3000s."

No, that doesn't mean that HP's newer line of Spectrum RISC systems are analogous to Coca-Cola's ill-fated "New Coke." Or so HP executives hope. But just as grocers were hesitant to bump "Classic Coke" from their shelves, some HP users have been hesitant to upgrade to the long-awaited commercial minicomputer line.

For some, the reason is simple. HP has had barely sufficient operating system support for the commercial Spectrum systems, referred to as the HP 3000 Series 9XX Precision Architecture machines. From the date of the first shipment of a 9XX member, it has taken HP a year to release an operating system considered acceptable by many of its minicomputer customers.

Operating systems, the bane of HP's commercial Spectrum development effort, were the main culprits behind the 9XX family's well-publicized nine-month delay in going to market. Now that members of the 9XX family are shipping, HP says that it is ecstatic with their successes, even while customers caution of incomplete systems.

### HP Faces Its Future

Give HP credit though. With Spectrum, it's attempting to move to a brand-new hardware platform that will carry the company through

the next decade. It is also trying to ensure that old applications written under its proprietary MPE operating system can be migrated.

Last July, HP began controlled shipments of MPE-XL 1.1 for the 9XX family. Since August, all 925 and 950 systems have shipped with this version. MPE-XL is the new operating system designed ex-

Spectrum systems until release 1.1 is a reality.

"I was about to have a 950 installed but I told HP not to deliver it without 1.1," says N.M. Silverman, dp manager for Mercantile Mutual Life Insurance Co. Ltd., Sydney, Australia. His reasoning is understandable. "1.1 works," he says, "1.0 doesn't." When HP shipped its first Spectrum



LONGS' ENCARNACION: "1.1 is the first real operating system."

pressly for commercial Precision Architecture machines. Chief among its features is user-mapped file access, which means disk files are mapped directly into the virtual address space. Older, non-RISC 3000s run MPE-V and its predecessors. (HP also sells a technical Spectrum line running Unix. See "Unix and MPE Share HP R&D Dollars").

Faced with MPE-XL's history, some customers have become understandably skittish. Several have gone so far as to delay receipt of their

business system (the HP 3000 Series 930 in August 1987), it went out the door with MPE-XL 1.0 software.

Apparently, Silverman is not alone in his assessment. HP Commercial Systems Group general manager Douglas Spreng acknowledges a "softening" of orders during the wait for release 1.1.

In going from MPE-XL 1.0 to 1.1, HP had to fix several hundred software bugs. Dave Hoover, HP product marketing manager for MPE systems,

sums up 1.1 as "improved performance, functionality, and reliability." He claims that 1.1 boasts 20% to 30% performance gain over 1.0 on average.

"1.1 is the first real operating system," says Osias Encarnacion, technical support analyst for Longs Drug Stores Inc., Walnut Creek, Calif. Longs is an important account for HP; the drug chain currently has two top-of-the-line 950 systems and was one of the first sites for the newer 935.

### Improvements Noticed

In moving to 1.1, Longs noticed performance and functionality gains. HP's TurboImage database system underwent "vast" performance improvements, according to Encarnacion.

The Albuquerque Publishing Co., Albuquerque, N.Mex., has two 950s installed. With 1.1, HP did fix several major bugs, agrees Albuquerque MIS director Debrah Whitaker, but she says that the system sometimes loses its logging capability.

According to HP, the latest operating system version supports more than 20 new peripheral products; communications capabilities have been added; and other technical improvements, such as the removal of all serializations in the Image database to speed up performance.

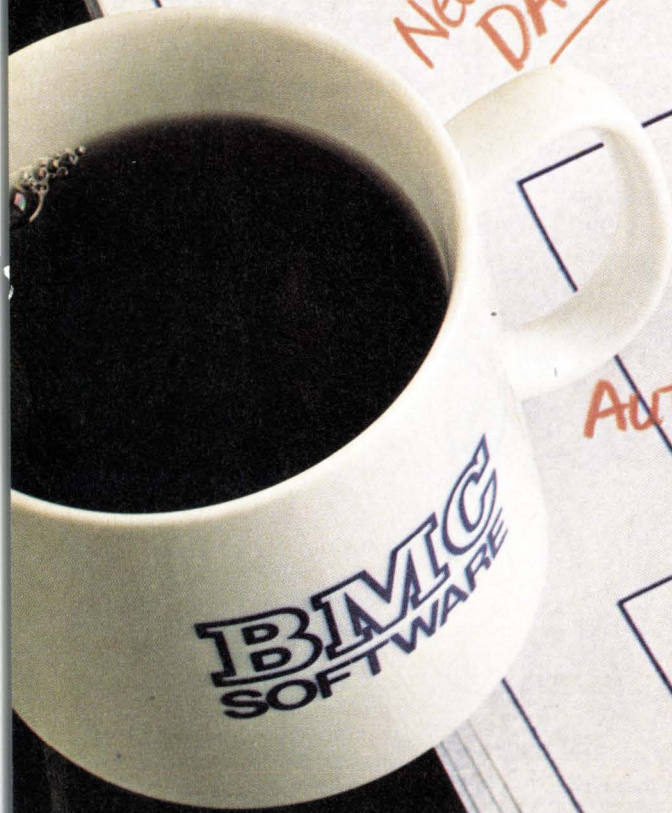
"With 1.1 software, we support virtually all the software and peripherals supported on MPE-V," says Hoover.

A brand-new architecture means enhancements are an everyday occurrence. MPE-XL 1.2 is expected to be released late this year or in the first quarter of 1989.

Looking ahead, HP's Hoover predicts that there will be more complete communications support, particularly for point-to-point wide area networking. In addition,

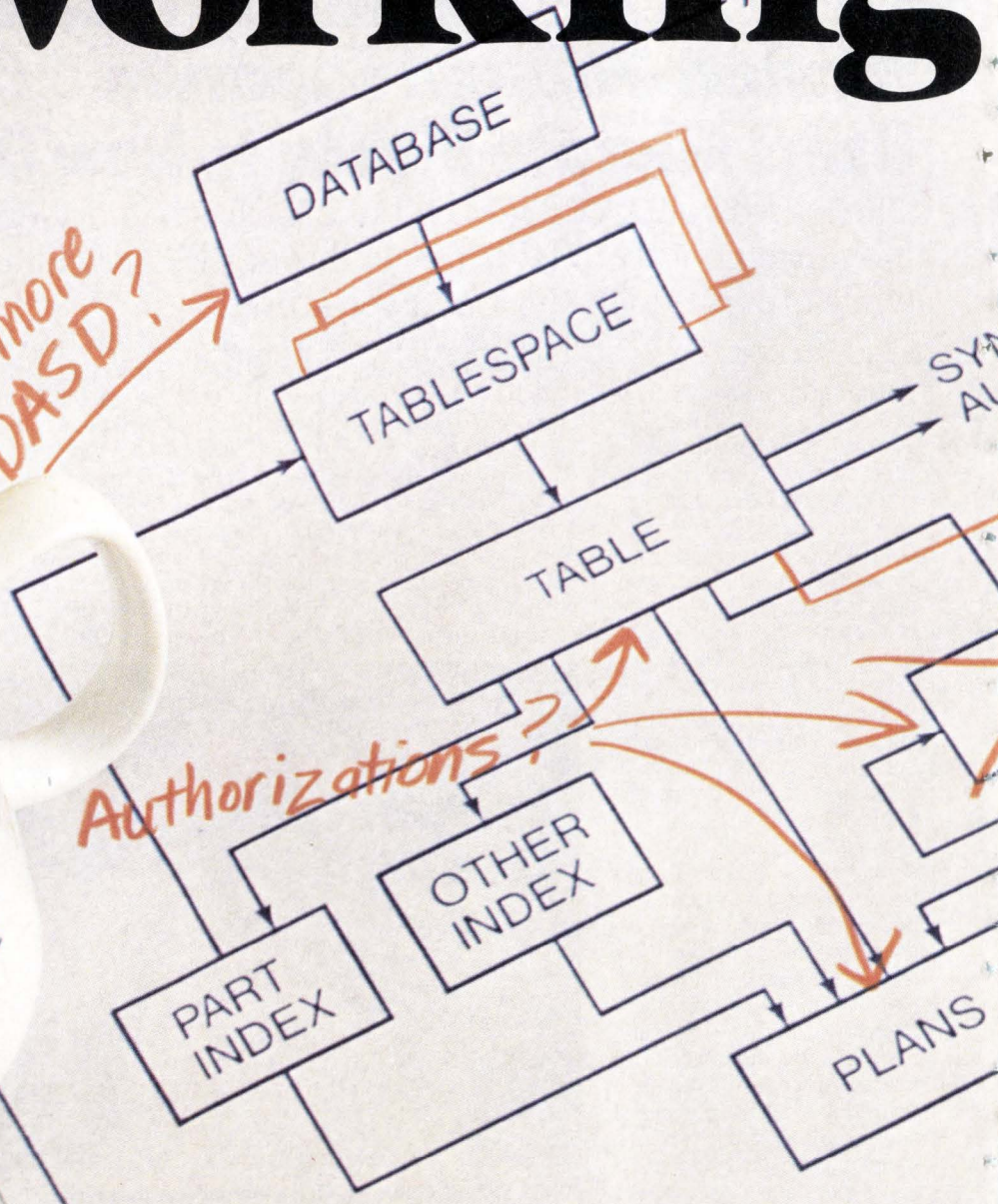


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X.25 capability will be up and running. Currently, some of these communications functions require an intermediary MPE-V-based system.

## Work Remains To Be Done

Yet there is a lot of work to be done. Despite gains seen by users running the 9XX systems—Longs reports cutting the run time of its payroll application in half—there are many HP loyalists who see little advantage in signing up to the new computers now. As expected with a project this size, shaking most of the bugs out is a huge task.

Norton Co., Stow, Ohio, is waiting until next year to upgrade its non-RISC HP 3000 Series 70 and Micro 3000XE. Michael Molli, Norton's manager of computer services, says the 9XX series needs better communications facilities.

"The drawback we

found going with the 950 this early," says Molli, "is that the OS changes are not far enough along to give the X.25 capability we need."

"The people who absolutely had to have a 900 series have ordered it," says Scott Hirsh, technical support manager for RCM Capital Management, San Francisco. "The people who can be waiting."

Nonetheless, it appears that even with 1.0 and all its software patches, the people who have made the great migration have done so relatively easily. One user of a 925LX, who asked not to be identified, reports that "migration to compatibility mode went smoothly."

To migrate to the Precision Architecture 3000s, HP users ideally need to be up on MPE version V/E. Other requirements include converting the Image/V database to

TurboImage/V.

For higher performance native mode operations, users must be using the latest versions of languages.

Just how many users want or need to take the extra step and convert to native mode is yet to be seen. Surprising many users, HP reports that programs under compatibility mode run at 85% the rate of native mode. The company believes that some users will not welcome the bother of having to recompile to native mode to make up the difference.

## Delineating the Issues

Then there is the backwards compatibility issue. Customers who want to continue with both MPE-XL and MPE-V systems may do better by sticking with compatibility mode. In addition, there is the hidden but expensive issue of

disk and memory requirements under Spectrum, particularly in native mode, where users may need at least 20% more disk space, compared with the older 3000s. That increase is not as significant under compatibility mode.

The MPE-XL operating system itself reportedly takes up 300MB of memory, many times more than is the case with MPE-V. Everything else about the system is bigger, however, and extra storage and memory shouldn't be unexpected, say HPers.

Eliminating the surprises is what both HP and its users want. Its user base remains committed, saying that despite all the delays and upheaval, HP's competition hasn't come up with a more convincing story. Even so, it may take several releases of MPE-XL to remove all doubt. ■

## Unix and MPE Share HP Research & Development Dollars

No matter when, where, how, or why, if there's a computer standards meeting taking place, it's a good bet that someone from Hewlett-Packard is there.

HP loves standards. But it also produces and furthers many proprietary products, not the least of which is its 15-year-old MPE operating system for the 3000 mini line.

During the last couple of years, most news of MPE has centered around the delays in upgrading the system to run on the new RISC-based Spectrum hardware platform. This is in sharp contrast to HP's work on (and somewhat surprising success with) Unix. In 1982, HP announced its version of Unix, called HP-UX, an amalgamation of System V and 4.2. HP-UX runs on its 9000 line of technical workstations. HP is involved with many Unix groups, including the Open Software Foundation, which, along with IBM and others, it helped form. Inevitably, the question arises as to MPE's future in a standards-driven world.

"Our strategy is to have twin towers," explains Doug Spreng, HP's Commercial Systems Group general manager. Currently, development dollars at HP are equally split between Unix and MPE. While the lines between technical and commercial systems are blurring, he maintains that MPE is clearly tuned to the commercial marketplace and to jobs such as transaction processing. Unix, however, is undergoing a very high growth rate and HP sees commercial uses for it, particularly in the financial sector.

Spreng adds bluntly: "You'd have to be stupid to drop a proprietary operating system." Proprietary typically means that customers are locked in, and that usually translates into bigger bucks for vendors. The MPE user base is extremely

loyal. In fact, some 3,000 users think spending 50% of R&D dollars on Unix is way out of line.

"MPE is fairly easy to learn," says Bud Beamguard, HP systems manager for Syntex Inc., Palo Alto. The simplicity and the fine-tuning for many commercial database applications is important to MPE's fans.

Unix still represents freedom to others. "You don't see Microsoft coming out with packages for MPE," says Tim Chase, vp for Corporate Computer Systems Inc., a Holmdel, N.J., company that offers HP-compatible products.

HP is trying to create a synergy between Unix and MPE. It is leveraging development efforts by creating common compilers and SQL database technology for both. One thing that isn't likely to be moved over, though, is HP's popular MPE-based Image database. Although it would be a roughly six-month project to put that on Unix, HP has its hands full with other projects and feels that Unix users want industry standard tools.

What's next? According to Joel Birnbaum, vp and general manager of HP's Information Architecture Group, "We will also do research to understand whether the running of those environments [MPE and Unix] on a common kernel—which would really be a utopian fantasy if we could accomplish it—might be possible. But I don't think it will be for at least another five to seven years." Other possibilities are providing common interfaces between Unix and MPE systems so that source code could be compiled to run on both sets.

Spreng says putting MPE and Unix on the same kernel "is a neat technical dream, but customers don't want it. They want interoperability between systems."



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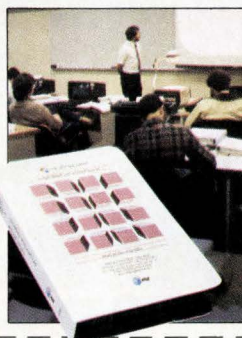
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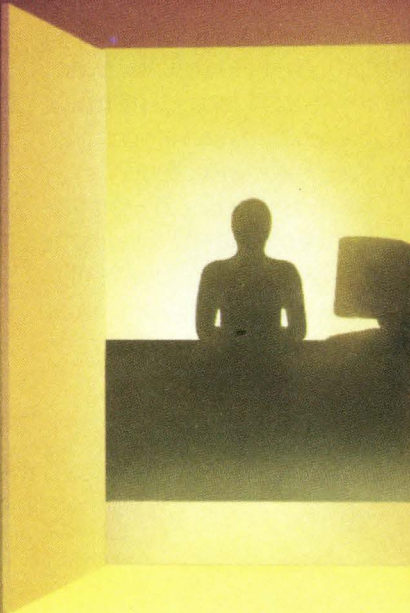
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# Behind the News

## SYSTEM OVERHAULS



## The Blues Take the IS Cure: The Prognosis Is Good

Buffeted by HMOs and others, Blue Cross/Blue Shield is pouring large sums into IS to develop new products and faster services.

BY GARY McWILLIAMS

In the 1950s, there were three primary colors in American life: white, black, and blue. All refrigerators were white, all telephones were black, and health insurance was blue. Three decades later, telephones come in a rainbow of colors, the modern icebox in dozens of hues, and Blue Cross/Blue Shield, once the undisputed leader in health insurance, is fighting to regain its former glory—and information systems are playing a key role in the struggle.

Known as the Blues, the health care groups have been under plenty of strain lately. Enrollments, although stabilized after several years of decline, remain well below their 1980 peak. In 1966, over 40% of Americans with health insurance got their coverage through the Blues; today, only about 30% do, according to statistics compiled by the Health Insurance Association of America.

Competition—especially coming from health maintenance organizations (HMOs)—is partly to blame. Little known back in the 1960s, HMOs are solid alternatives to traditional group plans. Soaring health care costs, which drove up insurance premiums, have made the Blues and other traditional group plan insurers easy targets for HMOs. One fast-growing northeast HMO now describes itself as “the cure for the blues” in a not-so-subtle swipe at its competitor’s rates.

Enrollments also are being squeezed by self-insurance programs. Corporations, which account for the bulk of the group plan business, are turning to self-insurance to lower their health care bills. Taken together, these enrollment losses are causing havoc among the Blues. Last year, the 77 regional plans within Blue Cross/Blue Shield suffered nearly \$2 billion in combined losses.

Despite their losses, the Blues individually and collectively are investing

huge sums in information systems to reverse the slide. Massive development programs to centralize a hodgepodge of discrete systems and newer development syndicates have become as commonplace among the Blues as the color itself once was to health insurance. Not surprisingly, many are also forming their own HMOs to lure back group plan members. Blues-sponsored HMOs, despite a late start, are growing faster than the industry rate. A spring tally by InterStudy, an Excelsior, Minn., HMO research and consulting group, credits the Blues with about 15% of HMO enrollments nationwide compared to 11% in 1985.

“Until recently, the Blues were isolated from the competitive pressures that the private [insurance] carriers faced,” notes Gregory de Lissoy, a professor of health economics at Johns Hopkins University in Baltimore. “They’re now being forced to become more competitive.”

### Trying To Change the Image

It is still too early to predict any significant recovery, but these IS investments are changing the image and IS organizations within the Blues forever.

“A Blue Cross/Blue Shield [plan] is no different from any commercial [insurer],” says Richard Farinholt, general manager and chief operating officer of HealthNet, the information services arm



## Behind the News

of BC/BS of Virginia. "We're a totally information-dependent industry."

For instance, Blue Cross/Blue Shield of Virginia hopes to complete within three years a \$40 million installation of new membership, claims, and analytical systems. Massachusetts Blue Cross/Blue Shield is two years into an equally ambitious IS program that calls for replacing most of its current systems in the 1990s. In both instances, they are building new systems around IBM's newest and largest "S" series mainframes, the DB2 database, and the MVS/ESA operating system.

Similar overhauls are under way or were recently concluded at Blue Cross/Blue Shield organizations in Maryland, Missouri, New York, Western Pennsylvania, and Washington, D.C. Dozens of others are dropping their traditional independence and joining systems and network alliances with the same intent.

"For over 50 years," says William J. Skowyra, senior vice president of information systems BC/BS of Missouri, "the Blues have had a provincial mind-set. Everybody did their own thing under the assumption that what works in Virginia won't work in Missouri. There's a realization that may be antiquated now."

Skowyra manages an operation that provides systems for one of two Blues



**BLUE CROSS/BLUE SHIELD MISSOURI'S SKOWYRA: Ending a provincial mind-set.**

syndicates organized to seek national corporations. The syndicates compete for business considered too large or geographically spread out for a single plan.

"It wasn't until the last 10 years that commercial insurers became major competitors," explains Louis DeMaria, vp of the information services division at Empire Blue Cross/Blue Shield, Albany,

N.Y. "I think as a group, the Blues are recognizing we've got to do things better and start using technology."

The newfound competition is obvious in areas beside HMOs. Empire and Massachusetts Blue Cross/Blue Shield recently competed with one another for all the health insurance business of Nynex Corp., the regional telephone company in New York and the six New England states. Nynex chose to continue splitting business between the pair.

"If you went back to 1979 and asked how many products we offered, it was one or two," says Marcel L. Gamache, senior vp of information services at Massachusetts Blue Cross/Blue Shield. "In a year or two, there will be 15 or 20."

### The Effect of Taxation Changes

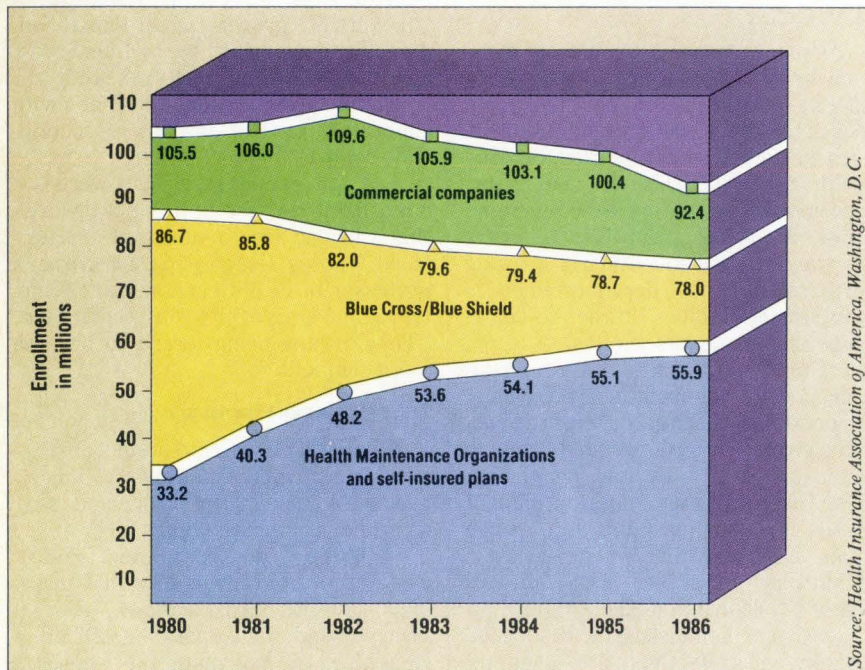
The changes are found throughout the business. Where once the Blues could rely on tax exemptions and discounts from hospitals and physicians to provide full coverage at cut-rate prices, such Blues-only perks are gone or no longer exclusive. Federal tax reform took away the Blues' tax-exempt status, and commercial insurers have won their own service discounts by creating preferred provider organizations.

The present emphasis on building new and consolidated systems says a lot about the evolution of the Blues. Historically, the nonprofit insurers won their market dominance as a result of such tax advantages and close ties with hospitals, physicians, and other providers. While the relationships provide a source of service discounts, they also encouraged the development of discrete systems. In the early 1980s, the drawbacks of such systems began cropping up.

As health care costs skyrocketed, employers who foot most health insurance bills began demanding more and frequent information on their employees' claims. Systems designed to quickly capture and process claims for health care providers proved ill-suited to respond to the employers' requests for information.

At the same time, heightened competition from commercial insurers and others was forcing the Blues to develop new products. More systems, still reflecting the discrete approach, were added. "The systems [that] we have evolved from a time when products were technically simple and discrete," explains Edward A. Foley, assistant vice president of corporate systems at Massachusetts Blue Cross/Blue Shield.

### HMOs' Health Leads Blue Cross to IT Cure





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## Behind the News

### Role Model

National Capital Area Blue Cross/Blue Shield was among the earliest plans to develop a strategy to deal with inadequate systems. Where others lost business by failing to act, the National Capital Area plan revamped operations to better compete with commercial insurers, and it now claims some significant victories.

Like so many others since, the National Capital Area plan decided in 1983 that it could no longer operate its myriad claims systems and provide adequate service. Its \$25 million to \$30 million systems centralization and replacement program grew out of that single realization, says Michael F. Long, vp and general manager of the special accounts business unit. "Our systems were organized by lines of business—doctors, hospitals, subscribers—in such a way that did not focus on the customer. We had to bring them together to create the customer focus."

Initially, the plan decided to replace nine claims processing systems with a single integrated claims processing system, and a current program to replace membership and billing systems continues the effort, says Long. Commercial insurers began to make inroads into Blue accounts in the 1970s because "we didn't put the same emphasis on the processing

and servicing side of the business as the commercial insurers," says Long. "We've recognized that now."

The payoff is coming in. Last year, the National Capital Area plan captured a prized contract with Washington Metro Airport Authority. Competition included Aetna Life & Casualty Co. and Cigna Corp. More important, the contract is seen as proof that a systems approach to service can work for the Blues. "We were able to demonstrate we could deliver the customer services they wanted," boasts Long.

A separate contract award with Bell Atlantic Corp., Philadelphia, shows how the National Capital Area plan matched its centralized systems to improve service. The contract covers Bell Atlantic employees scattered among seven mid-Atlantic states. Claims are processed centrally by the Washington, D.C., plan even as other services are handled by local BC/BS operations. "There is no longer any local interpretation to claims handling," explains Mary Stetler, a National Capital Area staff assistant. "A Bell Atlantic employee in New Jersey receives the same service delivery as another in D.C."

"Finally," Long says, "we're able to deliver the same consistency of service as a national insurer and still provide local provider discounts through affiliate plans."

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Massachusetts Blue Cross/Blue Shield's cadre of systems are typical of many larger plans. It currently operates between 12 and 15 separate claims systems for hospitals, dentists, physicians, pharmacists, and others. The Washington, D.C., plan at one time had nine separate claims processing systems, and the Oregon BC/BS plan had five claims systems. While the separate additions helped the Blues match the products available from the competition, they have strangled attempts to deliver information in a uniform and timely manner.

Problems from the lack of integration showed up first in claims processing systems. Commercial insurers, whose broader product lines fitted centralized IS operations, successfully lured corporate accounts with their ability to rapidly deliver information on claims. For example, in July, Massachusetts Blue Cross/Blue Shield lost to John Hancock Mutual Life Insurance Co., Boston, a nearly \$1 billion health insurance management contract with the state of Massachusetts. Loss of

the contract, which ended Blue Cross/Blue Shield's 12-year relationship with the state, was tied to the commercial insurer's ability to deliver information on employee claims more quickly.

The lack of integration among systems is well documented. "A lot of our customers either demanded through RFPs or indicated in discussions with us they would like to see a more integrated service," says vp Foley, who is overseeing the plan's development program.

#### Seeking an Integrated System

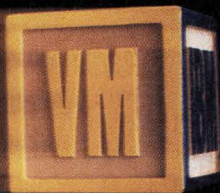
Even though the problems of systems that focused on health care providers instead of customers was apparent as early as the 1970s, the Blues' initial attempt at centralizing systems involved a cooperative effort to produce an integrated system all could use. The development was fraught with dissention and delays. The resulting software is used at a few plans today, but the effort kept many plans from beginning their own development programs earlier.

So, too, did a lack of management support for new systems, say IS executives. It may be no coincidence that many of the plans that have major ongoing development efforts have had recent management changes. "I grew up with the management that literally started the business, and dp was always a thorn in their side because it was so expensive," says Empire Blue Cross/Blue Shield's DeMaria. "Only in the last three to four years, when those managers retired, did that change."

Looking ahead, the Blues' systems are increasingly centralized and customer-oriented. With changes ranging from telephone deregulation to health insurance, few expect a return to the halcyon days of the 1960s.

"Right now, maintaining market share is a significant accomplishment," says Michael F. Long, vp and general manager special business unit, National Capital Area Blue Cross/Blue Shield, Washington, D.C. "The competition has become that much tougher." ■

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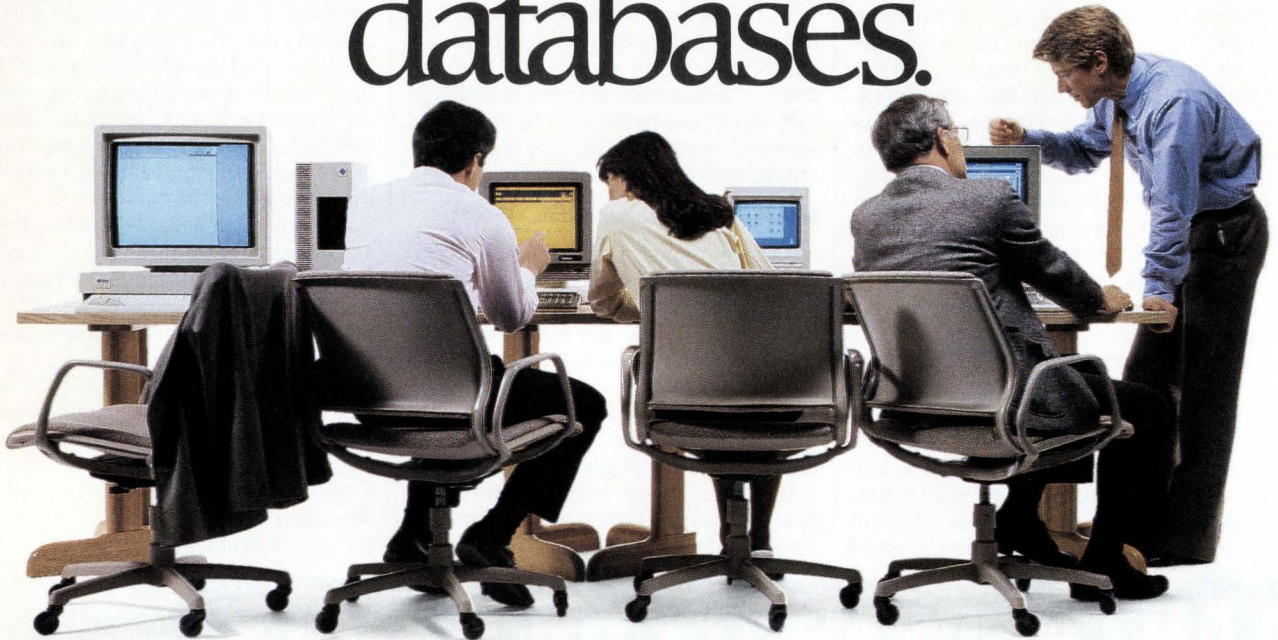


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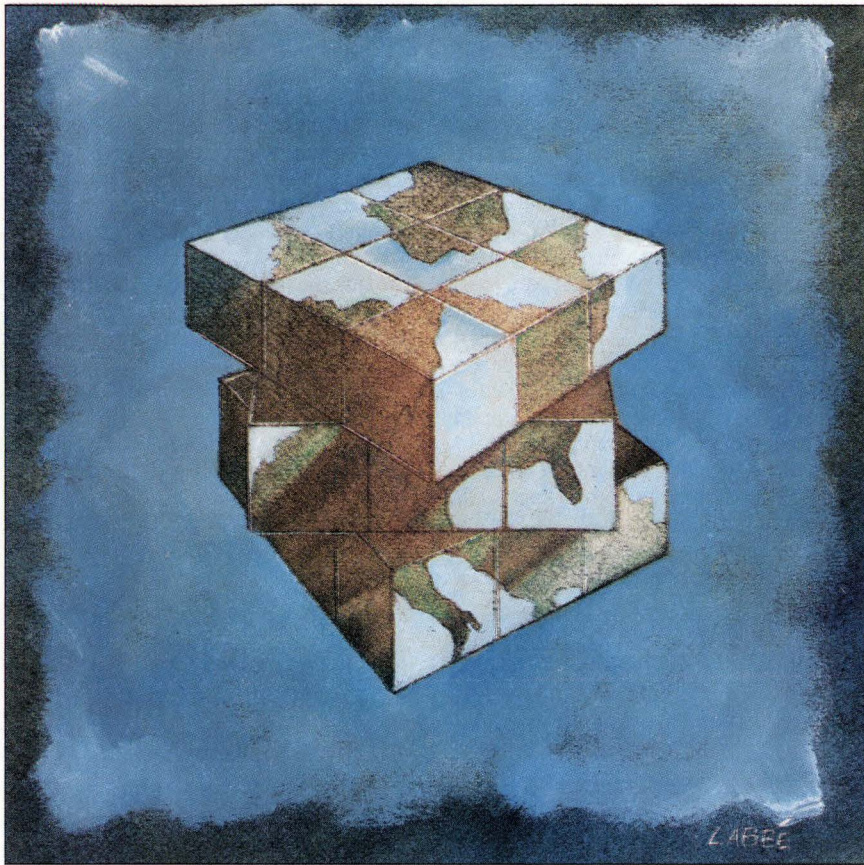


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*This article is based on the results of a recent study called "International Informatics Policy—From Participation to Regulation," which was compiled by a team of researchers headed by managing consultant Roman Krawec at Logica Consultancy Ltd., London.*

**T**he balance of power in the informatics industry is continuing to move East, despite attempts by IS corporations and governments in the U.S. and Europe to maintain a competitive dominance. That industry shift, combined with fundamental changes in technology, has led to new international trading patterns and new pressures on Western IS companies.

Equally important is the way the shift is forcing governments around the world to adapt their industrial policies and strategies to cope with the new informatics environment. The consequences for government policymakers have been threefold: a move away from direct intervention and toward regulation; a focus on the demand side of the industry rather than the supply side; and less protectionism of local markets in favor of moves to

attract international vendors and multinational users. The technology changes underlying this trend have become obvious to many observers.

The convergence of computing and telecommunications, together with the increasing internationalization of the informatics industry, means that information handling demands new solutions from users and suppliers alike. The informatics environment is extremely dynamic, with technological change driving rapid changes in industry structure and usage.

Alongside these changes has come a shift in the technological balance of power. Many of the developments that formed the basis of the early informatics industry such as telex, television, and the first generation of thermionic valve computers, have their origins in Europe. The development of the transistor and integrated circuits resulted in a shift in dominance to the U.S., typified during the postwar period by the successes of AT&T and IBM.

Today, however, it's the Japanese electronics giants such as NEC, Toshiba, Fujitsu, and Hitachi that appear best positioned to exploit the developments of a new information age. Their corporate

# Shifts in Global IS Trade

**In the last few years, there's been a distinct shift in the balance of power of the international IS industry toward the Pacific. That shift, along with changes in technology, have forced the world's governments to concentrate on demand-side intervention and to change from being local players in the industry to international referees between vendors and users.**



**Shifts In  
Global  
IS Trade**

structure is typically vertically integrated, with interests ranging from component manufacture through computers and communications to consumer electronics and broadcasting.

Governments have played a major role at each stage in the development of the informatics industry. The direction and aims of government intervention vary between countries that have chosen a complete espousal of free market forces—such as the U.S.—to those that have traditionally taken a more conservative or structured approach, such as France, West Germany, or Sweden. Nevertheless, some common trends are evident.

The telephone authorities (PTTs) in Europe, typically state monopolies, provided both a pool of technical expertise and a protected market for the developing national suppliers in the past. The so-

called military-industrial complex in the U.S., meanwhile, has funded successive generations of research and development initiatives through the nuclear weapons program, the space program, and, most recently, the Strategic Defense Initiative (SDI). The Ministry of International Trade and Industry in Japan, often known as "Mighty MITI," provided the vision and research direction that has enabled the Japanese companies to leap ahead of their American and European counterparts.

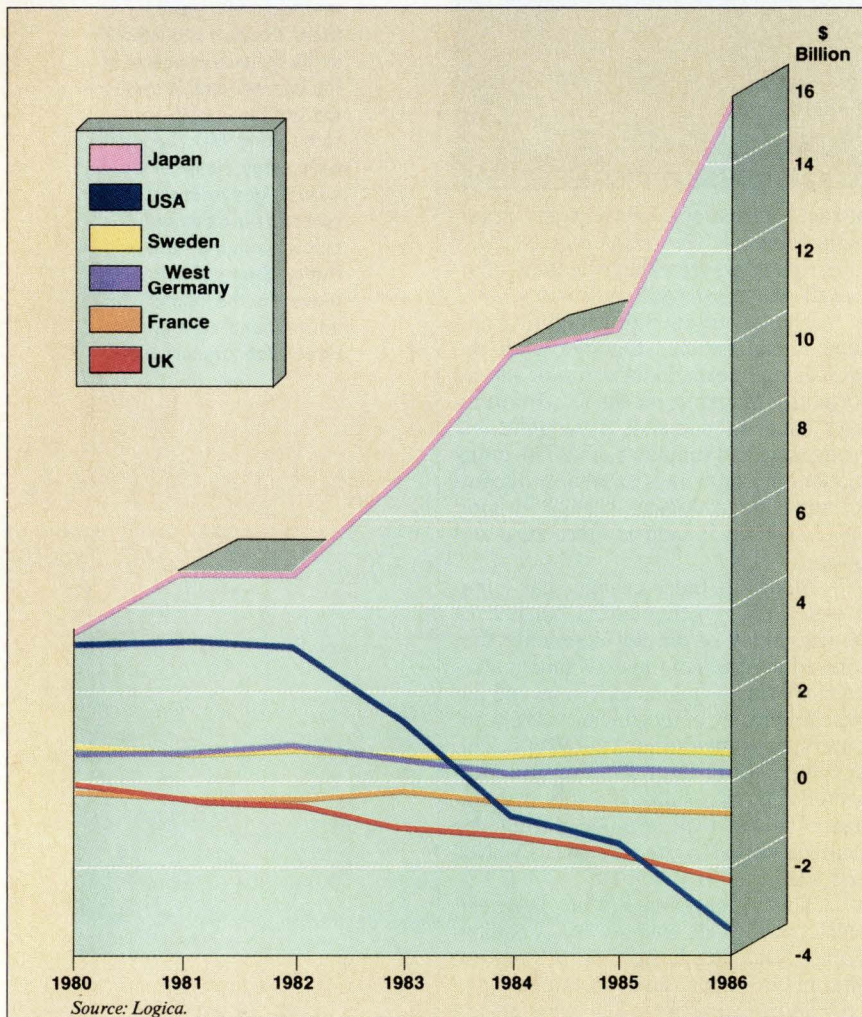
This type of direct participatory intervention in the supply side of the informatics industry—where the state holds direct control of telecommunications, invests directly in R&D programs, and supports national champions such as ICL in the U.K., and Siemens in West Germany—is becoming less relevant as the supply-side pressures become more

internationalized.

An examination of the global sales of the top 10 suppliers in informatics (which includes a broad range of technologies, from telephones to data processing systems) holds some surprises. Only two of the top 10 in 1987 were U.S.-owned, compared with four Japanese suppliers (see "Global Informatics Industry Top 10, 1987"). Of comparable interest is the fact that five of the top 10 are telecommunications operators. They are: NTT in Japan; AT&T; the Deutsche Bundespost (the German PTT); British Telecom; and the French PTT, known as the DGT.

In addition to these shifting patterns

**Balance of Trade in Computing and Communications**



**IT'S MIGHTY  
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PROVIDES THE  
VISION THAT  
KEEPS JAPAN  
AHEAD OF THE  
REST.**

of industrial dominance, the supply side of the informatics industry as a whole is becoming increasingly internationalized as R&D costs soar and suppliers reposition to take advantage of newly liberalized markets. These changes are especially evident in the telecommunications equipment market.

Consequently, the focus of government intervention has begun to shift toward demand-side issues. The demand side of the informatics environment is still closely linked to the fortunes of national economies. Now, it is well accepted that the successful use of IS can give a competitive advantage to individual firms and national economies alike. Moreover, governments have realized that information is a valuable resource and the jobs of millions of people are dependent on collecting, storing, retrieving, processing, and communicating it.

In the developing climate of convergence between computing and telecommunications, the PTT occupies a pivotal position between supply and demand (see "The Pivotal Role of the Telephone Authority"), and telecommunications de-



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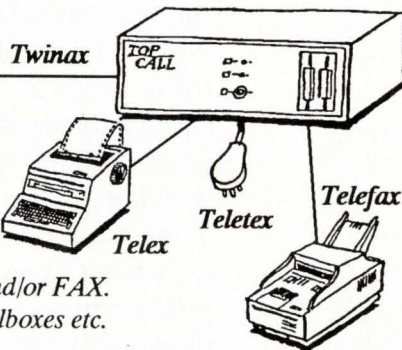
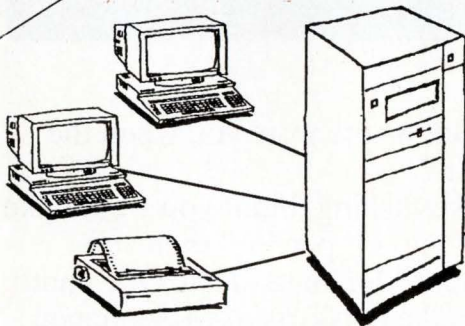
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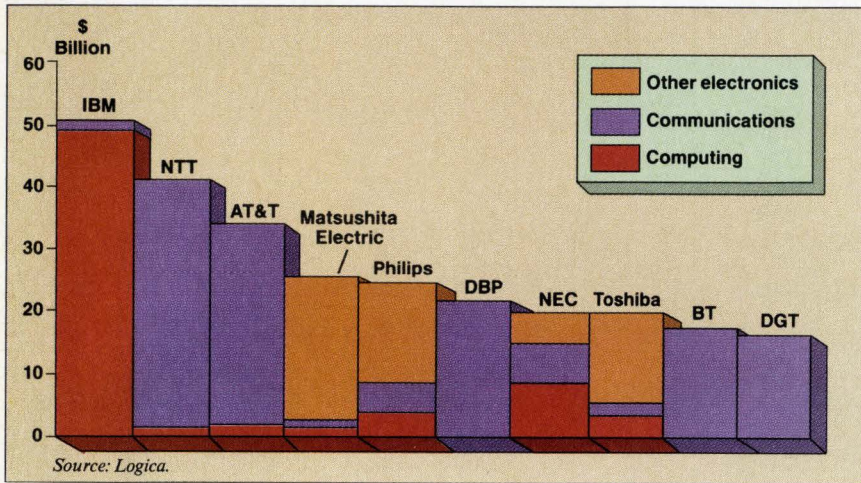
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## Global Informatics Industry Top 10, 1987



regulation plays a central part in the policy changes taking place.

Telecom policies are now being directed toward obtaining a higher quality of service and wider choice for users through the liberalization of services and terminal markets. Greater emphasis is being given to the development and promotion of open standards in telecommunications and computing, and to training and awareness schemes. The boundaries of regulation and competition are progressively being relaxed, allowing the creation of new services that cross the old frontiers between computing, telecom, and broadcasting. Around the world, the newly liberalized PTTs are diversifying their operations into areas outside pure telecommunications and are increasing the international scope of their business.

In this environment, the role of government is changing from that of a player to a referee, arbitrating between different interest groups and ensuring fair play according to the new rules of the game. The U.S. led the way with deregulatory policies directed toward telecommunications services, coupled with the divestiture of AT&T in 1982. Meanwhile, much of the present impetus for policy initiatives—such as the U.S.-Japan semiconductor agreement or the cooperative research of Sematech—is coming from associations within the private sector. The U.S. government continues to play a major role as a buyer of informatics products, especially in the defense sector, but its main policy thrust recently has been in extraterritorial issues. These include control over high-tech exports to Eastern Bloc countries, deregulation of international leased circuits and satellite

services, and pressure on major trading nations to grant reciprocal access to protected markets.

In Japan, too, the policy-making role of MITI has been progressively reduced as the companies it has assisted are now able to direct their own research and trading policies. MITI pressure is now being applied to the traditionally conservative Ministry of Posts and Telecommunications to force a shakeup in the structure of the telecommunications industry so that the new generation of value-added network services (VANS) can prosper. The first stage of deregulation has been achieved remarkably rapidly with the privatization of NTT, the introduction of network and service competition, and the growth of a Japanese VANS industry. Japan is now preparing for a second stage, which will include the introduction of more competition and the possible divestiture of NTT.

In Europe, similar trends are occurring as governments are moving away from direct participation and the fostering of national champions and toward regulations and the creation of a single European market. The U.K. government has progressed furthest toward telecom deregulation through the privatization of British Telecom and the creation of a network duopoly. The U.K. Department of Trade and Industry has withdrawn from near market support and retains support only for basic research and for precompetitive collaboration between firms.

In France, the nationalization of leading electronics firms is being reversed through privatization and sell-offs. Direct funding for R&D programs of national champions is being reduced and selected aspects of telecom provision,

such as VANS and mobile communications, are being opened to competition.

In West Germany, which has traditionally had one of the most restrictive telecommunications regimes, wide-ranging changes have been proposed by the government's Witte commission and have been adopted as draft legislation, expected to come into force in 1989. Although the Deutsche Bundespost will retain its network monopoly and control over basic telephony, a regression from the more liberal interim position adopted

**THE UNITED STATES HAS BEEN LEADING THE WAY WITH DEREGULATORY POLICIES.**

by the Witte commission, a route has been opened for increased competition in West German telecom.

In Sweden, the close relationship between the socialist government, the PTT (Televerket), and the leading supplier (Ericsson) is increasingly coming under threat as pressures for the liberalization of telecommunications grow. Swedish informatics policies show a high degree of coordination and integration, with programs ranging from basic research through industrial applications to education, training, and user awareness, an approach more akin to that of Japan than other European countries.

This new integrated and international policy environment demands more of policy-making organizations if policies are to keep up with technological change, the needs of the informatics industry, and the requirements for effective informatics use. Regulation is more demanding than intervention and calls for a greater understanding of market dynamics and structure.

For example, the global informatics suppliers can now afford to locate their operations where the policy environment offers new business opportunities or the most conducive conditions for profitable investment. Multinational use-



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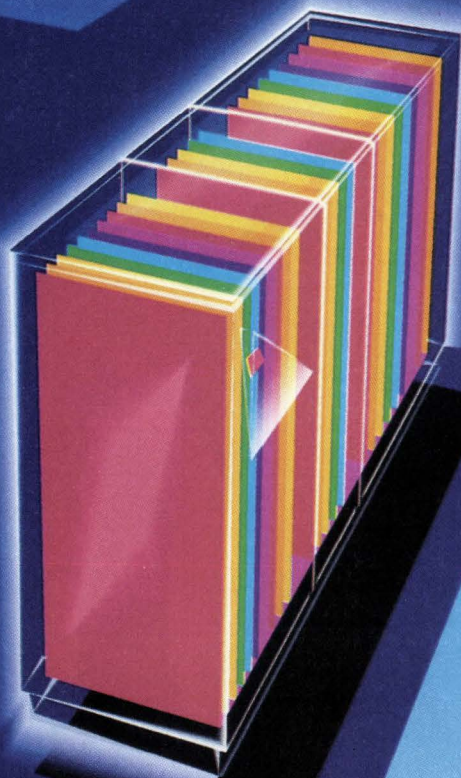
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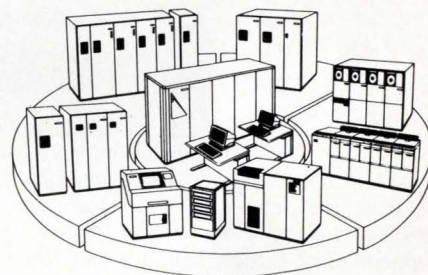
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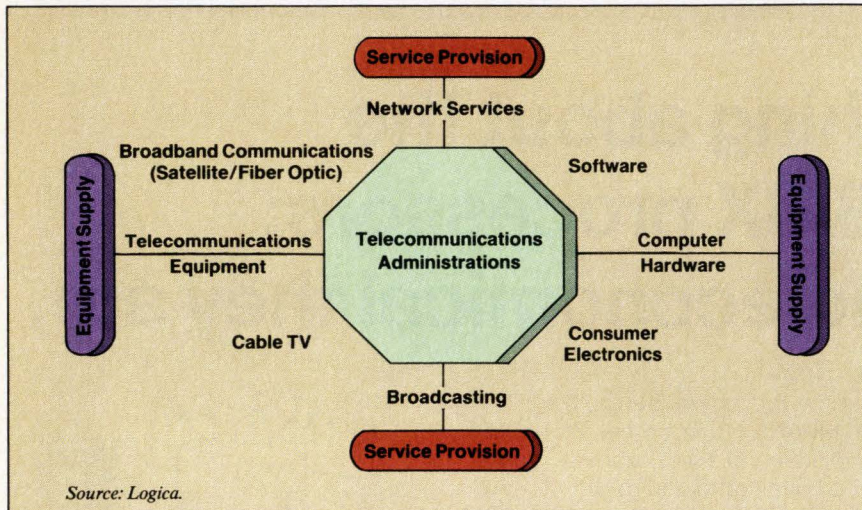
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## The Pivotal Role of the Telephone Authority



Source: Logica.

ers can also shift their data centers or network hubs to wherever regulations are least restrictive or the package of service availability is most attractive. Consequently, rather than directing the informatics industry in this new international phase of its development, governments are increasingly having to compete with each other to attract it.

While a deregulatory climate provides many benefits for users in terms of greater choice in services and equipment and generally lower prices, there are also costs involved. A competitive environment can lead to a deterioration in telecommunications service in peripheral regions or within disadvantaged groups in society. Deregulation can lead to the proliferation of incompatible proprietary standards and may deter investment in services or products that cannot guarantee short-term profitability.

The most evident problem arising from the liberalization of the informatics marketplace though, is the emergence of a growing trade imbalance in high-tech goods. "Balance of Trade In Computing and Communications" shows how Japan's trade surplus in computing and communications goods has risen from \$3.3 billion in 1980 to \$15.6 billion in 1986 at the expense of trade deficits in the U.S. and Europe. The Japanese trade surplus will continue to rise to an estimated \$25 billion by 1990, leading to protectionist pressures and a possible reversal of market-opening moves. The U.S. government has begun to put pressure on the Japanese government to ease trade pressures, resulting in:

- the U.S.-Japan semiconductor agreement;

- a bilateral treaty on the deregulation of international VANS; and
- the opening of Japanese telecommunications services to U.S. investment in new common carriers.

The agreements reached between the U.S. and Japan have eased considerably the tensions in informatics trade, but have resulted in criticism from several sources, such as the General Agreement on Tariffs and Trade (GATT), on the grounds of unfair trading practices.

By contrast, European governments have been largely preoccupied with national issues or the problems surrounding the creation of a single European market by 1992 which, while laudable, is in danger of blinding the European players to the global context of the informatics industry. Unless Europe can present a united front, it may be too late to prevent a U.S./Japanese hegemony of the international informatics industry.

The message for policymakers is that the informatics environment is becoming ever more complex. Simple direct intervention in supporting national champions or maintaining monopoly controls of PTTs is no longer necessary or desirable.

There is, however, a key demand-side role for governments to play in removing obstacles to the use of informatics in the economy as a whole. These obstacles may be financial or psychological, or they may be due to restrictive regulations, lack of choice, or lack of awareness.

One example of reducing financial and psychological obstacles, is the way the French government has supported and promoted the use of videotex sys-

tems throughout French society as a replacement for the telephone directory. The result is already close to 4 million users of the Teletel service and one of the busiest and most varied national information networks in the world.

In the new liberal environment, governments must also take positive action to counteract the negative effects of this increased competition. This involves the promotion of open standards, enforcing reciprocal access to overseas markets, and encouraging collaboration on high-risk projects or long-term basic research. It will also involve arbitrating

## JAPAN'S INFORMATION TECHNOLOGY TRADE SURPLUS HAD RISEN TO \$15.6 BILLION BY 1986.

between different interest groups in society and protecting the weaker groups, such as residential subscribers, small firms, and disadvantaged regions.

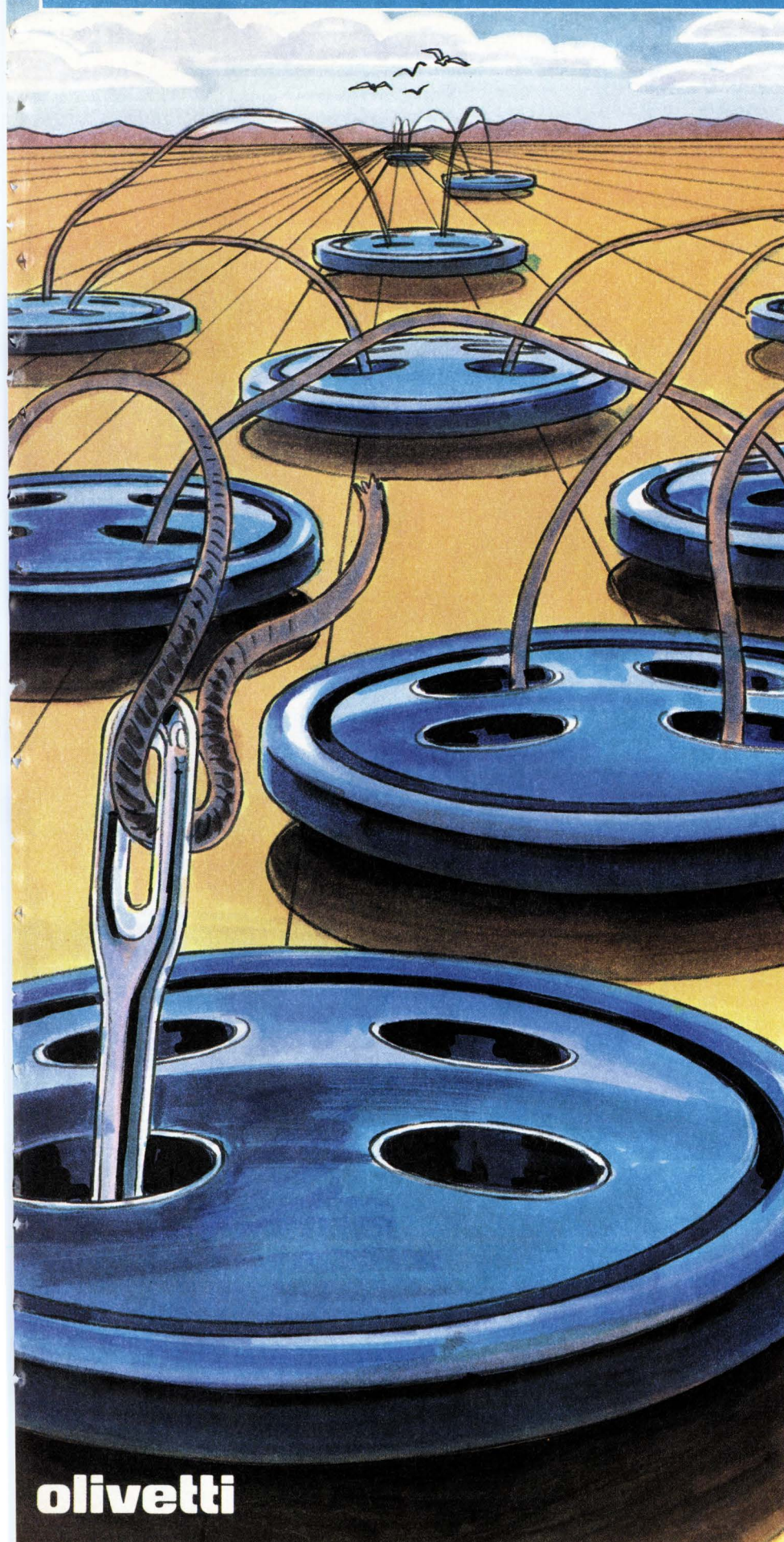
The major conclusion, however, is that governments must address international issues with greater vigor. Japan's MITI, for example, has now identified two major trends that will shape its future policy. First, the use of informatics will pervade all sectors of the economy—public, private industry, and consumer—and second, the trend toward global informatics operations will increase.

This is the first evidence of a cohesive response to the new challenges for the IS industry in the future. It is now up to policymakers elsewhere to realize that they can no longer afford an insular perspective. The future for the informatics industry is global. ■

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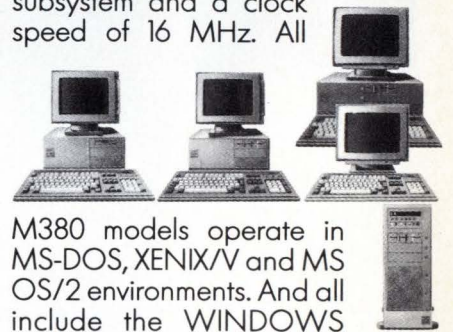


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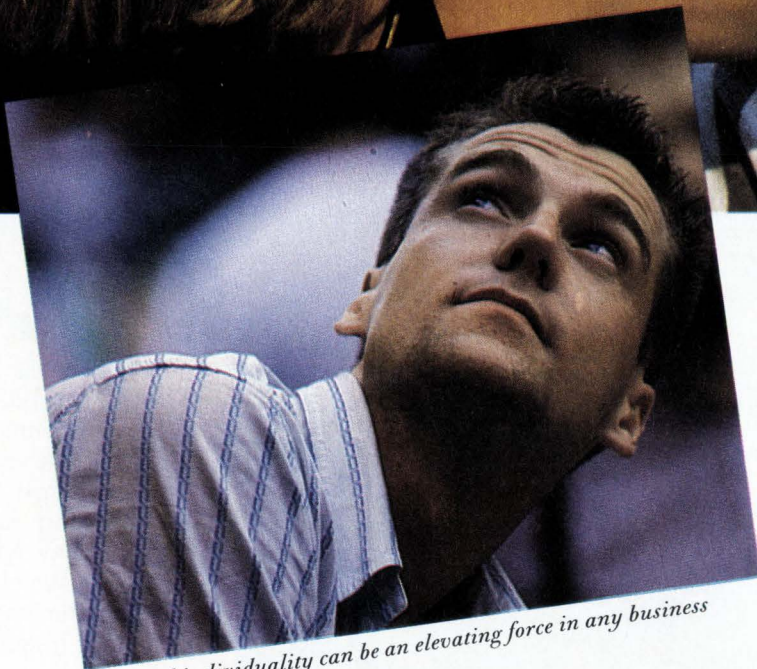
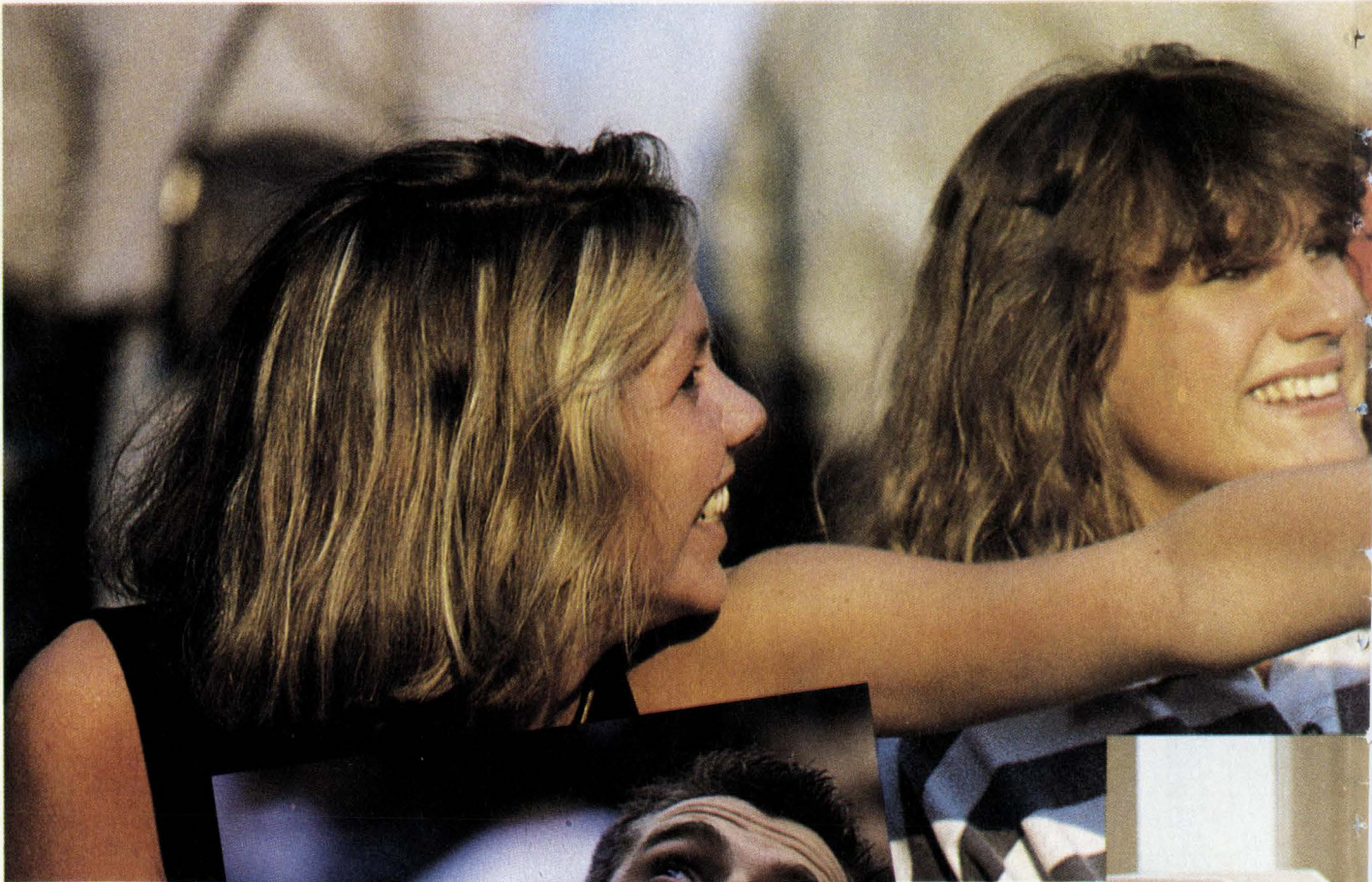
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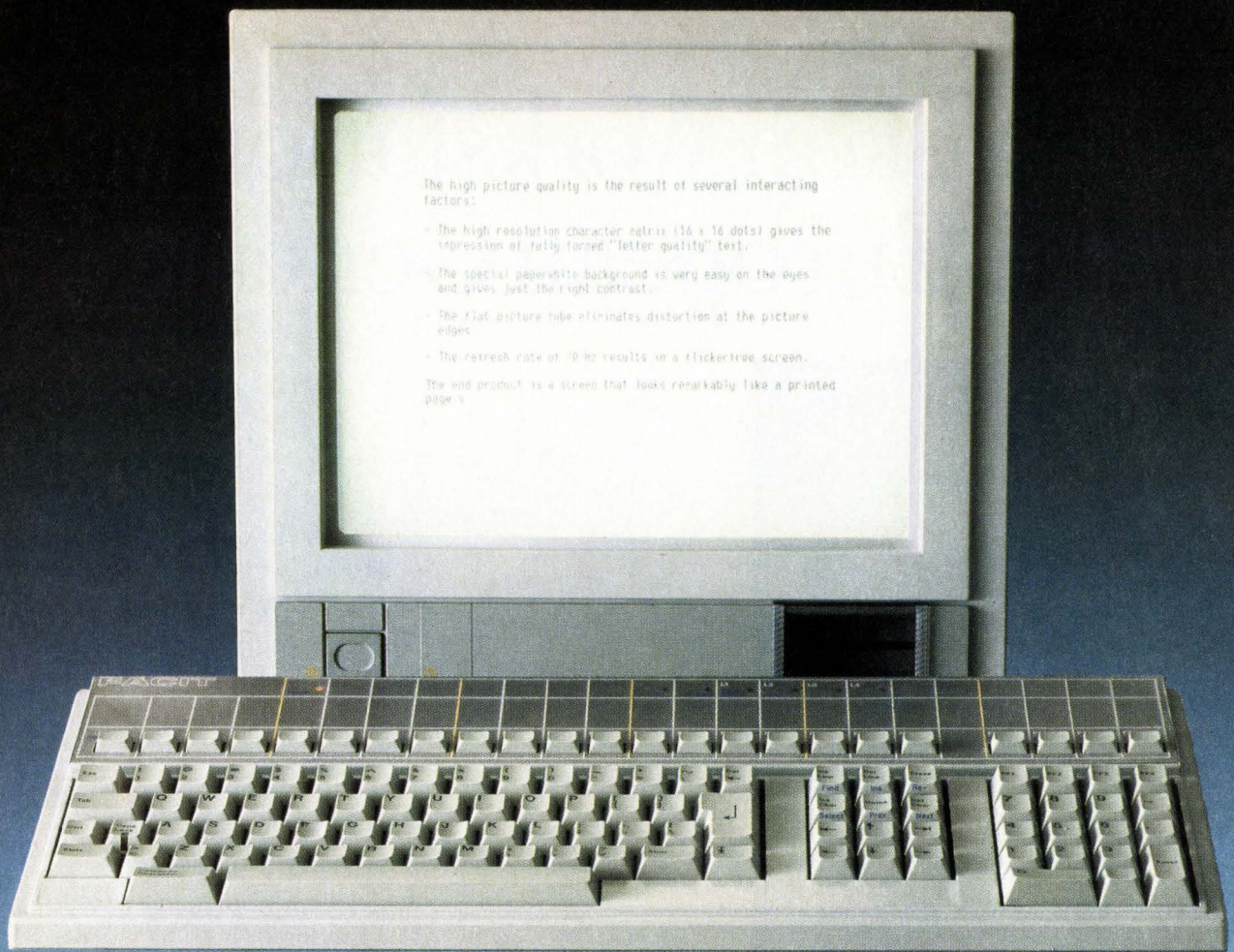
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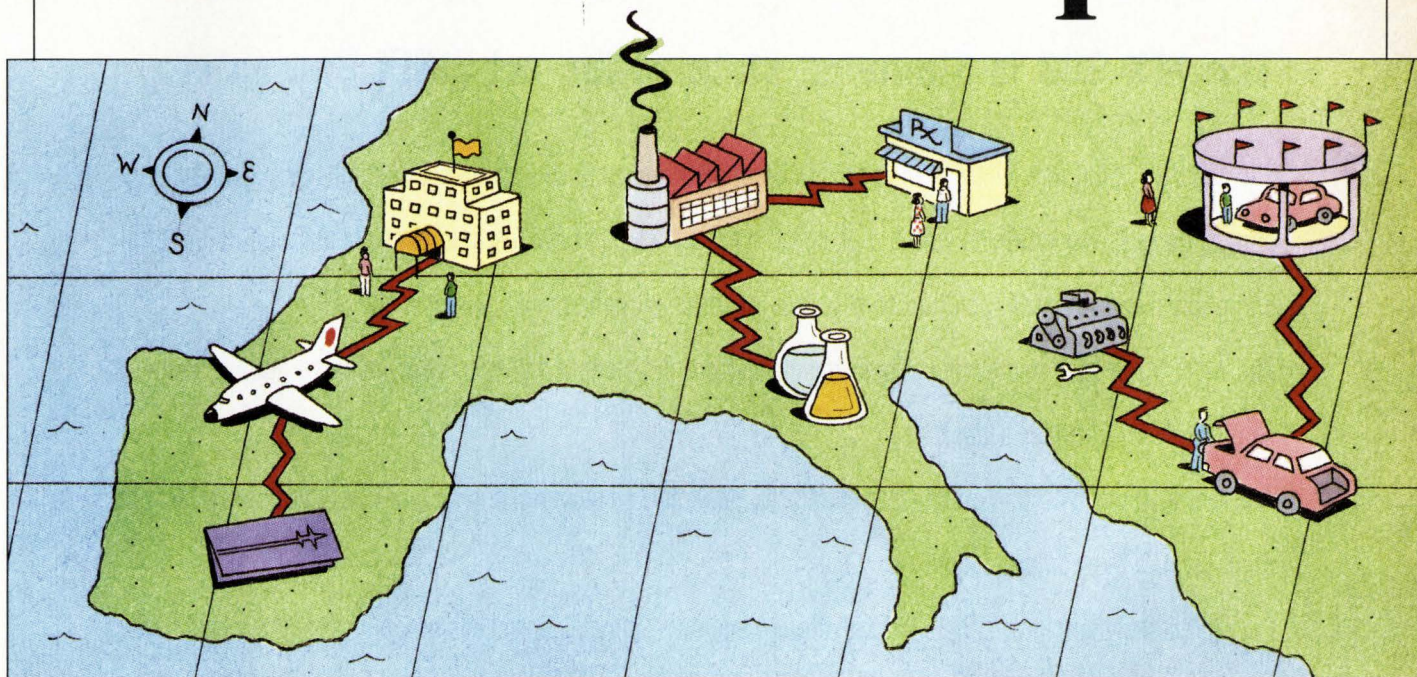
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# EDI In Europe



**A** s Europe moves toward its 1992 deadline for abolishing national trade restrictions, the benefits in cost, efficiency, and competitive position afforded by electronic networking between suppliers and customers are attracting the attention of individual companies and entire industries across the Continent. The era of electronic data interchange (EDI) is becoming inextricably linked with the era of European unity.

There are many steps yet to be taken: a greater management commitment by European companies to replace paper documents with electronic links; agreement on EDI standards among organizations engaged in bilateral and multilateral communication; and some adaptation of national telecom networks to accommodate these new services. Nevertheless, some progress has been made.

European industry is approaching EDI on a cooperative basis, concentrating on standards for particular sectors. Its motor manufacturers in particular are pushing ahead with their Odette project

for developing pan-European EDI norms to exchange data with suppliers and distributors. Similar projects are under way in the chemical industry (Cefic) and the electronics industry (Edifice).

### Banking Sector Takes a Leading Role

The banking sectors of a number of countries (notably the U.K. and France) are also on the move, developing systems for settling payments and exchanging information both among themselves and with their commercial customers, although they are acting at a national level and have not reached any general European agreement. At *Crédit Lyonnais*, one of the four leading French banks, Jean-Pierre Ruelle, manager of external relations in the IS and organization department, acknowledges that "English banks are well ahead of French banks in terms of EDI. French banks only discovered EDI a year ago."

The liberalization of the telecom market in the U.K. has enabled the British to push ahead with EDI, while most other European countries have been more inhibited. It is not the leader in Europe, however. According to London-based consultants *Butler Cox*, Sweden is the most advanced European country in EDI applications. The U.K. market has

really taken off only over the past two or three years, and ICL's *Tradanet* and *Edict* (run by networking firm *Istel*) can still claim no more than 500 users.

France is the only other player to actively develop EDI services. Elsewhere in Europe, PTTs are discouraging the development of EDI through comparatively restrictive regulatory attitudes to value-added network services. For instance, in West Germany, the motor industry is alone in operating EDI networks for communicating with its suppliers.

France, meanwhile, is the undisputed world leader in videotex services and point-of-sale EFT systems; many companies there have been content up to now to use the *Télétext* system for both internal and external data communications. EDI services have been developed by only a few industries with specific requirements—retailing, banking, aerospace, and automotive. According to *France Télécom*, the state telecom authority, France is three years behind the U.K. in EDI services.

French motor manufacturers, however, have proceeded in tandem with their British counterparts. According to Jean-Paul Kennis, IS studies manager at Renault and one of its representatives on the Odette committee, the European mo-



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## Europe's EDI Pioneers

Among the earliest examples of EDI systems run in Europe are two of the world's largest international networks, both set up on a cooperative basis, one by the banks and the other by the airlines.

The Paris-based Société Internationale de Télécommunications Aéronautiques (SITA) was founded in 1949 to meet airlines' telecommunications needs and now serves nearly 300 airlines in 169 countries. Its packet switched network is claimed to be the largest in the world, supporting more than 30,000 terminals in over 16,000 airline offices. It handles mainly passenger and cargo reservations, requests for flight plans, and lost luggage inquiries.

The Society for Worldwide Interbank Financial Telecommunications (SWIFT), based in Brussels, was established by the banks as an international message transfer service, handling a variety of data in addition to electronic funds transfer instructions. It now serves more than 200 banks in over 50 countries, and carries almost 300 million messages a year.

tor industry's Odette project got off the ground four years ago, when "a group of British motor manufacturers, especially Ford of Britain, came to see us to try to get EDI off the ground, with the aim of eliminating paperwork and speeding up the exchange of information."

Renault has had an EDI network operating for the past two years on the basis of Odette norms. "Nearly 100 suppliers have micros connected to our central site, and new ones are being connected at the rate of six or seven a month. We are now testing mainframe-to-mainframe links," explains Kennis.

One of the first tasks of the European motor industry's Odette project was to decide whether its EDI system should operate in real time or through file transfer. The latter course was chosen. Odette adopted FTAM (comprising the upper layers of OSI) as its file transfer standard, but, as Kennis points out, it will be years until FTAM is a reality.

"We had to develop our own temporary file transfer standards," which Kennis describes as the first European standards. "Edifact [a general set of EDI standards] did not exist when Odette started, so we also had to develop standards for syntax, which meant developing something from nothing."

The European motor industry has not only adopted Odette itself, but is imposing it on its suppliers. As Kennis emphasizes, however, "it entails a once-for-all investment and any supplier can then work with any European manufacturer." This, of course, would represent a significant advantage to the participant. Further, these companies may well decide to implement the same system for their internal communications as well as for data exchange with manufacturers.

EDI capability already has helped some firms win contracts and increase

sales. Boots, the U.K. retailer, now receives invoices from most of its major suppliers in electronic form.

Other large distributors give preference to suppliers with EDI facilities, so that such capability is now a definite competitive asset for many manufacturers. Similarly, one British construction company claims it won a contract for refitting a refinery thanks to its ability to accept—in electronic form—large numbers of plant drawings generated by CAD systems.

The ability to exchange the output of CAD systems electronically is now a *sine qua non* of participation in aerospace consortia in Europe. The trouble is that assessing the benefits of EDI requires both quantitative and qualitative analysis. In quantitative terms, EDI brings savings on the production, transfer, and processing of documents such as orders and invoices—some estimates suggest it is 25% cheaper to generate and process electronic data. First National Bank of Chicago calculates that savings of between \$3.75 and \$6.50 per document can be made using EDI.

### Cost Discourages Implementation

EDI can also reduce the number of errors in invoices, allow orders to be placed more frequently, and hence permit inventories to be reduced. Furthermore, it can enable payments to be made and processed more rapidly. But the improved cash flow on one side of the trading relationship necessarily means a worse one on the other, which has discouraged many companies from introducing EDI.

The cost of EDI systems is another significant disincentive, both in terms of the up-front development and installation costs and the operating expenses (consisting of the fees and volume-related charges payable to the network opera-

tor and the connection and usage tariffs levied by the PTT). Security concerns remain the most serious obstacle to the development of EDI, although organizations are becoming increasingly convinced that adequate safeguards exist.

The future development of EDI should be helped by the fact that a common set of international EDI standards applicable to all industries and all countries is emerging. Regarding communications standards, the OSI model serves as the common denominator, with FTAM seen as the ultimate standard for file transfer.

When it comes to the structure and content of messages, the emerging Edifact proposal has the backing of both European and U.S. standards organizations and is now recognized as the de facto market standard.

Nevertheless, "it remains a very confused situation," remarks Karol Szlichcinski, a consultant with Butler Cox in London and the author of a recent European EDI report. "Edifact is a set of standards establishing an overall structure for EDI messages, but they are very general and some people consider them too complicated."

French banks are applying two different sets of EDI standards—one to intra-industry exchanges, another to communications with their customers. Neither corresponds to Edifact. The industry has been using its own computerized clearing system for years, the *Système Interbancaire de Télécompensation* (SIT), as well as a system for communicating with its customers, Etebac.

"SIT has the merit of being unanimously supported within France," remarks Jean-Pierre Ruelle of *Crédit Lyonnais*. "If necessary, it could be adapted to Edifact norms; it already corresponds to the lower levels of OSI." Etebac was developed specifically for the banks to receive messages from their customers, but it could give way to Edifact. Ruelle would like other industries to adopt Edifact as a common standard.

While the European pioneers of EDI may have to accept the added burden of modifying their systems to bring them in line with international standards, those standards will make it easier for other corporations to get involved. Those that don't do so run the risk of being left behind in the competitive race to cut costs and offer better services. Those that do are likely to be among the survivors of a united European market. ■

*James Etheridge is DATAMATION's Paris-based correspondent.*



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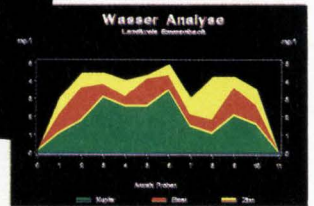
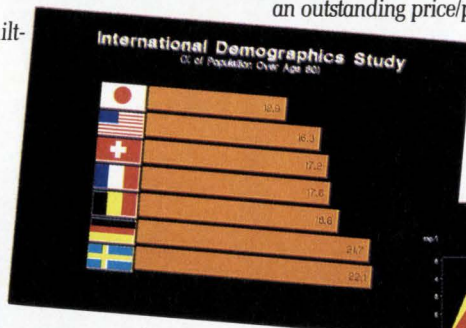
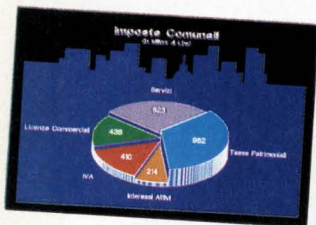
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# An effective System Architecture should provide an open bridge to communication.

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# IS Trims Down

**The rule in IS budgeting today is diminished expectations. Recent surveys by DATAMATION and Price Waterhouse show that growth in IS budgets has slowed or been cut back as corporations scrutinize their IS groups. Decentralization of ten parallels the cutbacks and seems to be a cosmetic excuse for downsizing in IS.**

BY SUSAN KERR

Scott Paper Co., Philadelphia, racked up an impressive 25% gain in profits last year, but its information systems staff at its headquarters was cut by 15%. "Why," asks Scott's IS vp Darwin John, "are we so concerned with keeping close tabs on the size of computer operations when things look this good?" Because, "It's better to be proactively competitive than reactively defensive."

Across the United States, corporations are taking a long, hard look at IS expenditures and staff sizes. Among the fundamental questions being asked is whether computers can provide the necessary payback, particularly in a corporate America fixated on quick sells and buy-outs.

In answer to those questions, many companies are deciding that less is best. That is the worst case scenario. "The best case I've seen," says one executive, "is holding your own."

Those are gloomy words in an economic climate generally described as good. IS departments have seen their share of slumps, but this latest slowdown is different.

While a company's cuts in central IS budgets often are accompanied by a decentralization of IS resources, users say that business conditions have been such that neither extra money nor personnel are provided to handle the more varied work load. Although decentralization often complicates attempts to gauge how much the total IS organization has shrunk, it appears to be little more than a cosmetic explanation for the downsizing in IS.

study. Those who will cut staff grew to 9% from less than 6%.

## Buying and Selling and Cutting

An important reason for both downsizing and the parallel decentralization is the rash of buying and selling that is a fact of modern corporate life. The amount of money and manpower allotted to com-

puter systems often is cut back during mergers and acquisitions because of the cash needed to finance a transaction. Decentralization also is often undertaken because top non-IS managers perceive that a centralized computer structure complicates the acquisition and divestiture of businesses.

## Merely Keeping Pace with Inflation

Even companies that project IS growth do so cautiously, and their numbers change almost daily. Surveys conducted by DATAMATION and Price Waterhouse in late 1987 and early 1988 make the trend toward diminishing expectations apparent. In two surveys of 973 information technology executives taken just one quarter apart, the percentage expecting to increase hardware expenditures this year dropped to 50% from 61%. The number that expect to increase systems and applications software expenditures also dropped, to 47% from 49%. The survey numbers do not state by how much these users will increase their IS budgets.

In a series of interviews conducted for this article, however, it appears that just keeping pace with the roughly 5% inflation rate is the best IS departments can hope to do.

The surveys are even less promising when it comes to employment. They show that over 67% of the surveyed professionals have no plans in 1988 to increase the number of systems and programming personnel; that percentage grew 4% from the earlier

study. Those who will cut staff grew to 9% from less than 6%.

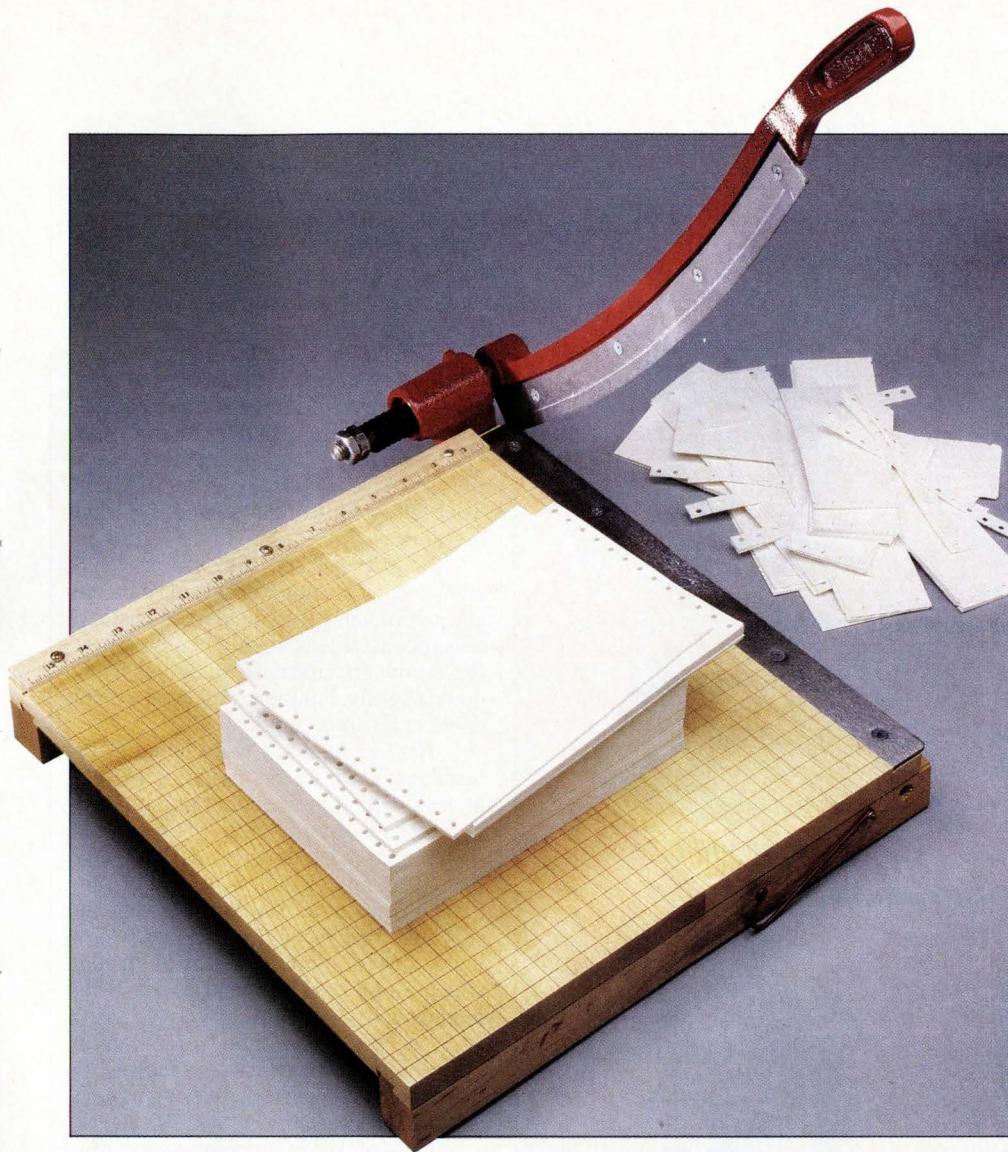
The salary picture is no better. A recent survey by Edward Perlin Associates Inc., New York, shows that the average salary for top IS positions, primarily in the financial services sector, will increase this year by only 3.6%, less than half of the 7.9% gain shown in 1987 (see "Rate of Salary Increases for IS Execs Is on a Downward Spiral," July 15, p. 32).

These forces are making some IS



*This is the third in a series of articles which will address new management, organizational, and systems issues confronting IS.*





pros rethink their profession. "Over time, we're making IS unattractive as a peaking point of a job," says one high-ranking IS executive who is not even in the financial community.

While not cutting back this year, Home Federal Savings and Loan Association, San Diego, will try to ring in 1989 with a flat IS budget. For the past four years, chief information officer Edwin Nichols has seen his budget increase at a slowing rate. "IS in all companies is being scrutinized much more closely than it's ever been," he believes. "Executive management of organizations understands the large expenditures IS is incurring and are asking, 'What is the value to shareholders?'"

The banking industry is in a tough phase, and Nichols must somehow respond to those kinds of management queries. So, he, too, sings the gospel of actively justifying IS's existence. Later this fall, he will present a study to Home Federal of what returns IS is making. For

now, Nichols cautions his fellow IS professionals against using the annual budgeting argument that "a little more money this year will bring in returns next year." Next year is here, and IS people had better prove their worth now, he says.

That could easily be the theme song whether you're on the Atlantic, the Pacific, or somewhere in between.

"We've been through a significant downsizing of the 1988 budget, both in dollars and size of staff," says William Harrison, senior vp for Hartford Insurance Group, Hartford, Conn. He hopes the pressure eases somewhat in 1989. Until then, the insurance and financial services company is working hard at getting more for its money.

"We're investing a lot of time and money trying to be more efficient in the development of products," says Harrison. Among the tools Hartford has come up with is its own CASE product, and it has adopted a greater reliance on fourth gen-

eration languages, which have "substantially increased our per person ability to build products, so we can accommodate downsizing."

Harrison believes the downward trend is a phenomenon that crosses industry and company lines. Others echo his thoughts. Home Federal's Nichols is planning to accommodate next year's flat budget by using new automation technologies, such as knowledge-based systems. The financial concern also affects other new areas, such as executive information systems.

Elsewhere, companies are looking more closely at packaged software and, of course, at getting as much as possible from existing hardware.

Still, some industries, by their very nature, are more pressured than others. The insurance industry, well known for its IS pioneers, is going through a tough competitive year and cuts are being made as a result. Similarly, last

October's stock market debacle had devastating effects on many Wall Street firms (see "Wall St. Crash Survivors: Who Had the Right Stuff?," March 15, p. 41).

"We're taking a very hard look at the systems we've poured money into for the last 10 years and are trying to wring out of that base as much as we can," says Harrison. "We've done a lot of automation in the last decade. The big expense savings are past." Thus, in some cases, he and others imply, it's becoming harder to find and defend computer paybacks.

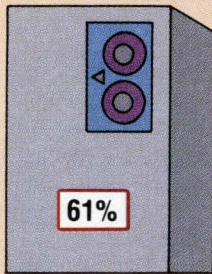
The result from many of these decisions could be that traditional programmers' roles change and, in some cases, perhaps disappear.

Exceptions to the downsizing trend can be found in industries where computerization is still relatively new and where obvious, immediate, and substantial cost savings result from automating certain tasks (see "The Downsizing Excep-

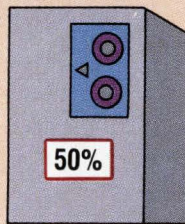


## The Trimming Down Trend

### Fewer users will increase hardware expenditures

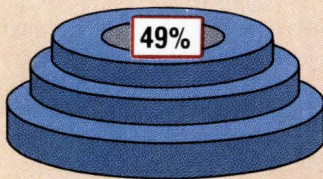


4th Quarter 1987

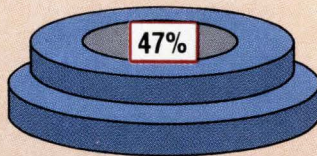


1st Quarter 1988

### Fewer will increase software investments

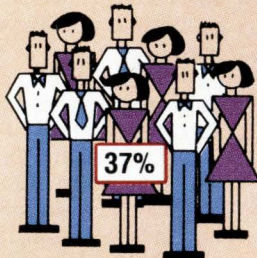


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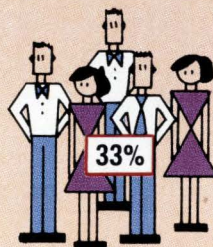


1st Quarter 1988

### Fewer will add personnel



4th Quarter 1987



1st Quarter 1988

Source: Price Waterhouse/DATAMATION

tions"). Even at those companies, however, the amount of new money available for capital IS expenditures is small.

### The Name of the Game Is Cost Pressure

For the majority, however, the name of the game is cost pressure, both within and outside IS. Richard Koeller, information services vp for TRW Inc., Cleveland, says the number one reason is that "corporations are facing a complete rethinking of industrial America." Furthermore, the demand to compete globally, and other management crises, are happening alongside specific IS challenges, such as decentralization.

TRW is highly decentralized. Within the last three years, its headquarters IS head count has dropped to 95 from 220. "You need to get more competency and knowledge into the field so that they can

think about the job differently," says Koeller. Decentralization is tougher than it sounds, but the attempt alone drastically changes the traditional picture of IS in that it changes who's performing what task and at what cost.

According to a March 15 DATAMATION/Price Waterhouse study, over 50% of companies in the U.S., Japan, and France have moved, or are moving, toward decentralized structures. This gives rise to an easy answer for the downward budget and hiring trend: because computer power and authority are shifting outward, it is not being counted accurately. And, of course, a decentralized central IS budget will become smaller. Yet, many professionals worry that business units and end users will not pick up the same number of people or dollars that were dedicated to larger central in-

formation systems. Indeed, if a corporation is under intense cost pressure, a division executive is not likely to hire personnel trained in information systems or to make any big capital expenditures. "Often, the [IS] responsibility is moved outward, but not the staff," Koeller says.

In fact, it is the job of today's IS professional to check expenditures in a decentralized world, notes Home Federal's Nichols. "The role of the CIO," he says, "is not to let the user budget increase at the [same] level [that] IS is decreasing." That takes a lot of diplomacy and training, adds Nichols.

Scott Paper is in the early stages of an IS decentralization program as the result of pressure to reduce fixed costs, of which central IS is seen as being a part. Right now, its internal IS budget is flat or down slightly, but more dollars are being spent at business units.

It's too soon to say if the individual businesses within Scott ultimately will be less willing to spend money on computers, says IS vp John. In the past year, the IS count at headquarters has dropped to approximately 200 people. Some moved into the business units, but the rest left either through attrition or a "voluntary separation" program, through which employees are paid to leave the company.

"At the same time," notes John, "the demand for IS work is as high as it's ever been, and we're all responding to it, although in alternative ways."

One of those ongoing alternative ways is a renewed use of third-party contractors. Two Big Eight firms are helping Scott with projects. The increase in the buy-versus-make decision could lead to an interesting, though not unexpected, result. "IBM controls [the market], not through technology but [through] support and service," says TRW's Koeller. "In a commodity market, they'll be a winner."

### Charging IS Costs Back to Users

Another alternative way is now in its third year at lumber giant Weyerhaeuser Co., Tacoma, Wash. IS costs are charged back to users, who may go where they choose for service. Weyerhaeuser planning and administration manager Donald Folsom guesses that throughout the company, information technology related expenditures are growing 5% this year ("the inflation rate," he notes).

Growth in IS is the exception, not the rule, at companies involved in merg-



## IS Trims Down

ers and acquisitions. Allied Stores Corp., for example, decided to discontinue an estimated \$30 million IS program following acquisitions by Allied's parent, Campeau Corp. (see "IS Development Is Being Pinched as Mergers Continue," July 15, p. 23).

Another corporation that has seen ups and downs due to acquisitions is McKesson Corp., the San Francisco wholesale drug distributor and retail products concern. This summer, it set out to buy Alco Health Services Corp. of Valley Forge, Pa. Robert Isley, vp and controller of McKesson information technologies division, is used to going back during the year and revising his budget. "We've had a little sizing down because we've sold off a lot of large companies," says Isley. "Our budget has been flat. We've not added a lot of things in the data center."

Things are now settling down somewhat, and with a healthy drug industry, McKesson may see a little IS growth and hiring. If the Alco buy goes through, some growth would also occur, Isley says. Yet, as others have found, while an acquisition brings a nice immediate boost to the IS ranks, it often doesn't last.

### The Downsizing Exceptions

Certain industrial and service segments, which traditionally have been light computer users, have experienced a slight increase in IS expenditures because they still have tasks that can easily benefit from automation. Such IS projects, which provide big cost savings, are therefore more palatable to those in charge of the budget.

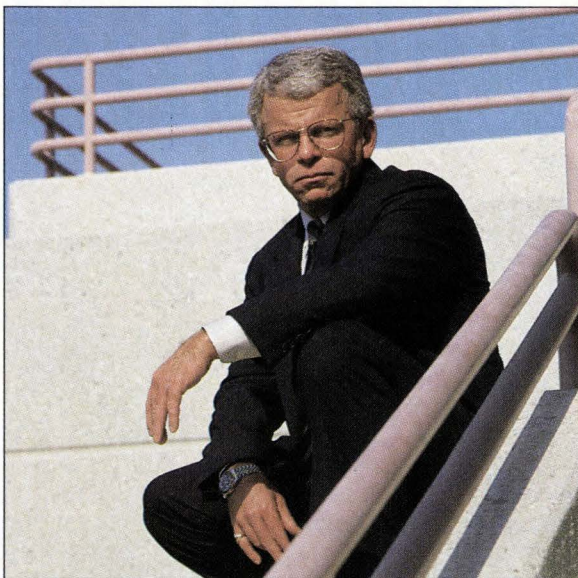
The health care industry is one example. One problem facing National Medical Enterprises Inc., Santa Monica, Calif., is finding a way to provide cheaper health care while coping with government funding restrictions. The company believes that computers will help it respond better to these imperatives.

Therefore, management's focus on computerization has intensified, says Barry Ganley, senior vp and head of IS for National Medical's \$1.5 billion hospital group. The focus represents a change from recent history. A health care industry fallout, which followed a phase of rapid expansion in the early 1980s, resulted in a flat IS budget for Ganley's division during the last couple of years.

"Some money is being shifted into IS," Ganley says. "So, while total expenses are down, IS is proportionately going up. Still, there's not a lot of money going around for capital expenditures." Corresponding to the slight increase in money, IS head count at the firm may go up between 0.5% and 2% this year.

Ganley mentally grapples with how to prove that automation pays off. It's not so much in replacing people, he maintains, but in improving the way they do their work. That's been the case with the automation of hospital billing procedures, where on-line collection systems cut down payment cycles and improve a hospital's cash flow.

Another traditionally light IS user is CSX Corp., Richmond, Va. Despite mixed financial results, MIS director Richard Moschler says that the transportation company's IS budget is going up. "Railroads are on a very aggressive program of getting new computer applications," he remarks.



HOME FEDERAL'S NICHOLS: Ringing in a flat 1989 budget.

"Each time we grew by acquisition, my budget went up as a result, and then there was a downward step after that," remarks James Beck, director of MIS for Case IH, the Tenneco subsidiary that purchased International Harvester in February 1985, based in Racine, Wis. Beck says that IS expenditures are rising slowly at Case IH, primarily because of an up-

ward trend in sales of farm and construction equipment.

By the end of next year, Beck figures the company will be out of the systems consolidation phase that was fueled by acquisitions. While the company may reduce the number of data centers, Case IH is doing some IS hiring. Salaries have been on the rise in this geographical area, according to Beck, because mid-America is on a comeback.

Defense contractors may not be on such an immediate comeback trail. Lockheed Corp. delivers its last C-5 transport plane next year, ending a multibillion-dollar program. The company may eliminate as many as 18,000 jobs as a result. "There's no question that some will be in IS," says Dean Allen, Lockheed's Calabasas, Calif.-based corporate vp of information

and administration. If other projects come through, some will be moved to work on them. This year, Allen suspects that, companywide, Lockheed experienced "modest" IS growth.

"Our IS managers tend to get as much out of equipment as they can," Allen says. "Obviously, when times get tough, you'll keep a piece of gear longer. I suspect we're all doing some of that. Just look at IBM." IBM's negative five-year income growth rate in recent years reflects that user thriftiness.

### Going Down for the Count?

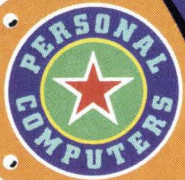
With many of these downward signs, does down mean out? In many ways, yes. The years of big percentage gains in budgets is over, a sign of the maturing of the technology and of the concept of information systems.

What will propel gains is new applications that perhaps can be gained only by having former IS professionals out in the field, living in new jobs. Yet, if a budget crunch continues and decentralized IS structures prove too costly and inefficient, some wonder if the tides won't turn and find companies recentralizing. Mitigating such a move may be the idea that large central organizations contradict other tenets of ideal business setups, such as being lean and mean for acquisitions and divestitures.

"Those organizations that are going through cuts need to be careful," warns Home Federal's Nichols. "They must not slash. Instead they must look at returns." Finding those returns is no longer a luxury; it is a top priority. ■



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605

615

620

630

70 COMPUTERS

75 SYSTEM

85 SYSTEM

70 COMPUTERS

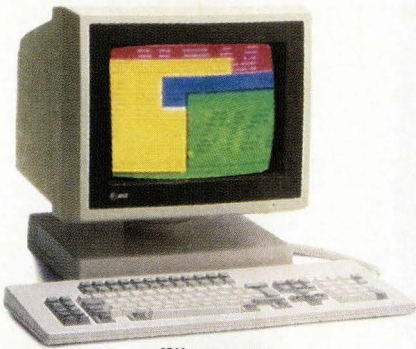
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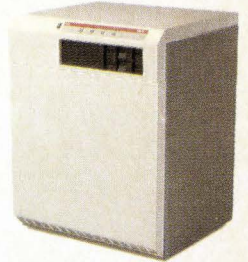
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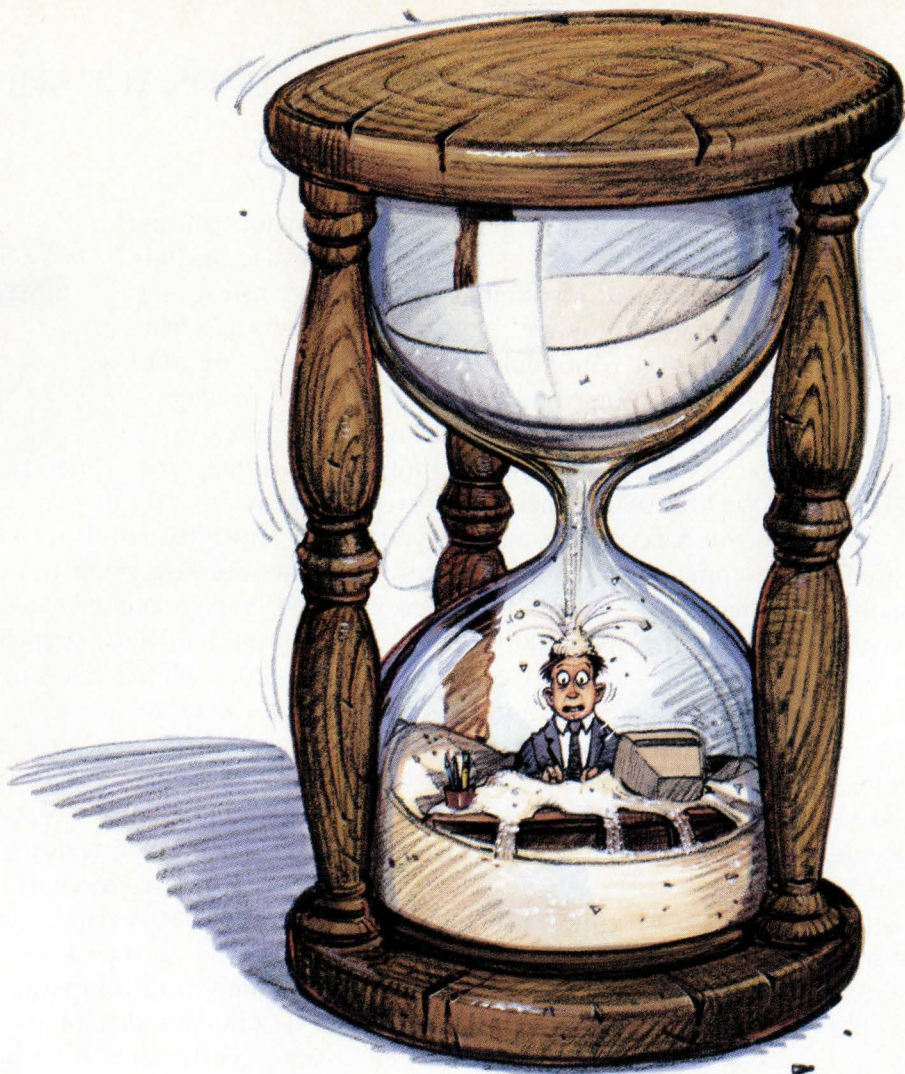
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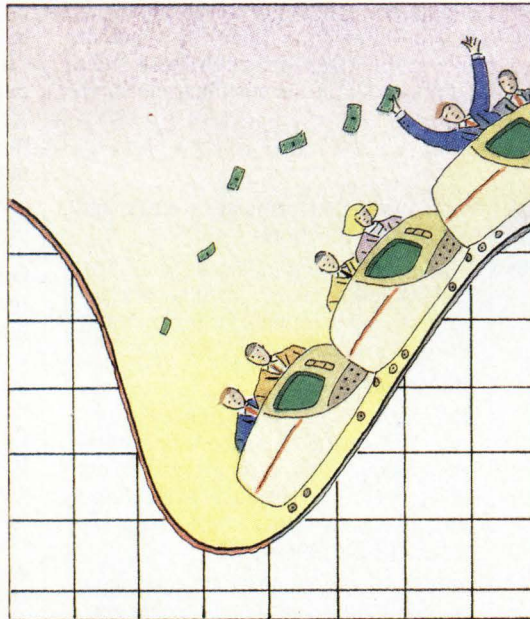
# What Are You Worth In '88?

## **T**A DATAMATION REPORT

o say that 1988 started out as a scary year for most IS professionals is putting it mildly. In the aftermath of October 1987's stock market crash, news reports were rife with speculation about a forthcoming business slowdown. Like their non-IS colleagues, IS staffers wondered whether they were going to be able to keep their jobs, much less get raises. But the U.S. economy surged ahead in 1988, carrying with it the careers of IS pros. DATAMATION's annual salary survey shows that IS jobs are more lucrative than ever before, and that the people in those jobs are optimistic about their immediate futures.

There's no question that, in general, IS specialists are better paid than the typical American. According to the U.S. Department of Labor's Bureau of Labor Statistics (BLS), non-agricultural workers employed by private industry earned an average of \$16,799 in the year up to June 1988, a rise of 3.6% from \$16,216 a year earlier. Of the 47 IS job categories surveyed by DATAMATION, not a single position's mean wage was under this national average. This year, in fact, only two IS posts reported mean salaries of less than \$20,000—word processing operators and data entry operators. (In last year's survey, these two positions—along with a third category, magnetic media librarian—weighed in with salaries below the national average.)

**DATAMATION's annual salary survey shows that IS jobs are more lucrative than ever. Average salaries for IS workers are well above the U.S. average for nonfarm workers; raises are heftier for those on the coasts.**



**IS jobs are more lucrative than ever, and most IS staffers are optimistic about their futures.**

IS salaries are growing at a faster pace this year than last. BLS says the average salary increase for all American white-collar workers with a professional specialty or technical expertise was 4.8%. The IS executives polled by DATAMATION reckoned that the average raise

garnered by their staffs will be 6.6% this year, better than 1987's 6.2% increase.

The overall averages, as good as they are, include some even more impressive gains made in several IS specialties. Comparisons between this year's salary survey and last year's show that mean earnings in fully two thirds of the IS job categories studied by DATAMATION were at least 6% higher in 1988 than those reported in 1987. Earnings in half of the classifications were higher by at least 10%.

DATAMATION did find a handful of positions in which mean salaries actually fell between 1987 and 1988. Office automation employees suffered, with both word processing supervisors and microcomputer user services specialists reporting lower average incomes. Poorly rewarded jobs were not confined to the lower ranks of IS organizations, however. The mean salary for directors of security was off more than 9% from last year's figures.

In the quest for bigger bucks, this has been a particularly good year for operating systems programmers. DATAMATION's research broke the OS specialty into four levels, and of these four positions, three—junior, intermediate, and senior programmers—posted the largest average salary increases of any job classifications in the survey. OS department managers didn't suffer either, still making it into the top third of average wage increases by job category. This is good for systems experts, but it can lead to dis-



ruption at the firms for which they work. When Wayne A. Bearstler, the IBM systems project manager at the Linthicum, Md.-based special programs operation of Computer Sciences Corp. lost two of his better operating systems programmers to other firms, he found out that they got 20% to 25% more pay at their new jobs. He believes his situation is not isolated, but rather that it's symptomatic of a trend in the industry as a whole.

#### Looking for Corporate-IS Synergy

The IS professionals who are getting the most impressive offers, Bearstler believes, are those who can position their companies to gain greater advantage from improved IS technologies . . . and who can explain this process to top management. But it is difficult for companies to find those who can bridge the gap between IS departments and the executive ranks. "There are just very few people who can tie the computer perspective, the business perspective, and the legal perspective together with a view to making a company more cost-effective," Bearstler asserts.

Operating systems specialists have the IS know-how, he continues, but they also seem to be "anti-social types, ones who can't be easily integrated into the



### Companies seek to lure "personable" operating systems specialists.

corporate culture." The top brass at corporations across the country, just now realizing the importance of effective input from these people, are snapping up the most personable of the bunch with the lure of big salary increases.

Even before this new wave of recognition washed across OS groups, their employers had seen the value of systems talent. In a ranking of DATAMATION's 47 survey categories by mean salary, all four OS jobs were among the top 10.

Another area to watch is systems analysis and applications programming. The upper echelon of this group made a strong showing in salary increases between the 1987 survey and this year's numbers. Of the six positions specified in

the survey, the top three slots—manager, lead systems analyst/programmer, and senior systems analyst—each reported, on average, 16% higher pay than last year's survey respondents did.

Salaries of computer operations staffers, while still generally low by IS professional standards, improved quite a bit from the levels reported to DATAMATION last year. Computer operator and shift supervisor positions averaged gains of around 20% during the year.

Randolph Burkhart, vp of information resources management at glassware marketer Princess House Inc., North Dighton, Mass., explains that he was forced to raise operations staff pay because he moved several employees into operations from other, higher-paying jobs in his company. "We had to adjust upward the wages of the people who were already in place to match the levels of the new ones," he says.

Employers' staffing problems are only one reason salaries have gone up for operation personnel. Ira Edelman, IS manager for SPD Technologies, a circuit breaker manufacturer based in Philadelphia, cites a very different reason for the increases among his operations people. "In our case," he explains, "it's because our computer operations staff is unionized. They get a cost-of-living adjustment as part of their salary, and they get quarterly raises. You can pretty much say that they have senior tenure; they're here for the duration."

The increases reported in the 1988 survey don't necessarily guarantee continuing wage leadership for this year's big gainers. IS executives say that the next boom in salaries may well be in different areas, as companies emphasize new goals for their IS departments. CSC's Bearstler predicts a jump in demand for telecom specialists and database professionals, with remuneration growing to match. At the same time, he adds, some IS personnel may find that their areas of expertise will become overcrowded. He cites programmers who work in second and third generation languages as examples of specialists whose skills are growing abundant.

#### Moving In New Directions

Bearstler's views are supported by a study conducted by Source Edp, a recruiter of computer professionals based in San Mateo, Calif. This research indicates that demand for IS professionals is already swinging in new directions. According to the firm, compensation is higher than average for IS auditors and

## Job Descriptions

The following is the job description guide respondents to the survey used.

*Corporate staff:* reports to senior management within corporation.

*Applications programming:* develops, designs, and prepares programs.

*Systems analysis/programming:* systems analysis and applications programming.

*Operations systems programming:* programs and maintains systems software.

*Database administration:* plans, organizes, and schedules the activities of the database section; establishes standards, maintains dictionary.

*Datacom/telecom:* develops and designs datacom networks and the installation and operation of data lines.

*Computer operations:* in charge of equipment, data entry, production control, and postprocessing, but not systems analysis, or other development functions.

*Production and I/O control:* sets up and schedules jobs for processing so as to maximize utilization and meet turnaround requirements.

*Data entry:* performs data entry and verification functions.

*Office automation:* operates word processing equipment, intelligent typewriters, and terminals for text editing/word processing.

#### Job Levels

*Manager:* advanced degree and minimum five years' experience or equivalent combinations; strong management skills, performs personnel evaluations, budgeting, progress reporting, and project management.

*Lead:* bachelor's degree or equivalent, minimum four years' experience (two in supervisory capacity); performs supervision as a project manager.

*Senior:* bachelor's degree or equivalent and minimum three years' experience, including some supervisory functions.

*Intermediate:* bachelor's degree or equivalent and minimum two years' experience; requires some direction.

*Junior:* two to four years' college and six months' experience; directly supervised.



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We're trying harder than ever.<sup>SM</sup>



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Avis features GM cars. Cadillac Sedan de Ville.

Circle 25 on Reader Card

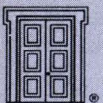


# How Would You Deal With These Problems?

① The CEO wants a completely overhauled customer information system in 9 months.

② Marketing needs external research information in their database to keep ahead of the competition.

③ Accounting needs changes to the old system by the next close.





# Start with a strong FOUNDATION™

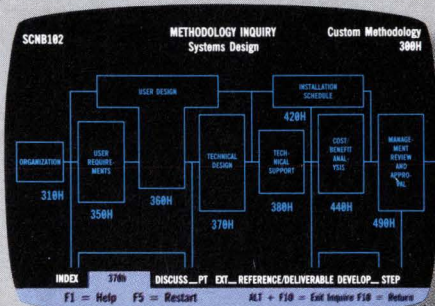
## Introducing the Integrated Software Solution for System Development Problems.

**FOUNDATION is a full life cycle CASE environment for planning, designing, installing and maintaining systems faster than you've ever anticipated.**

FOUNDATION provides the integrated components to tackle large and small system development projects more quickly, more efficiently and with better quality results than you thought possible. Integration virtually eliminates the standard snafus of single function tools. Redundancies. Incompatible functions. Multiple languages.

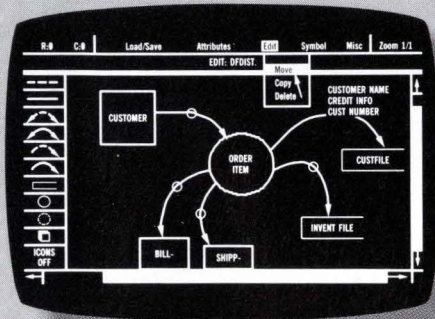
### METHOD/1™ for planning.

METHOD/1 provides an automated system for project estimating, work planning, project control and management change control. This established life cycle methodology has been used to deliver thousands of successful applications.



### DESIGN/1™ for system design.

DESIGN/1 is a dictionary-based system for analysts and designers to develop data flow diagrams, paint screens and reports, plus facilitate data design and maintenance. To facilitate better system design, the prototyping facility encourages user participation.



### INSTALL/1™ for code generation and maintenance.

INSTALL/1 uses the design specifications from DESIGN/1 and generates a production COBOL program. It promotes standardization during the development process by generating everything necessary for an on-line application: records, screens, SQL, logic and copybooks. Configuration management and testing aids complete the system. When maintenance is required, changes are resolved throughout the system automatically.

The screenshot shows a dictionary maintenance screen titled 'DICTIONARY MAINTENANCE'. It displays a table of entity relationships with columns for ENTITY ID, DEGROUP, ORDER DATA, CHILDREN LIST, SEQ, DESCRIPTION, and STATUS. The table lists various entities like DECTELEM and their relationships to other entities.

ENTITY ID	DEGROUP	ORDER DATA	CHILDREN LIST	SEQ	DESCRIPTION	STATUS
DECTELEM	50000001		CONTAINS	1	CUSTOMER-NUM	S
DECTELEM	50000010		CONTAINS	2	PROMISED-DATE	S
DECTELEM	50000011		CONTAINS	3	ORDER-DATE	S
DECTELEM	50000012		CONTAINS	5	SHIP-TERMS-CODE	S
DECTELEM	50000013		CONTAINS	6	SHIP-VIA-CODE	S
DECTELEM	50000021		CONTAINS	8	SHIP-TO-ADDR-1	S
DECTELEM	50000022		CONTAINS	10	SHIP-TO-ADDR-2	S
DECTELEM	50000023		CONTAINS	7	AR-TERMS	S
DECTELEM	50000024		CONTAINS	11	SHIP-TO-ADDR-3	S
DECTELEM	50000040		CONTAINS	8	CD-TERMS-DESC	S

At the heart of FOUNDATION is a central repository containing an active data dictionary that ties the components together. The dictionary is built on DB2™ to exploit its powerful relational capabilities along with the advantages of MVS/XA, CICS, and COBOL II.

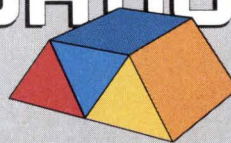
FOUNDATION comes with something no other CASE tool or environment can offer. The experience of Arthur Andersen & Co. Experience that comes from more than 35 years of developing systems solutions for our clients. Plus, FOUNDATION is supported by an experienced technical team that can be made available to service your special needs.

To learn how FOUNDATION can help solve your systems development problems call:

**1-800-458-8851**

# FOUNDATION™

ARTHUR  
ANDERSEN  
& CO.





## Average Salary by Region (in \$)

	ALL	BOSTON	MANHAT	NYC AREA	PHILA	WASH/ BALT	ATLANTA
<b>CORPORATE STAFF</b>							
■ Vice President	67,643	100,010	63,875	99,500	68,500	83,167	48,333
■ Director of Dp/MIS	54,189	54,571	250,000	63,921	50,500	56,827	44,000
■ Technical Services Manager	56,859	62,500	75,000	53,400	49,000	40,000	53,000
■ Information Center/Data Center Manager	42,203	40,667	77,500	46,500	23,000	57,000	36,800
■ Director of Security	40,876	40,000	40,000	44,000	40,000	56,250	22,000
<b>SYSTEMS ANALYSIS</b>							
■ Manager	45,561	55,000	50,810	55,000	40,667	50,000	42,471
■ Senior Systems Analyst	41,518	44,252	80,000	46,429	40,650	41,250	41,200
■ Lead Systems Analyst	37,067	40,000	60,000	42,500	35,000	41,000	NA
■ Systems Analyst	33,446	35,000	50,000	36,588	30,000	37,000	27,500
■ Junior Systems Analyst	27,599	28,000	NA	31,500	22,250	35,000	NA
<b>APPLICATIONS PROGRAMMING</b>							
■ Manager	45,581	50,000	65,000	48,000	41,000	52,000	29,500
■ Lead Application Programmer	38,269	40,000	40,000	44,250	39,150	34,250	31,000
■ Senior Application Programmer	36,397	35,000	42,025	42,500	NA	34,125	34,260
■ Application Programmer	28,493	31,929	34,000	40,333	23,400	28,334	33,750
■ Intermediate Application Programmer	26,127	28,500	30,000	34,500	23,250	25,037	NA
■ Junior Application Programmer	22,947	28,167	29,000	33,000	19,500	24,000	NA
<b>SYSTEMS ANALYSIS/PROGRAMMING</b>							
■ Manager	51,316	49,000	50,000	51,571	46,000	60,000	29,642
■ Lead Systems Analyst/Programmer	42,430	40,667	40,000	43,200	37,100	42,913	NA
■ Senior Systems Analyst/Programmer	38,974	30,500	38,500	38,750	29,500	42,500	40,500
■ Systems Analyst/Programmer	30,926	31,333	28,000	33,700	26,875	35,966	30,750
■ Intermediate Systems Analyst/Programmer	28,079	NA	NA	32,000	25,800	37,500	24,000
■ Junior Systems Analyst/Programmer	23,620	23,250	25,000	28,667	19,000	34,000	16,922
<b>OPERATING SYSTEMS PROGRAMMING</b>							
■ Manager	57,351	50,006	75,000	NA	NA	39,333	NA
■ Senior Systems Programmer	57,846	45,000	44,000	NA	NA	43,250	NA
■ Intermediate Systems Programmer	47,940	31,250	40,000	NA	40,000	40,000	35,000
■ Junior Systems Programmer	47,462	NA	29,000	NA	NA	35,000	NA
<b>DATABASE ADMINISTRATION</b>							
■ Manager	41,649	45,000	55,000	47,667	35,000	48,000	NA
■ Database Administrator	36,579	31,875	35,000	46,000	36,000	30,500	NA
<b>DATACOM/TELECOM</b>							
■ Manager	46,005	41,667	65,000	43,000	27,000	NA	NA
■ Analyst	33,998	34,000	40,000	35,333	14,000	NA	NA
<b>COMPUTER OPERATIONS</b>							
■ Manager	37,072	38,000	55,000	42,444	45,000	48,333	28,750
■ Shift Supervisor	30,827	27,333	40,000	40,750	38,933	28,822	24,000
■ Lead Computer Operator	24,464	24,333	24,000	30,500	19,850	21,433	19,433
■ Computer Operator	21,346	20,750	24,250	27,583	34,457	20,949	17,700
■ Magnetic Media Librarian	20,887	20,333	21,000	24,500	NA	NA	NA
<b>PRODUCTION AND I/O CONTROL</b>							
■ Supervisor	29,016	NA	24,000	28,500	NA	28,000	28,150
■ Lead Production Controller	26,433	45,000	22,000	NA	33,000	NA	22,200
■ Scheduler	24,493	36,000	19,000	18,000	11,000	NA	18,000
■ Control Clerk	21,127	20,325	15,000	17,000	12,100	NA	16,550
<b>DATA ENTRY</b>							
■ Supervisor	22,898	24,333	28,000	22,600	19,125	16,093	18,000
■ Operator	16,838	16,250	19,000	18,362	17,800	15,683	14,754
<b>OFFICE AUTOMATION</b>							
■ Word Processing Supervisor	23,822	24,000	26,500	34,000	NA	20,000	NA
■ Word Processing Operator	17,930	20,667	20,000	20,500	NA	17,000	13,500
■ Microcomputer User Services Specialist	25,054	25,500	NA	28,500	NA	NA	28,000
<b>OTHER</b>							
■ Specialists	24,828	25,000	30,200	32,000	NA	17,500	NA
■ Consultant	48,810	20,000	76,667	50,000	35,000	28,000	51,000
■ Pc Evaluator	32,127	30,000	NA	NA	NA	NA	NA



CHI	MINN/ ST. PL	CLEVE	CINN	DTRT	ST. LOU	HOU- TON	DENVER	DALLAS	SEATL	SAN FRAN	LOS ANGEL
48,333	47,000	40,000	52,500	70,000	48,667	100,028	57,500	54,000	NA	85,000	72,200
55,556	47,000	42,500	56,857	67,500	49,500	71,333	46,080	52,250	45,840	60,000	64,696
47,500	NA	35,000	50,500	45,000	NA	NA	55,000	54,000	40,000	NA	50,859
48,000	NA	28,052	41,333	30,000	25,000	100,000	48,000	30,902	37,500	57,667	43,125
30,000	NA	NA	NA	NA	NA	NA	30,200	NA	NA	NA	80,000
46,082	32,750	NA	41,333	NA	NA	NA	62,400	28,000	NA	NA	46,520
38,400	30,000	40,000	44,000	45,000	NA	NA	42,000	54,000	NA	NA	45,883
40,000	34,300	NA	29,000	NA	NA	NA	46,500	NA	NA	NA	31,000
35,000	29,500	27,000	30,000	NA	38,200	30,000	35,000	25,000	NA	NA	41,230
26,500	NA	NA	23,000	NA	NA	NA	30,000	NA	NA	NA	NA
50,143	42,000	NA	30,250	48,000	NA	NA	58,200	50,000	NA	61,000	44,000
39,800	NA	NA	36,333	48,000	23,500	NA	54,100	38,000	42,000	35,000	30,000
38,250	NA	NA	28,867	40,000	NA	NA	41,800	32,000	NA	46,833	40,500
31,571	31,000	28,000	27,500	23,500	NA	NA	31,300	28,000	14,000	33,000	31,740
25,667	NA	23,000	NA	30,000	21,000	NA	24,400	35,000	NA	24,000	30,500
19,667	18,000	NA	NA	23,000	NA	NA	26,400	NA	NA	28,000	23,500
49,400	NA	NA	40,000	55,500	41,533	61,250	39,050	40,000	45,000	50,667	64,667
37,600	NA	33,667	NA	46,000	40,450	47,500	37,925	NA	NA	40,333	44,885
36,900	32,500	27,000	28,700	40,000	33,033	45,000	31,700	NA	35,000	48,000	43,826
35,333	NA	23,500	28,000	35,000	31,100	35,000	30,750	NA	29,000	32,750	36,208
29,450	NA	NA	22,000	30,000	25,133	30,000	31,450	NA	32,000	NA	32,975
23,333	NA	NA	NA	NA	NA	NA	21,533	NA	26,000	26,500	23,038
44,000	NA	NA	31,000	48,000	52,800	NA	NA	NA	42,000	30,000	66,150
36,000	NA	NA	NA	28,000	38,900	35,000	38,000	NA	NA	NA	50,524
29,500	29,500	NA	NA	35,000	31,200	NA	27,000	NA	40,000	42,000	43,133
20,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26,000
40,000	NA	NA	44,000	65,000	NA	NA	33,625	45,000	NA	NA	NA
28,500	27,000	NA	NA	NA	37,000	41,000	33,133	NA	NA	NA	41,667
49,333	NA	NA	NA	NA	44,000	NA	42,250	NA	NA	NA	37,500
28,500	NA	NA	25,000	NA	25,000	NA	33,250	33,000	35,000	NA	36,467
42,571	24,400	20,000	25,500	39,667	40,600	24,000	34,154	NA	38,000	38,167	42,370
31,900	NA	NA	NA	20,000	28,933	NA	22,500	34,000	23,500	33,500	41,529
22,418	16,060	24,000	22,000	20,000	25,050	30,000	21,000	23,224	19,500	23,167	29,278
23,857	16,000	21,500	19,000	19,000	17,475	NA	18,020	19,728	23,500	21,760	25,215
25,000	NA	NA	NA	NA	21,500	NA	18,000	NA	20,000	24,000	21,725
33,000	NA	NA	NA	NA	NA	19,000	NA	50,000	35,000	NA	24,513
25,000	NA	NA	NA	18,000	NA	NA	NA	NA	22,000	NA	36,000
25,667	NA	NA	NA	36,000	30,200	NA	NA	NA	NA	NA	15,500
20,000	NA	NA	NA	18,000	NA	NA	NA	NA	10,000	NA	18,025
22,736	27,000	NA	NA	15,000	25,300	20,300	20,000	NA	22,000	30,000	24,810
20,927	15,000	NA	15,250	16,000	15,275	20,244	16,333	15,158	16,000	19,800	21,884
21,750	NA	NA	NA	NA	NA	NA	25,000	24,000	NA	28,000	NA
22,500	NA	18,000	NA	NA	NA	14,000	29,000	NA	23,500	NA	NA
28,500	26,750	NA	21,333	NA	35,900	NA	20,000	NA	24,000	NA	35,000
NA	19,800	25,000	NA	NA	38,200	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	56,000	52,000	NA	40,000	61,333
37,000	NA	NA	NA	NA	NA	NA	NA	NA	40,000	NA	31,250





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## Average Salary by Industry (in \$)

	ALL	CONSUM MFG	INDUS MFG	BANK	FINAN	EDP SERV	DISTRIB
<b>CORPORATE STAFF</b>							
■ Vice President	67,643	82,500	90,657	59,850	50,500	58,250	61,250
■ Director of Dp/MIS	54,189	57,040	54,445	NA	157,500	52,600	50,498
■ Technical Services Manager	56,859	54,875	97,875	38,000	52,000	49,400	37,500
■ Information Center/Data Center Manager	42,203	43,100	47,083	45,640	45,000	50,000	41,629
■ Director of Security	40,876	40,000	65,000	NA	40,000	40,000	NA
<b>SYSTEMS ANALYSIS</b>							
■ Manager	45,561	49,333	49,250	42,000	50,810	44,600	43,750
■ Senior Systems Analyst	41,518	42,274	40,812	58,000	NA	45,409	37,500
■ Lead Systems Analyst	37,067	36,600	36,533	60,000	NA	29,333	28,000
■ Systems Analyst	33,446	32,368	31,278	35,500	NA	34,800	29,750
■ Junior Systems Analyst	27,599	28,333	25,600	NA	NA	26,500	27,000
<b>APPLICATIONS PROGRAMMING</b>							
■ Manager	45,581	45,750	44,625	26,750	65,000	55,667	43,333
■ Lead Application Programmer	38,269	41,600	39,000	23,000	50,000	43,750	30,000
■ Senior Application Programmer	36,397	37,286	35,943	44,050	40,000	38,857	29,000
■ Application Programmer	28,493	30,370	27,750	25,500	35,000	33,242	28,640
■ Intermediate Application Programmer	26,127	33,000	24,833	25,000	NA	27,500	23,000
■ Junior Application Programmer	22,947	23,917	24,425	30,000	28,000	26,000	18,750
<b>SYSTEMS ANALYSIS/PROGRAMMING</b>							
■ Manager	51,316	50,312	67,655	26,000	48,500	64,000	39,333
■ Lead Systems Analyst/Programmer	42,430	40,944	48,053	NA	38,500	45,667	42,000
■ Senior Systems Analyst/Programmer	38,974	35,920	47,005	20,000	39,000	42,833	31,667
■ Systems Analyst/Programmer	30,926	32,697	31,695	20,000	28,000	30,500	32,500
■ Intermediate Systems Analyst/Programmer	28,079	28,089	28,245	NA	NA	30,000	30,000
■ Junior Systems Analyst/Programmer	23,620	25,500	22,823	NA	25,000	25,000	NA
<b>OPERATING SYSTEMS PROGRAMMING</b>							
■ Manager	57,351	49,252	50,450	NA	56,667	44,500	39,500
■ Senior Systems Programmer	57,846	42,600	39,644	NA	52,500	42,500	42,000
■ Intermediate Systems Programmer	47,940	37,333	34,188	NA	40,000	60,000	35,000
■ Junior Systems Programmer	47,462	34,000	29,750	NA	29,000	30,000	NA
<b>DATABASE ADMINISTRATION</b>							
■ Manager	41,649	39,000	47,000	NA	55,000	48,000	NA
■ Database Administrator	36,579	38,200	37,143	NA	35,000	40,000	30,000
<b>DATACOM/TELECOM</b>							
■ Manager	46,005	44,667	52,600	NA	65,000	NA	NA
■ Analyst	33,998	28,000	38,567	NA	40,000	NA	NA
<b>COMPUTER OPERATIONS</b>							
■ Manager	37,072	36,714	33,814	31,057	40,000	40,667	38,908
■ Shift Supervisor	30,827	27,571	27,180	23,690	40,000	32,000	32,950
■ Lead Computer Operator	24,464	22,735	29,489	17,670	22,333	23,333	22,764
■ Computer Operator	21,346	19,939	23,800	15,778	23,500	20,500	17,862
■ Magnetic Media Librarian	20,887	24,667	18,362	NA	21,000	NA	NA
<b>PRODUCTION AND I/O CONTROL</b>							
■ Supervisor	29,016	27,500	31,333	19,000	23,500	23,000	27,150
■ Lead Production Controller	26,433	34,500	24,000	NA	22,000	NA	20,100
■ Scheduler	24,493	32,000	30,800	13,000	19,000	18,000	20,500
■ Control Clerk	21,127	20,250	35,250	NA	15,000	17,000	16,300
<b>DATA ENTRY</b>							
■ Supervisor	22,898	21,611	22,516	NA	21,800	28,000	23,800
■ Operator	16,838	15,384	17,839	10,000	25,073	16,333	17,522
<b>OFFICE AUTOMATION</b>							
■ Word Processing Supervisor	23,822	28,333	19,000	25,000	23,000	20,000	NA
■ Word Processing Operator	17,930	18,800	17,214	12,200	21,750	17,000	NA
■ Microcomputer User Services Specialist	25,054	25,833	24,300	18,000	NA	NA	30,000
<b>OTHER</b>							
■ Specialists	24,828	27,667	19,800	NA	30,200	25,200	NA
■ Consultant	48,810	39,233	52,000	90,000	50,000	47,429	NA
■ Pc Evaluator	32,127	27,500	36,800	NA	NA	NA	NA



GOVT	MED/ LEGAL	TRANS/ UTIL	EDUCA	CONSTR/ MIN/ AGRI	ANNUAL SPENDING	
					< \$1 MIL	> \$1 MIL
54,180	92,750	83,650	59,667	NA	56,123	83,174
51,626	50,607	54,955	42,900	50,850	44,423	69,465
50,052	44,000	48,500	22,500	45,000	60,816	54,352
40,923	30,355	51,333	34,013	NA	36,303	50,463
36,988	NA	34,500	NA	NA	36,400	42,991
46,146	38,443	48,667	30,500	48,500	40,834	49,853
41,143	40,660	39,286	31,667	NA	39,848	42,172
41,326	27,500	37,333	NA	NA	30,082	40,726
33,744	36,433	33,440	NA	32,000	30,158	36,158
29,677	23,360	28,333	NA	NA	24,198	29,031
49,314	40,000	41,667	34,175	39,000	40,619	49,883
38,610	34,060	38,500	30,750	NA	34,300	39,765
33,757	31,800	34,000	29,250	35,000	35,883	36,727
27,724	28,417	30,000	25,389	27,500	27,111	30,504
25,602	24,625	26,500	21,450	NA	24,050	27,989
22,119	20,670	22,000	21,000	NA	21,522	24,264
44,418	44,350	47,607	38,547	NA	54,030	50,256
38,039	37,075	44,843	35,250	38,500	40,600	44,571
34,479	32,350	39,331	27,500	44,000	41,938	37,901
30,323	30,680	33,270	24,300	28,500	29,697	33,271
32,250	21,000	29,797	19,980	24,000	24,580	30,995
24,372	21,205	22,528	13,000	NA	20,564	26,878
47,210	70,000	41,607	27,000	NA	39,577	68,667
42,199	47,667	43,132	29,000	NA	40,308	86,526
32,461	37,800	38,646	28,000	35,000	35,250	49,690
27,333	NA	40,850	17,500	NA	24,000	52,561
40,568	NA	42,814	32,000	NA	30,875	46,228
38,072	NA	38,236	32,000	42,000	29,218	39,676
45,917	38,500	47,543	37,000	28,000	41,750	46,856
34,326	19,500	41,732	25,000	18,000	31,286	34,823
41,243	31,333	43,486	31,333	33,500	31,367	42,727
31,790	33,700	46,631	24,667	NA	25,392	33,884
24,451	21,317	26,915	16,333	25,000	22,863	26,724
25,163	17,712	24,048	20,100	17,667	20,969	21,970
20,550	NA	21,046	15,000	24,000	16,811	21,366
33,903	24,000	43,548	25,000	NA	25,750	30,757
24,203	33,000	37,644	18,000	18,500	27,875	25,989
17,833	11,000	33,922	16,000	NA	25,600	24,146
17,702	13,700	22,296	14,000	NA	31,043	18,109
25,518	19,136	27,377	18,000	16,500	20,469	25,314
18,907	13,990	19,159	14,492	19,000	15,851	18,933
24,182	30,000	NA	28,000	10,000	22,528	26,249
21,267	16,667	28,000	11,000	20,000	17,913	17,832
23,226	16,400	35,168	19,000	NA	19,722	27,106
16,700	28,000	35,100	14,000	NA	23,029	26,070
NA	41,000	NA	28,500	NA	49,042	47,386
26,400	35,000	NA	32,000	NA	37,000	32,290

analysts with expertise in communications, database management, office automation, and information center analysis.

Where you work can have a big effect on what you make and how fast your pay is likely to grow. Data on raises provided by DATAMATION's survey respondents show considerable variation with the employee's geographical location. IS professionals from the San Francisco and Silicon Valley areas, for example, said raises averaged 10.6% in 1987. This unusually rapid growth in compensation has not escaped the attention of companies in that area.

One San Francisco-based MIS director (who did not want to be identified) asserted that his company was relocating because it could not keep up with the Bay Area's prevailing salary hikes. According to this vp, by moving to a new location 75 miles away, his company will be able to operate where IS salaries average 18% lower. Los Angeles area respondents also reported solid gains: average increases were 8.3% in 1987, and, in 1988, the average wage increase will be 10.2%.

#### Raises Lower Between the Coasts

Workers in Boston, Atlanta, Philadelphia, and Manhattan also beat the national average in 1987, and they expect to do so again in 1988. And even though average IS salaries in the Baltimore-Washington region aren't setting national records, Bearstler thinks they are a mite too high. The reason, he believes, is not the area's shallow pool of talent. On the contrary, he notes, there is a good supply of qualified people. According to Bearstler, local companies are paying excessive wages because they don't want to be bothered training people just out of school. "They only look at midlevel people, and it's a shame. They're overlooking a wealth of knowledge," he says.

Unlike their fast-track colleagues on both coasts, IS professionals in the heartland found themselves in a financial quagmire this year. Survey respondents in Cleveland, Cincinnati, and St. Louis reported raises of 4%, well below the national average. Their counterparts in Houston, a city still hurting from a slump in the oil industry, did even worse in 1987—average raises that year were put at 3.3%—but they expect an upturn this year, estimating 1988 increases at 5.6%.

Outside the major metropolitan areas, the thin labor market takes a toll; neither employers nor employees have as many options. Richard Mellor, IS manager for the MIS unit of Harford County, Md., isn't overly concerned about rising

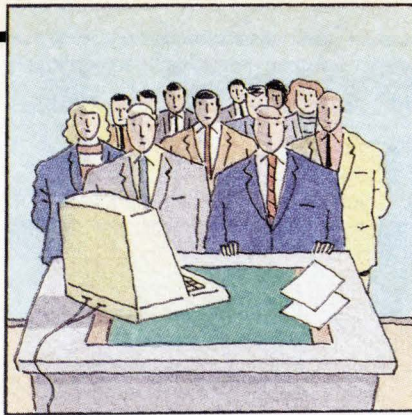


wages or heavy turnover. He really doesn't need to worry because, as he explains, "There are only three or four computer shops in this area. If our people want to work close to home, they don't have that many options."

The amount and growth of IS professionals' earnings in one industry can be quite different from those in another. An industry-by-industry breakdown of average raises confirms the expected—the IS side of the financial industry has felt the effects of last October's stock market crash.

Executives in this sector report that last year their raises averaged 13.8%. By contrast, the average 1988 raise reported by IS professionals in finance was 7.1%. Even so, IS pros in the financial sector indicate they will still beat the national average of IS wage gains by about half a point.

Among the other industry groups providing better-than-average IS salary increases this year are banking, consumer goods manufacturing, and medical and legal services. By contrast, IS managers in education, transportation, and indus-



**Some IS personnel may find overcrowding in their areas of expertise.**

trial goods manufacturing markets are giving their IS employees smaller increases than most.

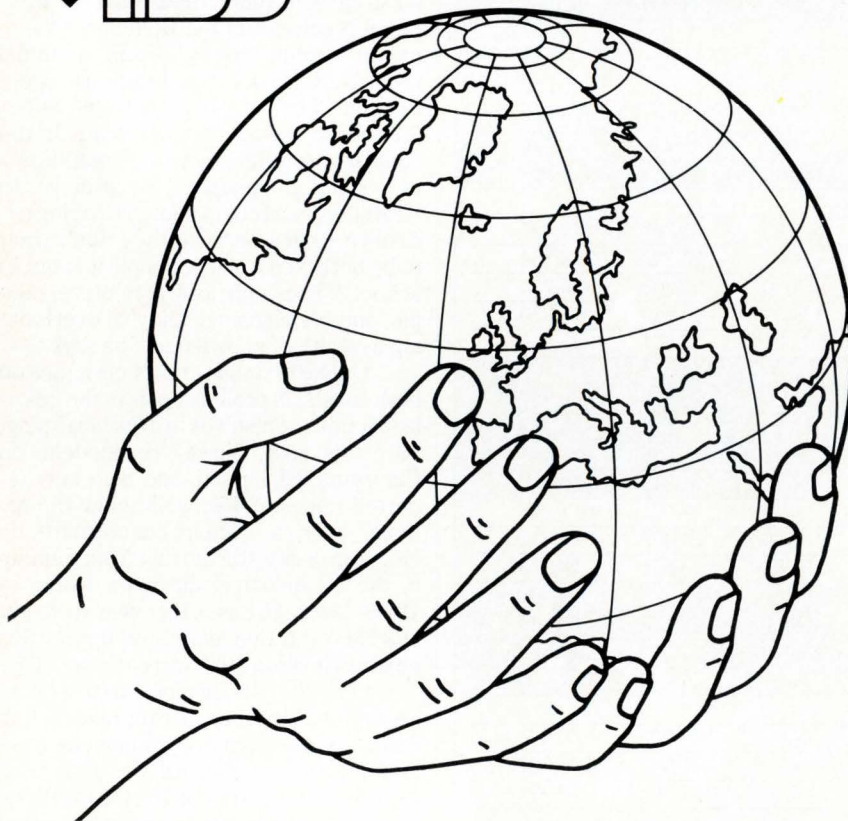
In between—exactly on the national average—was the government sector, which improved IS employees' earnings by 6.2%. That midpoint is precisely where Harford County's IS manager would put his shop. Mellor says he just "can't compete with the state's big IS employers like Baltimore Gas & Electric"; but he can reward his people more handsomely than many other local firms.

Some industry segments are sub-

ject to odd fluctuations in their work cycles, and, occasionally, this can play havoc with raises. CSC's Bearstler says 1988 has been a relatively good year for wage increases at his shop, particularly in comparison with last year, when revenue from its major customer, the Department of Defense, went through a dip. He recalls, "The end of 1987 was very slack for us. Gramm-Rudman had a very large impact; there were fewer funds available and that [had an impact on] our growth projections." Adding more pressure to control wages was a corporate reorganization that turned his group into a profit-and-loss center. On top of that, Computer Sciences moved to an annualized review system, and some raises were deferred.

Compensation packages offered to IS professionals include a great deal more than salary. According to this year's survey respondents, almost 90% of their companies offer medical coverage to both management and staff. Also on the list of common prerequisites are paid vacations, life insurance, disability insurance, and dental coverage, all of which

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are available to staff at more than 50% of the responding companies. Other fringe benefits, like company cars and club memberships, are generally less abundant, according to the survey results; when they are offered, it's typically only to IS employees who are considered to be management.

One perk with lasting value is education. Not only does it make employees more productive, it also helps them move up the corporate ladder. Last year, the average IS employee was given 64 hours of training at an estimated cost of \$2,800.

Employee turnover rates among IS professionals edged up this year compared to last, but remained lower than that of two years ago. DATAMATION readers reported that, on average, 7.5% of their personnel have been or will be replaced during 1988. In 1987, the turnover rate was 7.2%, a marked decrease from the 8.8% rate reported for 1986.

Both this year and last, the financial sector was more volatile. IS turnover in finance is currently running at a 15% rate, twice the all-industry average, and



**Faster turnover is just one unfortunate product of dynamic expansion.**

even higher than last year's 13.7%. But Wall Street isn't the only business sector with high employee turnover. Banking, too, is in turmoil, and this year will witness the changeover of 15.2% of its IS professionals. During 1987, turnover in banking was 7.7%, marginally above the national average.

**Small Companies Report Less Turnover**

Small companies seem to experience less IS personnel volatility than large ones. Survey respondents at companies with less than \$1 million in annual

revenue expect to end 1988 with an IS turnover level of 5.2%. At the other end of the spectrum, reports from companies with yearly revenue of \$3 billion or more put 1988 turnover at 9.7%.

The survey data for companies between these extremes confirms the pattern: in general, bigger shops must replace a greater percentage of their employees each year. CSC's Bearstler believes faster turnover is just one of the unfortunate concomitants of growth, and he cites his five-year-old group at Computer Sciences as an example. "In the early years, we had 3% to 5% turnover," he says. "Last year it was about 7%, and we will probably hit 10% in a few years."

Change per se may add to the rate of turnover, and when that change includes IS headaches, the effect is compounded. Princess House hired Randolph Burkhart in 1984 to renovate IS. Before his appointment, the IS department only supported order processing, and most of the work was in maintenance. Burkhart implemented a heavy investment in systems development, and then, in 1986, sales volume fell by 30%. "The company enacted strategies to counteract the downturn, and this meant a lot of pressure on people, a lot of changes in programs," he says. "Many had a hard time adjusting to that, and they left." But now the business is healthy again. "We've got good players, more experienced people. Things are settling down," he says. ■

**METHODOLOGY**

On June 24, 1988, 3,000 questionnaires were mailed to a random sample of DATAMATION subscribers. The sample was selected according to the following criteria: 2,010 names selected by key man per site; and 990 names selected by key man per site at Fortune 1000 companies. The sample was drawn on an "nth-name" basis from those who qualified according to the above criteria. That is, names were selected at a specified interval throughout the list so that a systematic random sample of the entire list resulted. To achieve the highest possible response rate, each outgoing envelope was personally addressed to the recipient, and a brand-new \$1 bill and a prepaid reply envelope were included to facilitate return of the completed questionnaire. By July 21, 424 completed questionnaires had been returned, indicating a response rate of 14.1%. The results were tabulated and this report was based on the data from the 424 replies.

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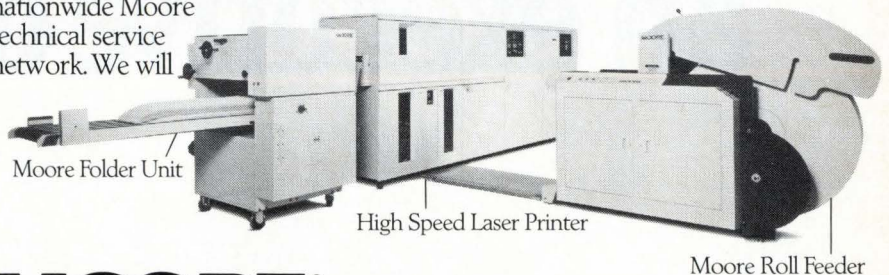
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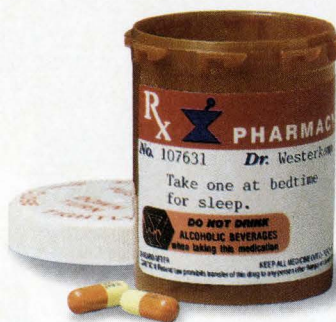
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# The Myths and Realities Of Competitive Advantage

## The Challenges of Information Technology

The frontier of information technology has moved from the back office to the front office, where it is playing an ever larger role in formulating business strategy, in improving and even redefining the effectiveness of operations, and in making organizations more responsive and accountable. Often, it is recasting the dynamics of an industry, shoving some into overcapacity and forcing others to change the roles regarding vertical integration.

In some companies, top management has responded to this challenge by rushing to embrace technology, on the assumption that IT will provide a silver bullet, only to realize later that any advantage they gained was fleeting. In other cases, managers have acted more cautiously or even shied away from active involvement with IT and then observed more innovative competitors gaining market share. Increasingly, managers are faced with the dilemma of recognizing the importance of IT while feeling ill-equipped to deal with this rapidly changing technology.

As a result of the work McKinsey & Company has done with clients, it is clear the use of IT must be tightly integrated into the overall design of a company's business strategy. Every company and its competitive situation is unique, and every top manager must somehow come to terms with an appropriate role for IT in his or her enterprise. This article is a framework to guide executives in doing so, and it introduces a series of forthcoming articles about the management of IT in organizations, from both a business and technological perspective. The series is intended to redefine the terms of discourse about when, why, and how IT should be used to change strategy or improve performance.

Carter F. Bales  
Director  
McKinsey & Company Inc.



BY MICHAEL MIRON, JOHN CECIL, KEVIN BRADICICH, AND GENE HALL

**I**nformation power! Legions of consultants, academicians, and vendors have been preaching the gospel of information technology—how its transforming power will create “strategic systems” that will propel business to new heights of success. The faith in technology has created what has almost become an admonition—if your company doesn’t get on board quickly with the latest technology, it will be left behind.

While information technology is often essential to maintain competitiveness, it may not be capable of achieving competitive advantage where none ex-

isted before, and its most common application—as a tool for automating a process—is least likely to yield that advantage. When IT is used to leverage existing business strengths, such as economies of scale or unique institutional skills, however, it is more likely to result in competitive gains. But the most strategic IT breakthroughs occur in industries where the continuing rapid rate of technological change, as well as other industry changes (government regulation, evolving customer needs, etc.) lead to new business approaches and opportunities to substantially change competitive position.

It is in these situations that early mover companies that are among the first to understand and use IT can create



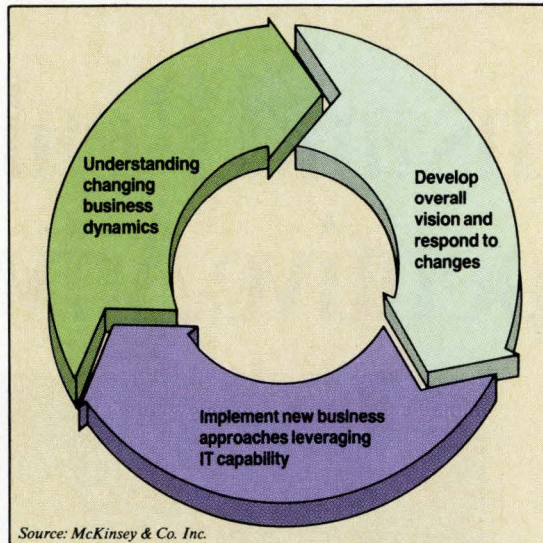
## The Challenges Of IT

new advantages and even change the industry structure.

However, most IT investments today involve standalone applications. They generally take the form of specific initiatives—such as image capture technologies or automated calling systems—that reduce costs or improve service. While these applications are often critical to remaining competitive, they generally do not provide an edge because most of these technologies are available from vendors to all comers.

Even internally developed systems can be copied by competitors. Because the underlying technology is widely available, the application can be replicated by those with comparable scale. Smaller players can often gain access to comparable applications through independent software vendors that can spread the development and maintenance costs across a number of users. Since the minimum efficient scale for single-user, internally developed systems

## Building Capabilities with IT



based on widely available technology is typically much higher than for externally acquired systems, the cost of these internally developed systems will generally put their developers at a disadvantage.

Because standalone IT investments can be copied, they do not lead to competitive advantage. In fact, the nonexclusive nature of the applications will often

allow competitors to meet or exceed the service levels of existing market leaders at substantially lower costs. As a result, technology will tend to homogenize competitive positions by driving the cost and service quality of broad sets of competitors toward similar levels. The net impact is typically a reduction in total industry cost and profitability, because in a competitive industry, cost savings will not be captured by the company applying the technology (except in the short term before others copy the application), but instead will be passed on to customers.

The overall homogenization of competition tends to intensify price competition by minimizing other forms of differentiation. The benefits will only be captured directly by companies that have a competitively defensible position in other areas, such as strong customer loyalty, which will allow those companies to avoid competing solely on the basis of price. Thus, standalone information

## How One Company Rode Information Technology to Success

One firm that used IT to ride a wave of industry change is an East Coast investment firm. Since the early '80s, the tide of competition has been steadily rising in the mortgage industry. With increasing securitization of mortgages, interest rate volatility, and overcapacity in the industry, competition has been intensifying, placing a greater premium on risk management. Since the mortgages acting as collateral in mortgage securities can be prepaid at any time, assessing and managing prepayment risk is crucial.

While many investment banks involved in structuring mortgage securities invested in information technology to track and analyze prepayment rates, this firm correctly anticipated the need to analyze the prepayment rates of the specific pools of loans backing collateralized mortgage obligation (CMOs). When the CMO market was small, the firm began to construct a system that takes publicly available data on the economic performance of each geographic area in the United States, default delinquency data, mortgage pool characteristics, and prepayment rates from the Federal National Mortgage Association, Government National Mortgage Association, and Federal Home Loan Mortgage Corporation. A computer-based analytic/decision-support system gives traders improved pool-specific pricing capability, which has led to a preeminent position for the firm in pool-specific trading. The system helps salesmen assist customers in valuing their portfolios, which strengthens customer relationships, and provides the firm with additional information about the location of specific securities. The system also allows the firm's underwriters to structure CMO payments more accurately, which has allowed them to obtain superior pricing by being among the first firms to construct innovative new securities that more closely meet investor needs.

The key to this firm's success has been the experience it

derived from being an early adopter—not only of the relevant technologies but also of ongoing, wholesale changes in the way it does business. These changes did not occur all at once: they represent the cumulative learning and refinement of business approaches over a period of years. For example, the experience of building and refining the system taught the firm what capabilities were required—but the firm also realized that whatever it might achieve, it would be useless unless customers recognized its value. That led the firm to conduct customer education seminars, which provided valuable feedback to refine the system.

Meanwhile, customers began to use the firm's capability to execute trades, allowing it to build market share. This translated into increased understanding of the marketplace and generated ideas for refining the system and making more adaptations to its business procedures. The firm then began efforts to link other functions into the system and expanded its training efforts by producing videotapes on the benefits of the system, making it possible to gain an additional share of the trading. This created opportunities to underwrite innovative new securities, resulting in greater placement volume, which increased commissions further, and generated funds to invest in ever-greater capabilities.

While competitors could duplicate the technology and information this firm uses, they could not easily duplicate the real source of advantage—the tremendous experience gained by the firm in adapting virtually all of its operations to the new business environment, coupled with the hundreds of refinements and enhancements made to the system itself since its inception. As a result, the firm has recently overtaken many of its traditional competitors and is now uniquely positioned to exploit additional information on specific loans within the pools as it becomes available.



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"The CSI annual conference is a must for all individuals involved in computer security. It is the one place for maintaining computer security expertise, and staying on the leading edge." John T. Devall, Jr., System Security Administrator, Tenneco Oil Exploration

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"As a first time attendee—I was overwhelmed—the info, ideas, organization, and quality speakers. I'm already looking forward to attending the next conference." Richard Panneck, Chief, Internal Security Unit, Minnesota Dept of Jobs & Training

"This was the best run conference I have ever attended and I have attended many different vendor and user conferences; Also you had the best speakers and workshop leaders." Rita Stracka, Assistant Dir., Facilities/Security, State of NJ, Dept. of Treasury

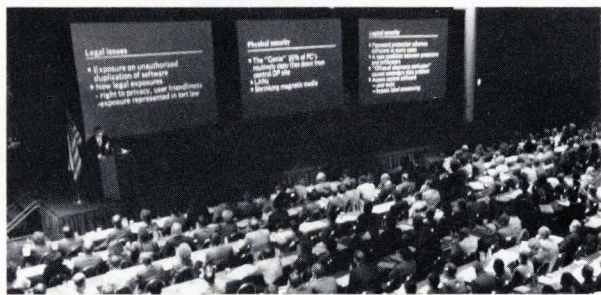


# Conference & Exhibition

November 14-16, 1988 • Miami Beach

## WORKSHOP PROGRAM

1. Short and Long-Term Planning for Information Security
2. Establishing Workable Information Security Policies
3. Building an Effective Data Security Function
4. Security Review of Communication Networks
5. Architectural Comparison of CA-ACF2, RACF, & CA-Top Secret: Pt. I
6. Planning & Implementing a Security Awareness Program
7. Multi-Level Security in a Commercial Environment
8. Computer Viruses, Part I—What They Are & How They Work
9. An Overview of Risk Management Tools
10. Introduction to Disaster Recovery Planning
11. Career Planning for Information Security Officers
12. Establishing & Managing the Security of Microcomputers
13. Data Security: Who "Owns" the Responsibility?
14. Security Considerations of Inter-Company Networking
15. Architectural Comparison of CA-ACF2, RACF, & CA-Top Secret: Pt. II
16. The Missing Link: Information Classification
17. Correlating Security "Incidents" to Deficient Organizational Policies
18. Computer Viruses, Part II—Protecting Your Systems
19. Controlling the Systems Programmer
20. Contingency Planning: What About Your People?
21. Management's Obligations: The Executive's Checklist for Information Protection
22. Outstanding Security Programs: Making Them Happen
23. Controlling Security Risks of Personal Computers
24. Network Security: A Primer
25. Computer Fraud: Effective Prosecution
26. Security Awareness for Government & Defense Contractors
27. An Introduction to VAX/VMS Security
28. Halon 1301: Can We Live With It?
29. Security Penetration Evaluation Methodology
30. Disaster Recovery Planning, Economy Style
31. Everything You Wanted to Know about Using Consultants
32. Achieving Support for Security: A New Communications Model
33. PC Products Evaluation: Part I
34. Security Implications of IBM's New ESA Environment
35. CA-Top Secret: For the Advanced Practitioner
36. Securing the MVS Environment
37. DECnet Security
38. Computer Viruses: The Law & Your Legal Liability
39. What the DSO & Auditor Should Know about Developing Secure Applications
40. Choosing & Negotiating with a Recovery Services Vendor
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42. Security of Local Area Networks
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44. Transborder Data Communications Security
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## OPTIONAL SEMINARS

You can attend one or two of the optional full-day seminars offered Sunday and Thursday, November 13th and 17th.

1. Introduction to Computer Security
2. Applying Computer Security to Meet Organizational Objectives
3. How to Become a More Effective Data Security Officer
4. A Blueprint for Establishing Security Policies, Standards, & Guidelines
5. How to Conduct an Information Security Review
6. Introduction to Data Communications Security
7. Information Security in a DoD Environment
8. "Criminal Code"—Risks and Countermeasures
9. Network Security in a Digital Environment
10. Developing a Structured Approach to Disaster Recovery Planning
11. Creating an Information Security Awareness Program
12. Computer Crime Investigation: A Practical Approach

## ABOUT COMPUTER SECURITY INSTITUTE

CSI, established in 1974, is a full-service membership organization dedicated to helping its more than 3,000 members safeguard their information assets. Services include the bimonthly newsletter *Computer Security*; the annual *Computer Security Buyers Guide*; a Hot Line telephone referral service; and reduced rates on CSI conferences, seminars, and publications. CSI also sponsors the summer IBM/DEC Users Computer Security Conference. CSI publishes the semiannual *Computer Security Journal* and the 500+ page *Computer Security Handbook*. CSI offers in-house training courses as well as a full program of regional public seminars throughout the U.S. and Canada.

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"You have me convinced that this is the premier security conference in the world." Melvin T. Swanson, Manager, Data Security, Borden Inc.

"Terrific! This is my 3rd CSI conference, and I get more out of it each time I attend." James H. McClelland, AVP/Data Security Administrator, Sovran Bank/Maryland

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"Still the fastest way to orient the new computer security professional; confirm direction for existing programs; become aware of future direction and strategies and broaden individual professional networks." Catherine W. Weyhausen, Senior Consultant, Data Security Services, AT&T



## The Challenges Of IT

technology-based cost reduction or service enhancement initiatives by themselves will not create competitive advantages, and can erode industry profitability. In these situations, the best strategy is one of superior execution. Investments in new applications should be selective and well timed.

### Leveraging Business Strengths

Developing a secure edge is more likely when IT is combined with existing nontechnology-based strengths. Scale, unique institutional skills, and customer loyalty are strengths that most often can be exploited.

IT can be used to enhance scale economies by increasing the volume through an existing process that has a scale advantage. This can be accomplished by implementing tailored business approaches through the use of large-scale sources of information. Opportunities to use IT to enhance scale can be found in unexpected aspects of the business, as a major retailer that developed a credit model for each store location in its large customer base discovered.

These models permit superior credit control (lower credit losses, without overly restricting credit to creditworthy customers) over competitors with lower scale. This type of tailoring using a large-scale base of information is often very powerful in consumer mass market businesses.

Another way to use information to leverage scale is to schedule and coordi-

nate complex but predictable demand more effectively. The management of a leading consumer packaged goods manufacturer with nationwide distribution faced a problem of how to distribute enough of its perishable food products to meet highly volatile consumption patterns. Since the worst possible problem they could create would be to run a promotion and find themselves without product, they had established multiple facilities around the country and overstocked them with inventory to avoid being caught short.

Although overstocking in this fashion caused waste, they were afraid to attempt any consolidation for fear of losing sales. Recently, however, they constructed a system to improve sales forecasting, scheduling, and production planning using historical information to analyze these complex demand swings under different kinds of marketing plans. They found that the demand was actually quite predictable. This allowed a significant reduction in inventories and a consolidation of facilities with scale economies, which lowered branch operations costs by 20% and improved capacity utilization without the risk of stockouts. This kind of application is most effective in businesses with large demand swings and wide geographic distribution, such as in the consumer products field.

Another way to exploit existing strengths is to use IT to leverage unique institutional skills. Routine activities can be automated to allow a company's high-

ly skilled employees to concentrate on higher value-added tasks. Alternatively, expert systems may be used to share expert knowledge across a broader labor force. Such applications are quite powerful when truly unique and valuable skills exist and are sustainable, but these conditions occur only in select situations, where the skills are not likely to be rapidly replicable by many competitors.

IT can be used to provide new, tailored features to strengthen product differentiation. A major airline provides IT-based services that are tailored to meet the needs of specific segments. It



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APPLICATION  
CANNOT BE  
IDENTIFIED  
BEFOREHAND.**

provides mileage awards to all of its frequent flyer program members and maintains a customer preference database for use in making reservations. For the top 2% to 3% of its customers, who account for half of their business travel volume, it identifies the person as a valued customer on all customer service screens and reports, gives those customers the ability to overbook, offers them larger mileage awards, automatically blocks off seats next to them if the plane is not full, and gives them free first-class upgrades at the gate whenever seats are available.

Opportunities to provide tailored features occur commonly in businesses with proprietary customer information, but in most cases they do not significantly strengthen competitive advantage, since such tailoring often increases the customer benefit of the basic product only marginally.

Many companies fail to exploit opportunities to leverage strengths with IT because most of the ways to enhance such strengths require them to integrate various aspects of their businesses. Integration opportunities are often unrecognized or underexploited because of organizational barriers and systems limitations. Many companies are structured around strong organizations defined by product lines, functions, or geographic customer segments. Accordingly, such

## A Test To Determine How Information Technology Fits

To understand the likely payoff of any information technology investment and to determine how IT fits within your business strategy, you need to answer the following questions:

*Do the initiatives under consideration or available to your business represent essentially standalone information technology applications?*

At best, investments in applications that simply introduce technology (typically automating an existing process) without significantly altering or leveraging other elements of the business simply help a firm stay abreast of competition, and, at worst, may actually reduce profitability. To get the most out of these investments, careful selection, timing, and execution are the keys.

*Can you use information technology to leverage other, nontechnology-based competitive advantages, such as economies of scale or customer loyalty?*

If so, you can usually be assured of a payoff on the investment and may be able to improve overall business performance.

Exploiting these opportunities often requires integrating activities in new ways across products, business functions, or geographic areas, not simply automating existing processes.

*Can information technology be used to change the way business is conducted overall?*

When this is possible, powerful changes in competitive position and industry structure can result. However, these investments usually must be accompanied by major business changes.



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be as smart  
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like the 4050, the 4075 and the 3700 for data centers and distributed locations; and the versatile low-volume 4045 for office and terminal-network environments. There's also the newly introduced 92 ppm 4090 for the ultimate in mid-volume productivity and the 4650 with 600 x 600 spi resolution. Team Xerox professionals have already converted thousands of data centers to electronic printing—Xerox Intelligent Printing Systems are compatible with virtually every mainframe—and as a result have specific applications

developed, proven and ready to put in place for you today. By installing a printer as smart as your computer, you'll not only increase printing quality, but gain a quantifiable competitive edge through superior applications documents.

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## The Challenges Of IT

cross-cutting opportunities are difficult to identify and typically are not exploited due to divergent priorities and a lack of coordination across the organization. Systems often have been developed as a series of ad hoc applications and add-ons, so it is extremely difficult to link across customers, products, functions, or markets because of incompatible data structures, applications, or operating environments. In addition, the data are typically nonstandardized and dedicated to specific applications.

### Creating Structural Advantages

Thus far, IT initiatives that deal with existing business approaches have been addressed. However, in certain businesses, opportunities may exist to create structural competitive advantages with IT. Merrill Lynch's Cash Management Account and American Airlines' SABRE reservation system are perhaps the best known examples of this kind of structural advantage. Structural changes with IT can be achieved through switching costs, sharing information with an existing business, introducing and controlling a new distribution channel, or gaining power over suppliers.

Switching costs are created by automating the interface between customer and supplier so that either the customer can make low-value purchases more conveniently or the supplier can become an important part of the customer's business system, locking in the relationship. IT-based switching costs can be important in businesses that have customers who make frequent repeat purchases of low-value items because the potential savings from competitive products are likely to be very small relative to the customer's total costs.

Alternatively, where there is a complex interface, switching costs are also likely to be significant. However, these situations are infrequent since there are a limited number of cases where sourcing from a very few number of vendors is acceptable.

Companies can enter new product markets with superior cost positions by sharing information costs with an existing business, since the cost of customer acquisition often is very high. Businesses with large-scale proprietary customer information are in the best position to exploit information sharing, as Merrill Lynch did. Banks can cross-sell other financial products, such as checking and savings accounts to mortgage applicants, by sharing information captured in a mortgage application. The

potential profitability of such cross-sell opportunities may be almost as high as making the original mortgage loan.

Information technology may also allow companies to create and control new distribution channels that provide advantages over traditional delivery methods. In the mortgage industry, for example, changes in IT are contributing to the trend of banks packaging individual mortgage loans into securities for sale to investors instead of holding on to them until they are paid off. This process, known as securitization, breaks up the traditional business system into discrete roles that are played by different firms, rather than having all the roles taken by the firm that first created the mortgage.

### Changing the Basis of Competition

This IT-supported trend has changed the basis of competition and has facilitated the entrance of nontraditional competitors into the industry. A major insurance company has entered the mortgage origination business with a highly automated centralized direct mail/telemarketing approach. The new approach has cut application processing to 10 days from 23 and saved the expense of branch offices and loan officers, allowing the

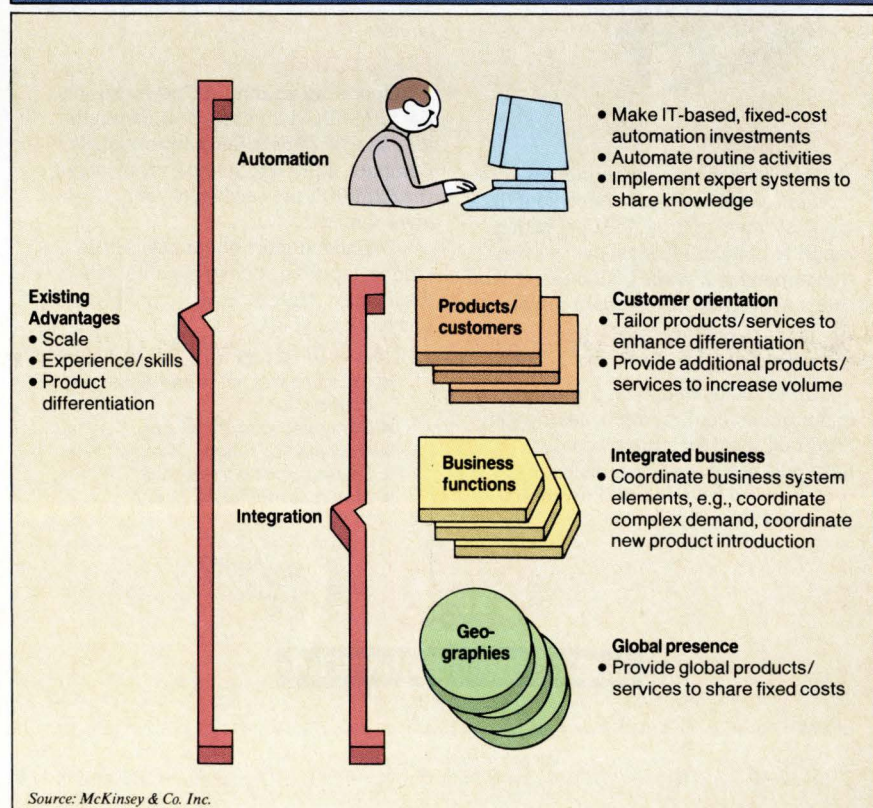
company to offer lower rates to customers.

Opportunities to create and control a new distribution channel may be found in businesses where customers have grown sophisticated enough to reduce or remove direct human contact in product delivery. Companies that correctly gauge whether customers are indeed ready can gain a powerful cost advantage over existing competitors who are saddled with higher cost operations that they cannot easily alter.

Finally, information technology can sometimes be used by customers to shift power away from suppliers. In the consumer packaged goods industry, most major retailers are beginning to integrate data obtained from checkout scanners on item-specific performance to increase power over manufacturers through better purchasing, more control over shelf management and direct store delivery sales forces, and improved understanding of promotions. Customers must capture unexploited information that is produced as a by-product of their businesses in order to gain power over suppliers.

There is an alternative way to create new sources of competitive advantage.

## Enhancing Existing Advantages with IT





## The Challenges Of IT

tage with IT, which may not be as rare as the creation of the kinds of structural advantages discussed above. Companies that develop new business approaches using technology in conjunction with aggressive changes to every other aspect of their businesses may be able to build up significant advantages if they can leverage institutional experience. The

strategy demands early implementation of IT applications and a significant commitment and ability to make organizational and other nontechnology changes to the business.

These advantages can be sustainable because competitors would have to copy more than just the technology. They would have to go through the same

learning and adapting process with their organizations, while the innovator stretches its lead.

### Adapting to Evolving Environments

To succeed in these situations, companies must continually adapt to the evolving business and technological environment. When change creates an opportunity, further changes could give future opportunities to competitors that move early. Thus, the firms that will be most successful will typically perform the following:

- reexamine all elements of the business system and understand the importance of organizational change, as well as new technology;
- commit substantial technical and non-technical resources to development early in the game; and
- recognize that the ultimate application cannot be identified beforehand—the application and supporting organization will evolve as the company sees new enhancement opportunities, and as the new business approach takes shape.

These principles contrast greatly with the appropriate approach to stand-alone applications, where rigorous economic analysis is the proper way to select technologies and determine the optimal point of adoption.

In creating new experience-based advantages, companies must commit resources early on, without knowing the magnitude of the total investment, the end product, or the scope of the impact. They must have the vision and unwavering commitment, especially of top management, to invest early enough to enable the company to make thousands of evolutionary adjustments and refinements to both the technology application and its organizational capabilities.

Let us not forget that all of the roles of IT we have described should be considered strategic. Omitting or failing at any one could cost a company its competitive position, even if it does not enhance or create advantages by itself.

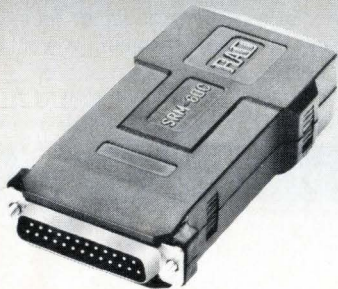
Ultimately, the strategic use of IT is a business decision, not merely a technology choice. The winners in any industry will be those players who first understand that, and then take the necessary steps to carefully assess the information technology potential for their own business situations. ■

*Michael Miron, John Cecil, Kevin Bradicich, and Gene Hall are consultants at the New York-based management consulting firm, McKinsey & Company Inc.*

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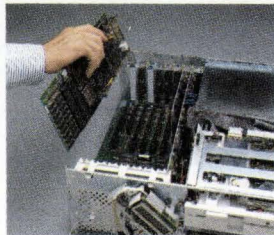
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Mr. Pitney



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# Who's In Charge?

**Who is at the switching controls for departmental data? Who should be responsible for the support of departmental systems? These are issues that have been around since installation of the first standalone minicomputer. New technologies and new schemes for distributing computer power have altered the nature of the debate to the degree that, in many cases, a department's system can ultimately subsume central IS operations. The arrival of hardware that no longer requires strict environmental controls invalidates one main argument for keeping the system in central IS. Consequently, the issue, if anything, has been complicated beyond belief. Installing a companywide computing network involves such a myriad of administrative details that setting administrative guidelines in advance proves nearly impossible.**

BY DAVID STAMPS

In 1981, J.S. Alberici, a St. Louis construction firm, installed a departmental computer to handle job scheduling. At first, the system seemed innocuous enough—a standalone Prime 250 minicomputer. Before long, it was being used to schedule jobs at each of Alberici's seven subsidiaries. Within a couple of years, there was \$2 million worth of Prime equipment, plus another \$1 million in communications equipment, scattered around the company.

An IBM 4381 remained responsible for the company's main accounting functions until it was decided that the time had come to consolidate computer operations. Suddenly, the IBM equipment and the IS department that ran it was gone. In its place were Prime minicomputers and a group called the computer services department, which was comprised of the original user department.

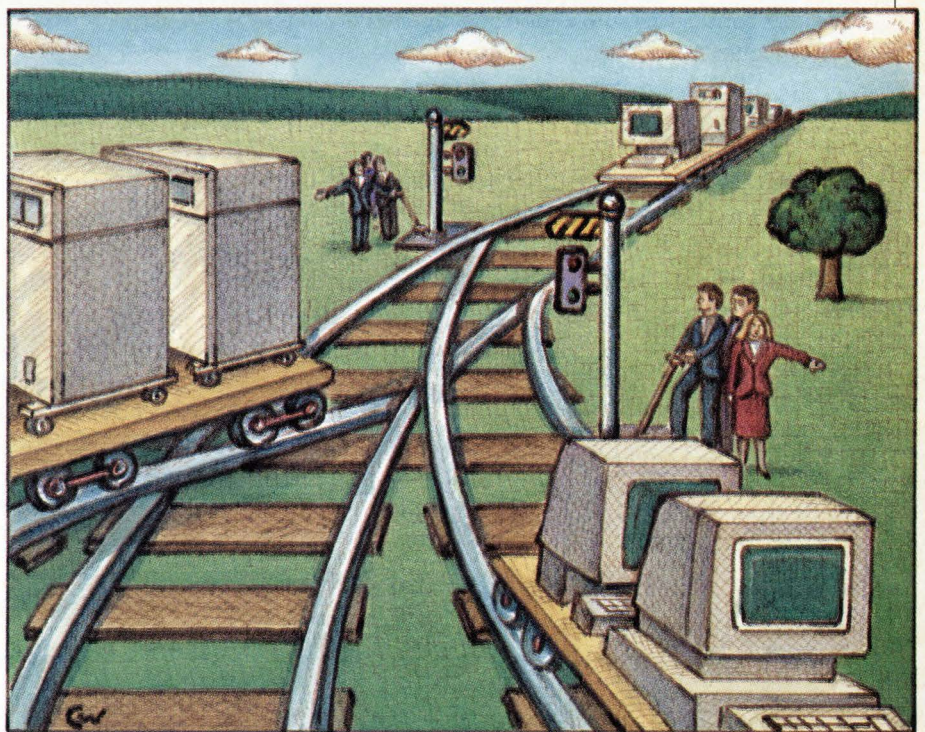
Make no mistake—the so-called consolidation was nothing less than a supplanting of IS by an upstart department. Eugene Novacek, keeper of the

original job-scheduling mini and now director of the computer services department, reports with more than a little pride that the new group has taken on responsibility for all applications development. Although there are a half dozen departments that might qualify to install their own systems, they still prefer to rely on Novacek's department for their computing needs. It maintains a library of some 3,000 utility programs and administers the data network that makes them available to a variety of technical and non-technical users.

### A Coordinating Agency Is a Must

Alberici's experience may be an extreme case, but it illustrates a crucial point about putting computer power in the hands of end users: inherent in any corporate computing environment is a need for some agency to serve in a coordinating or control capacity. In most cases, IS appropriates that role. If it doesn't, another department will.

The issue of control arises whenever there is a move to establish some level of end-user computing. How does a com-





# ANNOUNCING THE 1989



WORLD CLASS

MANUFACTURING AWARDS

For the last 10 years, U.S. industrial leaders have listened to endless stories about Japanese manufacturing tactics which have resulted in low cost, high quality products for world markets. More recently, the efforts of Korea, Singapore, Taiwan and Malaysia to capture portions of markets formerly dominated by U.S. manufacturers have received press attention.

But in 1987, U.S. manufacturing scored a record-breaking 4.5 percent increase in productivity, leading the world with its first big gain since 1972. In addition to this good news, factory utilization was at its highest rate in 10 years. 1987 saw 82 percent of U.S. manufacturing capacity in use.

This is solid evidence that the tide is beginning to turn and U.S. manufacturers are making great progress toward increased quality and productivity goals.

We think it's time to recognize the efforts of the hundreds of U.S. based companies that have implemented their own successful automation strategies. It is our hope that these success stories will serve as encouragement and provide role models for other companies considering automation and productivity improvement programs.

Therefore, the Advanced Manufacturing Systems Exposition\*, in cooperation with *Datamation*, *Metalworking News*, *Modern Materials Handling* and *P & IM Review with APICS NEWS* magazines, announces the 1989 AMS\* WORLD CLASS MANUFACTURING AWARDS.

The awards program will honor companies that have excelled in implementing productivity improvement or manufacturing automation systems. An award will be presented in each of seven categories:

- Strategic Planning for Automation
- Integrating Automated Subsystems
- Designing Automation Systems
- Automated Production Systems
- Information Management Systems
- Automated Material Handling Systems
- Quality Improvement Programs

The purpose of the AMS\* WORLD CLASS MANUFACTURING AWARDS is *not* to highlight the technical aspects

of specific applications. Each award will focus instead on a company's successful strategic implementation of automation technology in one of the seven categories. The award winners will be selected on the basis of how well they defined their overall goals for automation and how successful they were in meeting those goals.

Award winners will be selected by a panel of judges representing the AMS Exposition, *Datamation*, *Metalworking News*, *Modern Materials Handling*, *P & IM Review with APICS NEWS*, and Allred Marketing, the awards program coordinator.

**Deadline for applications is October 31, 1988.** The panel of judges will meet in November, 1988 in New York to select award winners. There will be a winner selected in each of the seven categories. Decision of the judges will be final. Judges reserve the right not to make awards in any category if they decide that no award is merited in that category.

Winners will be notified by mail in December, and announced in the January issues of co-sponsoring publications. A feature article on the award winners will appear in the February issues of each of the co-sponsor publications.

Awards will be presented at a special ceremony on April 25, 1989 at the 1989 Advanced Manufacturing Systems Exposition and Conference in Chicago, Illinois.

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If you have questions about the award program, or the entry form is missing, call the AMS\* World Class Manufacturing Awards Hotline: (602) 951-8994.

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\*The AMS Exposition and Conference is the live marketplace for integration and information intensive products and services used in discrete and process manufacturing/distribution. It is produced by Cahners Exposition Group (CEG), the world's largest and most experienced show management company.





## World Class Manufacturing Award Official Entry Form

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Division \_\_\_\_\_

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City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Name of Contact Person \_\_\_\_\_

Title \_\_\_\_\_

Telephone Number \_\_\_\_\_ FAX \_\_\_\_\_

### Award Category Of Your Entry:

Please check one. You may enter in more than one category, but you must complete an entry form (photocopies acceptable) and submit a separate success story for each category that you enter.

- Strategic Planning for Automation
- Designing Automation Systems
- Information Management Systems
- Integrating Automated Subsystems
- Automated Production Systems
- Quality Improvement Programs
- Automated Material Handling Systems

### Award Rules

1. Entries will be accepted from companies incorporated in the United States that manufacture some portion of their output in U.S. facilities.
2. Award winners will be selected on the basis of how well they defined their goals for world class manufacturing and how successful they were in meeting those goals. Specific benefits of the manufacturing strategy employed should be included in the success story for each category entered.
3. While technical details may help illustrate a company's qualifications for the awards, the focus of entries should be on the successful strategic implementation of automation technology.
4. All entries must be accompanied by an official entry form or a photocopy of the official entry form.
5. All entries must be postmarked no later than October 31, 1988.
6. Decision of the judges regarding all winners is final.

### Format

1. The first page of your entry should be on company letterhead. Entries should not exceed five typed, double-spaced 8½" × 11" sheets of paper.
2. Type the category of your entry at the top of each page submitted.
3. Mail the official entry form (or a photocopy) and your success story to:  
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Allred Marketing, Awards Coordinator  
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## Who's In Charge?

pany balance its need for central control against the desire of departments and business groups to control their own applications and data? The way this is resolved will influence implementation of departmental or distributed computing.

In the early days, when departmental computers were standalone systems serving a discrete user department, the focus was more on who should take administrative responsibility for the care and feeding of the system. "Ten years ago," observes an industry veteran, "the outcome of [the debate on further] distributing computing resources to users was often to scuttle the departmental system. Users didn't want to take on those responsibilities, so the applications got folded back into the mainframe." When departmental systems began to encroach on distributed data networks and users clamored for access to corporate databases, the issue of control expanded to include data security and integrity.

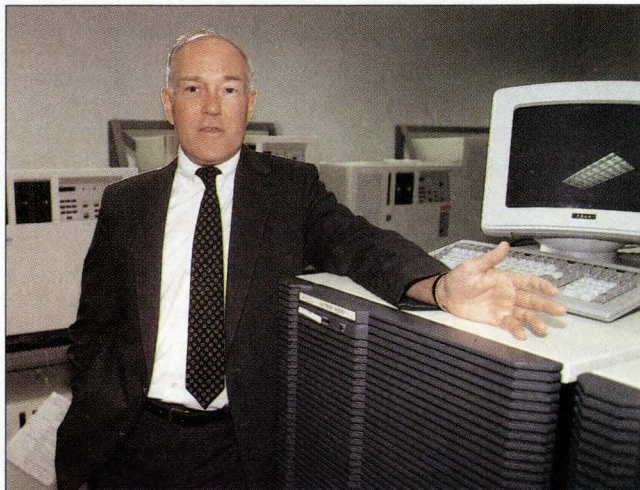
The current debate is influenced by a host of new factors. It includes the availability of more powerful hardware; greater end-user awareness, expertise, and demands; and new computing architectures and technologies, such as cleaved applications and distributed databases (see "Weaving Seamless Computing Systems," Sept. 1, p. 59).

### Readdressing Old Control Issues

While new architectures eventually may solve the problem of designing a distributed network, they may not necessarily simplify administrative control issues. The solution would be a network architecture that could distribute end-user capabilities while centralizing the maintenance, control, and administrative functions. Such a solution does not exist, at least not in a form that addresses the needs of companies trying to implement companywide, multivendor networks.

Indeed, as the technology advances, IS managers find they have to readdress many of the old administrative control issues. Chuck Anastasi, director of technology for 3M Corp.'s IS group, explains how one recent technological change—the availability of more powerful minicomputers—has altered the debate at 3M over which applications should—and which should not—be distributed onto recently installed pcs now serving its user community.

"We [used to] set the limit on core applications," says Anastasi. "If an application [had an impact on] the flow of corporate dollars, we didn't want it in the hands of non-IS professionals . . . the size of the hardware required to run those applications made the decision automatic. If it needed raised flooring and other environmental controls, it remained with



**JOHNS HOPKINS' LENHARD:** The decision to go with Unix was technical.

central IS."

With the new superminis that don't require environmental controls, however, 3M has found that it's having to decide on the basis of the application, not the hardware. "That's a tougher decision," says Anastasi. "It entails looking at a host of business risks as well as business opportunities."

At organizations where security is deemed crucial, distributing the computing resource too widely is still regarded as more of a risk than a benefit.

The Center for Devices and Radiological Health at the U.S. Food and Drug Administration maintains a database containing specifications for virtually every commercial medical device made in the U.S., from CAT scanners to condoms. Because the data include proprietary information, security is a sensitive issue. Access to the database is primarily through a VAX network, though about 30 pcs also have access to the database.

The center is considering a request from users to install a LAN that would expand the access to an additional 200 pcs. It's a proposal that has Bill Pakenas, director of computer services for the center, somewhat concerned.

"I'm not sure an expanded pc LAN is the right route to take," he says. Pakenas thinks a better solution might be to use more powerful minicomputers to sup-

port additional terminals, which would provide computer services with more control. He is also concerned about who will maintain the LAN.

### Bursting Users' Utopian Dreams

"Users get very frustrated when terminals can't [get access to] the computer, [but] at least then they know who to yell at," says Pakenas. "What happens when their pcs can't access the LAN? Users think it's going to be utopia. They think that once it's up and running, nothing bad will happen. That's naive."

Departmental systems can be set in place either by a decree from the top of the corporation, or in response to user demands. In either case, as ideas inevitably change about how much administrative control departmental systems need, so too must their definition, as the following two examples illustrate.

Eight years ago, Union Carbide Corp. decided to split IS responsibilities among seven newly created divisions. The plan was to eventually dissolve the core IS group entirely as more of its responsibilities migrated down to divisional and departmental computing groups.

"That hasn't happened," says Larry Harbuck, IS manager for Union Carbide's chemicals and plastics division. "We managed to slow the growth of the core IS group, but it's as large as it ever was. It became apparent early on just where departmental computing was productive and where it was counterproductive. Five people on a divisional staff aren't going to rewrite an IMS application. On the other hand, we've been fairly successful taking data from large applications, and putting that on a minicomputer at the divisional level in a report query structure."

Colgate-Palmolive's departmental computing was not the result of a decision from the top. Each product team developed its own applications, for product formulations and project budgets, for example. The product formulas were transferred to a central database, but all other departmental applications and databases remained under local control. "Things were all over the place, to the point we were losing administrative control," says Rich Polanski, a research associate in the technical computing group. "Too many of the systems addressed short-



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## Who's In Charge?

term needs, or had only limited functionality. A department would change, and we'd end up with six programs that no longer served any purpose."

Colgate-Palmolive installed Relational Technology Inc.'s Ingres database product two years ago. Ingres is frequently used to distribute computing access, but the intention here was to consolidate.

"We needed to combine databases and to try to come up with some standard applications that would provide broader functionality," says Polanski. The technical computing group plans to install Ingres Star within a year to regain some of the economies of distributed processing. "For now," says Polanski, "our goal is to regain administrative control."

Establishing a coordinated balance between central IS and departmental systems can be daunting both technically and politically, especially in large hospitals where departments tend to operate with a high degree of autonomy.

### The Operation at Johns Hopkins

Such was the case at Johns Hopkins in Baltimore in 1983. Departmental systems, though largely standardized on Digital Equipment Corp. processors running MUMPS, were each tightly controlled by departmental managers and physicians who hired their own programmers and developed their own applications. There was no integration among departmental systems, nor was there any link to the central IBM system, which ran the billing, pharmacy, and admissions applications. The task of forging an integration strategy fell to a fledgling group called the operational and clinical systems division, headed by Raymond Lenhard.

The solution, or at least one of its initial pieces, was to take the 2.4 million-record patient file on the mainframe and install it on a Unix-based superminicomputer from Pyramid Technology Corp., Mountain View, Calif., in a newly created medical records department. Other elements of the solution included an Ethernet LAN and Sun workstations to provide links between departmental databases.

Lenhard insists that the decision to go with a Unix-based solution was a technical one: "There were two huge systems. There was no way one was going to subsume the other. To protect our investment in lab software, we needed a solution that would unite both."

Steve Tolchin, a former technical director at Johns Hopkins and now vp of

very powerful little machines sitting on their desks."

### Setting Administrative Guidelines

One thing IS organizations soon learn when implementing a distributed computer network is that creating administrative guidelines for it can become a major task.

The Federal Reserve Bank of New York is now midway through a five-year project to implement a three-tier computer network. The new network consists of IBM hosts with Data General Corp. minicomputers acting as cluster controllers for workstations on an asynchronous Ethernet LAN. Part of that job has included three months spent creating a document that details user and IS responsibilities to the level of each type of device on the network.

The guidelines document was not part of the bank's original implementation plan. It grew out of experience gained during the project's one-year pilot phase. "We expected the pilot to be a learning experience," says Susan Young, vp of systems development at the bank. "The original plan was to proceed with further deployment based on what we learned in the pilot. But one of the things we learned was that we needed clearer definitions of responsibility."

The responsibilities outlined include the ever-complex issues of data security and network management. Security is retained primarily by the central IS group, but guidelines are being established whereby departments will be responsible for granting access privileges to individual users. Similarly, telecommunications technicians are responsible for managing the whole network, including each end station. But, within each work group, systems managers must be trained to do local troubleshooting.

"We knew there would be a need for basic procedure manuals," says Young, "but we hadn't anticipated the level of detail we'd need to go into—what groups do what, and just how they work together." Once again, it is the balance between how much responsibility remains in IS and how much responsibility



FEDERAL RESERVE BANK'S YOUNG: Clearer definitions of responsibility needed.

software engineering at Pyramid, believes that the politics of the decision should not be underplayed. "We staked out the middle ground between two intractable computer camps, and said essentially that we wouldn't allow the technology from either camp to dominate. By not siding with either," he feels, "we drew people from both camps to the new technology."

A measure of its success is that, in a variation on the departmental-system-eats-mainframe story, the operational and clinical systems division took on more and more control of computer operations, until it subsumed the central IS department two years ago. Today, Lenhard is vp of Johns Hopkins Information Services, with a staff of over 100.

"It's true, we did supplant central IS, but we try not to take an authoritarian role," says Lenhard. "Our role is in setting standards, defining interfaces, maintaining shared databases. The ability of Unix to support multiple vendors makes that job a little easier. We can give users the specifications they need and turn them loose to go find their own solutions. Obviously, we can't write every line of applications code and that's fine. Departmental computing should continue to play a major role in the 1990s. There are a lot of creative people out there with



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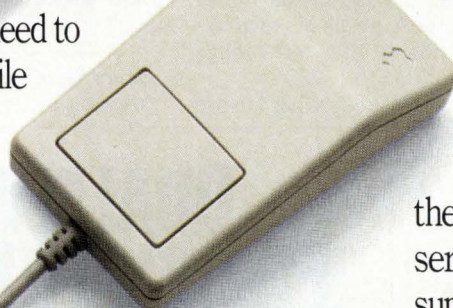
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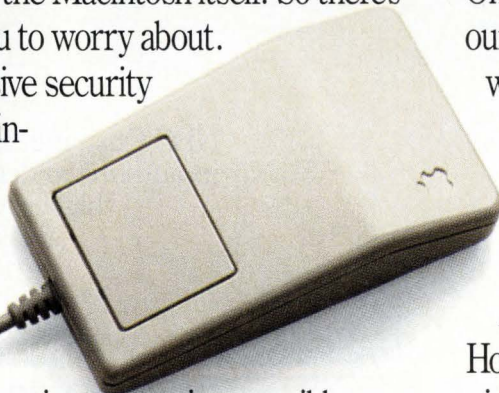
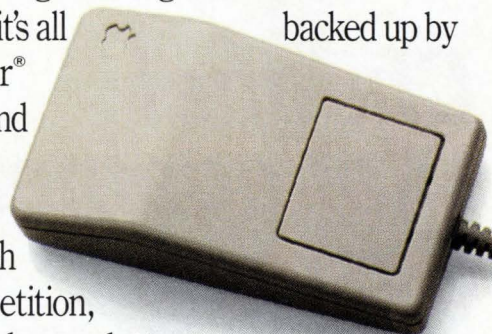
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## Who's In Charge?

will rest in the local work group that is the critical call.

"Keep as much of the technical administration as possible centralized in IS," advises Jim Tunis, vp of IS at Lincoln National, an Indianapolis holding company. "Most LAN efforts are doomed because of the level of technical administration that falls to users; so are some minicomputer networks," he says. "Users probably don't have the technical expertise to take on the job, and for sure they don't have the management interests. They don't see that as their job."

Tunis' advice is based on 10 years' experience in departmental computing. Lincoln National installed Prime minicomputers in 1978, primarily to reduce the use of paper through electronic mail, and to encourage end-user computing. (He claims success on the latter goal only. About 4,000 of Lincoln's 12,000 employees are frequent users; e-mail usage is up, but so is paper consumption).

Tunis credits the success of the installation to what he calls a "tribal computing" approach. "I never liked the term 'departmental.' It conjures up

something too narrow. We prefer letting several related departments or lines of business share a system. Too small a group will have too narrow an interest; it will be too isolated. A larger group ensures that the data that everyone wants will be there," says Tunis.

Some obvious economies and administrative benefits are associated with such an approach. Since IS is responsible for all technical support at the holding company, it means fewer systems.

Experience has shown that tribal computing groups will adopt responsibility for some of the administrative decisions regarding their systems.

"I don't like to call it a police action," says Tunis, "but if one user is doing a heavy processing run at 9 o'clock every Monday morning and slowing down the system, we'll hear about it. IS's response will be to do a technical analysis and get back to the users with the options: either the system needs tuning, one of the members needs his own system, or Joe in finance can start running his jobs at night."

Because user issues are hard to pre-

dict, Tunis advises against spending too much time worrying about them in advance. One issue that turned out to be much less of a problem than anticipated was the locality of data and the need for regular updates from the corporate database.

"I'm not exactly sure why, but I suspect it has to do with the fact that most departmental data don't start out as corporate data; it's ad hoc data, desk-drawer data. Refreshing the local database on a monthly or quarterly basis is sufficient," Tunis says.

On the other hand, an issue that has turned out to be more persistent than Tunis anticipated is the concern over the efficient use of programs and data storage: "I keep thinking hardware is going to get so cheap that it doesn't matter if end-user programming isn't efficient. Just about the time I decide it doesn't matter, someone comes up with a new, more inefficient way of doing the same job." ■

*David Stamps is a Minneapolis-based freelance writer.*

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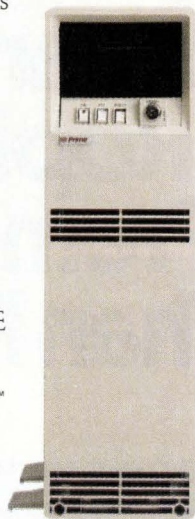
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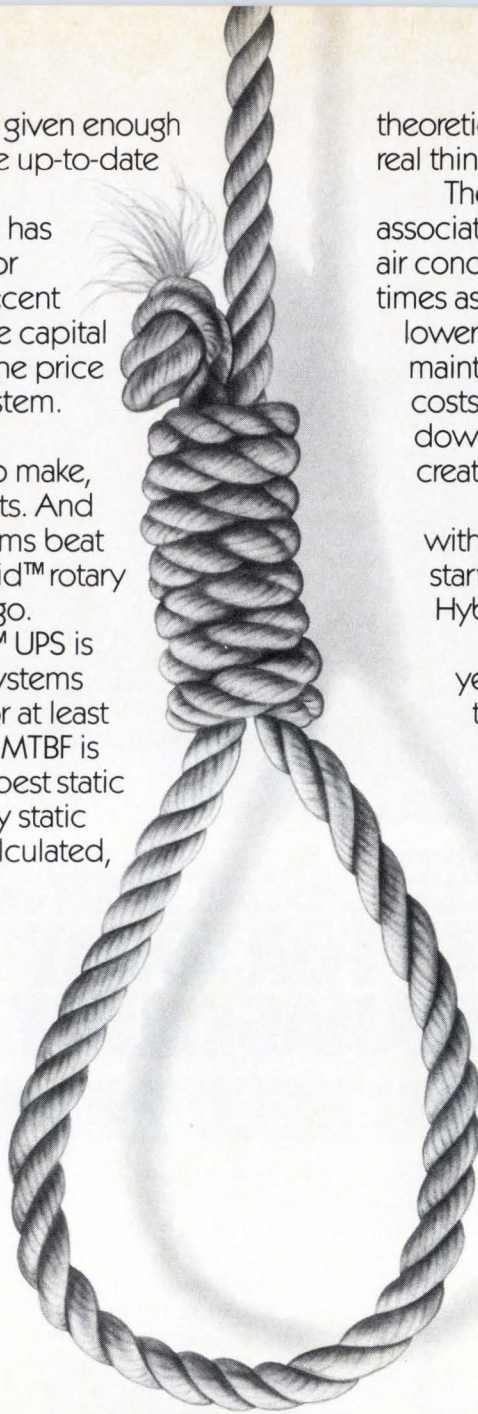
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# New Products

## TRENDS

**ANNUAL SALES OF IMAGE PRODUCTS** to small business/home offices are expected to continue steady growth through the end of the decade, with an exploding market for facsimile equipment overshadowing minimal or no growth in copiers and electronic typewriters.

A study by CAP International pegs 1987 total small office equipment sales at \$3.7 billion and projects 13% annual growth to \$5.3 billion in 1990. Without small business's insatiable appetite for fax, overall growth would be nearly flat.

A combination of factors—declining prices, despite the strong yen; aggressive promotion by manufacturers; and effective product distribution—will fuel 78.4% annual growth in facsimile shipments to \$1.6 billion in 1990 from \$280 million last year. CAP predicts that home offices over the next 12 months will develop the same hearty appetite for faxes. Comprising only 7.6% of the total market last year, fax equipment will account for nearly 30% of sales in 1990.

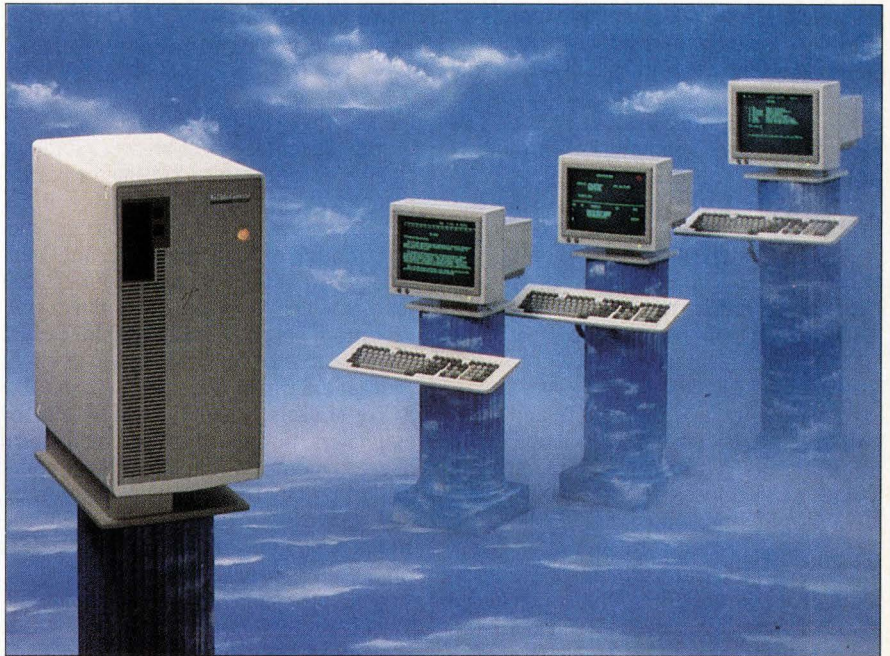
Copiers should grow at 2.9% annually through 1990, to \$2.3 billion, from \$2.1 billion last year. As a percentage of total volume, copiers will decline to 43.5% from 57.5%. Heavy competition at the low end, with Panasonic, Ricoh, and Xerox challenging the longtime domain of Canon, could spur sales in home offices, where copier penetration to date is light.

Electronic typewriter shipments are seen falling 10.9% annually, but personal word processors will pick up the slack with 26.7% annual growth. Overall, this segment will decline 3.2% annually over the three years, according to CAP. Personal word processor sales are strong among small offices that require advanced capabilities such as mail merge, but aren't ready for pcs or printers.

Finally, pc printer sales are predicted to grow at a 6.3% annual clip through 1990, driven largely by the requirement to produce documents in lieu of data printouts. The introduction of high-quality 24-pin printers and advances in ink-jet technology should offset the impact of recent price hikes, says CAP.

*If you'd like additional information about this issue's hardware Trends, please circle 201 on the reader service card.*

## HARDWARE



## Data General Rounds Out Its 32-Bit Line

Small business system fills in the low end of minicomputer family.

Data General Corp. has added a new member to its MV line of 32-bit minicomputers aimed at small business and departmental office automation applications.

The Eclipse MV/2500 DC is 72% faster than the existing models 1400 DC and 2000 DC, the company says, and it supports both the integral cartridge tapes and Winchester disks compatible across the MV family product line. The new system can handle up to 64 users.

The entry-level MV/2500 DC, priced at \$30,000, includes the cpu with integral floating point unit, 8MB of memory expandable to 24MB, integrated mass storage controllers, and office packaging. A 322MB Winchester disk and 21MB streaming cartridge tape drive offer media compatibility with other MV systems. An integral 130MB cartridge tape drive can be substituted for the 21MB unit for an additional \$5,000.

Data General also expanded its pc line with an AT-compatible system, the

Dasher/386. Based on the 80386, the system can function as a standalone tool, a pc in a networked DG environment, or as a technical workstation or multiuser pc, the company says.

A base unit, priced at \$5,735, consists of 1MB system memory, with a 40MB fixed disk; a 1.2MB floppy; AT-style keyboard; EGA adapter card; monochrome monitor; and MS/DOS 3.3. The operating system supports a range of single-user applications, including Lotus 1-2-3 and WordPerfect, as well as a multitasking environment through MS-Windows and a networking environment including MS-Net and NetBios. DATA GENERAL CORP., Westboro, Mass. **CIRCLE 271**

### Tape Drive

New line of tape drives offers 320MB of storage.

Cipher Data Products Inc. is offering a range of half-inch cartridge tape drives for data interchange and backup in micro, midrange, and mainframe applications.



## New Products

The Cipher Data 3000i family includes a series of 8-inch form factor tape drives for midrange and small mainframe computers, and a 5¼-inch drive for micros, workstations, and small minis. The new drives are compatible with the MSR (Multitrack Serpentine Recording) interchange standard, according to Cipher Data.

The 8-inch and 5¼-inch units provide 320MB of data storage. An optional stacker containing up to 10 cartridges and capable of boosting total capacity to 3.2GB will be available in 1989, the company says.

The 8-inch Models 3832 and 3834 are volume priced at \$3,710 and \$4,400, respectively. The 5¼-inch 3532 drive is priced at \$1,380.

Production shipments of the 3830 products will begin this month. Initial 3532 shipments are scheduled for early next year. Some 26 configurations of the three models will be released over the next 12 months. CIPHER DATA PRODUCTS INC., San Diego. CIRCLE 272

### RISC Workstations

Desktop, floor-standing models added to IBM's RT line

IBM has three new models in its RT series of RISC technology 32-bit workstations, claimed to offer up to 25% faster performance over previous RT units.

The new RT 130, a desktop machine, and Model 135, a floor-standing unit, must be attached to RT-supported displays and adapters as a minimum configuration. The floor-standing Model B35 must be attached to an IBM 5080 graphics system. All three models require the AIX/RT operating system version 2.2 or equivalent; and all three come with 16MB of CMOS memory, four times the amount of standard memory previously offered.

The 130 is priced at \$23,220; the 135 at \$30,595; and the B35 at \$32,165. All three are available now.

IBM also announced a new 310-million-character storage option on the RT. Larger models can be configured with up to three disk storage devices, allowing

up to 930 million characters of internal storage, the company says. IBM CORP., Rye Brook, N.Y. CIRCLE 273

### Image Systems

FileNet broadens its line of optical disk-based systems.

FileNet Corp. has expanded its line of integrated image and data processing systems with the 3100 System Series, a product aimed at low-volume users.

The 3100 complements the 3500 series, which is based on a distributed architecture in which document entry, image management, and other functions are processed by individual microprocessor servers on a LAN. In the 3100, says FileNet, the processing power of all of these functions is centralized in a single server. The 3100 can be upgraded to the 3500 by adding more servers.

Applications for the 3100 include paper processing; storage and retrieval tasks within departments, such as customer service; and branch operations,

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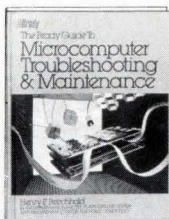
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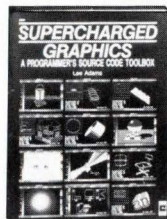
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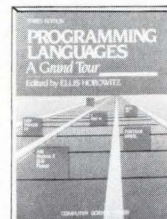
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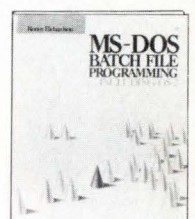
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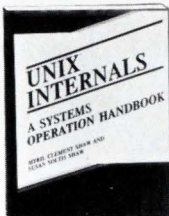
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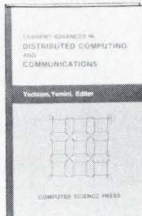
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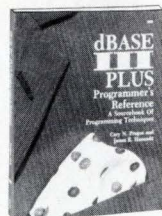
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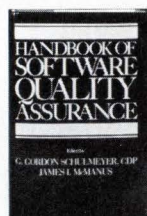
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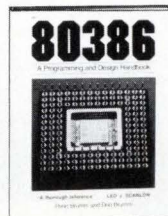
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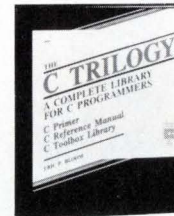
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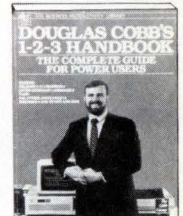
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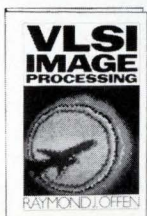
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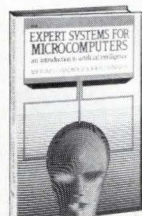
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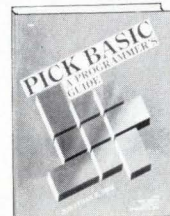
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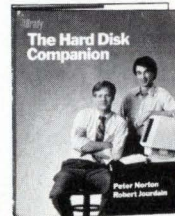
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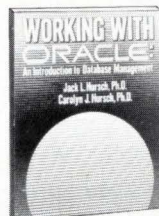
2838 \$19.95



2845 \$29.95



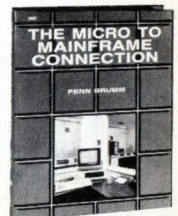
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2916P \$19.95



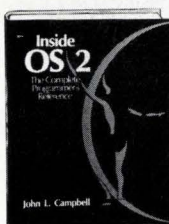
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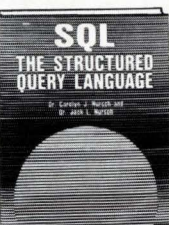
9815 \$38.95



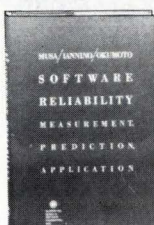
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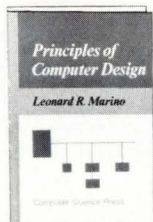
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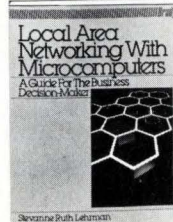
9824 \$49.95



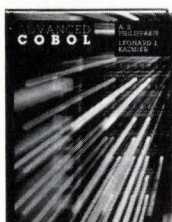
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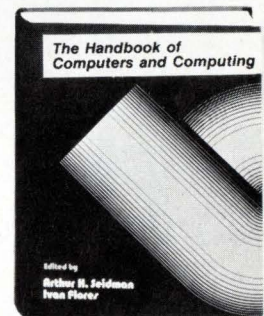
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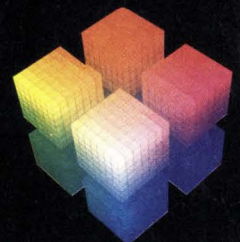
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## New Products

such as loan processing. It's available now; prices begin at \$135,000. FILENET CORP., Costa Mesa, Calif. CIRCLE 74

### Personal Computers

NEC unveils 386-based desktop and portable pcs.

NEC Information Systems has introduced two new personal computers: the Powermate SX and the Powermate Portable SX. Based on the Intel iAPX 80386-SX chip, the desktop and portable pcs are available immediately.

Powermate SX is priced at \$4,495 for a desktop unit that includes a keyboard, 2MB memory (expandable), 1.2MB or 1.44MB floppy, and 42MB disk drive.

The Portable SX is priced at \$6,595 and includes cpu, keyboard, 2MB memory expandable to 16MB, 1.44MB floppy, and 42MB disk drive. The Portable SX employs a gas plasma display screen that offers 640 by 480 dpi resolution and up to 16 shades of gray. NEC INFORMATION SYSTEMS INC., Boxboro, Mass. CIRCLE 275

### Laser Printers

ATI introduces two new high-speed printers.

Advanced Technologies Inc.'s new 1270 series printers, comprised of the 1270 and the 1275, can produce 12 pages per minute and support multiple workstations, says the company. They can accommodate up to three feeder trays with letter, legal, or statement size paper, providing a 750-page capacity. An automatic envelope feeder, which holds up to 50 standard, letter-sized envelopes, can be accommodated.

The 1270 is a tabletop model designed for office use. It emulates, among others, the Diablo 630 and the Hewlett-Packard LaserJet Plus/500 printers. The 1275 is targeted at both office and commercial environments. It emulates PostScript and the HP LaserJet Plus/500. It can output PostScript at 12 ppm in text mode. Users can draw on a library of over 600 fonts, which can be printed in any point style, pitch, or rotation, says ATI. It offers three interface ports, supporting RS232, AppleTalk, and Centronics. Both provide 300dpi resolution. The 1270 is priced at \$3,995, the 1275 at \$8,595. ADVANCED TECHNOLOGIES INC., Milpitas, Calif. CIRCLE 279

### BRIEFS

**Aydin Controls**, Fort Washington, Pa., has brought out its second **PC-compatible graphics system**, the 4110/EGS, which can emulate the ISC 8820. Its 8001 emulation features include ISC 8001G character graphics, set-up menus, and 80 x 25 characters a page. Available now, the 4110 is priced at \$5,715. CIRCLE 7

**Slicer Controls Inc.**, Minneapolis, has an XT-compatible **diskless workstation** that functions as a node on a network. The unit is priced at \$400. CIRCLE 278

**Genicom Corp.**, Waynesboro, Va., has added a new **24-wire printer** for word processing, spreadsheets, and color graphics applications. The Model 1040 prints 432 characters per second in high-speed mode and operates at 55dba. It lists for \$1,799. CIRCLE 23

**Exide Electronics**, Raleigh, N.C., is offering the System 80 **uninterruptible power supply (UPS)**, which supports 40KVA to 80KVA (kilo volt amperes) critical loads for small mainframes. The four

System 80 models, described as full on-line UPSs, typically are priced between \$27,500 and \$50,700. CIRCLE 273

**Trilobyte Computer Corp.**, San Leandro, Calif., has a ruggedized version of the Sun 3/60 **workstation**. In quantities of two to nine, the Trilobyte Model 6200 Sun 3/E, for military and industrial applications, sells for \$20,019. CIRCLE 274

**Irwin Magnetic Systems Inc.**, Ann Arbor, Mich., has announced availability of its Model 5080 **minicartridge tape backup system** for Macintosh computers. The system can back up 80MB of hard disk data on a single standard DC 2000 minicartridge, the company says. It is priced at \$1,695. CIRCLE 40

**Western Digital Corp.**, Irvine, Calif., has entered the Apple Computer market with a **hard disk drive**. The Preference AP is available in 20MB and 40MB capacities, priced at \$895 and \$1,195. CIRCLE 276

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Circle 51 on Reader Card



# New Products

## TRENDS

THE CASE FOR CASE is evidently getting stronger. The latest distributed systems industry research report from Boston's Yankee Group estimates that by the end of 1987, 4% of 580,000 MIS professionals and 6% of the pros in the integrator, engineering, and defense fields were using computer aided software design. Usage is forecast to hit 26% across the board by 1992.

According to CASE Consulting Group, Portland, Ore., there are over 150 companies competing in the broadly defined CASE market. Of these, 70 are "classic" front-end CASE vendors, representing \$120 million in sales in 1987. The exponential growth predicted by analysts translates to a market turnover of \$500,000,000 by 1992.

The drive for higher software quality and productivity has been a boost to the CASE market, and the outlines of a distinct CASE industry are now appearing. CASE Consulting, in its newsletter *CASE Outlook*, has itemized what it sees as the signposts of the transition from fledgling product to established niche (not in order of importance):

- increased attention in the trade and business press;
- industry fragmentation;
- market boundary expansion;
- greater presence of major computer manufacturers;
- entry of traditional software tool and DBMS vendors;
- entry of major application software oems;
- entry of established design automation vendors;
- acquisitions of, and by, CASE companies;
- the first IPO by a CASE vendor (Index Technology);
- increased CASE-related standards activity;
- strategic alliances; and
- greater emphasis on product differentiation and support.

Of these factors, perhaps the most convincing would be the presence of major computer makers. The heavy tread of the big blue giant tends to legitimize any market it steps into, and CASE probably will be no exception. IBM's new Workstation Aided Software Engineering product customizes Professional Work Manager version 2.0, allowing programmers to access a variety of tools to support the applications development process. WASE (as it's called), which runs on the IBM AT, PS/2 Models 30, 40, 60, and 80, and the IBM 3270 AT, costs \$350.

*If you'd like additional information about products covered in this issue's software Trends, please circle 280 on the reader service card.*

## SOFTWARE

The screenshot shows a software interface with a menu bar at the top: NODE EDIT RECTAKER NOTES IMAGES MARKERS TRAILS 7:45. Below the menu is a status bar: 1 found in 5 recs. The main window is divided into several panes:

- Outline:** A tree view showing a hierarchy: The Fabulous Encyclopedia Demo > People > Contemporary > Historical > Explorers. Other sub-items under Historical include Political Leaders, Business Leaders, Religious Leaders, and Authors.
- Criteria:** A table with columns 'Logic' and 'Values'. The row 'a-Explorers' has a value of '1492'.
- Response:** A text box containing information about Christopher Columbus: Name: Christopher Columbus, Dates: 1451 - 1506, Illustration: [] pcpaint columbus.pcx, Significant Accomplishments: Called the discoverer of America, landed in the West Indies in 1492., Discussion: Columbus was one of the greatest seamen and navigators of all time. In the 1400's, Europeans did not know that the American continents existed and Columbus himself at first believed he had landed on islands off...
- Map:** A map of the Atlantic Ocean showing Columbus's voyage route from Europe to the Americas.

## PC Program Organizes Data From Multiple Sources

Crowninshield package integrates data, graphics, video, and audiovisual data.

Crowninshield Software Inc., has begun shipping an IBM PC-based data management program that it says will organize, index, and retrieve data from multimedia databases.

MediaBase is designed for non-technical "information heavy" users who need to integrate full-text data, graphics, video images, and audiovisual sequences into a single database, the company says. For example, says Crowninshield, text regarding prescription drugs and their associated side effects could be joined on the same screen with graphic images of their chemical composition.

System features include a user-defined, menu-driven data outliner allowing users to create hierarchical structures; automatic indexing; contextual searching; and word processing. An optional publishing utility can output the databases for distribution on CD-ROM disks, the company says.

MediaBase imports dBase files,

ASCII text files, and DIF format files directly. It requires an IBM PC, XT, AT, or compatible, 640KB of memory, a hard disk drive, and MS/DOS 3.0 or higher. If a CD is attached, MS/DOS 3.2 with CD-ROM extension is required. MediaBase is priced at \$750 and is available immediately. CROWNINSHIELD SOFTWARE INC., Boston. CIRCLE 258

### General Ledger

McCormack & Dodge unveils first in a series of VAX packages.

McCormack & Dodge Corp. has introduced a version of its mainframe financial applications environment, called Millennium, for the Digital Equipment Corp. VAX computer family.

General Ledger:Millennium, the first in a series of Millennium applications for the VAX, is priced at \$100,000. Deliveries began in Europe in September and will follow in the U.S. next month. Existing users of the company's Plus Series financial applications for the



# New Products

## BRIEFS

VAX will receive Millennium at no charge.

Millennium is designed to work with the VMS operating system and record management system files. Future Millennium versions will support the VAX/Rdb DBMS as well as other SQL databases, according to M&D.

Millennium for the VAX is functionally equivalent to M&D's IBM, ICL, and Fujitsu mainframe packages, the company says. It plans to release VAX/VMS versions of its accounts receivable, accounts payable, purchase order, and systems development products at undisclosed times in the future. McCORMACK AND DODGE CORP., Natick, Mass. CIRCLE 259

### Artificial Intelligence

Expert systems development tools added by IBM.

IBM has expanded its line of artificial intelligence offerings with two new versions and two new products.

Version 1, release 2 of Expert Systems Environment is designed for users with few computer skills. An embedded applications programming interface allows full integration with IMS/VS and CICS/VS software delivery tools, according to IBM.

Expert System Consultation Environment/PC, a complementary new product, allows completed consultation applications to be run under DOS on a standalone PS/2, AT, or XT.

Version 2, release 1 of KnowledgeTool, aimed at IS professionals who are adding expert function to existing applications, incorporates a test facility with windowing capability for upgrade to program product status.

Finally, IBM KEE, a new product designed for IS professionals trained in AI applications, provides a System/370 MVS mainframe version of Intellicorp's Knowledge Engineering Environment (KEE). Potential applications include equipment design and configuration, factory scheduling, and process planning and simulation, says IBM.

Expert System Environment, with planned availability in December, carries a single charge of \$42,500. A single copy of Expert System Consultation Environment/PC will be sent automatically to current and new licensees of Expert System Environment. Additional copies will be one-time priced at \$595. Availability is March 1989. KnowledgeTool, also available next March, has a graduated one-time charge ranging between \$9,205 and

\$105,880. IBM KEE is available at a \$98,000 one-time charge, with planned shipments in December. IBM CORP., Rye Brook, N.Y. CIRCLE 260

### Local Area Network

Equinox brings out a LAN geared toward small companies.

Equinox Systems Inc. has entered the low-end local area network market with a new eight-user LAN.

SwitchLAN-8 networks IBM PCs and compatibles using the computer's serial COM port and twisted pair wiring, thus obviating network servers or boards in the pc, according to Equinox.

The SwitchLAN program provides users with simple pull-down menus for selecting printers, managing spooled print jobs, transferring files, and connecting to shared modems, the company says. Aimed at small-company and departmental networking applications, SwitchLAN-8 consists of an eight-user software license and network hub capable of connecting eight pcs. It is priced at \$995. The network may be expanded to support up to 16 pcs with the purchase of a second SwitchLAN-8 package. EQUINOX SYSTEMS INC., Miami. CIRCLE 261

### Performance Monitor

BlueLine adds CICS and disk management to VM program.

BlueLine Software Inc. has added CICS and disk management options on its Vital Signs VM performance monitor.

The new software, designed for managers and technicians of IBM mainframe systems, allows CICS performance data from Landmark Systems' product, The Monitor for CICS, to be integrated with VM performance data in the Vital Signs database.

A separate extension, dubbed Seekmiser, analyzes data from Vital Signs on seek activity for a single volume or group of volumes and recommends optimal placement of VM datasets and the most efficient sequence of steps for moving the data on the disk storage device.

Via an interface to IBM's VM directory management system, Dirmaint, Seekmiser's recommendations can be automatically implemented, says BlueLine.

Version 3.1 of Vital Signs is available immediately, with prices beginning at about \$300 per month for a permanent site license. BLUELINE SOFTWARE INC., Minneapolis. CIRCLE 262

**Connect Computer Co.**, Eden Prairie, Minn., is offering Turnstyle, a **LAN management tool** for controlling software copies on Novell, Banyan, 3Com, and IBM networks. The license metering system is priced at \$195 per server license and is available immediately. CIRCLE 263

**Data Access Corp.**, Miami, has brought out Office Works, **networking software** consisting of five independent modules supporting phone messages, document control, name and address database maintenance, e-mail, and scheduling. The productivity program is priced at \$1,395 in a LAN version, \$195 for the single-user version. CIRCLE 264

**Abra Cadabra Software**, St. Petersburg, Fla., has introduced Abratrak, a **job applicant tracking system** for the IBM PC and Apple Macintosh that complements the Abra 2000 personnel system, the company says. It's priced at \$995. A network version for an unlimited number of users is \$1,990. CIRCLE 265

**Binary Techniques Inc.**, Somerville, Mass., has released Zip, a **real-time multitasking executive** for the IBM PC family. Zip is compatible with MS/DOS, and is priced at \$995. CIRCLE 266

**PC Manager Inc.**, Vienna, Va., has debuted PC Album, an **image database retrieval library**. Video disks with up to 22,000 photographs in 500 categories can be integrated in the database, the company says. Prices begin at \$195 for a single disk at one workstation. CIRCLE 267

**Henderson Software Inc.**, Winston-Salem, N.C., is offering Finale, a new **program for analyzing corporate acquisitions, expansions, and restructurings**. Designed for business brokers, merger and acquisition specialists, and financial planners, it's priced at \$4,000. CIRCLE 268

**Unison Software**, Mountain View, Calif., has released a **disk space management system** for HP 3000 and Spectrum Series computers. DiscMaster is claimed to save up to one third of disk space. The prices range between \$1,600 and \$7,500. CIRCLE 269

**IntelligenceWare Inc.**, Los Angeles, has made available an **intelligent database system** for the IBM PC and DEC VAX/VMS. Release 2.0 of the Intelligence/Compiler is priced at \$490 for the IBM PC or PS/2, \$7,500 for the VAX/VMS. CIRCLE 270





# The Power of Automated Operations Is Here.

It takes power to automate. Not just iron and a little software. But a force behind the automation tool that can help when things get tough. Candle, the company that defined MVS performance with OMEGAMON<sup>®</sup> has entered the automated operations field with AF/OPERATOR.<sup>™</sup>

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*In addition to keeping MIS professionals informed on the subject, the article also provided important background and a clear mapping of the borderline between technology and the law for the producers of an ABC 20/20 tv segment.*

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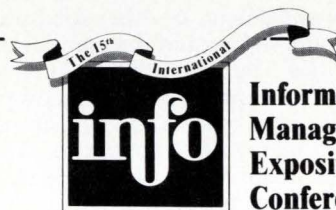
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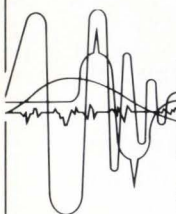
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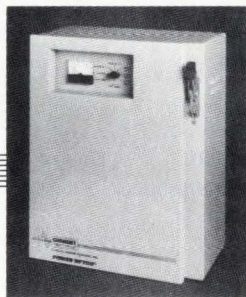


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## Departments

### CALENDAR

#### OCTOBER

##### National AS/400 Management Conference.

Oct. 9-11, Houston. Contact ADM Inc., 265 Highland Ave., Cheshire, CT 06410, (203) 271-1300.

##### Info '88.

Oct. 11-14, New York. Contact the Show Manager, Info '88, 999 Summer St., Stamford, CT 06905, (203) 964-0000.

##### Dexpo West 88.

Oct. 18-20, Anaheim, Calif. Contact Expoconsul International Inc., 3 Independence Way, Princeton, NJ 08540, (609) 987-9400.

##### Electronic Printing and Publishing Conference.

Oct. 19-21, San Jose. Contact Kristin Fischer, CAP International Inc., One Longwater Cir., Norwell, MA 02061 (617) 982-9500.

##### Office Products Exchange Network.

Oct. 19-21, Dallas. Contact Steve Oliver, OPEN Inc., c/o ICOT Network Systems Div., P.O. Box 91395, Mobile, AL 36691, (800) 762-3270.

##### American Society for Information Science.

Oct. 23-27, Atlanta. Contact American Society for Information Science, Exhibits Management, 1424 16th St., NW, Washington, DC 20036, (202) 462-1000.

##### Northeast Computer Faire.

Oct. 27-29, Boston. Contact The Interface Group Inc., 300 First Ave., Needham, MA 02194, (617) 449-6600.

##### Ninth International Conference on Computer Communication.

Oct. 30-Nov. 4, Tel Aviv, Israel. Contact Channy Greenberg, KENES U.S.A., 271 Madison Ave., Suite 903, New York, NY 10016, (212) 986-8300.

##### Unix Expo

Oct. 31-Nov. 2, New York. Contact National Expositions Company Inc., 15 W. 39th St., New York, NY 10018, (212) 391-9111.

##### DPMA Dallas '88

Oct. 31-Nov. 2, Dallas. Contact DPMA Dallas '88, c/o DPMA Headquarters, 505 Busse Hwy., Park Ridge, IL 60068-3191, (312) 825-8124.



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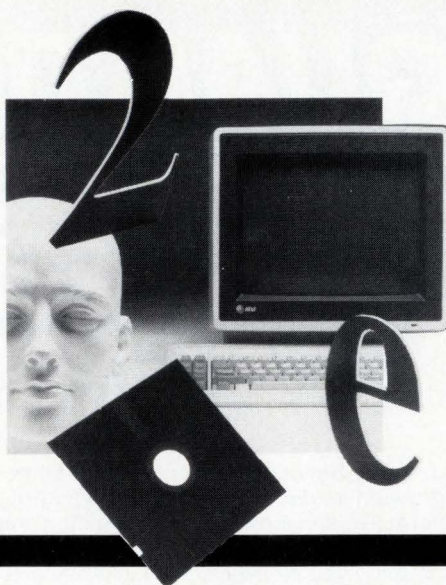
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To contribute to this important project, you'll need strong 370 Assembler skills and experience developing software at the system control program level in a VM/CP environment. Strong VM internals and 370 XA/ESA architecture skills are a must.

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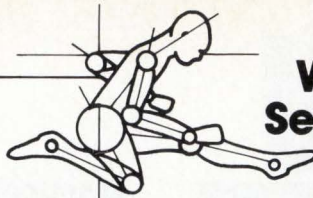
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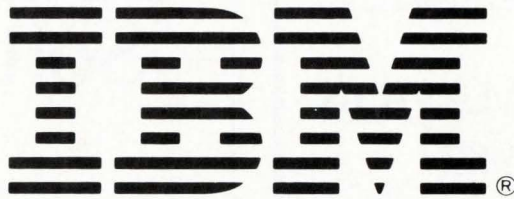
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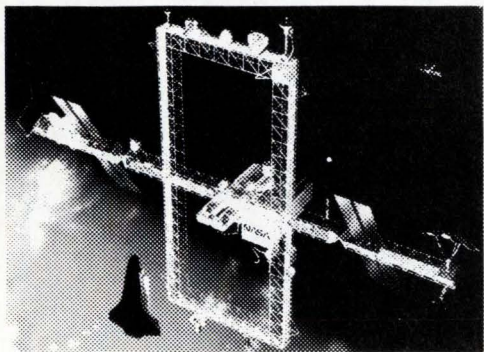
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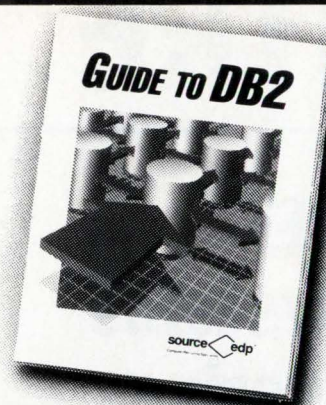
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