

HP Professional

AN INDEPENDENT PUBLICATION FOR USERS OF HP COMPUTERS ■ VOL. 3 ■ NO. 1 ■ \$4.00

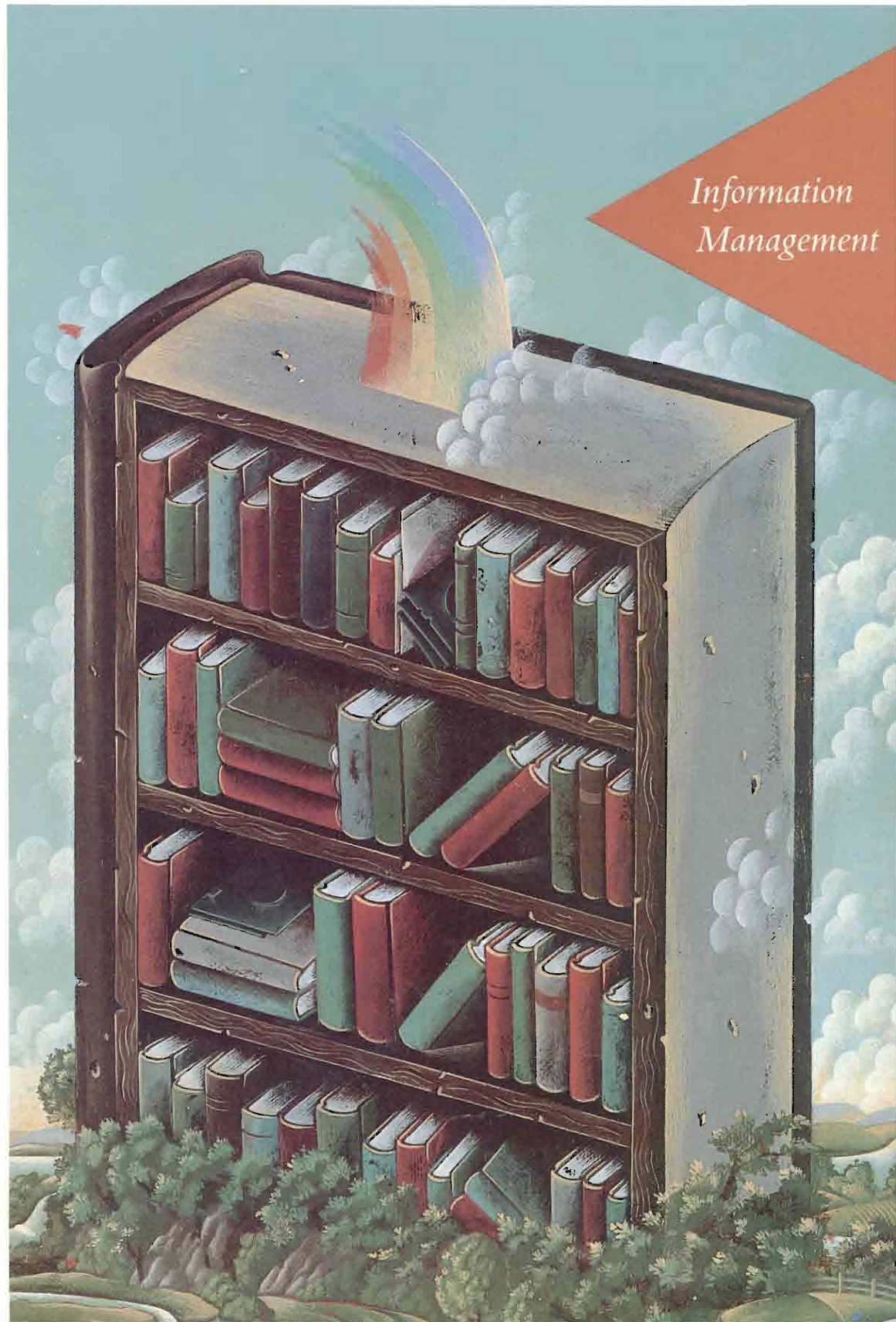
JANUARY 1989

- SpoolRescue Is NDS's Answer
- HPSQL: The Problem Solver
- An Introduction To IMAGE



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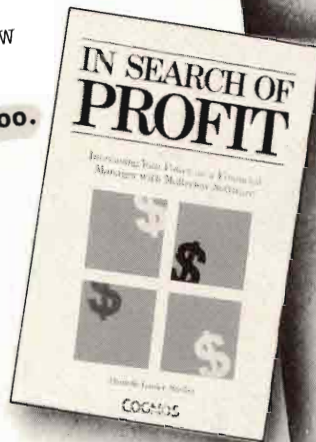
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This month's cover
illustration is the work
of Michael Schroeder,
Reading, PA.



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As a key member of MIS management, your challenge is to give your users the highest level of service while running your shop cost effectively. At Carolian, we dedicate ourselves to helping you achieve these goals. Our total commitment to listen to and understand your needs allows us to provide the highest quality software and support. It also allows us to create sophisticated new solutions when innovation is required to meet your business objectives.

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Session for Windows. The next generation in HP to PC connectivity.

The Microsoft® Windows environment has opened a new era in software for PCs and compatibles. With a speedy mouse and a powerful keyboard. Intuitive, well-organized menus and dialog boxes. Cut and Paste facilities for moving data between documents. The ability to run multiple applications at one time, each in a separate window on your screen. A standard interface for all applications, so manuals are almost obsolete. And with all the new Windows-based software from Hewlett-Packard—NewWave, OpenView, LaserROM, and LaserRX—it's clear that this is a trend no HP site can ignore.

A Windows-based terminal emulator

Business Session™ for Windows, our HP2392 terminal emulator, is part of this new breed of PC software. Business Session provides block-mode terminal operation with LAN compatibility, intelligent file transfer, automated command scripts and powerful logging, all within the high-productivity desktop environment of

Windows 2.0, 286 or 386. Building on the user interface we've spent four years designing and refining for our Macintosh-based emulators, Business Session takes advantage of Windows' mouse, icon and menu paradigm to boost user productivity. And because our PC- and Mac-based products share a common interface and feature set, companies with both types of computers can standardize on Session to reduce training time and simplify in-house support.

Window on the future.

Because Windows is the stepping stone to HP NewWave and OS/2 Presentation Manager, Business Session lets you increase your productivity with the hardware you have now—and protect your investment in software and training as you move to these powerful new environments. Get ready for the future . . . Choose Session.

The logo for Tymlabs, featuring the word "Tymlabs" in a stylized, cursive script font with a horizontal line underneath.

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CIRCLE 138 ON READER CARD

Omens And Portents

Oracle is coming, and Information Builders is right behind them. Many other major software vendors are closely watching this market. I know, because they call me up to ask if they can receive the marketing newsletter we put out for our advertisers.

Coming where? Right into the heart of "Image Country" bearing relational products. How come? Because, at last, on a 32-bit platform, there is enough address space for state-of-the-art software. The 16-bit barrier that kept the 3000 world stagnant for so long has fallen, and users are about to experience real software options.


Examine the latest restructuring of HP's computer division closely. Now we have a "Computer Products" division and a "Networked Computer" division. The time-honored divisive technical/commercial fault line is missing. (Who says that environment doesn't influence our business decisions?) I especially applaud the "Networked" appellation. Monolithic, isolated computers have no place in the business world in 1989.

The designation "Networked" is important. After 1990, our computing environment will be very different. CPU power will be free (like memory used to be). The 10x or 20x increase in power will make old "highly efficient" optimizations not so important. Fiber (FDDI) Ethernet will be the bus. The location of a specific data element on the local network will be irrelevant. It will not matter which platform is actually executing the job running in your window, nor will it matter that the agent assembling your report is actually using four others.

Old habits are hard to change. Just renaming something does not change it. Change requires change of heart, and change of heart requires inspiring leadership.

Go git 'em, John!

A handwritten signature in black ink, appearing to be "R. D. Mills", written in a cursive style with a long, sweeping tail.



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CIRCLE 113 ON READER CARD



INDUSTRY WATCH

Peggy King

DBMS Strategy

A distributed database management system (DBMS) is

a software program that allows data on multiple systems to appear to users as a single database. With a distributed DBMS, data can be shared across a corporation while local control of the data is maintained.

HP doesn't have full distributed database capabilities yet, but it has begun to implement a series of steps that will provide users of one HP operating system access to a database residing on another HP operating system and eventually to another vendor's DBMS.

Beginning The Process

The first step is ALLBASE/XL, a relational database. ALLBASE/XL, which includes both the relational HPSQL and the network model TurboIMAGE, is currently shipping. ALLBASE/HP-UX is the version of ALLBASE available for HP workstations in the 800 Series. It is a combination of HPSQL and HP Image. The ALLBASE/4GL product, a common set of tools that work on both the MPE/XL and HP-UX operating systems, includes ALLBASE/QUERY, a query language and a reporting product along with a fourth-generation language.

HP has proceeded with the first of a three-phased implementation of a distributed database management system based on HPSQL. Users of one HPSQL database can read and update a remote HPSQL database without coding for communication and remote processes. ALLBASE/NET is the product that provides this capability on HP-UX systems and it soon will be released on MPE/XL.

Because HPSQL is available on HP-UX workstations and MPE systems, HP users who have both workstations and business computers benefit from a

By the third phase of implementation, HP will have a true distributed system in place and multiple remote databases will appear completely local

H*P . . . has begun to implement a series of steps that will provide users of one HP operating system access to a database residing on another HP operating system and eventually to another vendor's DBMS.*

common information management environment.

The second phase of distributed database implementation will provide heterogeneous access to non-HP relational databases. When this phase is implemented, users will be able to access other vendors' systems from within an HP environment.

As part of the second phase, HP plans to allow heterogeneous access to IBM's DB2 by the second half of 1989. This means that HPSQL will be able to access DB2 (and eventually other non-HPSQL databases) without coding for DBMS differences.

to the end user. As part of this phase, HP first will provide retrieval-only transactions across databases without the need to code for coordination of results, and then will expand that capability to include update activities.

In Addition

As a further step, HP's distributed DBMS will allow greater transparency and enhanced performance and availability, first through multiple copies and then through partitioned tables, which allow portions of data in a table to be distributed.

When HP's phased implementation is complete, HPSQL will work behind the scenes in multivendor environments to provide standardized access to large composite databases. Users no longer will need to know where information resides in order to have access to it.

ALLBASE/XL

Hewlett-Packard
3000 Hanover Street
Palo Alto, CA 94304
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System Requirements:

HP Precision Architecture Series 900

Price:

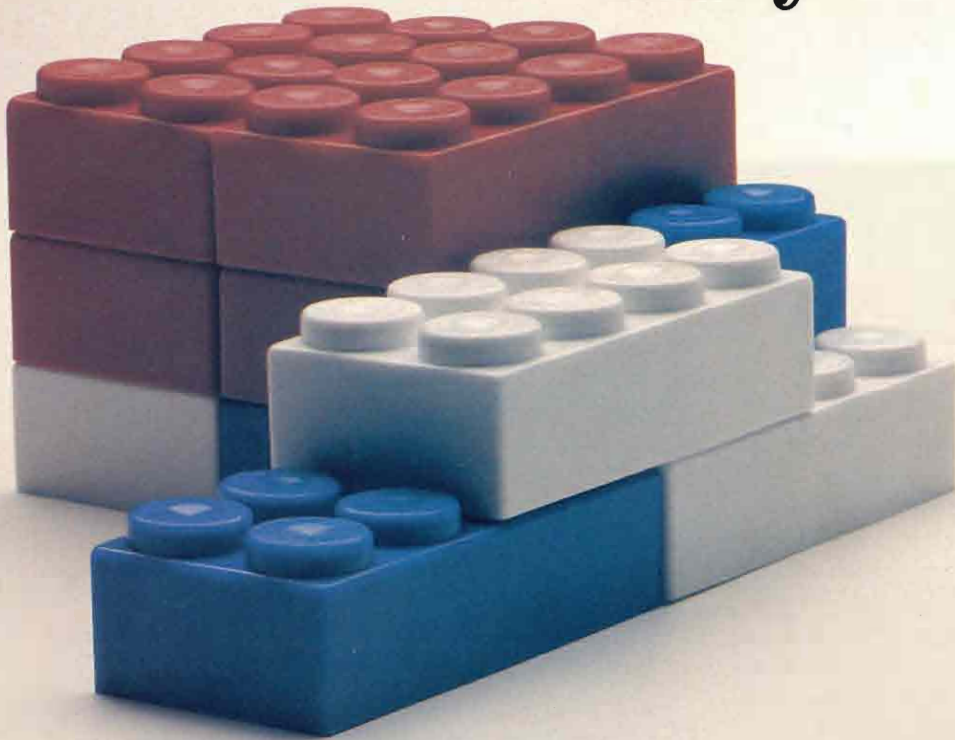
Ranges from \$5,000 to \$30,000 depending on system configurations

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Police Department Wins HP Technology Award

Uses Vision Technology Law Enforcement Software



The Morgan Hill Police Department (Morgan Hill, CA), which uses an HP 3000 system, HP terminals in the police station and laptop terminals in patrol vehicles, recently won a Hewlett-Packard State and Local Government Technology Award for the most innovative software solution. The department uses three law enforcement software products from Vision Technology (Reston, VA).

Morgan Hill uses BASECAD, a computer assisted dispatch system, in the dispatching center. Information that is received from dispatch is transmitted via radio waves to the laptop terminals in patrol vehicles.

POSSE-VT is an automated information management system that uses an IMAGE database to provide basic records automation. Cross-referencing is handled by the Master Names Index, which references names to all associated data; the Vehicle Master Index performs the same function for ve-

hicles. Other modules include Investigative Support, Traffic Management and Specialized Support, which handles interfaces to mobile digital terminals.

VT-NARCO, Vision Technology's newest product, is based on a relational master-name index and includes up to 10 levels of security. The product is an extension of POSSE-VT which assists police departments in organizing and correlating data related to investigation of narcotics trafficking and organized crime.

VT-NARCO maintains information on names that can be correlated with aliases, previous arrests, convictions, methods of operation and other information relevant to investigators.

Contact Linda Hill, Vision Technologies, 1150 Sunset Hills Road, Suite 320, Reston, VA 22090; (703) 689-0001.

Circle 358 on reader card

HP's DeskJet Wins Award

Datek Announces 'Printer Of The Year'

Datek Information Services (Waltham, MA) has presented the seventh "Printer of the Year" award to Hewlett-Packard's DeskJet.

Presented annually, the award is given to the printer judged to have had the greatest impact on the industry during the last year.

Datek, in consultation with a panel of industry executives, looks for technological innovations and marketing presence when selecting the most qualified recipient.

Contact Margaret Henley, Datek Information Services, P.O. Box 68 Newtonville, MA 02160; (617) 893-9130. **Circle 372 on reader card**

Computer Power Group Announces Purchase

Acquires BBJ's TODAY Software Product

Computer Power Group has announced that it has purchased the assets of BBJ Computers International Limited (Australia). The acquisition includes BBJ's TODAY software product and applications written in TODAY.

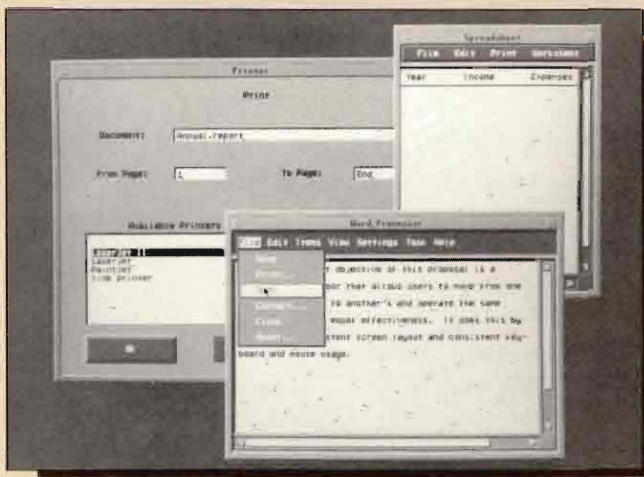
TODAY, a graphically-oriented and portable fourth-generation language, runs under more than 80 hardware/operating systems environments, including DEC's VAX/VMS, Prime Computer Inc.'s PRIMOS, Hewlett-Packard's MPE, per-

sonal computers running MS-DOS and systems operating under most versions of UNIX. TODAY also has the capability to support all major SQL databases.

Computer Power Group will provide continuing research and development and support services for the TODAY customer base worldwide.

Contact Computer Power Group, 24 Prime Park Way, Natick, Mass 01760; (508) 650-3500.

Circle 361 on reader card



The Common X Interface is a new graphical user interface for the UNIX operating system.

OSF In Search Of User Interface

HP And Microsoft Are Still In The Running

The Open Software Foundation (OSF) recently released the names of 26 companies and organizations whose technologies have qualified as candidates in OSF's search for a graphical user interface standard, and a joint submission from Hewlett-Packard and Microsoft still is in the running.

The identification and specification of a user interface are the initial steps in OSF's creation of an open, portable software environment for the benefit of the information processing industry.

OSF is the industry's first member-sponsored research and development organization aimed at bringing global acceptance to a single standard for UNIX-based open software. OSF is developing and will deliver within 15 to 21 months an open, standard operating system environment with extensions and subsystems, using core technology from a future version of IBM's AIX as a development base.

OSF will incorporate established standards where they exist and develop new standards where none exist, via a unique open development process that solicits input from the industry and user.

The final interface could be a single interface technology or a collection of discrete technologies, depending on member commentary and subsequent OSF evaluation.

In a related announcement, Hewlett-Packard and Microsoft Corporation announced the Common X Interface (CXI) graphical interface for UNIX operating systems. The new interface gives UNIX systems the same appearance and behavior as personal computers running MS-DOS with Microsoft Windows and Microsoft OS/2 with Presentation Manager.

CXI provides software developers with guidelines and tools for creating applications with a consistent user interface.

CXI is based upon the X Window System and has

ORACLE RDBMS Now Available On HP 3000

Oracle First To Provide Products For Entire HP-PA Line

At the Autofact show in Chicago, HP announced that Oracle Corporation's relational database management system, ORACLE, is available on HP 3000 Precision Architecture (HP-PA) Series 900 computers. HP said that Oracle is the first independent database management system vendor to provide its products on all HP-PA computers.

Previously available with the HP-UX operating system on HP 9000 computers, ORACLE now is available with the MPE-XL operating system on HP 3000 business computers. HP 3000 users will be able to access TurboImage from within the ORACLE database.

Products from Oracle will be available on the Series 900 in two releases. The first release, available this month, includes ORACLE, the relational DBMS; SQL*Forms, a forms-based application development facility; SQL*Plus, a powerful ad hoc SQL command processor; and Pro*C, Pro*COBOL and Pro*FORTRAN programmatic language interfaces.

The second release, available by summer, will include ORACLE version 6 with the transaction processing subsystem; SQL*Net, a machine-independent communication facility that permits peer-to-peer communication; SQL*ReportWriter; and SQL*Menu, a portable, customized menu-driven facility.

Oracle Corporation has become a national account under HP's Solutions Marketing Program. Oracle will work with HP to develop joint marketing programs using resources from both companies.

Prices for the ORACLE relational database management system vary from \$28,000 to \$125,000, depending on the HP computer selected. Tools and add-on products are priced separately.

Contact the Hewlett-Packard sales office listed in the white pages of your telephone directory.

Circle 374 on reader card

been submitted by HP and Microsoft in response to OSF's recent request for technology for a user environment.

For information about OSF contact Paula Slotkin, Open Software Foundation,

20 Ballard Way, Lawrence, MA 01843; (508) 683-6803.

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HP Germany Gains Partner

Product Demo At SYSTEC Exhibition

GPP Gesellschaft fuer Prozessrechnerprogrammierung now is an official software partner of HP Headquarters in Germany and recently displayed EPOS and RE-SPEC at the HP booth at the SYSTEC exhibition in Munich, West Germany.

Circle 303 on reader card

HP Gains Corporate License

Allows HP To Utilize CALLBACK/3000

Design/3000 Inc., (Salem, OR) and HP have signed an agreement granting HP a corporate license for Design's hardware and software package, CALLBACK/3000.

This agreement allows HP to utilize CALLBACK/3000 within its internal data centers. CALLBACK/3000 allows

the data center management team to monitor their data center for temperature variance, system failure, power failure and aborted jobs.

Contact Design/3000 Inc., 860 Lancaster Drive, S.E., Salem, OR 97301; (503) 585-0512.

Circle 301 on reader card

OCS Adds Software Feature

Allows Sites To Import Source Code

In order to accommodate a central software maintenance/development department that distributes standard software releases to branch sites, OSC has added a third-party supplied software feature to the OSC/LIBRARIAN program library management/version control package. This feature allows sites to import source code and other files from outside developers such as the corporate data center. Once the files are restored from tape, OSC/LIBRARIAN automatically organizes them according to the recipient site's specific structure. This process synchronizes newly received software with the corresponding site-modified versions and ensures that the

proper copy of a file is issued at checkout time.

OSC also has integrated capabilities between OSC/LIBRARIAN and OSC/EXPRESS' multiCPU batch job scheduling system. One of these new capabilities provides an automated release to the production facility. This facility pools the development area on a nightly basis, searching for all files that should have been approved and tested, or just simply modified that day. Polling also can be requested on an all-or-nothing basis.

Contact Operations Control Systems, 560 San Antonio Road, Palo Alto, CA 94306; (415) 493-4122.

Circle 305 on reader card

Unified Software Systems Earns HP PLUS Certification

SECURITY PLUS Noted For Outstanding Performance

Unified Software Systems (Springfield, VA) has earned the HP PLUS certification for its SECURITY PLUS software package. HP PLUS is an award presented by HP for products that have demonstrated outstanding performance in a series of rigorous tests specified by Hewlett-Packard.

SECURITY PLUS is a software system that integrates total system security with a menu-driven help facility. With SECURITY PLUS, users achieve complete data protection for every HP 3000 application.

As required by Hewlett-Packard, Unified Software Systems tested SECURITY

PLUS with its clients for almost a year before HP awarded the HP PLUS certification. The certificate testifies that SECURITY PLUS satisfied its users who used the system in performing actual work tasks.

Other routines included in SECURITY PLUS include a User Mail System, a Batch Job Submission System, an Advanced Query System, an Automated Job Scheduler, a Password Control System and a Job Entry System.

Contact Unified Software Systems, 6551 Loisdale Court, Suite 400, Springfield, MA 22159; (703) 922-9800.

Circle 304 on reader card

Samna Makes Announcement

Ami Distributed By Ingram And Micro D

Samna Corporation has announced that Ingram Computer Inc. and Micro D Inc. will distribute Ami, the company's new Microsoft Windows-based word processor that lets users create words and page layouts at the same time.

Ami (\$149) is a full-featured word processing package that uses WYSIWYG screen display. The new package features "style sheet" formatting to help users produce professional-looking business documents.

Ami includes complete facilities for basic word processing including cut, copy and paste; a 130,000-word spelling checker; search and replace; headers and footers; a full undo command and context-sensitive help.

Contact Bruce Cummings, Samna Corporation, 5600 Glenridge Drive, Atlanta, GA 30342; (404) 851-0007.

Circle 359 on reader card

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MCBA Brands Business Applications

Announces MCBA CLASSIC Software

MCBA recently attributed a brand name to its business applications. MCBA CLASSIC Software reflects the company's 14-year tradition of supplying reliable, quality software for mid-range computer systems.

MCBA's COBOL packages for Digital VAX, Wang VS, HP 3000 and UNIX-and XENIX-based computers will be known as MCBA CLASSIC

Software, grouped as MCBA CLASSIC Accounting, MCBA CLASSIC Distribution and MCBA CLASSIC Manufacturing. The individual package names are MCBA CLASSIC General Ledger, MCBA CLASSIC Accounts Payable and so on.

Contact MCBA 425 W. Broadway, Glendale, CA 91204-1269; (818) 242-9600. **Circle 368 on reader card**

Cognos Steps Up Sales/Support Efforts

Opens Office In Spain



Cognos Inc., a computer software vendor specializing in advanced language technology for developing business applications, has opened its 39th office worldwide in Spain.

Headed by Philip Little, the new office will sell directly to major customers, as

well as offer increased support to the nine Spanish distributors now representing Cognos and its products.

Contact Wendy Rajala, Cognos Inc., 3755 Riverside Drive, Ottawa, Ontario K1G 3Z4; (613) 738-1440.

Circle 365 on reader card

askSam Systems Signs Agreement

Micro D To Market askSam

askSam Systems has signed an agreement with Micro D, a national microcomputer products distributor, to market the company's personal information manager askSam.

askSam is a flexible text-based program for entering, manipulating and retrieving information in both fixed-

field and free-form text formats.

askSam (\$295) also includes a command language, numerical and calendar date selection capabilities, proximity searches and report generation features.

Contact askSam Systems, P.O. Box 1428, Perry, FL 32347; (800) 327-5726. **Circle 364 on reader card**

IDE Announces Procurement Contract

Software Through Pictures Available Under GSA Contract

Interactive Development Environment (IDE) (San Francisco, CA) recently announced that a new procurement contract has been finalized with the GSA. Government agencies desiring to purchase IDE's Software through Pictures computer-aided software engineering (CASE) product line now will be able to do so under the agreement, which is identified as GSA Contract Number GS00K89AGS5508, and comes under the GSA's Group 70, Part I, Section A, covering automated data processing.

Software through Pictures aids the analysis, design and documentation of software. Its open architecture permits users to tailor the tool to meet their individual requirements. Software through Pictures runs on Apollo, DEC, Hewlett-Packard and Sun Microsystems workstations in the native windowing environment of each platform.

Contact IDE, 595 Market Street, 12th Floor, San Francisco, CA 94105; (415) 543-0900.

Circle 362 on reader card

HP Releases New Product Brief

Highlights HP 3000 Business Systems

Hewlett-Packard has published a new product brief highlighting key features, performance and technology of the HP 3000 family of business computers.

Featuring VLSI chip technology for higher performance with fewer, more reliable parts, the HP 3000 family offers a wide range of compatible systems designed to meet varying computing needs. The low-end HP MICRO 3000LX delivers mid-range performance at an entry level price. The HP 3000 Model 955 uses HP Precision

Architecture, VLSI chips and a high-speed internal-bus architecture offering distributed data processing to more than 400 users.

The product brief emphasizes the variety of software solutions tailored for specific industries that are available from HP and its value added businesses.

The HP 3000 business systems product brief — Publication 3952-7831D — is free to HP customers and value added businesses.

Contact Hewlett-Packard, 19310 Pruneridge Ave., Cupertino, CA 95014; 1-800-752-0900, Dept. 164P. **Circle 374 on reader card**



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CIRCLE 141 ON READER CARD

MASTEROP/3000 To Be Distributed By Tres Associates

Kemp Software Systems And Tres Associates Sign Agreement

Kemp Software Systems (Hollywood, CA) and Tres Associates (Austin, TX) have signed a joint marketing agreement whereby Tres Associates will be the exclusive North American distributor of MASTEROP/3000, Kemp's operations scheduling system.

MASTEROP/3000 is a monitoring/scheduling/controlling utility. Jobs, programs, XEQ files, MPE commands, MASTEROP/3000 commands and UDCs all are capable of being scheduled by MASTEROP/3000.

MASTEROP/3000's sophisticated scheduler allows event introduction by time, date, business day, device availability, CS device status, job status, JCW state or any

combination of these.

It automatically can handle any pending replies on console for a particular job. A job can be scheduled to stream after the completion of one or more others. This allows job queues to be handled without worrying about job fences or limits. These queues can be regulated across systems, and one session using MASTEROP can be regulated to "look in" on and/or control another MASTEROP session on the same system or another system.

For more information contact Tres Associates, P.O. Box 9802-231, Austin, TX 78766; (512) 346-0904.

Circle 363 on reader card

Optimation Offers Terminal Emulation For HP-UX Workstations

Emulation Available For VT100, HP2392 And TEK4010

Optimation Inc. (Mountain View, CA) offers terminal emulations tools for the HP Series 300 workstations. Emulators for the three major standards, VT100 and HP2392 for text and TEK4010 for graphics, are available. They currently are running under HP-UX and Windows/9000 and are being

ported to the X Windows System over the next few months.

Emulation features are extensive, although scripting will not be available until later this year.

Contact Marlen Clough, Optimation Inc., 201 San Antonio Circle, Suite 282, Mountain View, CA 94040; (415) 941-2021.

Circle 371 on reader card

HP Succumbs To Competitive Market Conditions

Reduces Prices Of Midrange HP Vectra PCs

Hewlett-Packard recently reduced U.S. list prices by up to \$400 on its Intel 80286-based HP Vectra ES and ES/12 personal computers.

The company said the price reductions reflect competitive market conditions.

These reductions bring the base price for an HP Vectra ES PC to \$1,995. This announcement follows reductions of up to \$1,800 on high-end Vectra PCs in July 1988.

Prices were reduced \$400 on all models of the 8-MHz, HP Vectra ES PC and \$200 on select models of the 12-MHz, HP Vectra ES/12 PC.

Contact the Hewlett-Packard sales office listed in the white pages of your telephone directory.

Circle 374 on reader card

HP Signs Licensing Agreement

Will Resell Frame's Professional Publishing Software

Hewlett-Packard and Frame Technology recently announced a software licensing agreement under which HP will resell worldwide Frame's professional publishing software for engineering and design documentation, as well as view-only documentation for the factory floor.

HP selected FrameMaker, International FrameMaker and FrameViewer to be available on Motorola-based HP 9000 Series 300 and HP Precision Architecture (RISC-based) workstations.

FrameMaker is document publishing software designed for a variety of professional disciplines. It provides full-featured authoring and document layout tools, including capabilities for

creating, manipulating and importing graphics. With FrameMaker's spectrum of features, users can create a range of documents, from technical manuals and reports, to newsletters and viewgraphs.

FrameMaker software has an installed base of more than 5,000 licenses and will support HP LaserJet printers as well as other printers.

International FrameMaker includes user interfaces in English, French and German. It offers text hyphenation and spelling support for U.K. and U.S. English, French, German and Dutch. FrameMaker sells for \$3,000 and \$4,000 and will be available next month.

Contact the Hewlett-Packard sales office listed in the white pages of your telephone directory.

Circle 374 on reader card

O.K., It's Backup Time. Take Ten.



Traditional HP 3000 system backup averages five hours. High-speed backup utilities take about three hours. And until now, you've accepted all that system downtime as the cost of insurance.

But all that lost time is history now. Because now there's **ONLINE-BACKUP/3000**. The backup utility that runs during productive online uptime **requires only 10 minutes of system downtime to secure backup integrity!**

In addition to reducing the tape use by up to 60%, you can now perform a **full system backup online with no perceptible loss in responsiveness.**

Tired of seeing online and batch time "squeezed out" by old fashioned backups? Then you owe it to yourself and your users to **discover amazing new system availability with ONLINE-BACKUP/3000**. Join companies like Hughes Aircraft, Proctor & Gamble, Union Camp and General Motors — and experience the most productive coffee break your company has ever had!

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CIRCLE 130 ON READER CARD

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ORBiT Utilities
(Benelux) N.V.

ORBiT Software
(Scandinavia) AB

Gandalf, Hewlett-Packard Sign Agreement

Provide Joint Support Services

Gandalf Data Inc. and Hewlett-Packard recently announced an agreement to provide enhanced network support services to its mutual customers.

The agreement is designed to provide customers with streamlined network support, thereby decreasing their need to perform diagnostic and recovery activities.

The enhanced support services are available in the U.S. and Canada, and will be available in January 1989 in Europe, Australia and the Pacific Rim.

Contact Gandalf Data Inc., 1020 South Noel Avenue, Wheeling, IL 60090; (312) 459-6630.

Circle 302 on reader card

Cumulus Teams With CES

Opens Joint European Support Center

Display manufacturer Cumulus Technology has joined with U.K. distributor Computer Engineering Services (CES) to open a Cumulus European Technical Support Center based in Sheffield, England. This center will provide better product support to Cumulus distributors and customers throughout Europe.

The center will hold a complete stock of units and spare parts, and will provide the same factory support that is available in the U.S. The telephone number for the center is (44) 0742-560176.

Contact Robert David, Cumulus Technology Corporation, 1007 Elwell Court, Palo Alto, CA 94303; (415) 960-1200.

Circle 366 on reader card

Zentec Adds Six Sales Offices

Expands Factory Direct Sales Into HP Marketplace

Zentec Corporation (Santa Clara, CA) has announced the addition of six regional sales offices to support its factory direct sales into the HP Marketplace.

Through the recent acquisition of certain assets of DATAMAXX USA Corporation, Zentec now provides a direct sales team for its HP-

compatible terminal in the following cities: Troy, MI; Tallahassee, FL; Stamford, CT; Bethesda, MD; Long Beach, CA, along with a product support/telemarketing facility in Chicago, IL.

Contact Zentec Corporation, 2400 Walsh Ave., Santa Clara, CA 95051; (408) 727-7662.

Circle 360 on reader card

Infocentre Centralizing Forces

PICS For North America Now Centered In Montreal



Infocentre Corporation recently announced that its Speedware Phone In Consulting Service (PICS) for North America will be centralized at its Montreal location.

This move locates the PICS next door to the R & D lab, providing customer support engineers easier access to the Speedware development team.

Speedware technical support manager, Andy Kulakowski, reports that the PICS centralization is ex-

pected to provide improved service consistently across North America, but at the same time, Speedware expertise will be maintained in the regional offices to handle customer training and on-site consulting.

To reach the service call 1-800-361-6782.

Contact the Marketing Department, Infocentre Corporation, 7420 Airport Rd., Suite 201, Mississauga, Ontario, Canada L4T 4E5; (416) 678-1841.

Circle 369 on reader card

HP And Meridian Data Sign Agreement

Join Forces To Offer CD ROM Publishing

Meridian Data Inc. and Hewlett-Packard recently announced an agreement to integrate and market HP's LaserRETRIEVE with the Meridian CD ROM Publisher.

The agreement, which formally was announced at CD ROM Expo, matches HP's CD ROM publishing and retrieval software package (HP LaserRETRIEVE) with Meridian Data's micro-based CD ROM premastering system (CD Publisher). The end result is a turnkey CD ROM publishing system that enables the user to prepare a database ready for CD ROM mastering and replication.

According to the agree-

ment, the turnkey CD ROM publishing system will be sold through Meridian's direct sales force. HP will continue to promote Meridian's software with its corporate accounts and to the market at large. Both CD Publisher and HP LaserRETRIEVE also will be sold separately by Meridian Data.

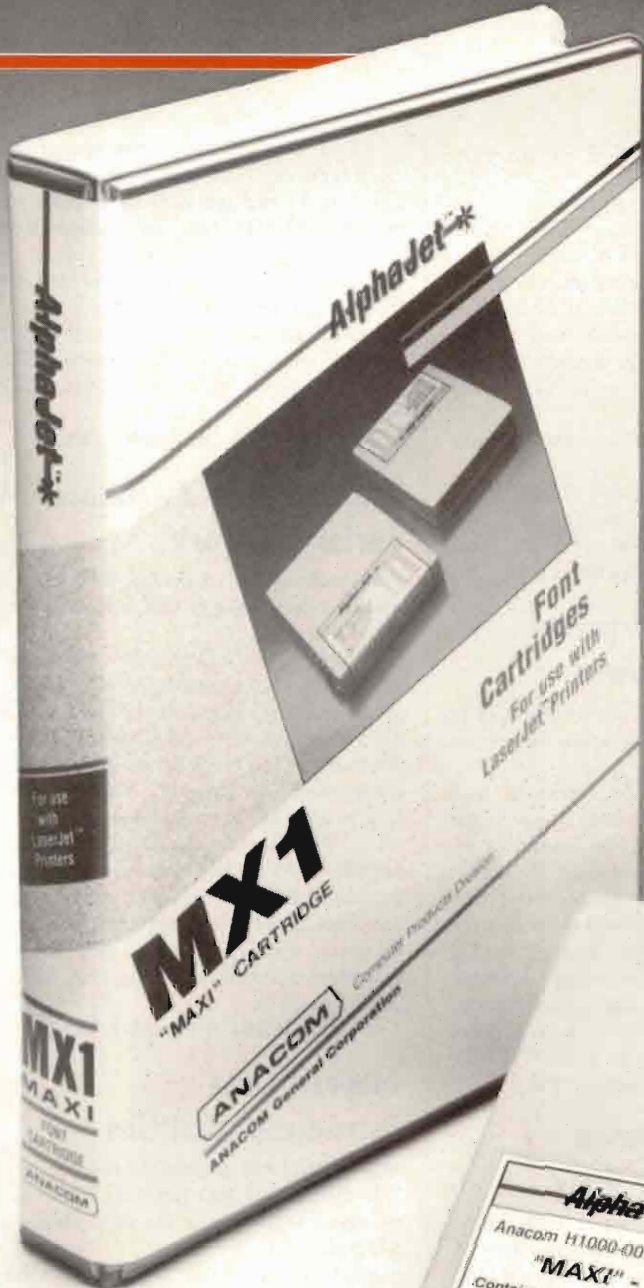
The complete CD ROM publishing system, which includes the CD Publisher configuration with 600 MB of hard disc space and HP LaserRETRIEVE, will be priced at \$49,950.

Contact Meridian Data 4450 Capitola Rd., Suite 101, Capitola, CA 95010; (408) 476-5858.

Circle 367 on reader card

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CIRCLE 103 ON READER CARD

Cameo II Available On HP 9000/800

Cameo Systems Inc., (Santa Clara, CA) has announced the availability of Cameo II, a computer-aided manufacturing application, on the HP 9000 Series 800 computer systems. These computers operate under HP-UX, that adheres to AT&T UNIX System V Interface Definition Issue 2.

Cameo II consists of several integrated software modules aimed initially at the semiconductor manufacturing industry.

The Manufacturing Management Module tracks material through the factory floor, collects information about the material and its environment and schedules equipment use and maintenance.

The Test Management Module verifies, stores and retrieves data generated by high volume test systems. The Data Analysis Module retrieves data from the database and provides statistical process control capabilities. The Report Writer Module allows users to generate custom reports or to pass manufacturing data to other applications.

All data is stored in the relational database ORACLE available from Oracle Corporation.

The HP 9000 Series multiuser computers are based on HP Precision Architecture, which uses the principles of reduced-instruction-set computing (RISC) to offer ease-of-use, reliability and high levels of performance at competitive prices.

Price is based on the hardware configuration and the number of Cameo II users. Software prices range from \$80,000 to \$200,000. HP 9000 Series 800 computers at \$35,000.

Contact the Product Marketing Department, Cameo Systems Inc., 2880 San Tomas Expressway, Santa Clara, CA 95051; (408) 986-9200.

Circle 356 on reader card

QMODIFY Reduces Lengthy Recompilations

PowerHouse programmers and database administrators can avoid lengthy QDD data dictionary recompilations by using a new

utility called QMODIFY from Grant Colvin & Co. Inc.

With QMODIFY, most changes require seconds to accomplish and complicated changes are completed in minutes.

QMODIFY accepts commands with a syntax closely resembling the QDD data definition language. Commands also are included for total or selective decompilation of data dictionaries, to provide constant source code.

For a single CPU, a QMODIFY license costs \$995.

For more information contact Grant Colvin & Co. Inc., 569 Melville, Suite 201, P.O. Box 3251, St. Louis, MO 63130; (314) 725-7446.

Circle 355 on reader card

Computer Enterprises Introduces Sbrowse

Computer Enterprises (Port Jefferson, NY) has announced Sbrowse, a interactive source code language browser.

Sbrowse provides the ability to find answers to specific questions about large, complex code — and is not dependent on links to written documentation.

Sbrowse uses a symbol index that it constructs the first time it is used on the source files and reconstructs only if a source file has changed or the list of source files is different.

For more information contact Ann Winter, Computer Enterprises, P.O. Box 8, Port Jefferson, NY 11777; (516) 473-7500.

Circle 354 on reader card

Optical Disc Drives Available From Sony

Sony Corporation of America, (Park Ridge, NJ) has announced the general availability of the first product in its family of rewritable optical disc drives, controllers and media for OEMs, VARs distributors, systems integrators and workstation manufacturers.

Available now, both the model SMO-S501 self-contained rewritable optical disc drive subsystem and the model SMO-D501 integrated rewritable optical disc drive device allow users to write, read and erase very large amounts of information.

Two 5/4-inch rewritable optical disc cartridges, the 512-byte sector size model EDM-1DA1 and the 1024-byte sector size model EDM-1DAO also are available. Both cartridges conform to the current requirements of the draft ANSI and ISO data interchange standards.

Contact Sony Corporation of America, Corporate Communications Department, 9 West 57th St., New York, NY 10019; (212) 418-9427.

Circle 381 on reader card

Fransen/King Announce Serial Network

Fransen/King Ltd. (Seattle, WA) has announced the release of Office Extend - the Serial Network.

Features of the Serial Network include PC to HP 3000 printing allowing for PCs to transparently access all the high-quality, high-volume printers and plotters on the HP 3000; and PC to HP 3000 HostDisc, which allows the PC to access HP 3000 disc space as if it were another local disc drive.

Office Extend - the Serial Network is priced at \$185 per PC. Volume discounts are available and Print Connection customers receive full credit when upgrading. Contact Fransen/King Ltd., 16400 Southcenter Parkway, Seattle, WA 98188; (206) 575-1570.

Circle 394 on reader card

Maersk Data Introduces Utilities

Maersk Data A/S has released two products, MD-DICU and MD-SPOOL. These new programs will increase the applicability of GDDM.

MD-DICU (Data Interface to Chart Utility) provides the user with the means to read data from files and have them passed on to IBM's ICU (Interactive Chart Utility). This program may be run interactively or as a batch job. MD-DICU runs under the control of MVS and VM/CMS.

MD-SPOOL facilitates the handling and control of the ADMPRINT queue (DSPRINT queue). It provides the user with



HP introduces the HP 9000 Model 340.

a survey of the print queues and makes it possible to handle each printer and print request, including previewing, status in the queue, transfer from one printer to another and deletion.

Contact Maersk Data Inc., Giralda Farms, P.O. Box 883, Madison Ave., Madison, NJ 07940; (201) 514-5100.

Circle 395 on reader card

HP Announces 9000 Model 340

Hewlett-Packard has introduced a new high-performance engineering workstation that HP believes sets a new price/performance standard for workstations based on the new generation of Motorola microprocessors.

With an entry level U.S. list price of \$5,495, the HP 9000 Model 340 workstation, based on the MC68030 system processor, offers one-third more performance than competing entry-level workstations based on the MC68020.

The Model 340, which offers performance of four MIPS (millions of instructions per second), is the first system in its price range to use the MC68030 and MC68882 floating-point coprocessor, currently the most powerful microprocessor team in Motorola's industry-standard 68000 family.

The Model 340 allows engineers and designers to create powerful system tailored to their applications. Two high-resolution choices provide workstations suitable for everything from general scientific computing and software development, to 2D CAD (computer-aided-design) and mechanical design and drafting.

The Model 340 delivers all the benefits of more than 750 advanced applications that run under the HP-UX operating system, which adheres to AT&T's UNIX System V

Interface Definition Issue 2.

The Model 340 offers flexibility of graphics, RAM expandability to 16 MB, an optional accessory slot and object code compatibility across the entire HP 9000 Series 300 product line.

This model is available in five configurations. All Model 340 bundles are available now and all include display boards and monitors; 4 MB of RAM; RS 232C, parallel (HP-IB), HP-HIL and LAN interfaces; HP-UX 6.2 and the X Window System. Prices range from \$5,495 to \$15,995.

Contact Bill Bennet, Hewlett-Packard, 19091 Pruneridge Ave., Cupertino, CA 95014; (408) 447-0806.

Circle 353 on reader card

DSP Coprocessor For HP 9000

Ariel Corp. has announced a new, second-generation, DSP coprocessor for the HP 9000 Series 200/300 engineering workstations.

Occupying a single DIO card slot, the DSP-300 combines Motorola's 10.25 MIPS 24-bit DSP56001, a novel architecture optimized for high throughput and an easy-to-use software interface to deliver the high precision (144 dB dynamic range) and high speed (3.39 msec for a 1,024-point complex FFT) necessary for the most demanding real-time signal processing applications.

A dedicated external I/O port brings real-world signals directly to the coprocessor eliminating the often crippling computer bottleneck. Throughput is enhanced further by the DSP-300's ability to communicate with the host while executing signal processing routines.

Finally, the use of host interrupts permits the workstation's high-level program to

continuously execute while the DSP is busy number-crunching.

Ariel supplies the DSP-300 with BASIC and PASCAL interfaces, the DSPFFT utility and complete documentation. The DSP-300 is available now and sells for \$2,400.

Contact Ariel Corporation, 433 River Rd., Highland Park, NJ 08904; (201) 249-2900.

Circle 399 on reader card

CLAS/SL Improves Shop Floor Management

Peripheral Software Concepts Inc. has announced CLAS/SL. The name is an acronym which stands for Closed-Loop Automatic Scheduling/Striped Lightning.

CLAS/SL gives production managers the ability to control production scheduling dynamically so that Manufacturing Resource Planning (MRP II) can be integrated with shop-floor data collection and capacity planning.

CLAS/SL can be integrated with a currently installed MRP system or with Striped Lightning. Striped Lightning tracks utilization of labor, material and machines on the shop floor. When problems arise, CLAS/SL enables management to resize lots and reschedule work.

The product is value priced on a site-license basis with prices starting at \$80,000 for a single-site, single-workstation license. Contact Peripheral Software Concepts, Inc., 600 Johnson Avenue, Bohemia, NY 11716; (516) 563-7000.

Circle 400 on reader card

CASE:W Generates Windows Application

SofTools Inc. (Atlanta, GA) has announced a new computer-aided software engineering tool that generates the Windows portion of its applications.

CASE:W is an expert system created from SofTools' specialized knowledge base of Windows code sets and production rules. It includes a complete programming environment to generate concise, well structured, pretested Windows code. This package features a special front-end "prototyper" that provides a high-level, convenient way to describe the application program's windows and controls.

SofTools recommends that CASE:W be used on a 386-based machine with at least 2-MB of memory. The package also requires the Microsoft Software Developer Kit, the

C Compiler, Make Utility and Linker and a DOS or Windows compatible text editor.

CASE:W is priced at \$795.

Contact SofTools Inc., One Dunwoody Park, Suite 130, Atlanta, GA 30338; (404) 399-6236.

Circle 396 on reader card

JetForm Supports HP LaserJet IID

Indigo Software Ltd. has announced that its new JetForm family of products will support the HP LaserJet IID printer, as well as all other LaserJet printers and PostScript laser printers.

JetForm runs under Microsoft Windows, has a full WYSIWYG design facility and supports graphics and barcodes. Graphics features include a selection of line widths and styles, circles and arcs.

Contact Indigo Software Ltd., 560 Rochester St., Suite 400, Ottawa, Ontario, K1S-5K2; (613) 594-3026.

Circle 385 on reader card

HP Announces Real-Time Interface Card

Hewlett-Packard has announced the HP Real-Time interface card, a user-programmable I/O card for the HP 9000 Series 800 family of HP-PA computer systems.

HP Real-Time interface gives original equipment manufacturers (OEMs), third-party software suppliers and systems in-

tegrators a tool for producing custom, real-time device communications software.

The HP Real-Time interface card provides the Series 800 computers with a multi-tasking, user-programmable interface for real-time communications with serial I/O devices including programmable logic controllers, supervisory control and data acquisition (SCADA) devices, robots or custom equipment.

Real-Time communications links are essential for workcell control and area management or multicell applications.

The HP Real-Time interface card, and run-time software is \$2,000.

Contact the Hewlett-Packard sales office listed in the white pages of your telephone directory.

Circle 398 on reader card

SUPERDEX Adds Speed And Flexibility To IMAGE

Bradmark Computer Systems announces the release of SUPERDEX, a software package that adds data retrieval speed and flexibility to the IMAGE, TurboIMAGE and Turbo-IMAGE/XL database environments on the HP 3000.

SUPERDEX allows multiple keys in master or detail sets, generic and partial-key lookups, wildcards, automatic keywording and keyword retrieval, transparent field grouping and sorted sequential access using concatenated keys.

It also allows dynamic relational queries

across multiple files, datasets and databases, adding to the flexibility and power of a relational database to the standard IMAGE environment.

SUPERDEX automatically creates and manages new B-tree indexes in standard databases, maintaining full compatibility with transaction logging, existing applications and utilities. Interfaces are provided for PowerHouse and other packages.

Contact Bradmark Computer Systems, 100 Oceangate Ave., Suite 505, Long Beach, CA 90802; (213) 432-7713.

Circle 393 on reader card

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Win/Route2, a new Internet Protocol (IP) routing product, recently was introduced by the Wollongong Group. Win/Route2 enables TCP/IP communication between HP 3000 802.3 computer networks and Ethernet networks.

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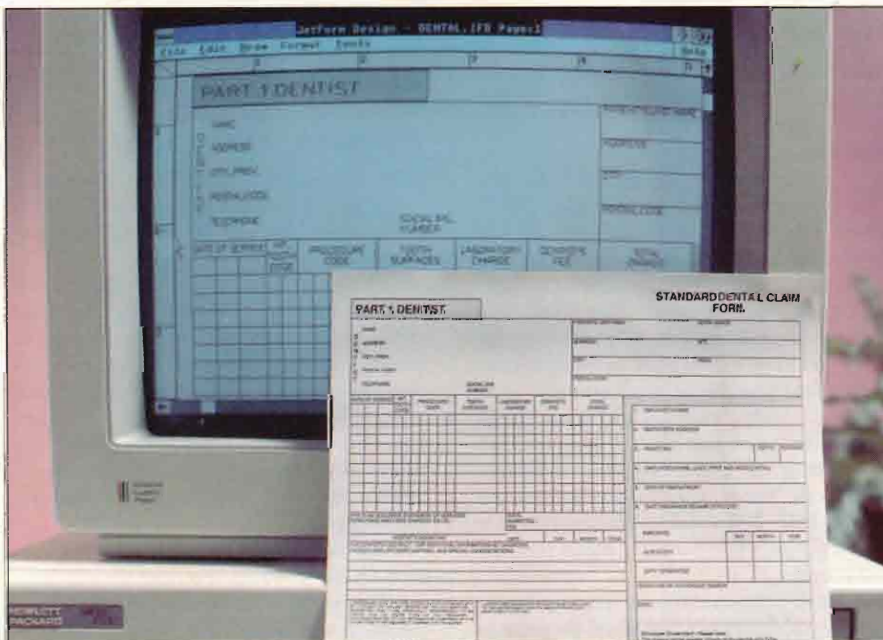
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Continued on page 86.



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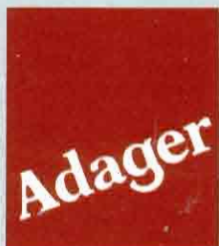
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IMAGE Is The Foundation And The Schema Is The Authoritative Blueprint

IMAGE

For The New User

[By Joseph D. Speier]

It wasn't so long ago that when you mentioned you were involved with data processing, people assumed you (a) worked for IBM, (b) were as smart as could be and (c) thought a lot. After all, THINK is IBM's motto.

But, that's ancient history. The data processing field has grown and marketing arguments have changed. Instead of think, today's users are urged to touch and feel. Yet, good data processing is impossible without effective thinking.

Consider the meaning of "data processing." It is made up of an object and a verbal noun. Data or information is the object of our efforts. Processing indicates the work to be done with the data.

In the HP 3000 environment, IMAGE is the object that holds the data. The processing, the collection of instructions and procedures that make up our HP 3000 information systems, can exist in one of many diverse languages. Any of the traditional languages, such as COBOL, BASIC, FORTRAN, PASCAL etc., and all of the latest hybrid languages referred to as 4GLs (see IMAGE Made Easy box), can be used to process the data contained within an IMAGE database. No matter what language we use to handle the processing, the system will be only as good as the database that forms its foundation.

Therefore, an understanding of the data needed by the application area and also a basic knowledge of the structures used to store that data are essential for both the

Image has two types of files:
detail and *master*. These
 are difficult to define
 in logical terms, but easy
 to explain in terms
 of organization.

responsible user and the system professional.

In this article, I will attempt to explain IMAGE to anyone new to the HP 3000, curious about how it works, serious about making good information systems and willing to think first and implement later.

To clear up the relationship between an application's data and the IMAGE structures used to store that data, we'll design and define in IMAGE terms a simple database for an advertising application.

The Lesson Begins

ADVERTISING IS NECESSARY TO inform buyers that your products and services are available. An interested buyer might respond by asking for more information. This creates a lead. Let's consider a system to store those leads.

Find any ad in this magazine and notice that it contains a "reader service number" that corresponds to a Reader Information Service card located elsewhere in the magazine. An interested reader can use this card to request more information about a product or service. The advertiser regularly receives a list of leads from the magazine.

Our main goal is to keep information about sales leads together with the ad that generated them. What develops is a file of ads containing a "subfile," if you will, of related leads.

A manual system for handling this data would require folders and file cabinets. To operate the system:

- place each ad in a labeled file folder
- place the labeled file folders in a file cabinet
- file all sales leads in the same file folder as the ad that generated the lead
- train someone to keep things running.

Our simple, manual system consists of two files. The main file consists of all the manila folders for the ads and is kept in the file drawer. The "subfile(s)" are contained within the folders and consist of pieces of paper with information about

the potential customers who responded to the ad.

This system works fine, but your business is growing and the marketing office is running out of space for additional file cabinets. But with an HP 3000 bundled with IMAGE, you can convert this file cabinet system to an electronic database.

An Introduction To IMAGE

IMAGE is Hewlett-Packard's database management system. A database is a collection of files whose data pertains to a common application. This collection is organized under one manager that controls the activities of these files.

The manager is a set of programs that determines the required structure of each database, constructs the database and allows the user to access the data through a set of special programs known as *intrinsic*s. These *intrinsic*s prepare the database for processing, place records within the database and retrieve records for reports.

The control which the database manager has over the data has to be well defined. This is specified in a blueprint called the *schema*. Strict rules to specify how the data will be shaped and stored are established before the database can be constructed.

The smallest building block of an IMAGE database is the *data item*. The name of the lead, the zip code, the telephone number and the date the ad ran are some examples of data items. Each item is named and described in terms of its size and data type (alphabetic or numeric).

The next building block is the *record* or *data entry*. Records contain data items for the object they represent. Records for sales leads contain data items such as the name and address of the prospective client. Records for ads contain items that describe the ad's code, its description, its cost and so forth.

A group of these records, called the *file* or *data set*, form the next building block. The file contains only those records that represent members of the same class of objects. In our example, we need a file for the ads and another for the sales leads.

Methods For Storing Data

IMAGE has two types of files: *detail* and *master*. These are difficult to define in logical terms, but easy to explain in terms of organization.

A detailed data set is an area on a disc divided into a number of like-sized storage locations into which the values for the data items that make up the records will be stored. These locations are pre-assigned and numbered.

They eventually will contain not only the data relating to the application but also numbers of other records in the same file with which they are related, assuming a relation-

ship exists and is specified by the database designer. In our example, leads are related if they come from the same ad.

As information is added to a detail file, IMAGE stores it

Master records appear scattered . . . but there is a method behind the apparent madness.

in the next available slot, usually following the last record added.

A master data set physically is very similar to a detail data set, but IMAGE places records in a master data set in a unique manner. Each master record, by its very nature, contains one data item that will hold a unique value within the master data set. At no time will IMAGE permit two records in a master data set to have the same value. IMAGE accomplishes this by keeping the values that represent records in a field called a "key." No two keys ever are permitted to share the same value. In our manual filing system each folder shows the ad ID on its tab. These IDs should not be the same but could be through negligence.

The IMAGE manager guarantees that this cannot happen. Before IMAGE places a master record, it takes the value found in the key field, runs it through a formula that generates a

number and stores the record at the location pointed to by that number. Master records appear scattered throughout the data set, but there is a method behind the apparent madness. To retrieve the record the known ID value must go through the same formula to compute the address. This formula is known as the *hashing algorithm*.

Retrieval

AFTER STORING INFORMATION, you need to retrieve it. There are many and sufficient ways to handle the demands of most applications. The records in a file can be processed one-by-one in the physical order they were stored. This process can start at the first and continue to the last or start at the last and work to the first. This is known as *sequential* or *serial access*. If you happen to know the number of the storage location containing the record you need, IMAGE lets you acquire that record directly. This is known as *random access by record number*.

With a master data set IMAGE will compute the record number and retrieve the record directly if you supply the value of its key. HP refers to this as a *calculated read* because the location of the desired record is calculated by the hashing algorithm.

A useful method of retrieving records from a detailed data set gets only those records that are related. In IMAGE, you can access directly only the related records you desire. You can read them one-by-one from the first to the last or the last to

[IMAGE MADE EASY]

Fourth-generation languages like Speedware from Infocentre and PowerHouse from Cognos are productivity tools used with IMAGE databases. These products are designed more for software developers, than end users, but they are products that give end users better access to information residing in IMAGE databases.

The Expert from Cognos is a component of PowerHouse. It is an information retrieval tool that allows end-users to build their own reports with the PowerHouse application building environment.

EasyReporter from Infocentre is sold as a separate product and can be used with Speedware, PowerHouse or even COBOL.

This report builder provides a menu-driven user interface that lets the user build reports, screen inquiries and graphs without writing queries to the IMAGE database.

The Answer from O'Brien Downs Systems currently works as a companion product to SFD (System Four Distribution), software for distributors from Distribution Resources (Denver, CO). The Answer provides distributors with information about items, customers and vendors to help them quickly answer customer and vendor requests. A future release of The Answer will offer integrated information management for IMAGE databases used with other products.

—Peggy King

PowerHouse

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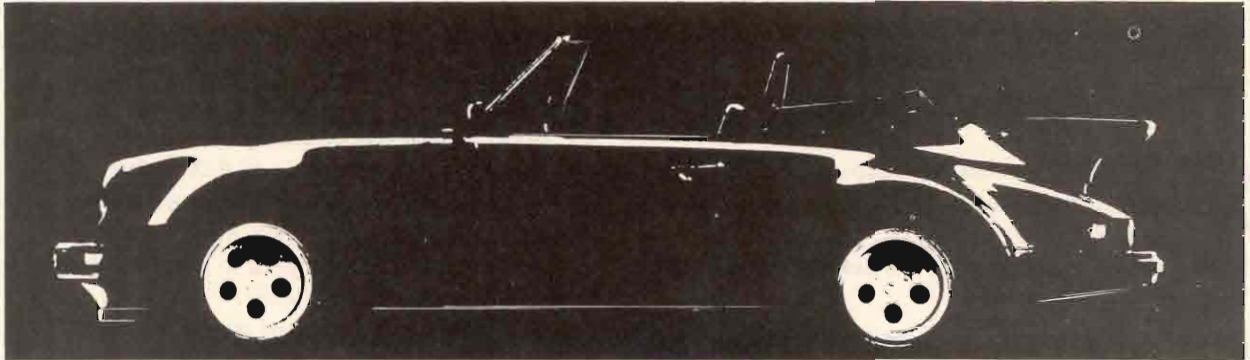
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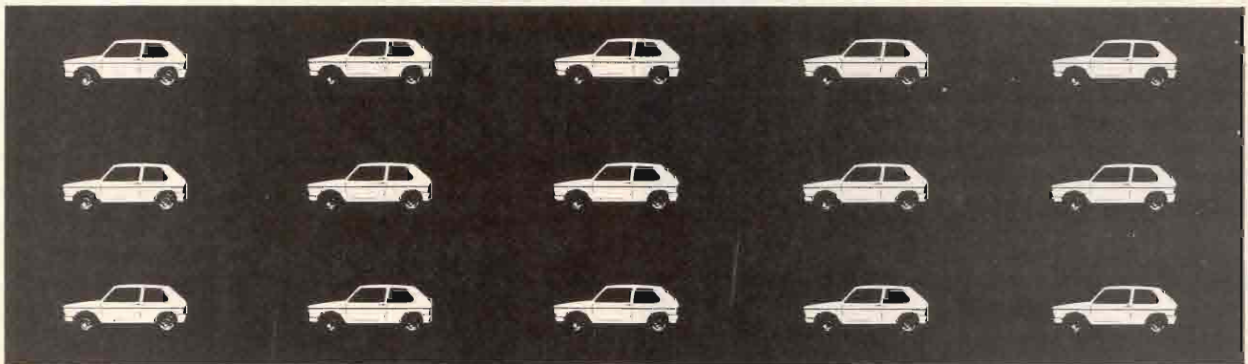
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first. This is known as *chained access*. It saves processing undesired records and is used, for example, when you want to list just the leads generated by a particular ad.

These are the main features of IMAGE. Applying these features starts with data items.

Building A Database

WHAT ITEMS OF INFORMATION do we need in order to track the ads we place and the leads they generate?

In practice we would begin by reviewing the informa-

tion collected in the manual system. An ad's folder contains a cover sheet for the ad, which contains constant information about the ad. Let's keep only the ad identifier, a brief description of its contents, the date the ad was placed, the name of the magazine in which it appeared and its cost. Five distinct items of information will make up the records for the ad file. For the leads, we will keep the person's name, address, phone number and the date the lead was received.

In our manual system, these leads were placed in the same folder as the responsible ad. In an IMAGE database, however, this relationship is achieved by storing the ad identifier with the other data items of the lead. All leads with the same ad identifier form a unit, analogous to the manual system's file folder. This unit is called a *chain*.

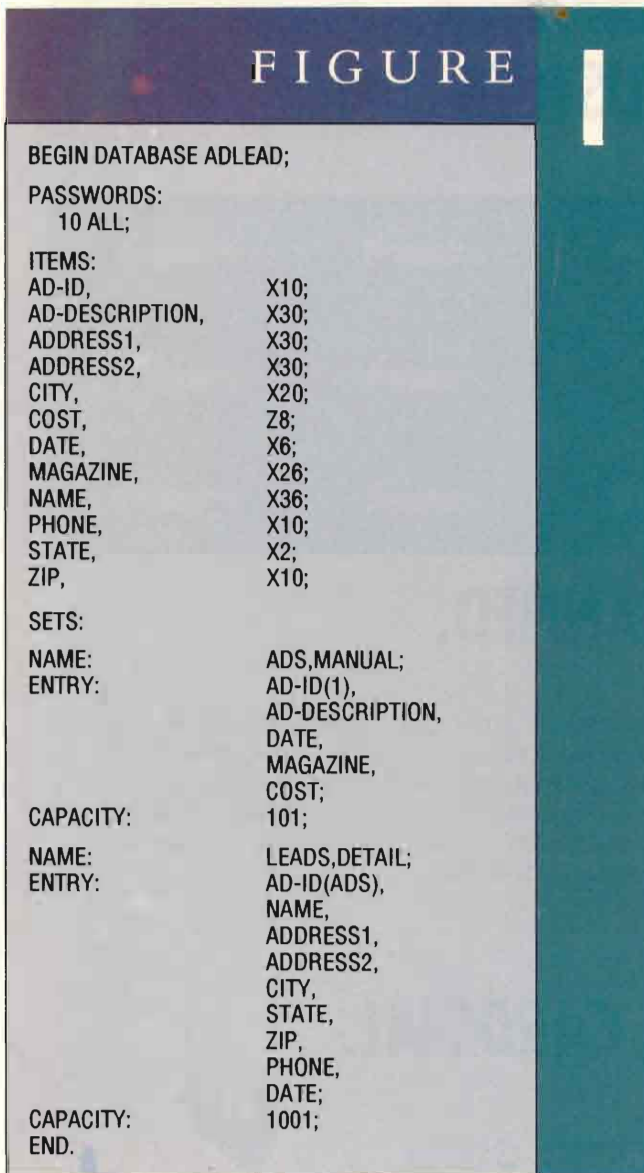
The chain begins with the record in the ad file with a unique identifier and continues with the detail lead records that also have this value as their ad identifier. IMAGE maintains the connection between these related records by pointers alongside the application information.

In this example, the ad is superior to its leads: It generates leads. In IMAGE terminology it is a *master file record*. The leads are called *detail records*.

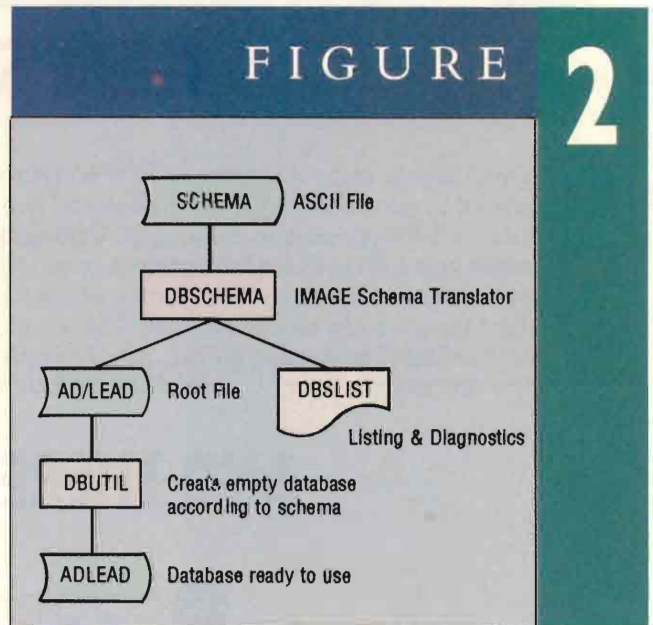
This database is now completely designed.

The actual construction of the database on the computer is a mechanical process. Not much thinking needed here. The design, which we just completed, must be expressed in a language that IMAGE understands. This is accomplished by entering an ASCII file known as the schema in which syntactical rules are followed in order to specify the database.

This schema, shown in *Figure 1*, has been formatted so



This schema defines the ad/lead database.



The schema is translated into machine language.

Whenever a name is required it's important to choose a meaningful name; one that indicates the function and content of what it names.

that its appearance indicates the functional components. The BEGIN and END components stand for just that. Following the BEGIN DATA BASE is the name you chose for the database. This name must be used in the future whenever you work with the database. It consists of no more than six characters, the first of which must be a letter. Whenever a name is required it's important to choose a meaningful name; one that indicates the function and content of what it names. ADLEAD does this.

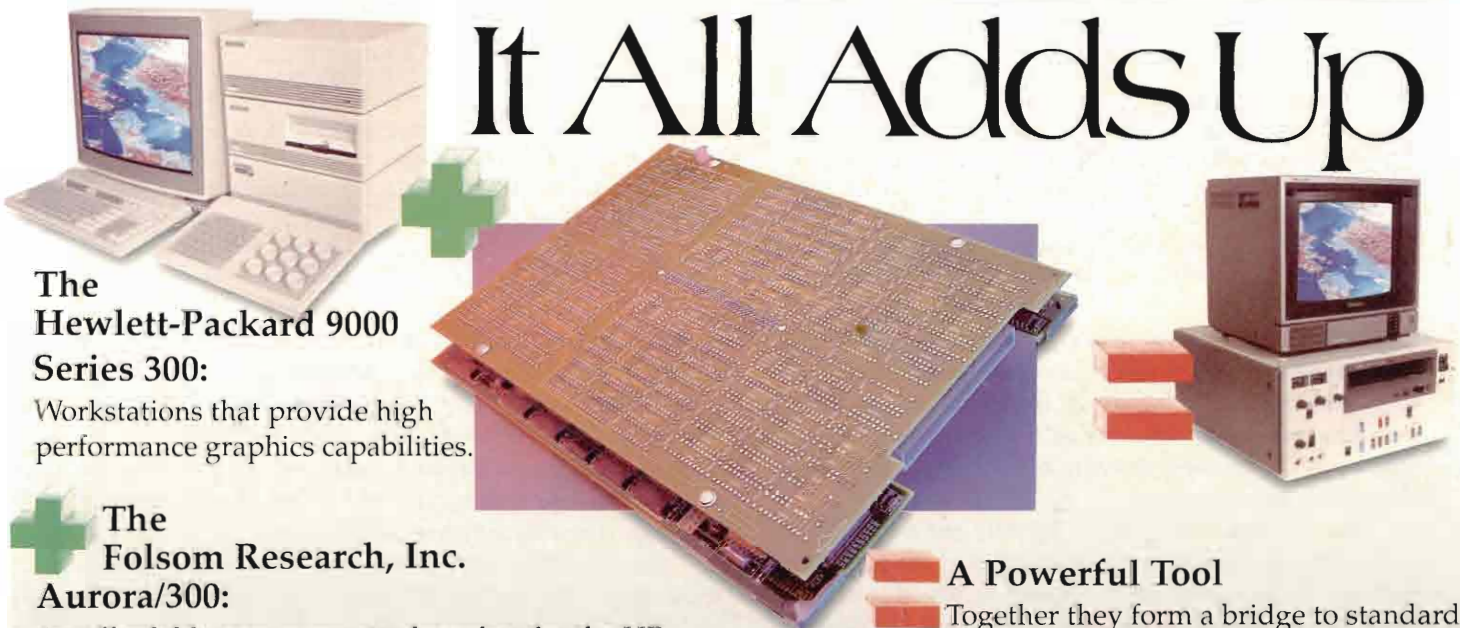
PASSWORDS allow for security. Through the passwords, IMAGE can restrict access to the database and limit the range

of activities once the database is opened.

ITEMS marks the beginning of a list of data item definitions. Its objective is clear. Each item of information is assigned a name and described by the type of data it will contain. In our example, X is for alphanumeric characters, Z for numeric. Only the cost information will be used in calculations so this data item's type must be numeric, thus the Z. The number following the X or Z indicates the number of these characters the item will need. The ITEMS section must contain every data item that will appear anywhere in the database. It is helpful to arrange them in alphabetical order. Since our list is short this may seem unnecessary, but a database schema with more than 50 data items is easier to study when the data item names are ordered alphabetically.

SETS indicate the beginning of the file specifications. To define the data sets or files we need to specify several attributes. Assign a name to the data set following the label NAME: and indicate its type.

MANUAL indicates a master data set that will contain more data about the record besides its key. (There is another type of master known as an *automatic*, which contains only the key field but we need not discuss this here.) DETAIL indicates a detail data set. ENTRY is followed by the data item names, defined above under ITEMS, that will make up each record. They are listed as they occur on the record. Notice



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[UPDATE ON TURBOIMAGE/XL]

Some customers are concerned that the introduction of the relational model HPSQL will mean declining support for TurboIMAGE, the network model database that comes with all HP 3000 operating systems. Recently announced enhancements to TurboIMAGE/XL on HP Precision Architecture (HP-PA) systems should allay fears that Hewlett-Packard is no longer committed to this database management system product.

The initial release of TurboIMAGE on HPPA systems included performance enhancements to take advantage of Precision Architecture features. Now HP's focus is to enhance the product with new functions. The enhancements will provide customers with added database system design flexibility and a better high transaction processing solution. These enhancements, which will be rolled out over the next 18 months, include dynamic expansion of detail data set size, IEEE Reals data type support, dynamic rollback of transactions and performance improvements in several database utilities.

Expansion Of Detail Data Set Size

The TurboIMAGE DBMS is a network model database that provides for Master set and detail set relationships. The capacity of the set must be defined at database creation time. Today when a set reaches its fullest capacity the database administrator needs to reconfigure the database in order to increase the set capacity. Capacity is changed by using a database restructuring tool like HP's DBChange, Adager's product of the same name, or Bradmark's DBGeneral, or by unloading, recreating and reloading the database. With the dynamic expansion capability, a customer will be able to specify a maximum capacity, an initial allocation and an expansion factor when more space is needed. This expansion allows the database user much more flexibility in disc space management within the application software.

The current version of TurboIMAGE supports only HP Reals,

HP's proprietary format for real numbers, that allows calculation to more decimal places than the adopted IEEE standards. The new version of TurboIMAGE supports IEEE Reals on MPE/XL systems. HP also will be adding features for Native Language Support and the floating point decimal data types D2 and D4.

Dynamic Rollback Of Transactions

Dynamic rollback of transactions will allow the user to decide whether or not to continue with a transaction based on information received after the transaction has been started. This UNDO feature also will cover automatic rollback of the transaction on program or system aborts. For example, a user could start a transaction and then have the application check for the validity or existence of certain data. Based on the value returned, the transaction could be "Rolled Back."

Utilities And Performance Enhancements

Several of the database utilities including DBUNLOAD, DBLOAD and DBRECOV are being ported to Native Mode for enhanced performance on HP-PA systems. These utilities will allow customers to manage data storage and recovery in a more efficient and timely manner.

The TurboIMAGE restructuring tool, DBchange, also is being enhanced with a Command File feature which will allow users more options in database restructuring. With the Command File feature, changes can be distributed to several different databases via job streams. Changes then can be made in job mode without using the VPLUS screen.

In addition HP plans to support higher concurrency by making continued performance improvements. Customers who have built applications around TurboIMAGE databases can expect continued support and enhancement of this database product.

—The HP Professional Staff

especially that one data item in each of these data sets stands out because of a pair of parentheses following it. It happens to be the same data item, AD-ID, the key to the master and item for grouping key details by ad. On the master, the parentheses contain a number that tells how many detail data sets this master file controls.

In our database, the ads control only one detail file, the leads. The information in the parentheses at the detail level indicates the key item and the master to which it belongs. CAPACITY is followed by the number of records this file eventually will hold. END is the last statement of the schema.

If you ever need to know what an IMAGE database contains and how it is organized, print the latest schema; it is the final authority. If the names were chosen well you'll be surprised at how easy it is to understand.

The schema that you see has to be translated into machine

language. This is done by a program called DBSCHEMA. (see Figure 2) If there are no mistakes in the schema, it will generate a ROOT FILE, which is used to tell another program, DBUTIL, how to build an empty database. After DBUTIL creates the structure, data can be stored and retrieved. At this point the object of "data processing" is ready for whatever processing language your company has chosen.

This introduction to IMAGE is intended to help you begin thinking effectively about the information systems on your HP 3000. IMAGE is the foundation and the schema the authoritative blueprint. — Joseph D. Speier is director of Speier Associates, a Cincinnati-based HP 3000 software supplier.

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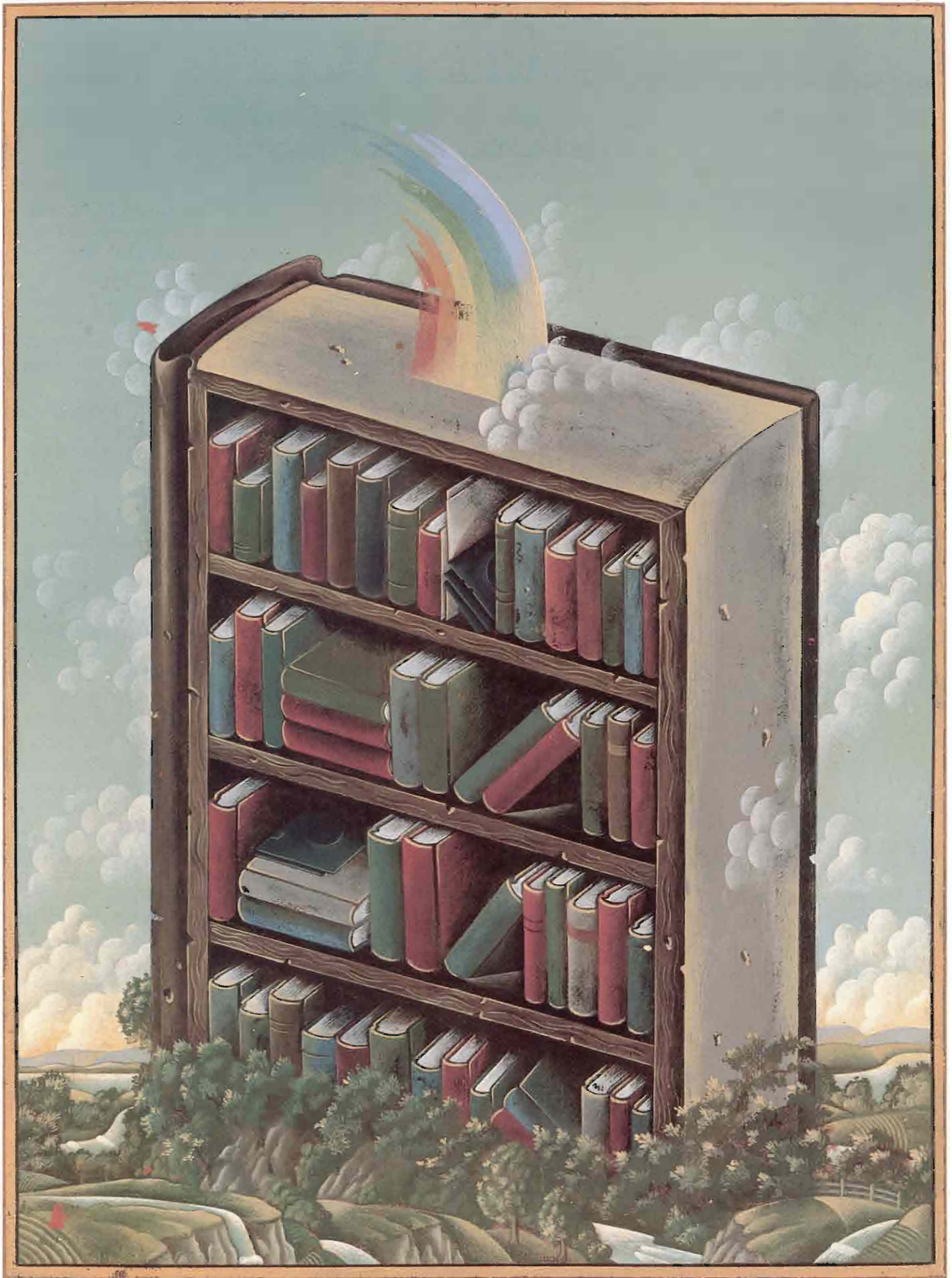
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Despite The Cost, Relational Is The Way To Go

IS THERE AN RDBMS IN YOUR FUTURE?

[BY MARC DESCOLLONGES]

All the new database management systems (DBMS) surfacing on the market claim to be relational. And, almost all of them have adopted similar versions of Structured Query Language (SQL) to provide a simple and consistent means for defining, querying, maintaining and protecting the contents of a relational database. Even vendors of older, nonrelational systems are offering relational-like access to data, usually via an SQL language interface.

The three families of DBMS are based on three well-known ways to model data: hierarchies, networks and relations.

The first hierarchical and networked DBMS appeared in 1963 and 1968 respectively. These old-fashioned systems still are being used by a majority of large MIS shops. We will briefly analyze them, in order to emphasize the benefits of migrating to the state-of-the-art relational technology. Networked and hierarchical DBMS sometimes still are preferred to relational ones for applications that require high performance. They are relatively stable, requiring infrequent maintenance.

In the *hierarchical model* of data, the schema takes the form of a tree whose nodes are entities, and the branches linking two nodes represent parent-child relationships. The top of the hierarchy, called the root, is the entry point in the database. It contains the only information that depends on no other. In the education database pictured in *Figure 1*, the TEACHER entity is a child of the OFFERING entity, and the COURSE segment is the root; it has no parent.

Such a hierarchy offers a simple, efficient representation of data. But, it's unable to map reality in sufficient detail and accuracy. The real world isn't always hierarchical.

Any entry in a table, regardless of its data type, may have the special value *Null*, which is equivalent to *unknown*.

Networks can be regarded as generations of hierarchies where a child entity can have any number of parents. In a network, any information can be an entry point. With this structure, the same data may be accessed via several paths, thus eliminating some of the built-in bias of a hierarchical model.

Because of the huge effort required to migrate large databases and application programs to relational DBMS, hierarchical and network DBMS still are used widely, mainly on large mainframe computers. These DBMS have the following limitations:

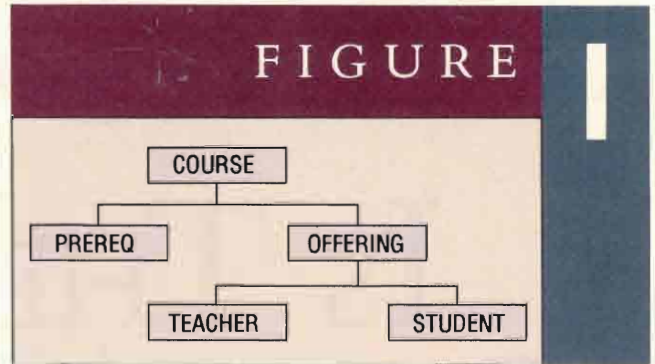
- Users need to have a deep knowledge of databases.
- Despite usability improvements, they aren't flexible in respect to frequent application changes and don't allow easy, unplanned data access by users.
- There is too much interdependency between programs and data. Errors or omissions during the design phase cannot be fixed easily, thus causing dramatic maintenance problems.

In order to solve the problems inherent in hierarchical and network databases, Doctor E.F. Codd developed the *relational model* in the early 70s. The first commercial RDBMS implementations appeared in the late 70s.

A relational database management system (RDBMS) is a system that implements the relational model, which is more flexible than the hierarchical and network models because applications are easier to implement and change.

In the case of networks and hierarchies, the relationships between data are represented by the structure itself — in a network, through owner-member links; in a hierarchy, through parent-child links. But, in relational data structures all relationships between tables are represented purely by the values in those tables.

A *relation* is a simple, two-dimensional table having a specific number of unordered columns and any number of unordered rows. Figure 2 uses the example of a telephone directory to show a table with three columns. The number of entries, and their order in the table, are insignificant according to relational theory.



A hierarchical database

NAME	OFFICE	PHONE
Euler	D23	1913
Johnson	A18	2112
Adams	J12	4128
Brown	C44	1944
Scotts	D23	1915
Keeler	D24	3622

A relational table

```

SELECT  NAME,  PHONE
FROM    PHONEDIR
WHERE   OFFICE = 'D23'
    
```

An example of an SQL statement

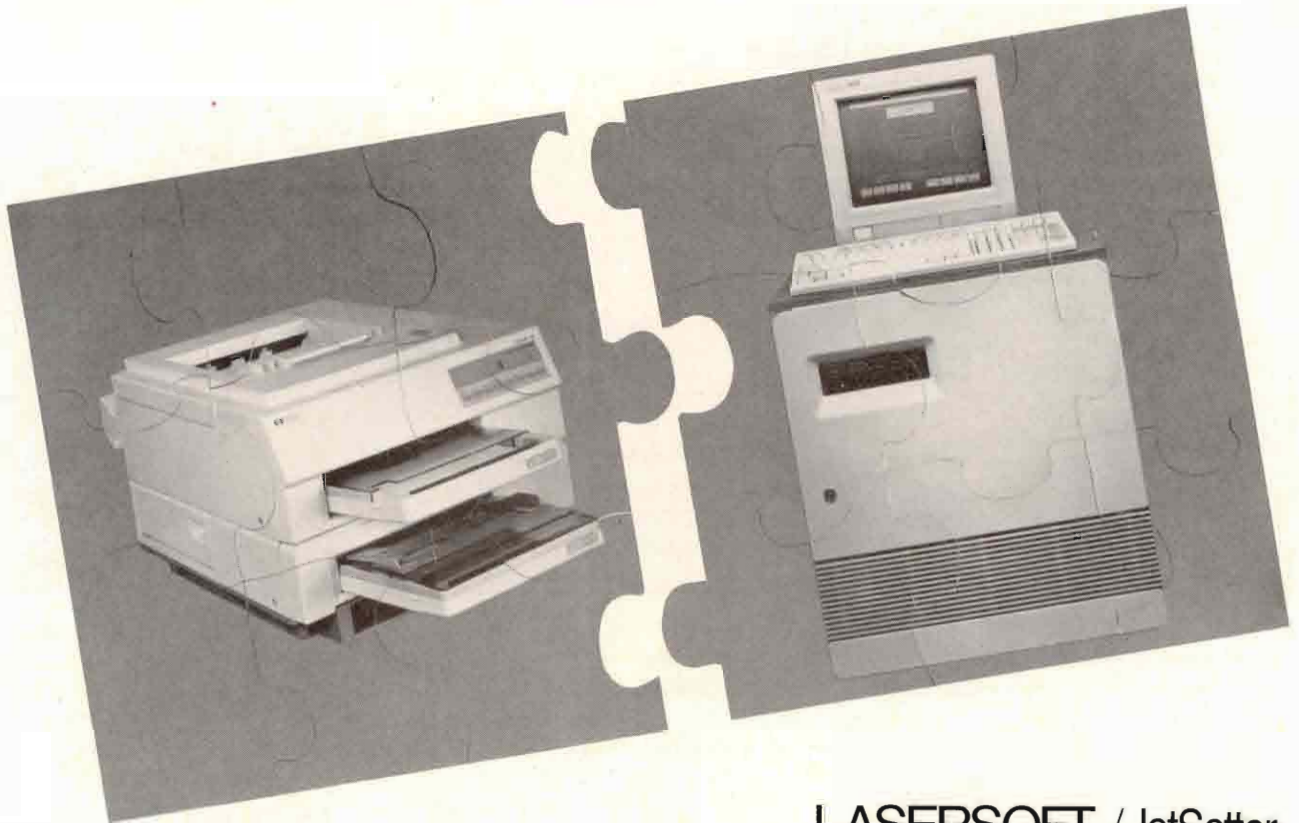
Any entry in a table, regardless of its data type, may have the special value *Null*, which is equivalent to *unknown*. A null value may be thought of as an empty space, or a space reserved for later insertion of data. Nulls can occur in a relational table by explicit user request through an insert or update operation, or implicitly when a new column is added to an existing table. Null values can be prohibited for specific columns when the table is created.

In addition to providing a structure for data in the form of tables with rows and columns, a relational DBMS also includes a database language to access and update these tables. Relational algebra defines a set of rules and operators allowing at least the following operations:

- Retrieval from a single table: A subset of rows from a given table or a subset of columns from a given table, or both, is selected.

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FIGURE

4

```

SELECT    NAME, PHONE, BUILDING, FLOOR, OFFICE
FROM      PHONEDIR, LOCATION
WHERE     OFFICE = ROOM
          AND CITY = 'LA'
ORDER BY  BUILDING, FLOOR, NAME
    
```

PHONEDIR Table

NAME	OFFICE	PHONE
Euler	D23	1913
Johnson	A18	2112
Adams	J12	4128
Brown	C44	1944
Scotts	D23	1915
Keeler	D24	3622

LOCATION Table

ROOM	FLOOR	BUILDING	CITY
D24	4	CENTRAL	LA
D23	4	CENTRAL	LA
J12	26	NORTH	NY
C44	28	SOUTH	NY
A18	32	SUNSET	LA

NAME	PHONE	BUILDING	FLOOR	OFFICE
EULER	1913	CENTRAL	4	D23
SCOTTS	1915	CENTRAL	4	D23
JOHNSON	2112	SUNSET	32	A18

Example of a Join statement

- **Combination of multiple tables:** Rows from different tables are combined into new tables based on common fields. This is an essential facility of an RDBMS.
- **Modification of tables:** Individual rows or a group of rows are inserted, deleted or updated. The ability to process a group of rows at once is called set processing.
- **Definition of tables:** A data definition language is provided for defining new tables and changing or deleting existing tables. This part of the language also includes the functions necessary for the database administrator to define and maintain the storage-oriented aspects of the databases.

Overview Of SQL

SQL IS A WIDELY used relational database language that supports most functions of relational algebra in a user friendly syntax. It is powerful, allowing complex data manipulation, yet simple for basic operations. For example, SELECT is the only SQL statement needed for all types of retrieval queries. To query data in SQL, you need to specify only:

- *What data has to be selected*
- *In what table(s) it is located*

- *What condition(s) must be satisfied by the data*

Figure 3 shows a typical SQL statement used to retrieve the names and phone numbers of all the employees located in office "D23" from the table called "PHONEDIR" shown in Figure 2.

Retrieving data from multiple tables can be accomplished using one of the three following techniques:

- **Join**
- **Union**
- **Subselect**

Figure 4 shows an example of a *Join* where the LOCATION table is associated with the PHONEDIR table in order to obtain an ordered list of employees with their internal addresses. The figure displays the SQL statement, the two tables and the result. This example assumes that the LOCATION table has one row for each room, which identifies the floor, building and city. The two columns called OFFICE in the PHONEDIR table, and ROOM in the LOCATION table, represent the same attribute. ROOM is the key (preferably unique) of the LOCATION table, and OFFICE is called a foreign key for the PHONEDIR table.

Figure 5 shows a *Union*. In this query a directory is created by extracting the rows for all the regular employees from the PHONEDIR table and concatenating this list with the list of

employees on temporary contract, extracted from the TEMPPHONEDIR table. The figure displays the SQL statement, the two tables and the result.

Figure 6 shows an example of a *Subselect*, in which rows in the PHONEDIR table are selected according to values in the LOCATION table. Note that this *nested select* can be an alternative to a *Join*.

Arithmetic calculations on column values, as well as aggregation functions may be used in SQL, and qualifying conditions may be applied to groups. The example in Figure 7 identifies buildings in Los Angeles having at least 10 rooms, and further indicates their total size and the size of their largest room.

SQL is not only a query language; it also allows data modification with the UPDATE, DELETE and INSERT statements. The example of an UPDATE shown in Figure 8 is good news for all personnel with a "2" appraisal.

Obviously, not everyone should be allowed access to salary changes. In SQL, security and authorization are provided by *Views* and the GRANT and REVOKE statements.

In addition to tables, users can create and manipulate views. A view is defined as a logical table that is derived from one or more tables (or views). The definition of a view, and

In SQL, security and authorization are provided by *Views* and the GRANT and REVOKE statements.

not the view itself, is stored in the database.

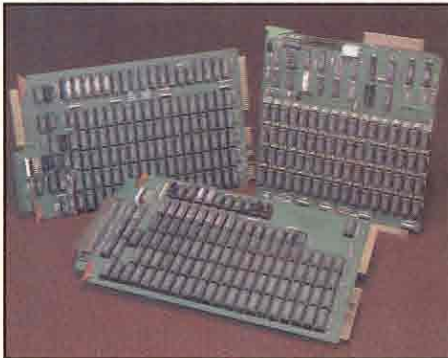
The semantics of a view are exactly the opposite of the concept of transparency. Transparent means not visible but there, whereas views are visible, but aren't there.

Views simplify data manipulation commands, provide a high degree of data independence and limit the user's perception of data.

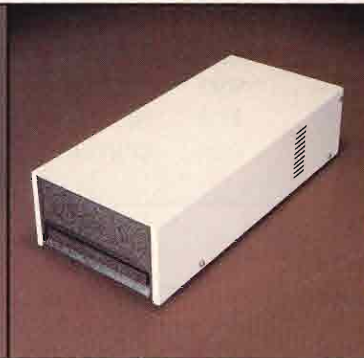
Complex SQL SELECT statements can be written using the name of a view in the FROM clause, to avoid the explicit coding of joins, subselects, etc.

Application programs should not reference real tables

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FIGURE

5

```

SELECT      *, 'Regular'
FROM PHONEDIR

UNION

SELECT      *, 'Contract'
FROM TEMPPHONEDIR

ORDER BY NAME
    
```

PHONEDIR Table

NAME	OFFICE	PHONE
Euler	D23	1913
Johnson	A18	2112
Adams	J12	4128
Brown	C44	1944
Scotts	D23	1915
Keeler	D24	3622

TEMPHONEDIR Table

NAME	OFFICE	PHONE
Stower	A01	4321
Mickey	A01	4321
Aston	A02	4325

NAME	OFFICE	PHONE	BUILDING
ADAMS	J12	4128	REGULAR
ASTON	A02	4325	CONTRACT
BROWN	C44	1944	REGULAR
EULER	D23	1913	REGULAR
JOHNSON	A18	2112	REGULAR
KEELER	D24	3622	REGULAR
MICKEY	A01	4321	CONTRACT
SCOTTS	D23	1915	REGULAR
STOWER	A01	4321	CONTRACT

Example of a Union statement

directly. They should reference views defined in these tables or in other views. Views can be used to prevent the users from accessing confidential data and from updating sensitive tables.

Unlike real tables, views cannot always be updated. And, in many cases, views based on multiple tables aren't updatable logically. In effect, most RDBMS don't allow updates on multiple-table views.

If information has to be shared among many users, the owners of tables have to authorize some other users to access (read, update, insert, etc.) specific data in the database. Privileges such as:

- SELECT
- UPDATE
- DELETE
- INSERT
- ALTER
- INDEX

may be GRANTED to or REVOKED from a given user, or all users. These privileges usually are granted by the owner of the table, who happens to be its creator.

Requirements Of A DBMS

IF YOU ARE IN THE MARKET for a DBMS, whether relational or not, the following considerations apply. Consider the problems listed, and see how they have been solved by the vendor.

A database system is an extension of a filing system that allows a large number of users to access a collection of data and to perform a large variety of database operations concurrently. A database management system is an integrated set of programs that are needed to create, control and maintain a

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database system. *Figure 9* shows how multiple users can invoke the programs of the database system simultaneously in order to access a collection of data.

Depending on the DBMS and the selected data grouping, this collection of data could be called either a database, a portion of a database, or even a collection of databases.

Recent developments have made it possible to make logical groupings of data residing on several processors ranging from micros to mainframes. To the user and to the application program, remote data looks as if it were local. This capability is called *data distribution*.

The essential functions and features that should be offered by a DBMS include:

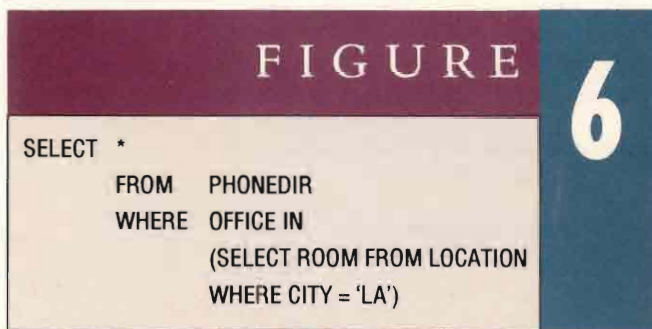
Data Sharing: Data sharing implies that the same piece of data may be used by several users, probably in different ap-

plications, instead of having each user maintaining and controlling his own data. Data sharing promotes a better integration of applications.

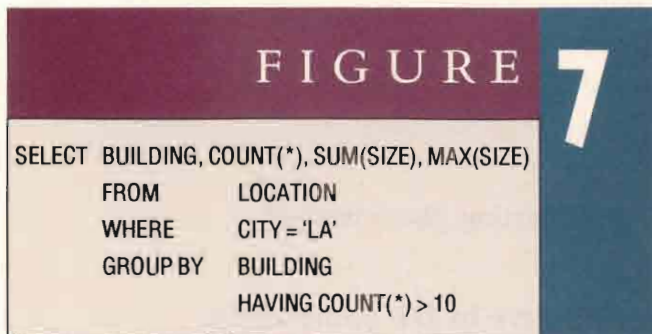
Minimum Redundancy: Although data duplication may be needed for better availability or for performance reasons, the data model used and the database design should enforce the minimization of data redundancy. This can be achieved using a technique called *data normalization*.

Data Integrity: This refers to data correctness. One important aspect of integrity will be ensured by the simultaneous update of two pieces of data that are interdependent, e.g., credit/debit of two accounts.

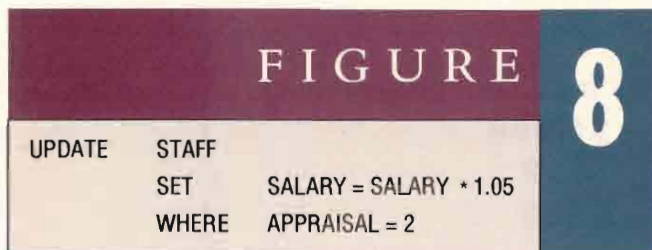
Data Security: This function is required to protect sensitive data against unauthorized or malicious access by specific programs or users.



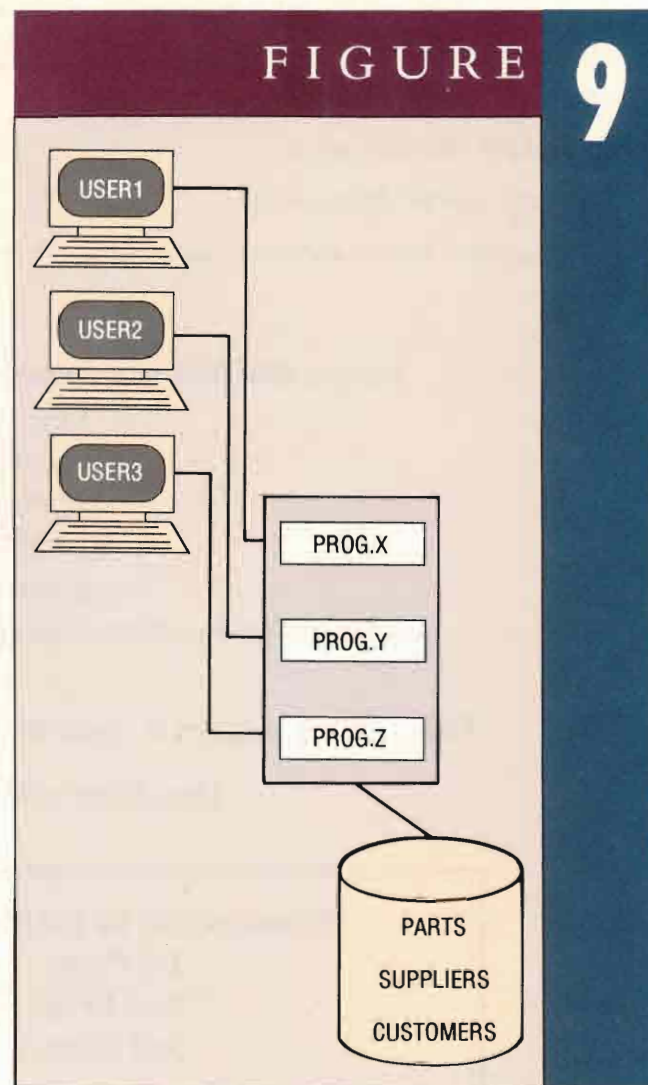
Example of a Subselect statement



Example of a Having clause



Example of an Update statement



Synopsis of a database system.

Database Recovery: The DBMS should be able to recover all data after any system failure.

Application Recovery: In case of program failure, system anomaly or a user's decision, the DBMS should be able to reverse all the changes made to the data during the current logical unit of work.

Database Administration: The database administrator should have the appropriate tools to control all the database system resources centrally. Data dictionaries, catalogs and directories are the usual repositories of comprehensive information about the status of all the data and the objects stored in the database(s).

Performance Tools: The DBMS should provide database administrators with well understood, comprehensive and easy-to-use tools that allow them to tailor the system to operate at a high performance level.

Ease Of Programming: Although the use of a DBMS requires developers to learn new concepts and protocols, the overall effect of a DBMS should be to simplify programming and reduce errors. The use of the same protocol for data manipulations in all programs, and the integrated nature of the data structures, which allows a program to access data from physically separate files via a single call from the high-level programming interface, are the major benefits of using a DBMS.

Relational Is Here To Stay

There is an enormous amount of research and development being done on relational databases. The relational theory is a solid foundation for future developments of database technology. It is the basis for distributed databases, expert systems, and has a lot of potential for parallel processing.

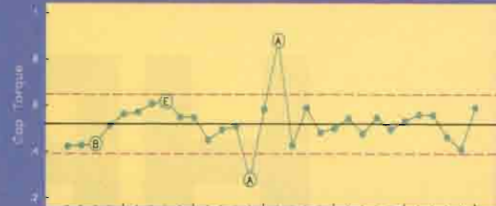
It's difficult to migrate from an older heirarchical system to a more structured relational model. But the only real question is when to do it. The answer is: "The sooner, the better." Your old applications are stifled by maintenance costs. The investment of cleaning up your old data and your old applications, and moving to a relational model, will pay off in the long run. Your new applications, once rewritten, will offer flexibility that your competitors may already have and help you respond quickly to new business opportunities, changing markets or new government regulations. — *Marc Descollonges is an independent analyst and consultant specializing in relational database management. He is affiliated with the Codd and Date Consulting Group.*

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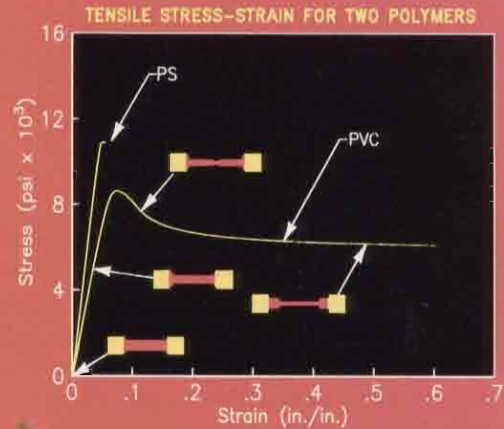
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Practical HPSQL

Saving Execution, Coding and Response Time

Once you decide that you're going to implement your next application using HPSQL, you're faced with making a few decisions. Like almost any system development tool, HPSQL provides multiple techniques to solve many problems. The question that you ask yourself is whether your choice of a solution is the best solution. The answer, isn't always apparent.

I've found several techniques for using HPSQL in a practical fashion, but in more than one case, these solutions were found after implementing less than optimal alternate solutions.

What To Look For

THE BIGGEST PROBLEM IS THAT we tend to make choices based upon the system that we know well, rather than the new system, in this case HPSQL, which behaves differently. For example, an HPSQL transaction can deadlock on a single table access while a TurboIMAGE transaction requires at least two. To learn the new system requires an open mind and a willingness to rethink how database access works.

[BY LARRY KEMP]

There are three areas you must be conscious of in HPSQL design and implementation: deadlock avoidance, access efficiency and minimization of non-access related overhead.

The locking mechanism used by HPSQL is somewhat unique. HPSQL uses an implicit lock request and grant mechanism. Normal SELECTs result in sharable read locks, while UPDATES result in exclusive locks. These locks are generated at execution time and are not coded explicitly. The advantage of this technique is that it is both automated and guaranteed to be correct.

The unfortunate side effect is that deadlocks can occur. HPSQL does detect and resolve deadlocks, but the ideal HPSQL application would be coded in such a way that they wouldn't occur in the first place.

Index maintenance and usage is one of the primary features of HPSQL. Indexes are used and maintained transparently to application code. The ideal application would have the optimal number of indexes. This leaves the database administrating a quandry over what the ideal number is.

Any database management system has a number of house-keeping chores that don't relate to accessing data but have more to do

with general operation. For instance, each transfer of control into HPSQL requires that HPSQL check for valid parameters. Optimal design would minimize overhead operation.

The following recommendations are ideals. None of which would be practical in all situations. But where appropriate, they may save coding time, execution time and perhaps response time.

RULE #1: *Within a transaction, a row should be either SELECTed or UPDATED, but not both.*

The primary reason for this rule is deadlock avoidance. Consider the following scenario where two users are executing the same transaction that reads a row and then updates it: User A reads the row, causing a shared read lock to be requested and granted. User B reads the same row, which causes a shared read lock to be requested and granted. User A then updates the row, which causes a request for an upgrade from shared to an exclusive lock. Since User B holds a shared read lock, User A waits. Next, User B updates the row, which also causes an upgrade to exclusive lock request. User B now has to wait for User A, who already is waiting for User B. As a result, a deadlock is detected, and transaction B requires a rollback and restart.

How often will this happen? Any two users executing the same transaction against the same row at a similar time are prone to this occurrence. So the answer for many applications is *often!*

Fortunately, there is a simple solution. The normal case of a transaction reading and then updating a row is to check the validity of the transaction. This normally can be im-

plemented in a simpler fashion through the use of multiple conditions on the WHERE clause of the UPDATE statement. The validation condition can be inserted onto the end of the condition clause, and the retrieval status can be checked to determine whether the requested update was successful.

Consider the example of a request of a part from inventory. The conventional sequence would be to read the part, determine whether a sufficient quantity of the part exists in inventory and then update the part with the decremented inventory. An alternative HPSQL approach would be to decrement the inventory, using as conditional clauses the part number and sufficient parts in inventory. This solution is shown in *Figure 1*.

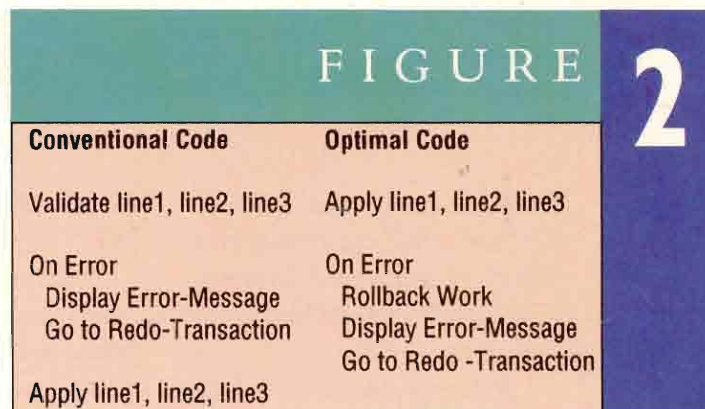
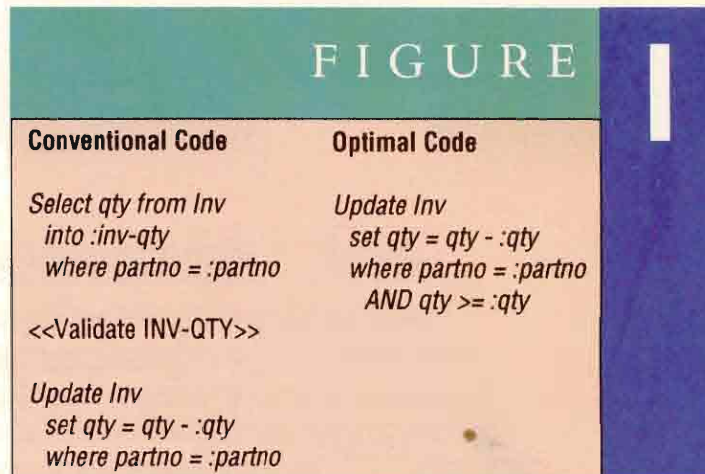
This technique avoids deadlocks because only one lock is issued against a given row. Hence, the same functionality is achieved with better results.

The technique of substituting a more powerful UPDATE in place of a simpler SELECT/UPDATE combination not only avoids deadlocks, it is easier to code and executes faster. Having fewer HPSQL accesses requires less coding. It also requires fewer entries and exits from HPSQL.

RULE #2: *Access tables within a transaction by alphabetical order of table names.*

The classical deadlock scenario is where one transaction locks resource A and requests a lock of resource B, while another transaction locks resource B and requests a lock of resource A. In this case, the two transactions deadlock each other. Had both transactions requested locks of resources in the same order, the deadlock would not have occurred.

The normal case of a transaction reading and then updating a row is to check the validity of the transaction.



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This same philosophy of ordered locks can be applied to HPSQL access. If all portions of the database are accessed in the same order, and a single lock is requested against each portion, then deadlock potential would diminish, if not disappear. A simple method of implementing that strategy is to order table access by table name.

RULE #3: *Avoid holding locks across terminal reads.*

A fundamental rule of any good transaction processing design is to minimize the duration of locks. The basic problem with terminal reads is that not only are they long in duration, but they also are indeterminate. That is, the length of time until a user enters the next transaction could be seconds, minutes, hours or even days. So, holding locks across terminal reads results in data being tied up for potentially long durations.

With HPSQL, the problem can be compounded in that rows and index pages that are not explicitly referenced can be locked within a transaction. For example, an INSERT command will result in an index page being modified, causing an exclusive lock to the index page. Spanning a lock across a terminal read would cause all references to that index page to wait.

The optimal solution is to make each transaction begin

and end within a terminal read. Some of the newer features of HPSQL, such as *cursor stability* and *commit keep cursor*, can be of help in this type of implementation.

RULE #4: *Assume that a transaction will be valid, and use ROLLBACK WORK when an error is detected.*

Conventional transaction processing design uses a two pass strategy. The first pass validates the transaction, while the second part performs the actual work. This technique assumes, in effect, that the transaction is most likely to fail. That is, the smallest amount of work is performed when the transaction fails, while the largest amount of work is performed when the transaction succeeds.

In good system designs, most transactions succeed. An optimal implementation would take advantage of this fact and produce the least amount of work for the majority of transactions, which happen to be the successful ones.

The technique for HPSQL is to apply each line item of the transaction, checking the return code of the command for completion status. If a line item of a transaction fails, the transaction can be rolled back with an error message returned to the user. This technique works in a single pass for transactions that succeed; that is, the validation phase is eliminated for most transactions.

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As an example, consider a transaction that enters multiple line items of an order. A transaction that assumes validity would add each line item of the transaction, updating inventory for parts each time it adds a line item. The updates to

The number of keys per index page dictates the number of levels or number of pages to migrate while searching for a key.

inventory specify the part number and the inventory quantity as part of the WHERE specifications. If any of the updates fails, the entire transaction is rolled back. Since most transactions succeed, the entire transaction takes a single pass.

RULE #5: *Eliminate redundant indexes.*
Maintenance of indexes is well recognized as a time and resource consuming event. Updates to indexed items, as well as the insertion and deletion of rows, requires maintenance of indexes. The ideal system would contain the minimum number of indexes.

HPSQL allows an index to be imposed on multiple columns. If a WHERE clause includes conditions on multiple columns, and if a multiple column index does exist, HPSQL will use that index.

The internal B-tree mechanism also allows the high order portion of a multicolumn index to be used for searches. This allows, for instance, an index on CUST-NO and ORDER-NO to be used in conditions that only specify CUST-NO.

Redundant indexes result when two indexes contain the same information. For instance, an index on CUST-NO is redundant if there also is an index on CUST-NO and ORDER-NO. In this case, the CUST-NO index could be eliminated, allowing specifications of CUST-NO to use the high order portion of the combined index.

RULE #6: *Be judicious about key lengths.*
This is a basic rule that applies to any DBMS or file structure that uses B-tree indexes. The longer the key length, the fewer keys will fit into an index page. The number of keys per index page dictates the number of levels or number of pages to migrate while searching for a key. Keeping the keysize short will reduce the index search time.

The keysize for HPSQL is one or more columns that are concatenated to form an indexable key. It is the size, not the number of columns, that makes the difference. Values such as 80 bytes are considered large, while values such as eight bytes are considered small.

The attempt to make small key sizes can be at odds with specifying multiple columns to satisfy complex WHERE clauses. I only can suggest using good judgment.

RULE #7: *Specify separate DBEFILES for medium-to-large size tables that will be scanned serially.*

A DBEFILE is a physical storage area for HPSQL data. It can contain one or more tables or indexes. When a DBEFILE contains multiple tables or indexes, individual pages are allocated by table or index, but consecutive pages can contain entries from different entities.

Specifying that a table will be assigned exclusively to a DBEFILE assures that when the file system brings part of the DBEFILE into memory, all of the data will be from the same table. If the table is to be scanned serially, all parts of the DBEFILE are relevant, and there will be no disc I/O or memory waste.

Furthermore, scanning the table serially will result in HPSQL issuing sequential file system reads. MPE/XL will detect this behavior and adjust the physical I/O size to the large sequential fetch size, rather than the smaller random fetch size. Therefore, fewer physical reads are required, so less time is spent both in waiting for physical disc transfers and in the operating system I/O code.

RULE #8: *Minimize the number of authorization levels.*

Prior to the execution of an HPSQL query two events must occur: parsing and optimizing of the query, and authorization of the access. HPSQL efficiently moves the parsing and optimization stage into the preprocessor stage (except after a relevant database change has been made). But, unfortunately, authorization must happen on every execution of a query.

Authorization can be as complex or simple as the database administrator desires. At its simplest level, authorization can be done by assigning each user ID access to every table or view. Because both the number of users on a system and the number of database tables are often large, a shorthand approach to assigning authorization is the *authorization group* facility. This technique allows a database administrator to assign authorization to groups of users.

Authorization groups can be nested. That is, an authorization group can consist of other authorization groups as well as individual users. This can be a useful facility for example, creating a sales group that consists of all order processing and quotations users.

Unfortunately, each level of authorization group nesting requires additional work. The problem is that the authoriza-

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tion group structure must be searched on initiation of each query, and more complex structures require more processing time.

So, the rule requires that you be reasonable about authorization group complexity. This reduces the overhead on every query execution.

RULE #9: *Use the BULK facility.*

By far, the best way to avoid the non-access overhead is to reduce the number of entries into and exits out of HPSQL that are required to perform a given task. The BULK facility of HPSQL allows multiple rows to be accessed within a single query.

I tested the efficiency of BULK access by changing a report program that formerly performed a table scan using single entry FETCHes into a program that now uses BULK FETCHes of 200 rows at a time. The result was a 25 percent improvement in elapsed time!

In interactive programs, the use of BULK fetches generally can decrease the coding requirements because the bulk quantity can be set to match the number of rows required by the transaction. The decision to use BULK operations is an easy one. Even where more coding is involved, the use of BULK type operations is preferable.

RULE #10: *Avoid dynamic queries. Use the preprocessor stored query facility wherever possible.*

The normal operation for HPSQL is to execute stored queries. A stored query is one that has been optimized by the preprocessor and stored as part of the database environment. The benefit to executing a stored query is that the overhead of optimization has been done at compile time, rather than at execution time. That is, parsing and optimizing of the commands has been done once (or perhaps just a few more times depending upon how often the database structure has been modified), rather than upon every execution cycle.

The alternative to stored queries is dynamic queries. Dynamic queries are HPSQL commands that are parsed and optimized at execution time. The intent of the dynamic query facility is decisions about which commands to execute can be made at execution time. Ad hoc inquiry programs and database tools are examples of programs that make good use of the dynamic query facility.

Production programs, however, make repetitive use of the same commands. These programs should use stored queries.

In some cases the technique of access may not be known at compile time. For instance, the WHERE clause may vary over time. In those cases I recommend using a view to isolate the access from the program. What I have attempted to address here are implementation issues for HPSQL. And as more people gain experience I expect that more ideas will surface. However, I have not addressed logical database design since I see no difference between logical HPSQL design versus design in any other DBMS. — *Larry Kemp is a systems consultant at the Hewlett-Packard sales office in Bellevue, WA.*

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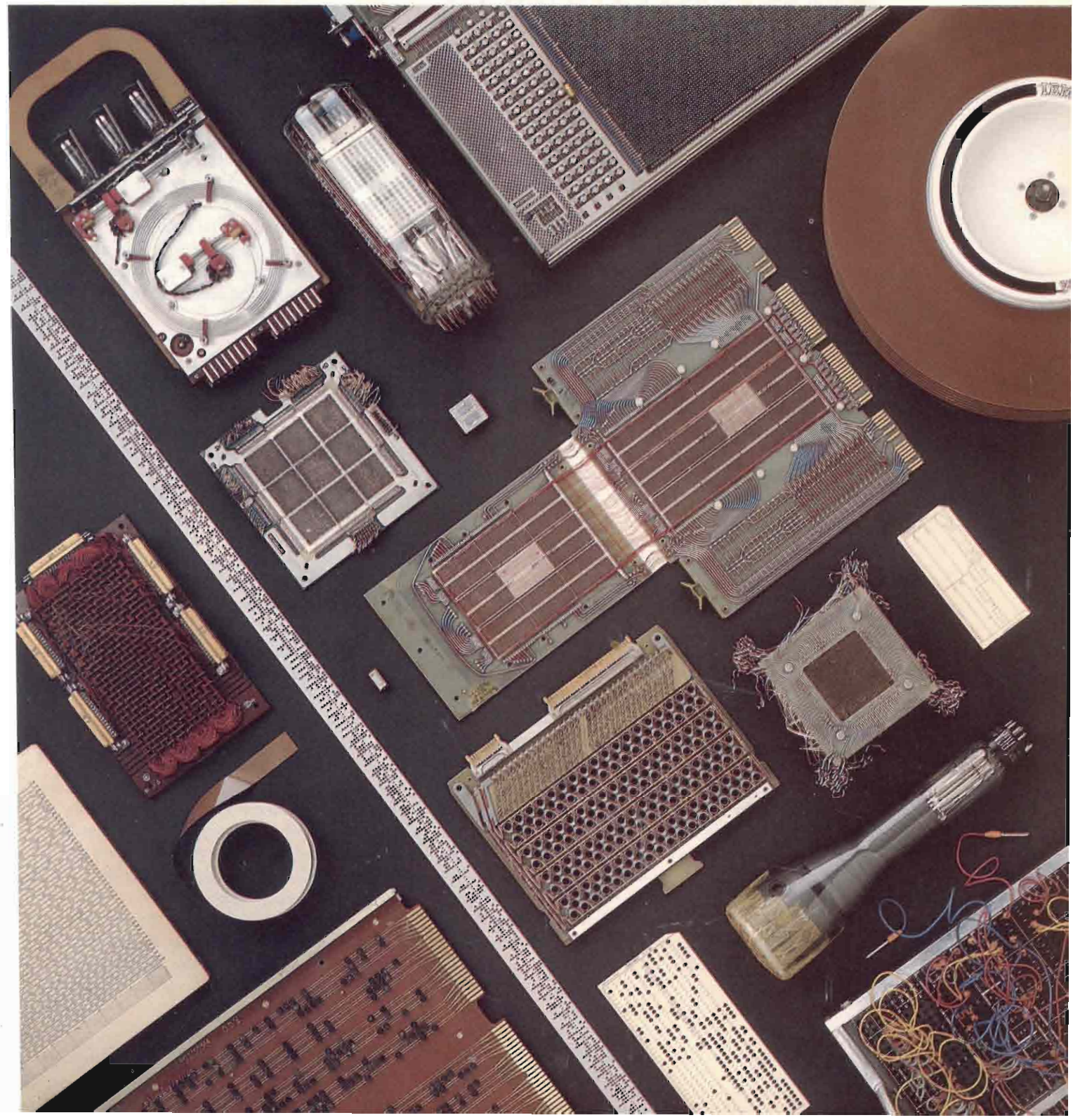


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SpoolRescue

**NSD's
Answer To
High-
Performance
Utilities.**

At the recent INTEREX conference in Orlando, Florida, NSD Inc. (San Mateo, CA) demonstrated its newest product, SpoolRescue. NSD describes SpoolRescue as "a high-performance spoolfile utility with features previously not available. It is designed for anyone wishing to access all spooling data. SpoolRescue allows you to peer directly into the spooling system with few limitations."

I received a copy of this program and ran it through its paces on an HP 3000 Series 70 system. I tested it during both high and low usage periods, and with spoolfile counts ranging from zero to 126. I tried to stress the program and provided it with ample opportunity to kill the system.

SpoolRescue performed quite well. It was well-behaved, and it proved itself extremely useful in our very busy production environment. Not all of the commands and features were totally predictable, and a few modifications might be helpful, but overall, like NSD's JobRescue, SpoolRescue will be a welcome addition to any HP 3000 shop's toolkit.

For Starters...

Installation of SpoolRescue was accomplished in three simple steps: build the account, build the group and restore the SpoolRescue program. During installation, I observed that the program requires Process Handling (PH) and Privileged Mode (PM) capabilities. SpoolRescue employs PH capability to execute other programs. PM capability is required to gain direct access to Spoolfiles and the system tables that store spoolfile data.

A quick look inside the SPOOLRSQ program shows that several of the privileged system intrinsics are employed as are some privileged machine instructions. The existence of

privileged code requires you to do some careful compatibility testing to determine if your version of MPE will be compatible.

Three kinds of problems crop up with privileged code: operating system compatibility, interaction with other PM code and interruption of operations. To avoid falling prey to these problems, I tested SpoolRescue using our development system and also tested it on our production system, outside of the critical processing windows.

I first tested for compatibility with system table layouts, privileged intrinsic parameter passing and location of data. SpoolRescue performed well on both MPE-V-U-B-Delta4 and MPE-V-V-Delta2. Although not stated in the reference manual, SpoolRescue is not supported for MPE/XL machines.

I then ran SpoolRescue while other PM utilities were in action. Programs like OPT/3000, CAPPLAN, SYSVIEW, SYSPLAN and SPOOK5 were executed while SpoolRescue was in operation. No unusual events occurred and SpoolRescue performed as expected.

I used the BREAK/ABORT, KILL, ABORTJOB and CONTROL-Y commands to interrupt SpoolRescue while it was in operation to see if it would corrupt data or even crash the system. SpoolRescue stood up to the test.

A Closer Look

SpoolRescue has three operating modes. *Output mode* allows operations on output spoolfiles. *Input mode* allows operations on input spoolfiles, and *control mode* provides direct interaction with a magnetic tape drive or disc file for print-image tape creation.

In output and input mode, the most advanced feature provided by SpoolRescue is its ability to save spoolfiles to disc and to restore spoolfiles into the appropriate queues upon re-



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quest. SpoolRescue demonstrated high performance and total MPE compatibility when storing and restoring output spoolfiles. Forms messages, copy count, priority, device class and laser printer environment file information was transferred to the store file successfully. When working with input spoolfiles, including jobs in SCHEDULED status, the save and restore operations also worked flawlessly. The ability to store print and job spoolfiles on disc or tape and the ability to retrieve stored spoolfiles enable computer operators to handle scheduling or printer problems effectively.

Another "magical" feature of SpoolRescue is its ability to work with OPEN print files and EXECuting job stream files. What is that job doing? What is that job going to do? How far along is that report program? All of these questions can be answered by TEXTing and LISTING the JOB, \$STDLIST or print file. SpoolRescue even displays

data from file buffers that is not yet written to disc.

The key to communicating with SpoolRescue is to learn the correct syntax for a fully-qualified spoolfile. To SpoolRescue, a spoolfile name is made up of a *filename* (MPE's actual file designator), a *name* (MPE's J/S name), an MPE username and an MPE account name. This four-part fully-qualified spoolfile name looks like:

filename : name, user . account

The structure of a SpoolRescue fully-qualified file name and SpoolRescue's treatment of the wildcard character "@" in various positions is sufficiently different from SPOOK5. These differences require that new users pay special attention and devote a sufficient amount of time and experimentation getting used to the new syntax. Once mastered, you'll see how powerful it is.

In addition to using a fully-

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qualified spoolfile name, SpoolRescue uses the job or session number, device name or number, priority, existence of forms message, spoolfile state, number of copies and number of lines to select target spoolfiles. Some examples will be shown later.

Input and output modes support a SHOW command, which operates with the various selection criteria, to display spoolfile data. The information that is displayed is both more thorough and easier to read than that provided by SHOWJOB, SHOWOUT and SPOOK5.

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Especially useful in the output spoolfile display is the job/session name and the number of lines in the print file.

Output Mode Operations

The ALTER command will change DEVICE, COPIES or PRIORITY for the selected spoolfiles. This is the same as SPOOK5; however, the ability to subset with much higher selectivity can be very useful.

To defer all print files that require forms mounting and prevent a printer hold-up situation, you'd use:

```
ALTER @:@, @:@; FORMS = ON  
TO PRI = 1
```

To defer all print files that will generate multiple copies so that the copies may be printed together at a later time, you'd use:

```
ALTER @:@, @:@; COPIES > 1 TO  
PRI = 1
```

Using the spoolfile selection parameters described above, a group of spoolfiles may be stored on disc or tape using the SAVE command. The save file is given a file code of PRIV to prevent unauthorized access or destruction. The contents of this file may be listed using the SHOWFILE command, which will produce a display that is in the same format as the SHOW command. Files are placed back into the queue using the RESTORE command, which operates on selection criteria also.

An output spoolfile may be reviewed and copied using the TEXT command. Once a spoolfile is TEXTed, additional commands can be used to manipulate the data further.

The LIST command displays the "printable" content of a spoolfile without carriage control and forms data. If the spoolfile has a forms mount message, it will be displayed as the first record of the file.

The COPY command can be used in conjunction with MPE file equations to produce copies of a spoolfile or part of

a spoolfile. This again is much like SPOOK5. SpoolRescue, however, can remove CCTL (carriage control), FCONTROL (channel or multiline skips) and FDEVICECONTROL (laser printer environment files or VFU download directives) codes. This is quite useful for creating download files for PCs or for stripping laser printer environment files.

The LABEL command displays spoolfile user labels. The INFO command displays detailed file structure data, and the DUMP command shows all spoolfile content in ASCII and OCTAL. These three commands reveal the entire content of a spoolfile with sufficient detail to debug the most pernicious PC or foreign printer-interface problem.

Input Mode Operations

Most of the input spoolfile facilities are not available from any other supported program on the HP 3000.

The COPY, DUMP, INFO, LABEL and LIST commands are available for TEXTed input spoolfiles.

The SAVE, SHOWFILE and RESTORE commands also are available for input spoolfiles.

The brevity of my description of input mode functions is a tribute to SpoolRescue's simplicity, but does not do justice to the power that the package gives to the computer operator in this area.

Normally, when a system must be shut down for any reason that will require a cool-start or a cold-load, all input and output spoolfiles will be lost. SPOOK5 can be used to store the output spoolfiles to tape, but no program exists for storing and restoring input spoolfiles. With SpoolRescue, you can:

```
SAVE @:@, @:@ TO JOBFILE; PURGE
```

SpoolRescue's input spoolfile handling features fill a glaring omission in the MPE tool set that has existed since the birth of MPE.

Control Mode Operations

Control mode provides a unique interface to a magnetic tape subsystem or a

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disc file. With a set of simple commands, individual spoolfiles or groups of spoolfiles may be written to a magnetic tape, either appended or as individual files.

file priority and perhaps even output device and SCHEDULING parameters.

The CONTROL command is valid in output mode but not in input mode.

This makes the program easy to learn and makes it comfortable when you move from one command set to the other.

The tape then can be used for microfiche generation, as an interface to laser-printing services, foreign system input or as a print-image tape.

A typical operating sequence would be to OPEN a tape file, SELECT the spoolfiles and write them to the file, issue a WRITEEOF to end the file set and issue two WRITEEOF commands to end the tape.

By using control options through the SET command, EOF markers automatically may be generated or suppressed. Likewise, laser printer environment files may be stripped from the spoolfiles as they are written to the tape.

An Analysis

The user manual is functional and accurate, but are sparse and very few application hints are provided.

The program syntax is consistent throughout and is fairly close to the syntax used by MPE commands, EDITOR and SPOOK5. This makes the program easy to learn and makes it comfortable when you move from one command set to the other.

COPY, SAVE and RESTORE performance is good to excellent and all other commands respond almost instantaneously. The program is robust and it functions as documented.

Unfortunately, ALTER doesn't work on input spoolfiles. It would be very helpful to be able to change input spool-

When working on input spoolfiles, you to move from input mode to output mode to get to control mode.

The INFO command is only available for TEXTed spoolfiles, whereas using SHOW for a single spoolfile in SPOOK5 gives low-level details. Using this two-step process is more complex than using SPOOK5.

The LIST command for TEXTed spoolfiles cannot display FDEVICECONTROL records as SPOOK5 does. This is a minor problem in that even DUMP doesn't give the interpretation of the commands. SPOOK5 must be used to compensate for this deficiency.

The PURGE command doesn't operate on input spoolfiles. Because the SAVE command with the PURGE option does an ABORTJOB as it saves the input spoolfiles, it seems that a mass purge feature would be available. An input spoolfile PURGE command would be a great convenience in eliminating the need for using multiple commands.

The REDO command doesn't work like the MPE REDO command in that there is no "implied replace." This is the way EDITOR/3000 modify works, but because MPE REDO is used more often, the difference presents a major inconvenience causing multiple retyping of command-line modifications.

The SET command alters certain default conditions. In control mode, SET without options displays current defaults. This isn't the case in output or input mode. This is a major inconvenience and another inconsistency that increases

the number of steps required to perform some tasks.

Like SPOOK5, SpoolRescue has a TEXT command that LOCKS a spoolfile, but has no CLOSE or UNLOCK command to free it when it's no longer in use. TEXTing a non-existent spoolfile works the same way with SpoolRescue as it does with SPOOK5.

SpoolRescue imposes more strict security/capability requirements than does MPE. CREATOR, ALLOW and JOBSECURITY privileges that MPE gives to users are not available through SpoolRescue. This incompatibility with MPE limits the application of the program to some extent.

Overall Opinion And Recommendations

SpoolRescue addresses many problems and presents many opportunities that have been left hanging or supported only by home-brew utilities. The features and functions are made available through a simple user interface that is easy to learn and operate. The program works reliably and is supported by online help and a functional operator's manual.

This program should be available in every HP 3000 shop. It can help to improve operator and equipment productivity. It can help ease system failure recovery, help reduce reruns and avoid losing printed reports. In many shops several programs may be eliminated by using the rich feature set of the SpoolRescue program.

NSD gave operations personnel the most powerful tool since batch schedulers when JobRescue was introduced. SpoolRescue again addresses the needs of computer operators in their efforts to effectively manage batch jobs and reports. —James F. Dowling is president of Data Center Management Associates, Shrewsbury, MA.

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CIM Technology Center Opens In New Jersey

Process industry managers who want to explore the latest in computer-integrated manufacturing (CIM) options, now can visit a CIM Technology Center in Tenafly, New Jersey, jointly established by three automation heavyweights: Coopers & Lybrand, Fisher Controls and Hewlett-Packard.

Unlike facilities, which actually are intended to showcase a particular manufacturer's line of automation hardware or software, the new CIM Center is a first-of-a-kind process industry educational complex set up to demonstrate the capabilities and benefits of integrating the total array of CIM know-how: process controls, computers and information management systems.

Although it is a state-of-the-art installation, the center's principal focus is not on technology or the latest in automation gadgetry. Instead, its major emphasis is the importance of systems integration — the total integration of all information systems — and what that means in terms of linking business functions with process automation and control.

The CIM Technology Center provides a real-world look at process control technology, including supervisory control and plant management, in a fully integrated environment. It has all of the key hardware and software components to make it a true computer-integrated manufacturing operation. It enables process industry executives to better understand the CIM applications in their own business operations. It also demonstrates that a sound, planned approach to implementation can reduce risk, optimize their return on investment and provide a foundation for under-

standing successive stages of CIM-based technology.

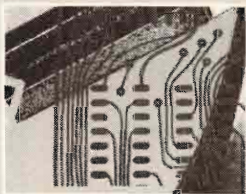
An Idea Whose Time Had Come

HP has been supplying measurement and computer equipment to the process industry for more than two decades. During this time, it's developed close working relationships with both Fisher Controls and Coopers & Lybrand. Since all three companies have a regional marketing and sales presence in the New York City/North Jersey area and have promoted many of the same process industries in the region, they've been involved in numerous cooperative CIM sales and installations. However, it wasn't until 1986 that all three joined forces to cooperatively promote full-service CIM capabilities to a local food producer.

Out of this strategic alliance came the idea for a process industry CIM seminar. It was held at the Meadowlands Hilton in New Jersey on April 15, 1987, and was attended by about 50 managers from a variety of process companies.

As described by Gary Gensheimer, a vice president of Control Associates, Fisher's representative in the New York area, "The purpose of the seminar was to talk about overall CIM philosophy as it related to the process industry and to explore where these industry managers wanted to be in the future with regard to process automation.

"However, we didn't get very far into our presentation," Gensheimer continued, "until some of the participants started to ask us where they could go to see the types of CIM systems we were talking about actually set up and running. We already had thought about starting a CIM technology center, so these questions let us know that the time was right



CIM

Richard M.
Voelker

for a demonstration facility. So that's really how the Tenafly center began — as a result of two needs: the need of potential customers to see actual CIM

and refining industry, while San Francisco's will be set up to cater to the needs of the biotechnology and food industries.

“What we're really selling at the

“We like to work with one group at a time, one company at a time,” Gensheimer continued. “A cross-functional mix is absolutely crucial because what we talk about at the CIM Center is the total enterprise — how to coordinate, bring together and address all of the concerns of a manufacturing enterprise from one shared information base.

“Our presentations are somewhat customized to reflect the unique needs of each group,” Gensheimer said. “Each normally takes about 2½ hours from start to finish and doesn't cost the attendees anything. We have experts on hand from each of the three companies to answer questions individuals might have about their own specific process needs. No one makes a sales pitch and no one pushes automation just for the sake of automation. We preach a CIM philosophy, with the realistic expectation that if we're successful getting our message across, then sales ultimately will follow.”

A Step-By-Step Process Demonstration

At the CIM Technology Center, manufacturing executives can see a step-by-step demonstration of CIM process technology, where computer hardware,

... the Center's principle message can be applied universally to almost all types of industries and manufacturing activities.

technology and capabilities at work at one location and the partnership's need to have an educational/demonstration facility where process-industry top management could be exposed to the cross-function integration of CIM know-how.”

Why Tenafly?

Each of the three participating CIM Center companies has a sales region more or less centered upon the New York City area, including parts of New Jersey, Connecticut, southern New York State, Long Island and New York City. Most of the manufacturing activity in this region happens to be some type of process industry, whether food, pharmaceuticals or specialty chemicals. So it not only made sense to focus the regional CIM center on the process industry, but to locate it in Tenafly, New Jersey, in the same building already occupied by Control Associates.

As explained by Gensheimer, “The focus of the Technology Center is on the process industry, because that's what's here. However, as other regional CIM centers are established throughout the country, each will reflect its own regional mix of industry. The next one getting ready to open is at Fisher's location in Austin, Texas. There's also one being planned for Houston, another in Los Angeles and similar centers being talked about for San Francisco, Chicago, St. Louis and Philadelphia.

“The Houston center will feature CIM applications for the petrochemical

Center,” Gensheimer continued, “is a philosophy. Once we get that message across to potential customers, then product sales will follow naturally. So even though our bottom line is sales, our everyday message is education. That's not to say that we let everyone tour the facility who's interested in learning about CIM, because we don't. We pre-qualify everyone who goes through the center. Normally company representatives are referred to us by a salesperson from one of the three participating sales organizations. In that way, we at least know that they have a reasonably serious interest in finding a CIM solution to their process automation needs.



HP's Brian Moore addresses the audience at the official opening of the CIM Technology Center in Tenafly, NJ.

software and control systems simulate the creation of a fictitious product. Executives are able to watch as CIM experts at the Center "walk through" the simplified, cost-effective process that results when business functions are integrated with manufacturing operations.

Strategic Alliance At Core Of Center

Each of the three firms involved in the CIM Technology Center has a vital role to play. Together, their partnering arrangement, with no binding financial agreements, forms a unique strategic alliance enabling each to respond candidly to key questions about the benefits and planning requirements of CIM. Typical key concerns include:


- *How to set CIM objectives.*
- *How to determine where a company currently stands with respect to CIM.*
- *How to select and implement requisite hardware, software and control equipment.*
- *How CIM can increase competitiveness.*

Each of the partnering companies had specific responsibilities when setting up the CIM Center. Coopers & Lybrand was responsible primarily for identifying the business needs of the

typical process industry and pinpointing the links between planning and production functions. This input was based on

sally to almost all types of industries and manufacturing activities.

As seen by C&L's William J.



We have experts on hand from each of the three companies to answer questions individuals might have about their own specific process needs.

C&L's service capabilities in manufacturing planning, including factory automation, materials requirements planning (MRP), just-in-time (JIT), total quality control (TQC) and a proprietary CIM planning methodology for manufacturing automation.

Control Associates, Fisher Controls' representative in the New York area, designed the CIM Technology Center and integrated the Provox instrumentation system using a standard hiway interface package manufactured by Fisher.

Hewlett-Packard supplied the computer hardware, software and much of the technical expertise required in the CIM process. Its manufacturing specialists were responsible for system networking and program integration. They also developed the supervisory control system and the simulated business environment. Company products in use at the Center include an HP 3000 minicomputer, an HP 1000 real-time computer, NS local area networking, MS-DOS personal computer and Materials Management software.

The Philosophy Called CIM

There is a great deal of confusion, disagreement and misinformation about what the term computer-integrated manufacturing actually means. So a significant part of the message delivered to visitors of the CIM Technology Center is aimed at eliminating this confusion. Although it's presented in the form of a CIM philosophy, the Center's principal message can be applied univer-

Mosconi, one important aspect of a CIM philosophy is the need to integrate business functions when implementing computer automation systems. "Management doesn't understand that designing an effective CIM environment requires integrating the company's critical issues and business objectives with the technology. Unfortunately, U.S. companies believe that just automating, without integrating, will get the job done. It won't."

Speaking at the Center's official opening, Mosconi said that applying technology without first determining the business's strategic objectives can be pointless. He went on to say, however, that the environment in most American companies — which he characterized as "functionally organized and culturally conservative" — does not encourage integration.

"Managers are rewarded for maximizing performance within their functional area, not for integrating with other functions," Mosconi noted. "When corporations understand that this behavior does not optimize overall performance, then they can begin to integrate business functions. Achieving integration is dependent upon leadership from top management, which must first have a vision of how and where the enterprise must move."

In his address at the Center's opening, Hewlett-Packard's Brian Moore identified three factors as being critical to the understanding and advancement

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Fisher Controls

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Control Associates

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of CIM: human factors, technology and standards. Of these, he felt that technology is the easiest to embrace, since machines are much more compliant to change than are the employees in a CIM enterprise. In talking about human factors, Moore said "I think the progress of CIM has been slowed significantly by human factors, and not only in improving skills that have to be instilled in today's production workers, but also in the reluctance of industrial leaders to experiment with and adopt these new technologies.

"Some blame must be placed on those who offered the hope of buying CIM off the shelf," he said, "delivering it on a couple of flatbeds and installing CIM complete on a factory floor. Close analyses (of these instances) would show technology was not to blame, but implementation was the culprit. At HP, we favor an incremental approach to CIM. Install the pieces that will produce the

best return — a JIT system, quality tracking or MRP software, perhaps — but do it project by project. Plan CIM from the top down, but implement it from the bottom up."

In talking about the role of technology in advancing CIM, Moore cited more powerful processor chips driven by finer geometries, faster clock speeds and RISC architecture as providing more and more computer power in the same space for less money. These more powerful processors make the real-time responses required for process control applications affordable. And he credited distributed control systems, like those made by Fisher, with the ability to distribute the control function economically. He also cited ongoing developments in application software as being remarkable technology gains, specifically dynamic scheduling and simulation applications and HP's new Industrial Precision Tools program,

which enables HP to integrate various applications from its CIM partners.

Moore described standards as "the glue that makes the integration of machine tools, information systems and manufacturing applications possible." In talking about their importance, he asked, "How do we tie it (the variety of available hardware) all together? In the past two years there has been a groundswell among buyers for standardization. The operative word in computer-integrated manufacturing, after all, is integrated."

HP views its alliance with Coopers & Lybrand and Fisher Controls as a synergy that gives process customers one-stop shopping for comprehensive CIM solutions.— *Richard M. Voelker is a free-lance writer based in Pittsburgh, PA.*

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DESKTOP PUBLISHING

Ashley Grayson

On Writing And Writers

The desktop publishing process, like all publishing, begins with writers. Not much has been written in the press about writers perhaps because they all are writing about desktop publishing, and the editors, who know about writers, don't write much.

Most writers will claim they are an abused and misunderstood group. While largely true, it IS a funny comment to come from people whose principal job skill is communication.

The problem stems from being more misused than abused and occurs when the writer is not matched to the task. No one today would expect an osteopath to prescribe glasses or any M.D. to make a housecall. Yet, the perspective remains that writers are the general practitioners of prose.

Unfortunately, many writers preserve this misconception out of a strange unisex macho that a good writer can write anything. This is not true. Good writers almost always can make bad prose better, but good writers specialize and talented ones achieve recognition by polishing their talent.

In the realm of desktop publishing, where the distance between the author's draft and the laser printed page is so short, having the right writer is crucial. When selecting a writer for a project it is important to first determine which of several organizational and prose skills are necessary and make the assignment with that in mind. Often the best writers are lousy resume writers — especially their own. Interviewing a writer should always be done by reading the candidate's written material.

Know Where They're Coming From

The major types of prose fall into five areas: conceptual, procedural, motiva-

tional, policy and news.

Conceptual writing is a part of most documentation. Conceptual content is especially necessary if the subject is new to the reader. Expressing the idea behind the product, putting it into perspective and leaving the reader with an understanding of what it is intended to do, requires basic knowledge and understanding by the writer. If a new product manual is weak in its conceptual elements, the reader may say, "I know how to use feature x, but I don't know what to do with the product." Look for such clips in the portfolio of anyone you're interviewing for a conceptual-writing job.

Procedural writing is found in all product manuals. It is the narration of a sequence of events that leads to a goal. Effective writers of this type of prose are concise and specific in exposition and adept in selecting examples. Organizational skills are key here, plus ability at rewriting after the first testers try to perform the procedures.

The equivalent genre in the trade book business is "how to." The difference is that most corporate procedures are being read by an audience paid to read them. The trade book reader paid for the book and must be motivated to continue reading.

Motivational writing is necessary if you want the reader to have an emotional response or strong opinion about the ideas and procedures in the document. The key skill is the ability to draw out of the product or topic the inherent qualities and present them in the text.

Policy writing delivers strategic information to a mixed audience. Heavily conceptual, it also seeks indirectly to channel activities and motivate the audience. Clearly seen in the political arena, it is occasionally needed in corporations during major shifts in organization, market areas, or during

mergers and acquisitions.

The conceptual writer delivers a new or innovative idea in a way that causes it to be accepted. The policy writer raises audience awareness of issues without always having the spark of an idea to work from.

News writing is the most familiar genre. It records the occurrence of events to inform a mixed audience. News writing is driven by an external sequence of events and people.

Job Types

Perpendicular to these prose types are the more traditional job descriptions of writers: journalist, technical writer, PR writer and copywriter.

These are convenient labels for classifying typical tasks performed, but they don't totally qualify the underlying skill as much as indicate what the writer might produce out of habit.

The journalist can be anyone from a feature writer, requiring conceptual and policy skills, to a news reporter who tries to squeeze who, what, where, when and why into four short paragraphs. Journalism experience is good in writers who must create the first written document on a subject.

The technical writer is virtually guaranteed to be procedural. Like the journalist, the technical writer may be the first to discover nonsequiturs in the product or policies being documented. The responsible technical writer will provide feedback to improve a clumsy product.

The PR writer generally writes to excite journalists to absorb at least the minimum significant element in the company's news release. The PR writer is predicting events to come. Journalists often are successful in this job because

they are sensitive to the audience: other journalists.

The copywriter develops brochures and other multimedia forms from an existing body of material. Usually the

house writing department. They edit, polish and publish, but they don't write.

Invest a small amount in locating and qualifying key individuals who can complement your own group or absorb

Particular offenders are "It was..." "It will..." "There are" or any phrase that reoccurs often. Check for changes in voice or mode of addressing the reader of the document. Beginning with "the user" and switching to "you" is a frequent disease of computer manuals. Check for vague words in material that should be specific. "Many," "a variety should be of," "occasionally" and "frequently" should not appear if real values exist.

Check for use of concise, correct verbs linking the nouns and numbers. Does the device draw, deliver, supply, puff or blow 25 units-per-time interval? Determine if the writer is using words to describe material that could be presented better in tables, graphs or diagrams. Adeptness at this is not necessarily bad.

Especially for non-procedural matter, see if the writer qualifies his audience. From the first three paragraphs, can you tell who should be reading this?

Determine whether the writer can structure information so that form fits content. Weak writers just usually throw facts together like potatoes in a sack, or, if they do structure, they have one standard structure they always use.

The easiest way to check this is to look at the first sentence of each paragraph of the sample. Is there anything there to tell the reader how the material just covered relates to what is about to follow? If you have more than one sample, does the writer seem to use the same structure for everything?

In a word: voice. Each writer's word choices, sentence structures and ordering of the material will be unique, and he will sound different from any other writer.

The question to ask yourself is: Does this voice sound like we want to sound? —Ashley Grayson is the founder of ADG, a market and product analysis organization based in San Pedro, CA.

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Each writer's word choices, sentence structures and ordering of the material will be unique, and he will sound different from any other writer.

copywriter is asked to rewrite for presentation material that already has been drafted by others.

IF PERFECTION WERE ACHIEVABLE, all writers would possess all skills, but alas, they don't. The challenge to the desktop publisher is to acquire individuals with complementary skills and blend them to produce the publications required. When the match is not successful, the result can be a pretty bizarre document.

We once were called on to referee a book teaching word processing on UNIX using the *vi* editor. The author was a liberal arts professor with a journalism background. The book was readable, but failed in its goal. The structure of the book was driven by the digressions of the consulting UNIX hacker. As a journalistic recreation of the experience of being taught the subject by a hacker, it was perfect.

Unfortunately, the author lacked the necessary conceptual base to rework the presentation to meet the needs of the audience. Building the writing resources you need begins with selling management on the concept that writers aren't general purpose interchangeable pegs.

Raising awareness may include slipping her a copy of this article, which is largely conceptual. Next, and this is the hard part: Make sure the desktop publishing budget includes funds for freelancers to supplement the in-house team when necessary. Even Random House, the world's largest publisher, has no in-

house writing department. They edit, polish and publish, but they don't write. Invest a small amount in locating and qualifying key individuals who can complement your own group or absorb overload. Sooner or later, someone in the company will come to you because you are the desktop publisher and ask for something not part of your main charter. One answer is "We only do product manuals." A better response is, "I know just the person to ghost Mr. Biggley's speech. He will need six hours of Biggley's time for each half-hour of speech and at least two weeks advance notice."

Reviewing For Talent

If your department is large or growing, you will want to build a group in-house with a wide variety of skills.

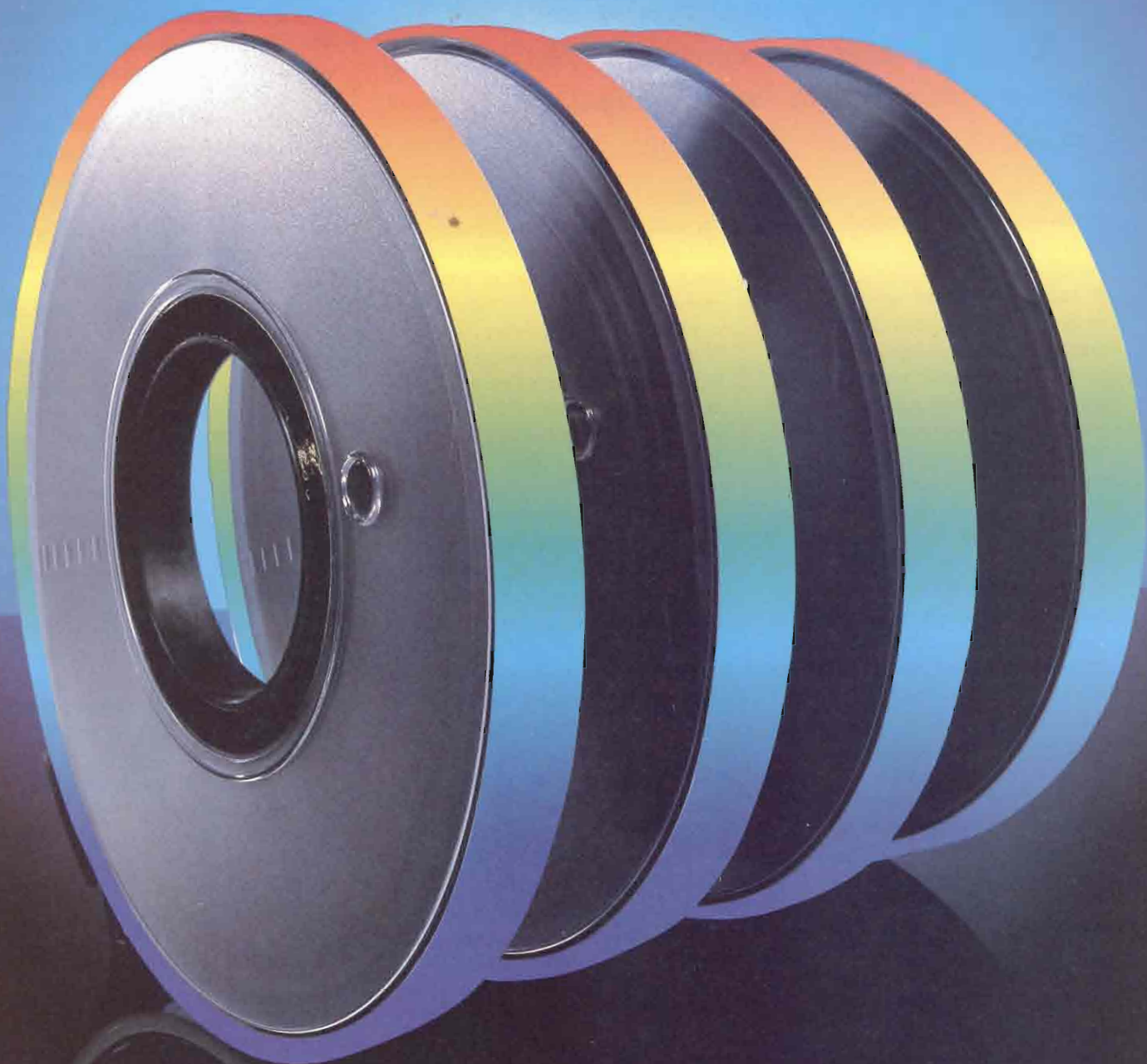
In either case, you must assess the writing of dozens or hundreds of writers to select the few you need. Here are some hints from the major trade and technical publishers to help you sort through the resumes and writing samples.

■ *Begin with a clear idea of what type of material you are seeking. Make a pile for each type of submission that passes the quick test.*

■ *Read to reject, but keep an eye open to unpolished talent. When possible, request submitted manuscripts rather than finished work because that is what you will be working with. The quick test will help you eliminate unpolished writers from your selection process.*

■ *Give special consideration to any work that makes you sit up and take notice, especially if you can't decide which pile to put it in. This individual may be multit talented.*

The quick test lets your eyes unfocus when reading a page of copy to see if any patterns become visible in the text. Repeated patterns tire the reader.



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The Future Of HP Computing



OPINION

Don Person

It's hard to believe sometimes, but even the mighty can

be moved. Hewlett-Packard is stepping out from behind the old public perception of stodgy non-competitiveness that plagued them so in the early 1980s. No kidding.

In the past eight years, I've been following developments in a number of the company's computer-related lines. This recent span has all the makings of a mini epoch in the small computer age. I've seen evidence of HP advancement in the market with battles won and lost and even occasional leadership displayed. Here is a corporate heritage to be proud of. But now where is HP headed?

It's not easy to say, because HP is many things to many people. To the greater world, the name is synonymous with top-quality laser printers and plotters. HP's plotter quality, durability and performance are legendary. Increased competition notwithstanding, if the game is pen plotting, HP continues to be the undisputed market leader.

The same is true of the LaserJet. While the Canon-built laser engine dealt some good cards to everybody in the biz, it was HP alone that had the vision to play the winning hand. In the face of strengthened opposition from the Japanese, HP has continued to expand market share and prosper. More recently, the DeskJet again has demonstrated that HP still has a pioneering spirit in the output technology field, especially as it applies to small computers. Gutsy innovation has proven that you can translate engineering lab

"what if" into market share, profits and respect.

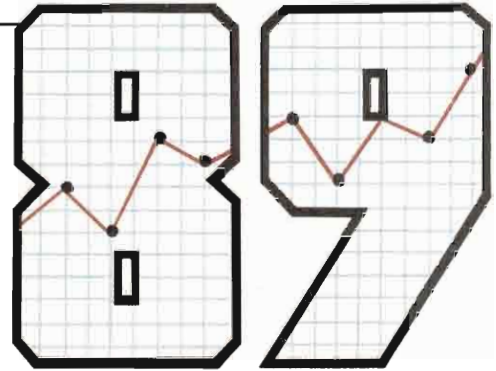
Yet, in other supporting areas, the question is not "What if?"; but "Why?" The ScanJet illustrates this situation. While possibly the best product of its type and price, it fails to define the genre. Consequently, it hasn't been earth shaking. This is not to say it has been a failure, rather an instance of what we might call understandable over enthusiasm. Reality fell short of projections. Every big company has products like this. There's no shame in claiming a niche.

Around The Industry

Elsewhere I see a success story waiting to happen in digital audio recording (DAT). DAT is a Japanese standard; dis is serious. HP's past coziness with Sony may have helped to get the inside track on marrying cheap, dense tape drives with DOS. DAT's advertised trick is digital audio recording, but HP appears to have recognized the possibility of tapping the basic transport sub-assembly of the device for massive data storage.

How about gigabytes of data on a \$20 palm-sized tape cartridge? Add a significant improvement in access time over conventional tape drives and we could see a real mass market winner. Sony does the mechanics while HP supplies the controller and software. Watch for more on this one. I'm saying a little prayer that it comes with a driver that allows programmers to have single volume access, with or without direct DOS support.

There is one peripheral line that has just about fallen flat. HP's foray into small hard-disc production has been anything but a success. The only significant customer for these devices has been HP itself. Today, Seagate is usually the



name you see inside HP's smaller computers and external desktop Winchesters up to 40 MB.

Many factors governing product success can't be planned or controlled. Two of HP's recent headaches last year were wild fluctuations in component prices (most notably DRAM costs) and public fickleness about software and operating system platforms.

SINCE THE NOVEMBER ELECTION IS history, let's be more political. Government policy of the recent past has not meshed so well with conditions on the world market. Industry wide, DRAM users have not had it so easy. Planning lapses and lobbying pressures have come together in a most problematic way over the last two years, and it would be wrong to blame HP for price changes brought on by essentially political considerations that affect the price of components for assembly.

The converse of the hard disc business now is surfacing in HP's move toward a greater reliance on other divisions within the company to insure a centrally planned, predictable flow of vital parts for production. Open up a DeskJet and see what I mean. A subtle, definitely praiseworthy move. The

payoff in this sort of thing is not lowest price, it's quality and guaranteed availability. Hats off here.

In the software business, I'm happy to report that HP has taken dramatic and laudable steps to break out of the blahs. For a long time, HP couldn't seem to make up its mind about whether it wanted to act cooperatively or competitively with the rest of the software industry. Where it could, as in the case of the Series 80, 200, 300 and 1000 lines, the attitude has been 99 percent old-time proprietary. The idea was to try to get and hold all the marbles, usually at the expense of a vigorous third-party business.

Looking At MS-DOS

In the more competitive world of MS-DOS, we were treated to disappointments on the order of PAM (yet another DOS shell) and ultimately forgettable gems like MemoMaker.

HP now has charted a course out of those doldrums and is on the verge of making a big splash with NewWave. Here we have a product that shows genuine creativity. It is everything good that PAM was not! Just look at the energy with which the Apple Corporation bandits are protesting visual similarities to the intellectual property they "liberated" from Xerox.

In fact, NewWave probably is no more a derivative than the Mac user interface, and from the standpoint of openness, it's a cut above the mess that Apple expects its developers to swallow. Had HP been this bold, the user community view of the company's line would be several notches higher than it is today.

In MS-DOS products, the watchword at HP has been *follow*. With NewWave it finally has been switched to *lead*. The change is remarkable, and if it represents a shift in policy and product direction as well, we have a lot to look forward to.

I was sorry to see Mom more or less fold up the tent after taking a beating in the Newport AKA Vectra CS portable debacle. Selling relabeled

Zenith laptops, as is now the case, has the "look and feel" of abject surrender. While we're talking about MS-DOS, don't think that you've seen all that's to come from the 80x86 family. I don't mean the mythical 486 or the 386SX chips either. Two possible product events worth watching include:

■ A big bucks version of the RS sporting a 25- or even 28- MHz clock. The technical boost being toyed with now is a total static

RAM main memory. Very pricey, but it promises high performance. No DRAM + No cache = NO REFRESH and NO cache-load time degradation.

■ Look for a post ES-12, 20-MHz 286 based on the Harris CPU chip. Rumor has it that a few breadboard machines already exist, but fear and trembling over the "product killer" possibilities here have held back the project. In all likelihood, 20-MHz 286 systems under MS-DOS will outrun 16-MHz RS gear and

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be machine enough for many other would-be 386ers.

A pile of great MS-DOS news is not mirrored over at the UNIX corral. Open Systems Foundation or not, HP's cowpokes have a Texas-sized problem when it comes to operating system platforms at the technical and small- to medium-size workstation rodeo. Probably the sorest spot in HP's saddle is the creeping disarray that has shown up in the technical computer universe.

The worst news on this side of the fence may still lie ahead, and it's called HP-UX. UNIX, the parent of HP-UX, never has been noted for its real-time response. At its heart, it's a process-driven operating system as opposed to the event-driven domain demanded by quality real-time programs.

HP's biggest mistake in recent memory may be its port of Rocky Mountain BASIC (RMB) to HP-UX. HP-UX is big and even the smallest kernels, such as those found in the integral PC, need lots of memory. RAM hogging, primitive user shells, a profound disconnection from real time, and user commands cryptic enough to satisfy the most devoted techno-nerd, top the list of HP-UX drawbacks.

Here is a stage where HP could show leadership and grab back hardware market share and profits. What we need now is a good script. Microsoft Inc. has all but sewn up the market for Intel's kludgey 8088/80286/80386 microprocessors. Trying to innovate here is a stiff swim against the current.

The only operating systems that do much with the Motorola 68000 family of CPUs are UNIX, the Apple Mac and RMB. Both RMB and the Mac are proprietary, and UNIX is that most hideous of monsters: an operating system created and modified by committee.

HERE IS MY SMALL computer challenge to HP. Create a new operating system, which is a superior alternative to MS-DOS, written for a new generation of 68000-based PCs with expandable internal support for advanced peripherals. Forget about multitasking and just make

it wickedly efficient for one user. Publish the external specifications, just like MS-DOS. Then, cash in by supplying hardware using that high-quality pro-

Thank heavens that HP saw the light with the Modular System Interface Standard.

duction system the PR types always drone on about in the press releases.

And one other thing, don't tie it down with the bulk of an onboard proprietary language linked to the disc-operating kernel. Let the third-parties decide for a change.

There are bonuses for HP in doing this. First, it makes new meaningful work for all those RMB folks who will be out of work in the near future anyway. Best of all, HP gets to cash in on the body of knowledge it already has from the HPL-RMB days. HP could gain the high ground in hardware once again. Lastly, it gets fresh respect in the core computer business. This isn't bankable directly, but ask Microsoft if it doesn't mean money in the long run.

What I see happening other than HP-UX closely resembles a sorry situation in Mom's technical computing past. The Series 80 line, partly because of aggressive cost effectiveness and partly through failing to capitalize on its research investment, became exemplary of the ascendancy of sales in second-guess engineering. The designed-in strengths of the family were in conflict with other products dating back to the release of the first member. Series 80 was a cost-effective instrument controller and superb desktop scientific calculator, but the seeds of its success

also were the root of its demise.

The Series 80's most significant rivals were upscale 68000-based computers in HP's own 98xx/200 product line. From day one, the sales force was forced to make a choice. Two product families could do the same job in eight out of 10 situations. One carries five times the price tag of the other. Which one do you push? No contest folks. The death blow was corporate insistence that the model 86/87 make a midlife change to fit it into the mold of a general-purpose personal computer.

Adding a CP/M coprocessor gave us all a few laughs, but sales moved steadily downward in the face of steady pressure from the IBM PC's open architecture. Positioning a budget technical computer against IBM, and taking years to release a true competitor, revealed the depth of foolishness you can get into when you let marketing call the shots. HP systems internals never made it into developer hands until the final decision to drop the line already had been made. The last thing HP needs is a repeat performance.

The difficulty is that RMB and the Series 200 that helped shove the 80s out of the picture is ready to suffer the same fate. This time the squeeze is coming from the low-priced end of the spectrum, and the competition is not from other HP products. Rocky Mountain BASIC, the major platform for Series 200, is showing signs of old age at a time when its handlers have little maneuvering room left for a revival.

A Possible Problem?

In the face of equivalent performance from cheap PC-AT clones, coupled with cut-rate third party IEEE-488 adaptors and a host of inexpensive I/O cards, HP suddenly has a problem. The open versus closed architecture question obviously has been discussed; like Series 80 on its deathbed, system information grudgingly is leaking out the door. And like the 80s, it's probably too little, too late.

Adding to the confusion has been the VIPER coprocessor. The idea here is that adding a limited 200 core platform

to a PC-AT will extend the life of a product suffering from price competitive alternatives. Reminiscent of the CP/M box on the 80's, isn't it? With the arrival of the first native MS-DOS work-alike language to run RMB programs on a PC without VIPER, the end of the trail is coming into view. RMB and the 200 line will be walking it quite soon.

Now here's the crazy part. The big appeal in the Series 80 and 200 was HP's leadership in instrument control techniques. The HP-IB, later to be adopted as IEEE-488, defined the state of the art in complex instrumentation for years. It still does. HP's technical computer lines traded on the company's expertise with HP-IB devices and prospered in large part from the connection. These computers were proprietary internally, but their success derived from public standards that HP had the good sense to explain. The result was wide acceptance and adoption as the way to go.

Today, IEEE-488 is a desirable feature found in virtually all high-end instruments. HP's newer PC Instrument bus has not caught on with third parties for the same reason that the 200s are starting to fade. It's that good old proprietary urge again. Thank heavens that HP saw the light with the Modular System Interface Standard. Let's hope that success with opening MMS reminds HP that another "P" word — PUBLICITY — is preferable to the bad, old word — PROPRIETARY!

The moral is the same one that the Hunt brothers failed to grasp when they tried to corner the silver market. When you try to capture the whole pot by holding your cards too closely, you risk losing it all. This stunning lack of adoption is sure to flush the PC-Instrument "standard" down the same old plumbing.

NOW WE COME 'ROUND TO RISC and the mini line. While this move may not put HP on top of the minicomputer business, it is the right move at the right time. Even if surpassed by multiprocess-

ing CISC machines, look at it this way: It opens up the possibility of reinventing the wheel for hordes of programmers, and may even give rise to a new generation of emulators for existing software. If nothing else, it is a boon to the sales force. This time, even third parties may benefit.

I wish I could take as charitable a view of the Micro 3000, however. It has the earmarks of the MicroVAX, without the momentum, pizzazz or clout of a well-known big brother to draw from. Performance aside, the MicroVAX hangs its hat on the popularity of a huge installed base of DEC equipment. The Micro 3000 has a much smaller set of coattails. Its bigger sibling has a fraction of the market penetration of the VAX. What the Micro 3000 and MicroVAX do carry in common is the last desperate hope of the minimakers within each company.

Where there is resistance to these

scaled down systems as application terminal handlers, the sales push goes toward network server duty. What is the future here? I think it's mighty slim pickin's. So far, the installed base of these baby behemoths is hard to find, while other brands of networked 386-class products are breathing down Mom's neck. Oh yes, PCs run downright cheap software, too. Got the message?

The Underlying Factor

The lesson that can be drawn equally from HP's triumphs as well as its flops is this: Leadership in providing standards for new technology coupled with genuine innovation practically guarantees a good showing in the marketplace. It doesn't matter if we are talking about software, hardware or service. The situations in which HP currently and historically has excelled (and profited) all are examples of a carefully measured blend of solid research and

well thought out, publicized standards.

HP's roots are planted firmly in a tradition of technological innovation guiding product offerings in cooperation with market forces. The idea is to combine what can be done with what needs to be done. Reliance on market research tools, such as the discredited "focus group" idea has led the company down the path to its most notable blunders. Take the 150 Touch computer — PLEASE!

The big question is, now that HP apparently has rediscovered the source of its old excellence, can it pull back from following the mediocrity of market wisdom? Stay tuned. 1989 promises to be a very interesting year. —Don Person is an independent consultant based in Albany, NY.

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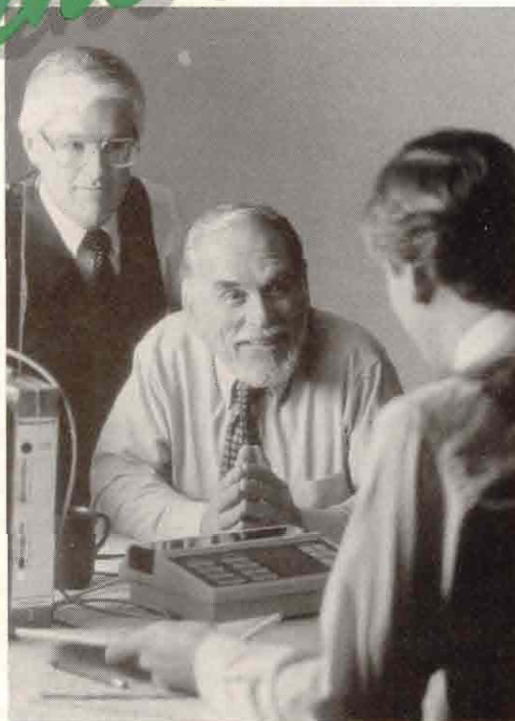
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PC TIPS

Miles B. Kehoe

Getting Organized

January is a month of beginnings and endings, named as it is after the Roman god Janus who could look both forward and backward at the same time. Because it is the beginning of a new year and the beginning of my participation with *HP Professional*, I'd like to establish a common ground, one upon which we can build together throughout the coming year.

Most of my interest and expertise over the last dozen or so years has been focused on the PC area, although I also have worked with a number of larger systems from HP and other vendors. In the coming year, I will be writing about technical issues dealing with standalone PCs as well as PCs connected to HP minicomputers. I always will try to present information you can use in your job, whether programming applications or general configurations to make your PC more productive for you.

If you like something I write, or if you have a topic you'd like me to address, please contact me through *HP Professional*. You can also reach me via electronic mail on CompuServe at [72466,723].

Many of my friends consider me a bit picky and perhaps compulsive about the organization of files on my hard disc. I just want to go on record as stating that I am not picky, and I certainly am not compulsive. Well, maybe I am picky. When a friend asks me to help him with a PC problem, I find my fingers itching to create a few directories and get the files out of the root and into the newly created directories. OK, well maybe a little compulsive.

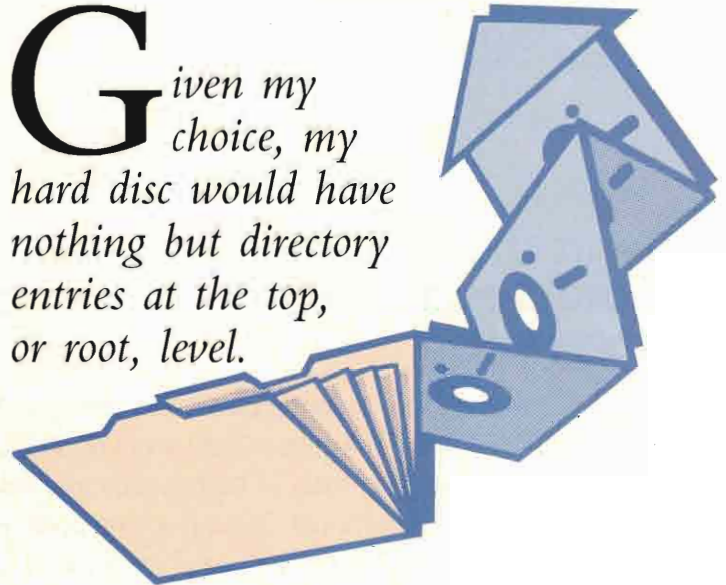
Actually, I do have good reasons for organizing my hard disc the way I do. Let me tell you how I like to organize the disc and why I do it that way.

Disc Organization

Given my choice, my hard disc would have nothing but directory entries at the top, or root, level. However, MS-DOS requires that a few specific files exist in the root directory, so I make sure those files are created first. The three files which must be at the root are:

COMMAND.COM	The MS-DOS command processor
CONFIG.SYS	MS-DOS configuration information
AUTOEXEC.BAT	The start-up batch file

Given my choice, my hard disc would have nothing but directory entries at the top, or root, level.



If the hard disc contains an MS-DOS system, there will be other hidden files at the root as well:

IBMBIO.COM	The RAM BIOS
IBMDOS.COM	The MS-DOS system
PAM2.VOL	PAM's hidden information file

Sometimes you will find other files located in your root directory. Most of these do not need to be there and can be safely moved. This is true even of device drivers, although you will need to modify your CONFIG.SYS file to direct MS-DOS to load the driver(s) from the directory where you store them. In my system, I use a driver called MULTIVOL.SYS, which I keep in the SYS directory. My CONFIG.SYS file, therefore, contains the line:

```
DEVICE=C:\SYS\MULTIVOL.SYS
```

You also will find two other files visible at your root, or top, directory if you use any of the popular HP applications:

HPVIDDB.BIN	Screen information for HP applications
HPDEVDB.BIN	Printer/plotter information for HP applications

Depending on the software you use, you may find others. Nonetheless, to keep my root directory as clean as possible, I use the ATTRIB program to hide any other files. The format

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¹"The Three Pillars of EIS" by David Friend, August 1988

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for the ATTRIB command to hide the above two HP files would be:

```
ATTRIB +H C:\HP*.BIN
```

I may not be able to store them elsewhere, but I sure don't have to look at them!

By the way, there are no other files on my disc, which must exist at the root level. Because of the installation procedure for PAM, I have to copy a few files into directories, but everything seems to work fine.

After I have the root directory the way I want it, I create a few key directories as follows:

PAM	For all PAM and File Manager files
BIN	For all my miscellaneous programs and files
BAT	For all my batch files
DOS	For all the MS-DOS programs I need to keep
WIN	For Microsoft Windows
GAL	For HP Drawing Gallery
EMM	For HP's Executive Memomaker
ADV	For HP Advancelink
MBK	For my personal files and documents
SYS	For any device drivers or 'SYS' files

Because HP considers PAM integral to the MS-DOS, it is sometimes hard to tell exactly which files need to be in the PAM directory. *Figure 1* shows the files in the PAM directory on my system.

The PATH To Success

At the heart of my disc organization are the files in the BAT directory. Even then, the thing that makes it all work is the proper PATH. Let me explain how this MS-DOS feature works.

When you type a line into the MS-DOS command processor, it determines whether what you typed is one of its built-in commands. If it is, MS-DOS executes the command. All of these commands are memory resident at all times, so no disc access is necessary.

If you did not type a built-in command, MS-DOS will attempt to find a batch or executable file by that name on the current drive and directory. Incidentally, executable files can be of file type 'COM' or 'EXE'. The difference between these file types is not critical. Just for information, however, MS-DOS will first search for a 'COM' file, then a 'EXE' file. Finally, if no executable file is found, it will attempt to locate a 'BAT' file by the specified name.

This is one of the ways in which MS-DOS differs from most UNIX based systems: MS-DOS always looks in the cur-

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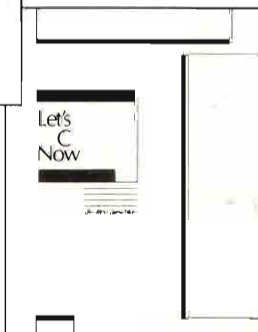
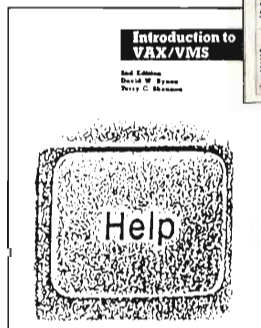
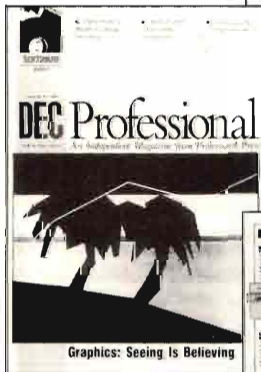
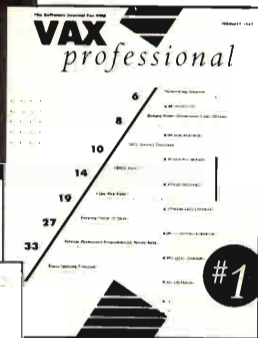


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*June 1988 BPA Publisher's Statements.

FIGURE

Volume in Drive F has no label

DIRECTORY OF F:\PAM

FM.EXE	51670
MANAGE.OVR	22938
PAM.OVR	19008
MANAGE.MSG	10498
PAM.MSG	6825
MNGEPAM.EXE	5550
FILEMNGR.MSG	4685
PAMINSTL.COM	4453
PAMCODE.COM	2163

Files in the PAM directory.

FIGURE

2

```
echo off
cls
echo Loading Executive Memomaker from Drive D:
d: > \dev\nul
cd d:\emm > \dev\nul
emm64 mm.run;lib=mml.v71,mma.v03
cd \
c: > \dev\nul
echo End of EMM
```

A batch file used to start HP's Executive Memomaker Version C.03.00.

rent directory first, while UNIX systems will only look in the current directory only if it is in the current PATH.

Like UNIX, however, MS-DOS allows users to define a path of one or more directories which may contain executable files. When MS-DOS is not able to locate the command in the current directory, it will look through all the directories named in the current PATH statement. Again, it searches for 'COM', 'EXE' and 'BAT' files. Only when it can find no executable files will it return and notify you that the command you typed was not located.

In my system, I arrange the BAT directory to be the initial one searched for a typed command. This allows me to define and direct the commands that invoke any program on my hard disc from the MS-DOS command prompt.

My batch files typically include a number of commands, including a message to the user as it starts up; MS-DOS com-

mands changing to the correct directory and starting the application; and most importantly, statements to return the user to the root directory after the application is finished. This final step assures the user that he or she will always start applications at a known point.

A typical batch file on my system is shown in *Figure 2*. This particular file is the one which I use to start HP's Executive Memomaker Version C.03.00.

A few additional notes are probably in order.

The first two lines are the same in all of my batch files. These direct MS-DOS not to display the commands in the batch file as they are executed; and then clear the screen to erase the 'echo off' command. These lines are followed by a line telling me which application is being loaded, as well as which disc that application is on. This is a handy reminder since I have a number of applications on each of my hard drives.

The next line changes to my D: drive, but with a twist. One of my pet peeves is batch files that constantly echo commands and results to the user as if he has any knowledge or control over what's actually happening during batch file executing. I'm sure you've all seen line with such cryptic nonsense as '1 file(s) copied', 'cd C::\ gallery \ temp' and so forth.

These lines appear because the person who wrote the batch file wasn't concerned with making the batch files as easy to use as their software. (If you find software as bad as the batch installation files, return package before going on. It will save you years of premature gray hair and countless bottles of antacid.)

By using a feature called 'I/O redirection' which MS-DOS inherited from the popular AT&T UNIX operating system, you can create batch files that send these useless messages to the bit bucket so you will not have to see them. In MS-DOS, this bit bucket is called '29-NOV-88 12:38:44ev \ nul', a null device. Therefore, any messages that result from a command will not be seen at the console.

Indiscriminant use of this feature can, of course, cause problems: The batch file may not execute properly and the user would have no clue why. Nonetheless, I believe it is up to the programmer and not the user to determine how well a batch file is executed. If it did not properly complete, the programmer should notify the user of any appropriate next steps.

The next line changes to the directory where the Executive Memomaker files are located. I specify a fully qualified directory in case I am not at the root directory when I execute this batch file. Again, I redirect the output to the null device.

The following line, which actually invokes the application, is the real workhorse of this batch file. I copied it directly from the batch file I found on the HP Executive Memomaker disc. Different HP applications use slightly different run commands, so be sure to check the batch file installed with the application.

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Finally, when the application ends, I change back to the root directory and return to the C: drive. I include a message reminding me where I was.

Before I close I'd like to explain why I go to all this trouble to organize my hard disc.

Let's take a quick tour of any office's file cabinet. When you open it, you'll see a collection of hanging files and manila folders. That's because people don't file all the papers, memos and articles they get in serial fashion. It's human nature to organize files by subject. When you need to retrieve a particular file, you can go directly to the folder containing all the papers you have on that subject and locate the individual file much more quickly.

Now, in that same office, let's take a look at the typical hard disc. There's a good chance the files on this disc all are stored in the same directory. Hundreds of programs, letters, databases, games and hot stock tips all filed there, one after the other, in sequential order. The owner of the computer will be hard pressed to tell you which files go with which programs. He also may be wondering why his hot 286 processor and fast disc are running so slowly lately.

When you open a file inside of an application, MS-DOS actually scans every file in the directory to locate the file you've specified. If that file is the first file in the directory, your ap-

plication will quickly return with the data. If there are 300 files ahead of yours in the directory, MS-DOS will have to scan through every one of those files before it can return to your application. This happens not only when you open the file, but whenever MS-DOS needs the other information stored in the file name entry.

Systems are not like people; they do not necessarily get slower as they age. If you will take the time to organize your hard disc into logical directories, your system can get back a lot of the zip it had when it was young. Think of it as Geritol for your hard drive.

If you ask the office occupant why his filing cabinet is so well organized, he will tell you how important it is to be organized. If you ask him why he doesn't use directories on his hard disc, he may shyly explain that he doesn't know why he needs them. In fact, directories are to your hard disc what manila folders are to your filing cabinet.

Well, that's it until next month. I'll leave it up to you to decide if I'm as picky as some people think I am. Have a nice Superbowl. —Miles B. Kehoe works in product marketing for UNIX systems at Hewlett-Packard, Cupertino, CA.

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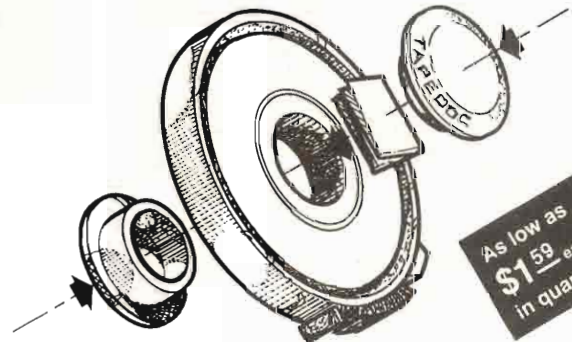
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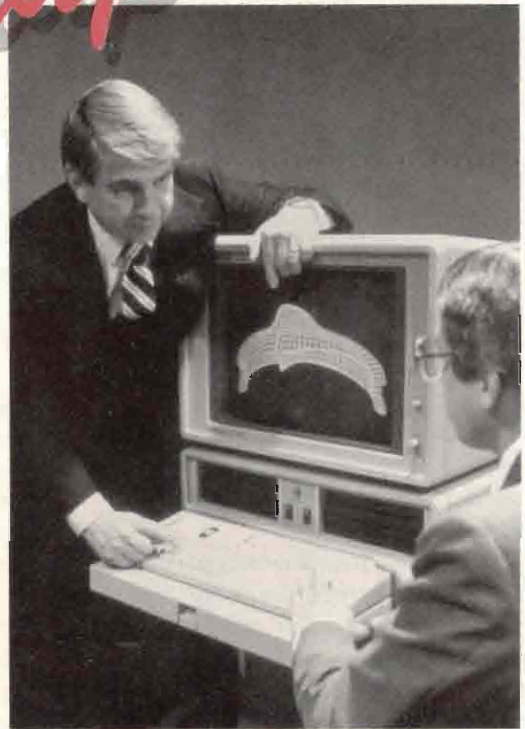
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RDBMS

Fabian Pascal

Shaky Data Management

The relational approach to data management is one of

the most important technologies of the 80s. Anybody who deals with computers in general, or databases in particular, has probably been exposed by now to the hottest market trend — relational database management systems (RDBMS) and Structured Query Language (SQL).

The importance of relational databases stems from the simplicity, and, therefore, usability and productivity they bring to those who need it most: the users. Yet, it's they who know and understand the least about them. Over the next few months we will define and explain the concepts, features, methods and practical implications of relational technology in a simple, systematic and useful manner.

Traditional Data Management

An inspection of traditional, nonrelational DBMS (referred to as hierarchical or network systems) reveals that they suffer from several serious deficiencies. These deficiencies:

- are procedural
- don't separate the logical and physical levels
- don't have a systematic foundation
- are proprietary

It will be easier to demonstrate these problems and their practical consequences by using an example. Consider a school's database, consisting of the five related data files shown in *Figure 1*.

One basic purpose of a database is to be interrogated by users for informa-

tion. A common query would be:

"What are the classes and teachers of the student George Walters?"

If the database is a traditional one, a program usually will have to be written to extract this information. *Program 1*, is used for Ashton-Tate's dBase III plus, a popular microcomputer data manager. The program combines data from all five files to come up with the answer to the query.

Let's take a closer look at the deficiencies in this approach:

1. Procedures

To query a database, the user usually must specify not just *what* data he wants, but also the step-by-step procedure to be followed by the system to retrieve it: Get one area in memory, open first file, use this index, get another area, open second file, etc. It's like sending somebody for a cup of coffee by instructing: Go to the door, walk through the hall, enter the kitchen, switch on the burner, etc.

Also, records are processed by such systems one at a time. Thus, if operations must be performed on multiple records, for example, searching or updating several records based on certain criteria, the program will have to contain LOOPS, i.e., instructions from the user on how to repeat the operation on each record, until the criteria is satisfied

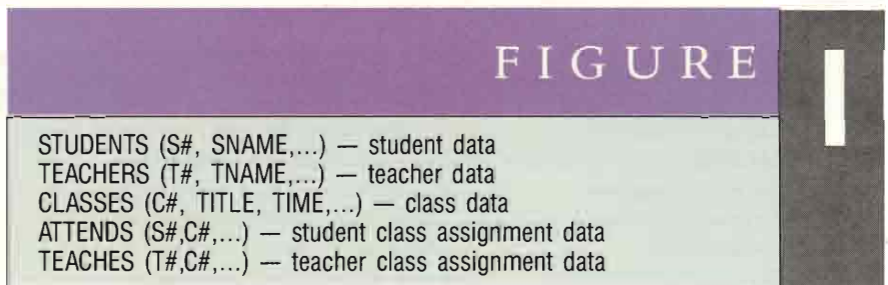
fully. The DO WHILE...ENDDO segment in *Program 1* is one such loop.

2. The Logical-physical Separation

The informational content of the files (i.e. the data itself) is what matters to the user. That is the logical level. How the data is represented and accessed internally is the physical level. The bits and bytes, disc and memory addresses, arrays, pointers, etc. are irrelevant. Yet, traditional systems expose users to these elements, forcing them to use them explicitly in programs when manipulating the data for logical purposes. In the example in *Program 1*, indices, that is, internal fast access paths to the file records must be specified in the query. Indices are the least complex physical mechanisms to clutter programs.

3. Unsystematic Foundation

The lack of a systematic foundation isn't visible in the program, but it's a very critical deficiency in nonrelational DBMSs. You wouldn't send a rocket into space without the benefit of physics and ballistics theory! Similarly, database systems could benefit greatly from a theoretical foundation, which would give them reliability, precision and completeness. But, traditional systems lack any such basis. All were developed in an ad-hoc manner and suffer from the



A school's database consisting of five related-data files.

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*Product available for shipment 1/89

CIRCLE 104 ON READER CARD

Program 1.

```
SELECT 2
USE teachers INDEX t_code...
SELECT 3
USE classes INDEX c_code...
SELECT 4
USE teaches INDEX tc_ccode...
SET RELATION TO t# INTO teachers
SELECT 5
USE attends INDEX sc_scode...
SET RELATION TO c# INTO teaches
SELECT 1
```

```
USE students INDEX s_name...
SEEK 'George, Walters'
SELECT attends
SEEK students->s#
DO WHILE students->s# = attends->s#
    SELECT classes
    SEEK attends ->c#
    ? teachers->tname,classes->time,classes->title
    SELECT attends
    SKIP
ENDDO
```

consequences described below.

What's more, it's frequently argued that because the relational approach has a theoretical basis, it's difficult and impractical for users. This is similar to claiming that mathematics has no practical applicability. It is theory that makes everything systematic, precise and, therefore simpler and easier to learn and use.

4. Proprietary Languages

Traditional data languages are proprietary. This means that vendors define their own, unique ways of representing and manipulating data. Our sample program is unique to dBase; a different program would be required by a different DBMS for the same query. It's not the users but the *vendors* who need to master the underlying theory to bring practicality to users.

The Practical Consequences

These deficiencies have made the use of nonrelational systems problematic. Programs need to be written for database operations as soon as they show the slightest sophistication. This makes data inaccessible to nonprogrammers. The level of technical expertise demanded even from programmers is high. This is because of the complicated software (e.g. loops) and hardware (internal storage and access) constructs, that must be

handled explicitly in programs. Procedural code is error prone and highly unreliable, imposing significant debugging and documentation burdens.

Because they have no systematic, comprehensive foundation, traditional DBMSs initially are incomplete. As functional gaps are discovered in practice, commands and functions are added, causing language instability and burdening users further. The technical expertise required makes it difficult for users to communicate with the programmers to define their requirements. Neither can programmers in different DBMS environments communicate because the proprietary nature of nonrelational systems makes expertise narrow and unique to each system, inhibiting the transfer of skills from one product to another.

The lack of separation between the logical and physical levels in programs makes traditional DBMS not only difficult to use but also inflexible. Internal specifications must be imbedded explicitly in programs whenever internals change for the following reasons:

- *the hardware or the software is enhanced by vendors*
- *data or processing needs change, or for performance tuning purposes*

Think about what happens to *Program 1* when an existing index is dropped, or when a new one is added.

This creates the famous "maintenance backlog" problem — the difficulty of keeping up with the changes imposed by the dynamic nature of the business environment. This dependence of traditional applications on physical internals, unique to a specific operating system and hardware combination, also reduces their portability and distributivity across networks.

These practical problems translate, cumulatively and rapidly, into economic ones. Because users cannot get at their data quickly, and the programming effort is considerable, productivity is low and costs high. With these problems in mind E.F.Codd devised the relational approach. Next month we will investigate his simple, but brilliant ideas. —*Fabian Pascal is a Washington D.C.-based analyst, consultant and author specializing in relational database management. He is affiliated with Codd & Date International.*


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Continued from page 24.

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Contact Insight Development Corporation, 1024 Country Club Drive, Suite 140, Moraga, CA 94556; (415) 376-9451.

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TrackStar Helps Meet Demands Of Managers

T and B Computing Inc., has announced the release of TrackStar Version 2.0, a project-scheduling package designed to meet the needs of department or workgroup managers.

Traditional critical path scheduling requires the user to determine how much time each activity in a project would take. The user must estimate when people and other resources will be available, how much time they can devote to the project, and then calculate a duration for each activity.

T and B Computing has developed resource scheduling that eliminates these estimates by calculating activity durations based on the actual availability of staff and equipment.

TrackStar runs on VAX, Prime and HP-UX computers.

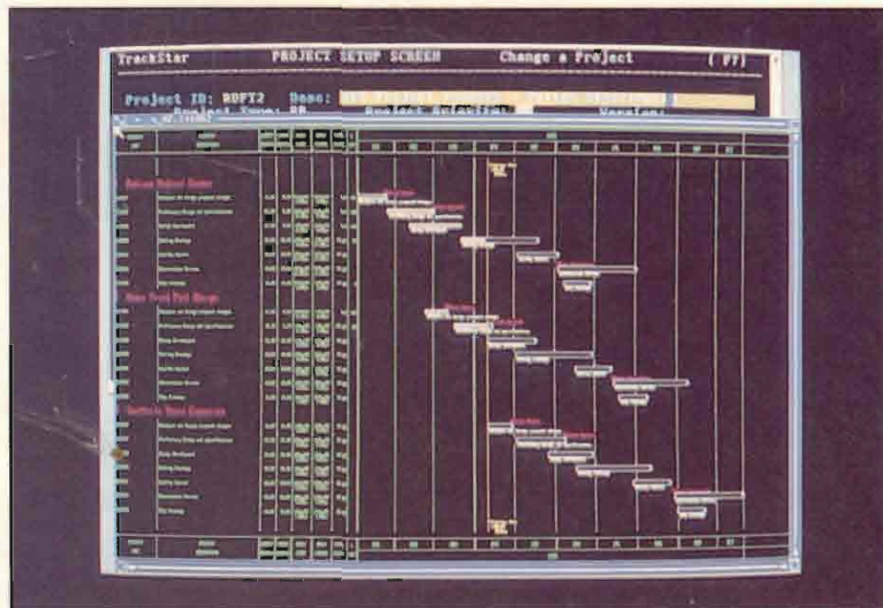
Contact T and B Computing Inc., 1100 Eisenhower Place, Ann Arbor, MI 48108; (313) 973-1900.

Circle 379 on reader card

EMC Announces Memory For HP-PA

EMC Corporation has announced its shipping memory for HP-PA Spectrum Series systems. The memory, named HXP-95X-16MB, is available in a 16-MB board and is priced at \$32,000. Step pricing is available for volume purchases.

The product is fully compatible with the high-end models of the Spectrum Series, which include the HP 950 and 955. The 16-MB board also is compatible with HP's 850 and 855 UNIX machines. Completely transparent to HP diagnostics, the board was designed with status indicator LEDs and an



TrackStar's Resource Scheduling gives managers the ability to manage the interaction between projects and staff resources.

on-line/off-line switch to eliminate finger-pointing and to make diagnostics easy and efficient.

Contact EMC Corporation, Hopkinton, MA 01748-9103; (617) 435-2541 or (800) 222-EMC2.

Circle 390 on reader card

DBTUNE/XL, HIBACK/XL Available For Spectrum

HI-COMP Hinrichs GmbH has released production versions of DBTUNE/XL and HIBACK/XL for Spectrum.

The new XL version has the same functionality as HIBACK/3000 and DBTUNE/3000 for MPE/V. Some parts of the products are running in native mode.

Full compatibility between the MPE/V and MPE/XL-versions is guaranteed. Backup and restore now can be performed on either operating system.

Free demo tapes can be requested from the New York City office.

Contact HI-COMP America Inc., 305 Broadway, 4th floor, New York, NY 10007; (212) 732-1946 or (800) DBE-TUNE.

Circle 386 on reader card

IEM Introduces Latest In Optical Disc Storage

IEM Inc. has announced the 16-GB optical disc subsystem with an automatic cartridge change mechanism (jukebox).

The system is media compatible with IEM's 800-MB 5 1/4-inch optical disc cartridges for the model OD5-HP800 drive. This unit is compatible with any HP computer that attaches via an HP-IB cable and uses the CS-80 data transfer protocol.

The model OD5-HP16G incorporates two optical disc drives and gives users access to up to 20 WORM (Write Once, Read Many) cartridges without the need to load and unload manually. Each unit comes complete with all software support utilities and drivers, to allow the unit to work on all HP machines.

WORM optical discs offer users true data security because information cannot be overwritten or erased.

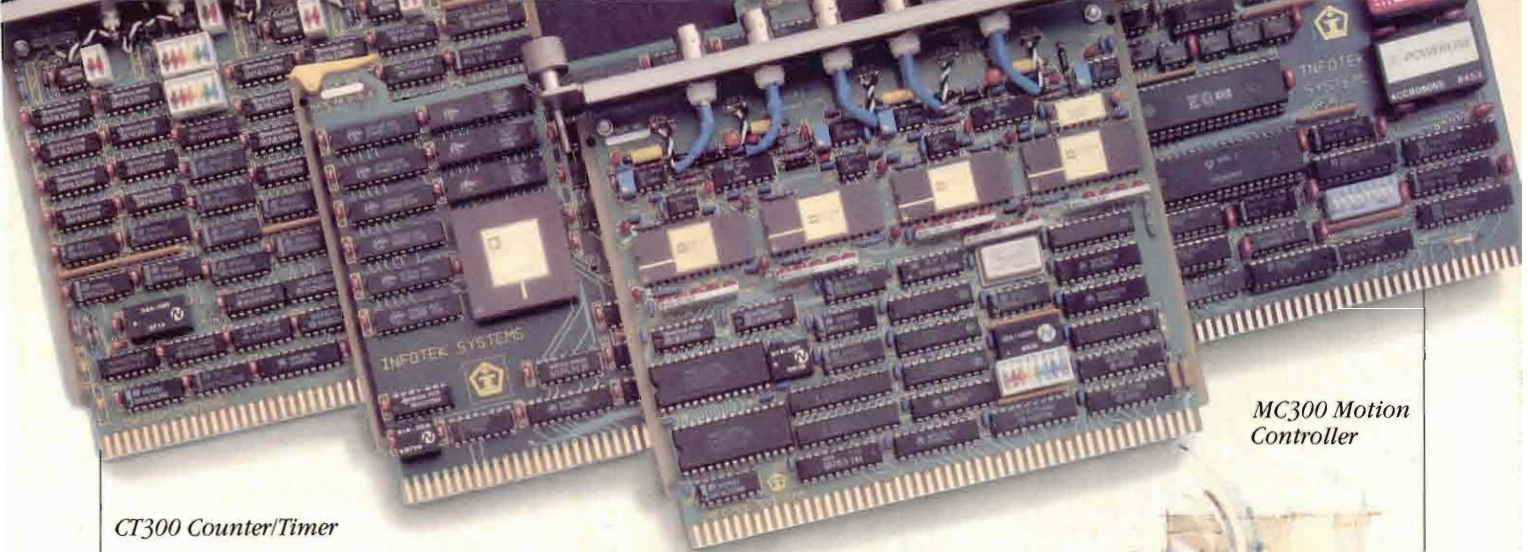
Contact IEM Inc., P.O. Box 8915, Fort Collins, CO 80525; (303) 223-6071 or (800) 321-4671.

Circle 392 on reader card

Graphicus Offers Image Interface

Graphicus Inc. has released the Image Interface software program module for the Statit statistical and data analysis system. The program runs on the HP 1000 A-Series minicomputers and automates many of the complex and time-consuming tasks performed by Image database users.

The programs allows users to read selected datasets and subsets. Features include obtaining structural information about the



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MC300 Motion Controller



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Now, four new data-acquisition, analysis and control products are available for your Hewlett-Packard 9000 200/300 computer—from Infotek, the world leader in HP enhancements.

The new, economical Infotek DA300 digital-to-analog converter features four independent channels with 16-bit precision. Modes of operation include direct voltage output or waveform generation, supported by a 64K buffer. It's a first for

HP 9000 users.

Another first, the CT300, is the industry's only board-level four-channel Counter/Timer for HP Series 200/300 computers. Each channel operates independently with 16- or 32-bit accuracy. Input rates up to 20 MHz can be achieved in counter mode.

For signal processing applications such as FFTs and digital filtering, Infotek introduces the DSP316. Based on a fixed-point DSP and 16-bit data memory, this single-slot coproc-

essor operates at up to eight million instructions per second.

And now Infotek also makes available a programmable motion controller, the MC300, for control of d.c., d.c. brushless and stepper motors.

With the popular family of A/D converters, Infotek offers the most complete

line of data-acquisition and control products for HP users. Imagine the new possibilities, then call or write today to Infotek Systems, 1045 S. East Street, Anaheim, California 92805-8508, (714) 956-9300, (800) 227-0218, in California (800) 523-1682, TELEX 678870, FAX: (714) 491-8644.



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The license fee for the Image Interface is \$1,000.

Contact Graphicus Inc., 150 Lake Street, Suite 206, Kirkland, WA 98033; (206) 828-4691.

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Ada/300 DS Compiler Available From HP

Hewlett-Packard has announced the immediate availability of the Ada/300 DS compiler for the HP 9000 Series. The Ada/300 DS replaces HP's Ada 200/300 compiler.

The advanced Ada/300 DS development system couples a high-quality compiler with a set of value-added Ada software, including development tools, a window-based source-code debugger and a set of utilities to manage multilibrary developments.

Ada/300 offers software developers the solution for large-scale, complex systems and Department of Defense projects.

Ada/300 DS complies with industry standards and validation requirements and also supports distributed application development.

By supporting disless workstations on a network to accommodate additional application developers, Ada/300 DS provides a seamless and cost-effective way for users to expand their Ada development environment.

Contact the Hewlett-Packard sales office listed in the white pages of your telephone directory.

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PrintManager Releases Sharing Device

PrintManager Inc. (Watertown, MA) has introduced a printer sharing board for all HP Series II laser printers that allows users to select and merge graphics with text to customize and print actual stationary and forms.

The LaserSpool Image Maker lets users merge graphics with text and Lotus spreadsheets to create presentations or customized letterheads and forms. Fonts, graphic overlays, copies, text enhancement and control functions all are selected from "pop-up"

menu windows along with customized printer commands and the programs automatically load to the printer.

The LaserSpool Image Maker lets three PCs share one printer, prioritizes the printing jobs and has a 250-KB buffer. Capable of enhancing text, printing logos or images and multiple letterheads, users can establish an electronic library of forms.

The LaserSpool Image Maker sells for \$695.

Contact PrintManager Inc., 108 Water St. Watertown, MA 02172; (800) 642-5019 or (617) 924-3952.

Circle 387 on reader card

Taurus Introduces Chameleon

Taurus Software (Palo Alto, CA) has announced the introduction of Chameleon, B.01. The MPE-XL emulator has been enhanced to include commands not yet available in MPE-XL.

Chameleon now supports MPE-XL intrinsics, which gives programmatic access to variables and MPE-XL commands. These intrinsics can be used by your programs to access MPE-XL commands, UDCs and command files.

Chameleon has added commands to read and write from files. These commands provide the same function as the file system intrinsics such as FOPEN, FREAD, FWRITE, FCONTROL and FFILEINFO. The file commands can be used to do file lookups, password lookups, write out data to global variable files and more.

Chameleon, B.01 is available free to all customers with support contracts. Contact Taurus Software, 770 Welch Rd., Suite 3A, Palo Alto, CA 94304; (415) 853-6893.

Circle 383 on reader card

Unison Technologies Offers Power Supplies

Unison Technologies Inc. has introduced a new family of low-cost uninterruptible power supplies designed for integration into distributed processing environments.

The products provide value-added resellers (VARs) with a total solution to power protection for personal computers, network file servers and microbased multiuser applications. Each member of the new UniPower DP Series combines continuous on-line power and a local area network (LAN) interface.

Unison's UniPower DP Series consists of three models, each distinct in its applica-

tion. The UniPower DP 600 is targeted for single PC/workstation environments, while the UniPower DP 800, which includes a Novell LAN interface cable at no extra charge, is geared for networks with central file servers.

The UniPower DP 1000 is designed for multiperipheral applications, such as LAN systems where printers, plotters and auxiliary storage devices share the same power line.

Prices range from \$695 to \$1,095.

Contact Unison Technologies, Inc., 23456 Madero, Mission Viejo, CA 92691; (714) 855-8700.

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Engineering Software Announces Hydronet 3.0

Engineering Software (Nevada City, CA) has announced an upgrade of a hydraulic network design package, Hydronet 3.0.

New features include a Lotus 1-2-3 type environment, display and printer graphics of hydraulic grade lines, fitting and valve usage, an on-line help facility, critical pressure and pump calculations and larger system design capacity.

Hydronet sells for \$495, runs on all PC/MS-DOS microcomputers and uses math coprocessor chips, if available. It requires 512KB RAM and one floppy minimum.

Contact Engineering Software, P.O. Box 1450, Nevada City, CA 95959; (916) 288-3470.

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HP Style Commands Added To NI-488

National Instruments Corporation has announced a new version of its industry standard NI-488 MS-DOS IEEE-488 software handler that features an option for programming IEEE-488 instruments using HP style commands. The new NI-488 MS-DOS software works with two of National Instruments IEEE-488 interface boards for IBM PC/XT/AT or compatible personal computers, the GPIB-PCII and the GPIB-PCIIA.

The company also plans to include HP-Style Calls in several other NI-488 software packages.

HP-Style Calls implements complete IEEE-488 bus management and control functions using the standard I/O commands of any programming language.

HP-Style Calls accesses the high-speed NI-488 MS-DOS handler through a terminate-and-stay-resident program that

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HPPRO8801

uses a sophisticated character parser to sort individual functions.

HP-Style Calls commands are best tailored for BASIC where standard I/O commands allow data to automatically be formatted. A language interface is not needed to interface to the NI-488 MS-DOS handler because standard I/O commands are a part of the programming language.

Contact National Instruments, 12109 Technology Blvd., Austin TX 78727-6204; (512) 250-9119.

Circle 380 on reader card

RAET Software Products Improves Artessa

RAET Software Products, the manufacturer of Artessa has announced the new Release 3.0.

This release features a wider choice in design of on-line transactions and improvements to aid the developer in identifying and changing components of an applications systems.

Release 3.0 also features support for Relative Files, intended to assist companies

with a substantial RPG history (on HP or IBM S/3X systems) and who need to preserve the higher performance of relative files in transaction-chains.

The applications may be run on any HP 3000 computer (classic or precision architecture) and no run-time support is required. Contact RAET Software Products BV, P.O. Box 4077, 6803 EB Arnhem, The Netherlands; (USA) (800) 338-3772.

Circle 378 on reader card

VOCUS Releases Sales And Marketing Software

VOCUS, a software developer for Hewlett-Packard, recently has released its latest version of a sales and marketing software system known as VOCUS Prospect Tracking (VPTS).

VPTS performs a variety of functions for sales, sales management, customer service, telemarketing and marketing while reducing clerical functions almost entirely.

Customized mailings and telemarketing calls can be made selectively with ease while

data is provided to marketing without imposing any burden on sales.

Lead analysis lets marketing know what the results of their efforts have been and where best to spend advertising and marketing dollars in the future. Analysis can be made in a variety of ways including by rep, by product, region, prospect priorities, date ranges and more.

Contact VOCOS, P.O. Box 847, Ithaca, NY 14851; (607) 272-8464.

Circle 377 on reader card

InCase Releases Version 2.0 Of EnGarde

InCase Corporation (Redwood City, CA) has released Version 2.0 of EnGarde, a system security analyzer for MPE/V HP 3000 minicomputers.

The new version includes improvements in documentation and on-line help as well as a streamlined installation process and expanded STREAM file analysis.

The product is designed to assist system managers and account managers maintain tight security on HP 3000s. EnGarde reports a systemwide score for HP 3000 security and finds loopholes in accounting structure security in minutes.

Version 2.0 expands EnGarde's ability to check STREAM files for password and logon loopholes. More than a dozen new stream file vulnerability messages have been added to EnGarde's reporting ability.

In addition, EnGarde now examines Image database schema files for security problems.

The product is priced at \$1,495 for the first copy and \$1,050 for each of the next three copies; copies beyond four are priced at \$750 each.

Contact InCase Corp., 2055 Woodside Rd., Suite 171, Redwood City, CA 94061; (415) 369-1941.

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Vestronix Releases PROC-C Version 1.3

Vestronix Inc. has announced the release of Version 1.3 of PRO-C, the C source code applications generator for MS-DOS, QNX, XENIX and UNIX.

Vestronix has added a number of features including Windows, dBase III interface, multiple records, improved help functions and full color support.

Contact Vestronix, Allen Square, 180 King St. South, Suite 230, Waterloo, Canada, N2J 1P8; (518) 745-3660.

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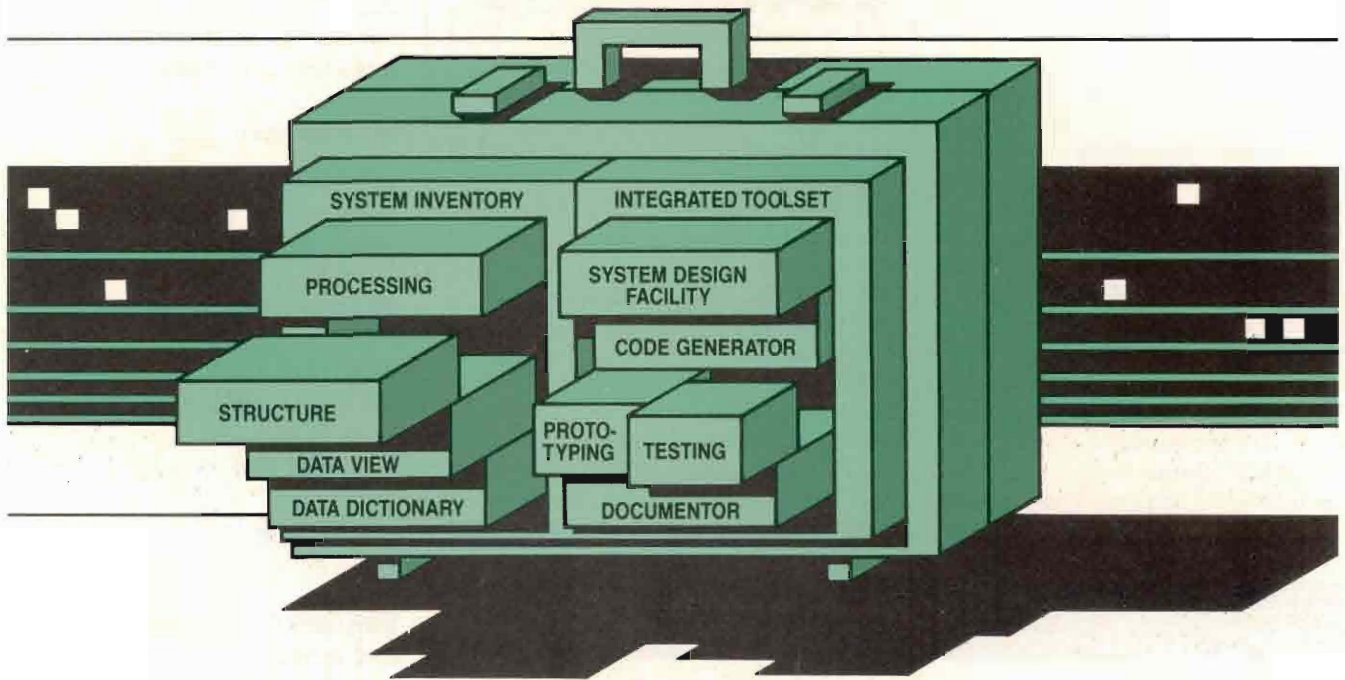
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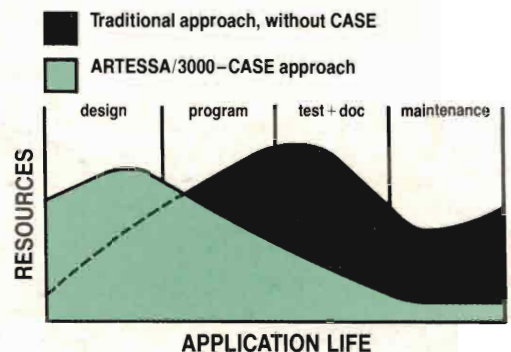
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[CALENDAR]

[JANUARY]

19-20: There will be a NOWRUG conference at the Washington Convention and Trade Center in Seattle, WA. The theme will be "Small Shops and the Future of the HP 3000." For more information contact Doris Goertz at (206) 746-0212.

23-25: CAP International will hold its second annual Optical Disk Systems Conference at The Pointe at Tapatio Cliffs in Phoenix, AZ. Contact Kristen Fischer, Conference Assistant, CAP International, One Longwater Circle, Norwell, MA 02061; (508) 982-9500.

[FEBRUARY]

9-10: Georgia Regional Users Group (GRUG) will hold a two day meeting and vendor show at the Northwest Hilton, Atlanta, GA. The topic will be "Focus on the Future." For more information contact Tom

Brightwell, CompuPros Inc., 2382 High Forest Court, Atlanta, GA 30136; (404) 729-1903.

28-3/2: The Sixth Annual UniForum, the International Conference of UNIX Operating Systems Users, will be presented at the Moscone Center in San Francisco, CA. For full details, write UniForum 1989, 2400 East Devon Avenue, Suite 205, Des Plaines, IL 60018; (800) 323-5155 or (312) 299-3131.

[MAY]

30-6/2: NECRUG is holding the Tenth Annual Eastern American Hewlett-Packard Users Conference at Harrah's Marina Hotel and Casino in Atlantic City, NJ. The total fee is \$279 for members if you register by April 28, 1989 and \$319 thereafter. The \$450 vendor fee includes one representative, booth space, meals and conference activities. For information about the conference contact Jeri Fuller c/o U.S. Mortgage Insurance Co., (215) 825-7760. You can contact Scott Baldwin at Hunt Manufacturing Co., (215) 875-5324 for information about exhibition booths.

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