Toward More Flexible Computing Systems

The continuing development of computing systems often force users to spend much of their time converting large numbers of in applications to run under new systems. The user should not suddenly be forced into this bind. We will give information about developments in systems that may avoid these problems.

1. Users want to be able to use old applications

   "Users flock to Windows because the environment allows a smooth transition: you can continue using your DOS applications while you acquire Windows programs."

   OS/2 did not provide users with DOS support needed to keep running their old programs. This is one reason the user community has not voted for OS/2. The new OS/2 2.0 (late 1991) will have good DOS support. It will also give support for Windows. It may become popular.

2. Scalable interfaces

   "The blizzard of application products, often with hard-to-use interfaces, has intimidated many potential customers. Ease of use remains the largest barrier to mass market success."

   Berkeley Softworks is working on scalable interfaces that are very simple for novice users and different for professional users.

3. IBM and Metaphor

   A very good operating system may be developed, but it won't be much good for users unless there is a good set of applications to go with it. Methods are needed to live with today's bewildering choice of operating environments: DOS, Windows, OS/2-PM, UNIX with Motif, etc.

   "Developers (of applications) can't decide what to build for and users can't decide what to buy. Everything should be portable, but nothing really is."

   The new Patriot offering will "allow developers to build object-oriented applications without worrying about operating systems." Customers will be able to unlink their choices of applications and operating systems. It will be easier for companies to introduce improved operating systems because the applications can be automatically linked to work with the new system.

4. Users want multiple choices of operating systems and applications, and these need to inter-operate with each other.
Reactions and responses
from the PC World community

Can IBM Come Back?
I enjoyed Richard Landry’s "Where’s Big Blue’s Big Mo?" in April. I think IBM’s present lack of status in the PC community came from Big Blue’s attempt to go too far too fast with some of its products. Instead of setting standards, IBM alienated itself from its users. No one wants to throw away something that works well in exchange for promises. Users flock to Windows because the environment allows a smooth transition: You can continue using your DOS applications while you acquire Windows programs. We all want more flexibility and power—but not at the price of dumping our entire DOS investment for a totally new OS/2 environment.

Roger Ramteerath
New York, New York

You make a major error in underestimating IBM. No, IBM hasn’t bought the Windows bill of goods, and yes, some at IBM would like to see those terrible tens of millions of PCs turned into mainframes. But many others realize that the time of dominance by traditional big iron is over. As the computer giant, IBM has often proved more nimble than expected, and Big Blue’s research facilities are still equal to any and better than most. Don’t be surprised if the proliferation of personal workstations signifies the end of the DOS-PC era. If so, IBM may set the new standard with the RS/6000 without having to bear the Windows albatross.

John Newbert
Madison, New Jersey

July 1991 PC World
POWER TO THE PEOPLE

The microcomputer industry in the 1980s saw enormous growth, turmoil, shakeout, and ultimately success in penetrating and nearly saturating the corporate market. But with the exceptions of Tandy (a special case) and Apple (which has reoriented itself to the corporate marketplace), the companies that sparked mass-market computing—Commodore, Atari, Tandy, Texas Instruments, and Sinclair—have all stumbled or fallen by the wayside.

There's no consensus as to who will lead or what the path will be to mass-market computing in the 1990s. For those companies, like Berkeley Softworks, whose primary goal is to make computing, in its broadest sense, a truly mass-market phenomenon, the second decade of microcomputing offers particular challenges. The paramount challenges: delivering ease of use and picking the right hardware platform.

The microcomputer is the most complex device ever to have entered a mass retailer's store. Its ability through software to become a game machine, productivity tool, telecommunications terminal, fax machine, command and control device, and so on holds enormous promise. Yet the blizzard of application products, often with hard-to-use interfaces, has intimidated many potential customers. Ease of use remains the largest barrier to mass-market success.

Ease of use is a relative concept. The Macintosh and Windows are easy to use compared to command line interfaces. But they're not easy for someone in a small business or home who has no access to training and just wants to use an electronic calendar/address book, write a memo, or send a fax. The solution isn't as simple as making everything easier. While a scripted, sequential interface that walks the user through each step might be easy for a naive user, it becomes tedious and frustrating as a user's skills and aspirations grow.

What we need to open up the mass market is a Scalable GUI (SGUI), a GUI that allows the same applications to be accessed at various user-selectable levels of functionality. These levels range from an appliance mode, where users are only required to push a few buttons, to a novice computer interface (such as Tandy's DeskMate), to a full-fledged professional GUI like Presentation Manager.

An SGUI would also allow users, as their skills and needs grow, to simply switch interface levels to access more powerful features. Ideally, an SGUI would allow users to choose among different looks (Windows versus Macintosh versus Next Step) and use different input devices (keyboard, mouse, stylus, touchscreen, voice, and so on) to drive the same applications at various levels.

Over the last 3½ years, Berkeley Softworks has devoted substantial resources to solving these complex interface and ease-of-use requirements. We believe a more flexible user-interface solution is required to break open the mass market. The industry needs to offer a solution that any user can access, regardless of his or her previous experience. The solution must be able to grow with the user without requiring expensive hardware upgrades.

This leads to the second major challenge for mass-market PC success in the 1990s: the hardware/pricing equation. To date, the industry, led by Microsoft's system software requirements, has forced mass-market customers to live with hand-me-down solutions. All the innovation in the industry has occurred at the high end for the corporate market, where users can afford the expensive new machines. Efficient software development, which could bring many of these breakthroughs to low-cost mass-market machines, is rarely practiced. The message has been "If you can't afford to run with the big companies and buy new hardware every other year, you're doomed to run obsolete software." This is insane.

The potential mass market dwarfs the corporate market. Statistics show that during the 1980s, the percentage of the population employed by the Fortune 1000 companies dramatically declined. The majority of the population today is employed by small- to medium-sized businesses that can't afford to buy new hardware every other year. Add this to the consumer, home office, and K-12 educational markets, and you can see the potential. The industry needs to deliver innovative system and application-software solutions for machines that have already been driven down the price curve.

New enabling system and application technologies targeted at the needs of the mass market will soon be available. These technologies will dramatically change the frame of possibility for low-cost, high-performance computing. The 1990s will finally see PCs deliver power to the people.

Brian Dougherty is the Chairman and CEO of Berkeley Softworks, a software developer and publisher specializing in system software and applications.
What’s Up with IBM And Metaphor? Their new venture will enable developers to build applications for any operating system.

"MARLA MAPLES?" says Donald Trump. "She’s just a good friend."

"Metaphor?" says IBM. "They’re just our good friends."

I suspect there’s more to IBM’s recent deal with Metaphor Computer Systems to form Patriot Partners than meets the eye. Yes, it may signal some IBM dissatisfaction with Microsoft, as everyone says, but this partnership also makes good technological sense.

It addresses a pernicious problem that nags both application developers and users: how to live with today’s bewildering choice of operating environments—DOS, Windows, OS/2-PM, Unix with Open Look or Motif or whatever. Developers can’t decide what to build for and users can’t decide what to buy. Everything should be portable, but nothing really is.

All these formats and interfaces are precisely the kind of rich, structured, complex data that are best represented as objects. That’s where the IBM–Metaphor deal comes in. I can’t predict the outcome of the IBM–Microsor marriage, but I can understand the appeal of the new Patriot offering, which will allow developers to build object-oriented applications without worrying about operating systems. This, in turn, should allow customers to unlink their application and operating system decisions—a truly liberating prospect.

Why might the IBM–Metaphor team gain from object-oriented programming a benefit that has so far eluded others? Because Metaphor has all the right pieces in place to make this new programming model fly. The often-touted advantage of object orientation is reusability, but this promise must be tempered from two sides: All code is theoretically reusable, but it must be both worth reusing and modular enough so that you can reuse or extend discrete parts of it in new combinations. Object orientation makes these benefits easier to attain, but it doesn’t guarantee them.

First, the objects must be carefully constructed, with clean, intelligible interfaces for interacting with other objects and for modification or specialization by reusers. Second, the objects should be well-conceived ones that developers and users understand and want to deal with. A variety of companies have built their own object-oriented applications, but these pioneers tend not to encourage third-party participation. On the other hand, a number of vendors have built rich foundations for such systems, but without much embedded application knowledge.

Hewlett-Packard’s NewWave, for example, is a full-fledged object-oriented environment for developers and users, complete with interface. Unfortunately, most of the objects it manages are merely DOS files linked to the applications that created them. In a sense, HP put the cart before the horse: It has the framework, but little to put inside it.

A few applications have been converted to be NewWave-aware (1-2-3 and Excel, for example), enabling them to work as NewWave objects such as a spreadsheet or a chart. But there are few standard NewWave objects available at the level where an application might manipulate objects instead of being a set of methods attached to a formatted file. (That is, a WK1 file plus 1-2-3 is an object, but 1-2-3 itself knows little about objects; its cells are not objects, but internal data structures.) In short, NewWave is an object-oriented environment, but it has very few classes of objects and no built-in support for a particular object-oriented language.

Unlike NewWave, Metaphor has started with an application—its own Data Interpretation System—or at least a set of specific capabilities, rather than an abstract notion of an object-oriented environment.

Likewise, Patriot will offer an object-oriented environment already populated with a fair amount of applications capability encapsulated as objects. It will be C++-based and 32-bit-specific, but it will run with OS/2 or Unix. Other versions should be easy to develop for any platform that supports a C++ compiler. The IBM–Metaphor system should offer a rich array of objects for applications to manipulate, starting with text and data objects, voice and image.

Asked how the system differs from NextStep, the programming environment of NeXT computers (apart from its basis in common PC standards), Metaphor Chairman David Liddle replies, "Not much. But we're five to five years further along from where we started."

What can users do now to prepare for portable, object-oriented software until the Patriot toolkit appears next year? Develop for OS/2 or Unix and use C++. Liddle says. That's the way IBM and Metaphor will go, and whoever wants to ride with them should take heed.
THE LIBERATION OF DOS

BY JOHN QUATTLEBAUM

With less fanfare than one might expect, a new industry standard is helping to free workstation users from the "forced choices" discussed in PW's April '91 editorial and May '91 Back Page. The new standard — called the DOS Protected Mode Interface, or DPMI — allows workstation users to have off-the-shelf DOS applications and state-of-the-art multitasking too.

With the backing of industry heavyweights IBM, Intel, Microsoft, and Unisys, DPMI has liberated DOS from its traditional PC platform. Users will soon be able to select from a variety of Intel-based systems that will provide true multitasking of extended DOS applications.

The first version of the DPMI spec, version 0.9, was released in May '90; version 1.0 shipped in April '91. Ironically, DOS with DPMI is the first environment to realize one of the key hallmarks of open systems: binary compatibility of applications across many vastly different operating systems.

DPMI defines a standard interface that allows protected-mode applications to more fully implement the multitasking capabilities of Intel-based personal workstations. Protected-mode, or "extended," DOS applications use the extended memory capability of Intel's latest microprocessors to break beyond the traditional DOS 640K barrier. DPMI also ensures that extended DOS applications can be multitasked reliably without compromising the integrity of the host operating system.

Windows already supports DPMI-compliant applications. Unisys' CTOS commercial workstations, the first non-PC DPMI hosts, are the first systems capable of running multiple DPMI sessions concurrently with true preemptive multitasking between sessions. CTOS, an operating system running on more than 800,000 workstations, underscores the revolutionary aspect of the new standard: an Intel-based but non-PC platform can now provide equal — if not better — support for the latest DOS applications. Other operating environments that either multitask DPMI applications now or will in the future include DESQview, OS/2, Ergo DOS, VP/ix on Unix 386, and VM/386.

Goodbye, Emulators
The benefit, of course, is that workstation users now have an assortment of powerful, multitasking operating environments to which they can migrate while maintaining their investment in DOS software. DPMI freedom of choice will enable users to choose the Intel-based platform and operating environment (e.g., Unix, CTOS, and OS/2) that best suits their needs without sacrificing their off-the-shelf classics. Good-bye, DOS emulators. Hello, 100 percent DOS compatibility.

For example, large enterprises that require distributed processing for transaction-intensive applications often choose CTOS because it is message-based rather than procedural- and semaphore-based, like OS/2 and Unix. The foundation for distributed computing on both types of operating systems — the remote procedure call (RPC) — is layered on top of procedure-based OSs. But in the CTOS message-based architecture, the RPC is inherent and is therefore more efficient and transparent to programmers. All applications written for CTOS are automatically and necessarily distributed.

However, to support popular shrink-wrapped applications, many of these same organizations run DOS under CTOS. In fact, CTOS can multitask multiple DOS/Windows applications concurrently with multiple CTOS applications. The result: the best of both worlds on a single personal workstation.

DPMI also benefits developers, who will be able to sell shrink-wrapped software that runs in multiple operating environments. These applications are not perpetuating the old DOS legacy. It is DOS's limitations in performance, memory, networking, and user interface that are keeping users tied to the past. New applications that break beyond the limitations of DOS and 8/16-bit architectures via DPMI and the Intel 386/486 architecture will continue to form the basis of productive personal computing for some time to come.

A Bigger Picture
DPMI represents an even larger trend in the "No Forced Choices" movement. Increasingly, the industry is focusing less on the operating system and more on technologies that mask the environment from the user. For instance, many organizations are using programming interfaces such as POSIX, Presentation Manager, and XV T to create a single version of source code that is portable across dissimilar systems.

Further, hardware standards ranging from VGA to SCSI to Ethernet are giving users the freedom to choose the optimal operating environment without sacrifice, since a one-size-fits-all approach to operating systems simply isn't viable. It's becoming increasingly evident that one or two operating systems — however popular or powerful — are not enough for all the world's computing problems.

A new effort in this area is the Advanced Computing Environment (ACE). This was developed by 21 vendors, led by Compaq, DEC, and MIPS, that have pledged a high degree of interoperability through software that will run on chips from Intel and MIPS and on operating systems from Microsoft and SCO. ACE, like DPMI, is a noble effort, but it has one notable difference: it is top-down and vendor-driven, not bottom-up and customer-driven. Software developers still need to be convinced to write applications for ACE, and customers still need to buy them. It is users' and software developers' past investment in and commitment to the DOS world that is forging a strong future for DPMI.

It is, after all, a no-compromise personal workstation — not a single operating system — that is the goal of the "No Forced Choices" movement.

— John Quattlebaum is a product marketing manager at Unisys Corp.
IBM Countereffensive Bolsters OS/2—Finally

Corporations See Windows’ Limits

Four years after its grand debut as the successor to DOS, IBM’s OS/2 seemed stuck somewhere between disappointment and debacle. Early versions of the next-generation operating system were mammoth, slow, clumsy, and often lacking basic amenities such as the abilities to print, run DOS applications, and work on networks. As IBM fixed those problems, Windows took off and took most PC software vendors with it—encouraged by Microsoft, IBM’s former OS/2 partner.

But OS/2 remained critical to IBM’s strategy, and this spring the $60 billion firm put some muscle behind it. “In a real sense, we’re starting over,” says Lee Reiswig, assistant general manager for programming, IBM desktop systems. Key is an upcoming version that’s more advanced and DOS friendly than anything coming soon from Microsoft, and that appeals strongly to firms merging PCs with large systems. “In OS/2 we have the best of both worlds,” says Charles Feld, vice president for management services at Frito-Lay in St. Louis.

“Next Generation” Defined

Arriving by year-end and requiring a 386 or better, OS/2 2.0 is a 32-bit system built upon a robust, flexible multitasking architecture that promises better performance than the 16-bit Windows. OS/2 2.0 also lets you directly manipulate files in icon form; you can print a document simply by dragging its icon over and dropping it on the printer icon. “Never again do you have to see a directory or a file listing,” promises Reiswig.

Most important is DOS support, which IBM acknowledges has been wholly inadequate. OS/2 2.0 will run multiple DOS applications and give each of them 620K even with network and mouse support. You can cut and paste between DOS applications, run communications packages out of the box, and display applications in VGA mode. OS/2 2.0 sees Windows as a DOS application, so once you buy a copy of Windows, you can juggle Windows packages under OS/2 2.0—with better protection from system crashes than Windows provides.

Realistically, hardware requirements are similar; IBM says you’ll need at least 3MB of memory and 10MB to 15MB of available disk space. OS/2 2.0 will sell for less than $200, and PC-DOS users can upgrade for $99 through year-end. IBM also is unbundling the OS/2 Extended Edition communications and data base components and working with Compaq and others to ensure they run on compatible PCs.

Application software remains the weak link. Over 300 Presentation Manager programs and more than 2500 OS/2 packages have been announced, but most developers yanked programmers away from OS/2 to work on Windows a year ago. Moreover, Microsoft is leading this crowded toward OS/2 3.0—a built-from-scratch 32-bit operating system with different programming interfaces. Four million copies of Windows have shipped and only 600,000 copies of OS/2.

Corporations on Course

But almost all of those OS/2 copies landed in Fortune 1000 firms that are quietly plugging away at crucial in-house programs. For these customers, OS/2 2.0 “is a no-brainer,” says Paul Zagecki, analyst with the Yankee Group in Boston. “Everyone is trying to eschew what IBM is doing to a PC environment,” says Ron Roy, manager of information resource management for the state of Illinois’s Department of Commerce and Community Affairs in Springfield. But, he declares, OS/2 is vastly more capable. “I’m sorry—you can’t compare DOS and Windows to OS/2.”

“Windows is a powerful product, with a lot of acceptance in the marketplace,” notes George Oliver, manager of information delivery technology for Royal Bank of Canada in Toronto. “We still look at it as a graphical environment sitting on top of DOS, and it has all the issues that DOS has.” With approximately 20,000 PCs installed, the giant bank plans a major push behind OS/2 2.0—partly because it can bring custom DOS code along. “OS/2 represents the cheapest way we can get to the kind of operating system we’ll need,” Oliver says. —E. B.

OS/2 2.0 will provide a more advanced user interface than Windows and smoothly run multiple DOS and Windows packages.
The Operating System That Wouldn’t Die

Ten years and five versions later, DOS is still the desktop operating system of choice. How much life is left in the old survivor?

It’s hard to believe that anything can last ten years in the PC world, but DOS—the operating system that launched the PC revolution—is about to enter its second decade, and it’s still going strong.

That’s not what was supposed to happen. Way back in 1987, a mere six years into DOS’s existence, IBM and Microsoft hatched a plan to relegate the program to the dustbin of PC history. DOS didn’t have the steam to keep up with the next generation of high-performance hardware and graphical software being designed in the PC giants’ development labs. So it had to go, and the sooner the better. By now, most of us were supposed to have moved from DOS to its designated successor, OS/2.

But a funny thing happened on the way to the upgrade store. PC users went crazy over the new hardware—386 processors, VGA graphics, fast hard drives—but we didn’t respond nearly so positively to the software side. Compared to lean, mean DOS, OS/2 came off looking fat, slow, and silly. It gobbled up RAM, didn’t really take advantage of the new hardware, and was incompatible with the old DOS software.

Four years later DOS still lives, thanks to millions of PC users who voted with their pocketbooks to keep it around. Thanks to Microsoft, too, which came back with a double-barreled answer to the OS/2 debacle in the form of DOS 5.0 and Windows 3.1. Now Microsoft is championing the DOS-Windows combination as the preferred desktop solution for users who want to tap the power of next-generation PCs. But if DOS wasn’t broken in the first place, why then did IBM and Microsoft try to fix it with OS/2?

DOS 5.0: OS/2 Lite

Those of us with short memories forget that it hasn’t been all hearts and flowers between DOS and PC users, either. DOS 4.0 was a wholesale rout, for some of the same reasons that OS/2 met with an icy reception. Version 4.0 added significant new talents to the operating system’s repertoire: support for large hard disks, and a new interface designed to appeal to novice users. But 4.0 was too RAM-hungry to use in business settings that stretched the limits of PC hardware and software. If you tried to use DOS 4.0’s new options while running a big data base on a local area network, for example, you quickly discovered another meaning for the term short memory.

DOS 5.0 represents a return to the original idea behind DOS: to provide a simple, fast, powerful environment to run productivity software. While DOS 5.0 has its share of frills—a spiffier interface, on-line help, and task-switching capabilities—most users are going to get the greatest benefit from this version’s winning way with memory. Networked data bases won’t pose quite the same challenge; version 5.0 can load network software into unused memory space above 640K, making it a better operating system for networks than any previous version (see the cover story “DOS Does It Right”).

When you add DOS 5.0 to Windows, you get a clearer sense of Microsoft’s bottom-up strategy for filling in the gap left by OS/2. DOS 5.0 makes Windows run better. Windows makes DOS shine with a graphical user interface, multitasking capabilities, program-to-program communications, and powerful network support. For most users, Windows represents the simplest, best way to harness next-generation hardware power in order to accomplish more, and do it faster. What Windows won’t do is prevent errant programs from crashing with each other and bringing the PC to a grinding halt. Microsoft’s at work on a more powerful version of Windows that addresses this problem, but the fix ultimately lies with DOS itself.

OS/2 2.0: A Better DOS Than DOS?

IBM—and many of its customers, too—maintains that the DOS-Windows combo does little to help companies trying to automate their business practices with the aid of PC technology (see Industry Outlook in this issue). For these (continues)
Add HP NewWave to Windows
and what do you get?
Simply a breakthrough.

Windows 3.0 is a great step forward. It just doesn't go far enough. You still have to overcome barriers you thought you've left behind. Such as DOS. The complexities of file management and application integration. And working in two environments.

The solution? Simply add HP NewWave. In this one simple step, you turn your PC into the most powerful, easiest-to-use information tool in business. To prove it, we've put an eye-opening, interactive demonstration on disk.

It shows how NewWave's simple object model lets you work on one desktop environment, instead of having to use both the Program and File Managers. You don't have to understand the DOS file system at all. And it works with the Windows applications you already have.

Integrating NewWave applications is astoundingly simple. Just drag and drop. "Drill down" editing lets you make changes in part of a document, such as a chart, without leaving it. And with "hot links," your data changes automatically in all connected files.

To evaluate NewWave, call (408) 376-2727 for your interactive demonstration disk. (Handling charge $3.95.) Then experience one of the most dramatic breakthroughs ever brought to your screen.

HEWLETT PACKARD

HP NewWave 3.0
For Windows™

HP NewWave's object-oriented approach to integrating "off the shelf" applications makes computing easier for everyone. Tasks that once took days to figure out and set up can now be done in minutes. NewWave links data and applications together so you can move effortlessly among many applications and integrate text, spreadsheet, graphics, image, or video data with just a point and click of the mouse.

Along with easier integration, the HP NewWave Agent can automate all the jobs you do with your PC—from simple tasks to complex, multi-application projects. And NewWave 3.0 includes Object Storage which lets you easily share information across a network.

For more information on HP NewWave call (800) 752-0900.
What's Wrong with Graphics Software...

A series of radio ads in Texas a few years back opened with an announcer asking "What are you mad about today, Eddie?" A gravelly voice—Eddie, a wealthy Texas oil-field equipment supplier—then weighed in with the day's harangue against some no-good, welfare-state, Yankee, liberal nonsense.

Those ads, and Eddie himself, have gone the way of the oil boom, but I'm going to adopt his trademark opening: I'm mad. I'm mad about graphics programs that are old and outmoded. And about software companies that don't take their graphics packages seriously, but just keep milking those cash cows with half-hearted, half-witted upgrades.

Graphics applications have been the backwater of the software business for years. There are exceptions (PowerPoint and Persuasion, for example), but the charting and graphing programs most of us use—to turn out bullet-chart overheads for a meeting, or to put together a few market-share pie charts for a report—reek of early-Eighties design. At best.

Harvard Graphics has gotten tweaks and cleanups since Software Publishing introduced it, but it still feels remarkably like the program Mario Chavez developed in 1986. What was slick five years ago is tired today. SPC adds crude clip-art libraries and hypertext-like "jump" buttons, and we do mid-air flips, as if it had done something important. C'mon, SPC: Harvard needs a major overhaul.

Lotus's Freelance Plus is Harvard Graphics' running mate at the top of the market. But Freelance is even worse than Harvard in the long-in-the-tooth department: It's little changed from the package Lotus bought five years ago. Lotus made improvements this year in an OS/2 version of Freelance... but who's going to buy an OS/2-PM program now? C'mon, Lotus: You've been milking this market way too long. Fix it or fold it.

Here are ten steps that publishers of graphing software could take to catch up:

More Chart Types: No current PC graphics program includes enough graph types. Very few include such useful and powerful choices as bubble charts and polar charts. Software developers claim few PC users actually use these kinds of graphs—but that's a chicken-and-egg problem: how could they, when the software doesn't offer those possibilities?

Chart and Data On-Screen Simultaneously: When a graphics program allows you to enter data directly into a form (rather than going out to a spreadsheet for the numbers), it ought to allow you to see that form on-screen along with the graph based on those numbers. Users should have a choice between seeing changes in the tabular data reflected immediately in the graph, or having the graph redrawn only after a "redraw now" command.

Easy Spreadsheet Linking and Easy Direct-Entry of Data: No PC graphing program I know has both. A program may do one or the other pretty well—but invariably, it does the other poorly. Both approaches should be fast and easy to use.

Multiple Graphs per Page, and Easy Scaling to Page: It ought to be easy to issue a "layout" command that would produce two, three, four, or more graphs on a single page. And it should be easy to independently scale any or all of those graphs (as well as single graphs) to whatever size and position we want on the printed page.

Better PostScript Drivers: The PostScript drivers in most graphing packages stink. They make feeble use of PostScript operators and little use of PostScript typefaces. Of all the programs that should use PostScript well,
Better Fonts on Non-PostScript Printers: If you don’t have a PostScript printer, there’s a good chance you have a laser printer with typeset-looking fonts built in, a font cartridge, or some soft fonts. Why don’t PC graphing packages give us access to them? Stroke fonts are dead, guys.

Easy Annotation: Excessive annotation on the face of graphs clutters them up, but subtle use of notes (pointing to anomalous data points, for example, or showing that a series of data points is above or below an important threshold) aids comprehension. Yet it’s a bear to annotate graphs in most PC software. Why? Because vendors hurriedly added annotation to win features-list contests, then never bothered to get it right in succeeding releases.

Instant Chart Rotation: It ought to be possible to instantly and effortlessly rotate a graph on the page. Or rotate vertical-bar graphs to horizontal bars. Or reverse the sequence of a data series. It’s never easy, and often it’s impossible. For shame: That’s easy to fix.

More Points in Data Series: Financial and scientific types need hundreds or thousands of data points, and scores of data series. No business graphing program accepts enough data points or series. Limitations on the number of data points are artificial, remnants of a day when no one took PC graphing packages seriously.

Curve Fitting/Smoothing Options: You don’t have to be a math whiz to want to do some curve fitting or curve smoothing. It’s far easier to see where a trend is headed, and how fast, when you can apply some basic analysis, such as a best-fit option. Few PC graphing packages offer many choices, nor very useful ones, in this area. Indeed, the lack of data-analysis features is the single biggest shortcoming of PC graphing packages, across the board.

I said here not long ago that Windows graphics programs aren’t going to knock off older graphics packages overnight, just because of the new programs’ graphical interfaces. And I said the DOS warhorses are still darned good programs. They are good—but they need to get a lot better, fast. Or they’ll be swept under, not because of GUIs, but because they failed to grow with their users.
RISC standard at stake
Compaq/Mips alliance could hobble Sun

ANALYSIS
BY J. A. SAVAGE
CW STAFF

There is more on the line than just a simple OEM contract in Compaq Computer Corp.'s reported search for a reduced instruction set computing architecture. With two rival architectures battling it out to create an industry standard, analysts and industry executives said a move by Compaq to popularize RISC systems could prove decisive.

The rivalry rages between Sun Microsystems, Inc., the dominant workstation vendor, and Mips Computer Systems, Inc. If RISC technology were to migrate to the personal computer level, Mips Comput-
er could "overtake or at least catch up to Sun," said David Brown, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Compaq is intent on developing RISC systems and is apparently close to signing up with Mips Computer, according to users and analysts who said they have received various hints from company officials (see story page 103).

Although Sun had reportedly been bidding for Compaq's allegiance during recent months, Sun Chief Executive Officer Scott McNealy earlier this month belittled the prospect of the PC vendor competing in his company's backyard.

Compaq "can't out-engineer us, and they have no

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RISC
FROM PAGE 1

direct sales force, so they can't out-distribute us," McNealy said in a meeting with Computerworld. "I don't know where they think they can add value."

Both IBM and Hewlett-Packard Co. have plans for low-end, low-cost RISC machines, and HP's is slated to debut at the end of March. But IBM has not licensed its architecture to others, and HP has not done so widely, although it would both like to.

With Mips Computer and Sun vying for the larger shares, a market heavily weighted in one direction would draw resources such as software developers to it like ants to a picnic. This could result in more connectivity, more applications and lower costs to users.

If Sun's architecture stays on top, it would benefit from an expanding workstation market estimated to grow over sixfold by 1995, according to Tom Kuchary, an analyst at Summit Strategies, Inc., a market research firm in Boston.

- Sun's share is currently estimated at 53%, in units, for 1990.

Mips, through its major vendors Silicon Graphics, Inc. and Digital Equipment Corp., has about 25%, according to Summit.

- Without a change to the status quo, Kuchary estimated, Sun's share would only decline to 45% by 1995, and Mips would dive to 15%. However, if Mips is able to corner more high-profile vendors, Kuchary estimated its share would climb to 30%, leaving 40% for Sun.

It has taken until this year to even consider one architecture taking over the RISC market. Analysts, including Michael Goulde at Open Systems Advisors, Inc. in Boston, agreed that "it's a tumultuous period, reshaping the face of the workstation industry."

Sun licensed its first vendor, Solbourne Computer, Inc., in 1987. Sun compatibles and clones just began hitting the market with force at Comdex Fall '90. Although Sun has had some success with U.S. firms signing on, they generally have been smaller ones.

Mips has signed up larger U.S. firms such as DEC and also claims some Asian companies. It offers systems for resellers as well as the basics of processors and compilers.

Most vendors also evaluated Motorola, Inc.'s 88000 processor, but few have chosen it. The major reason given for this by Dick Snyder, president and general manager of Prime Computer, Inc., and others was, "In our judgment, the market would come down to two architectures: Mips and Sparc."
Investing in OS/2

BY LARRY MARION

Remember all the moaning and groaning when IBM finally unveiled OS/2 and Presentation Manager? Howls of protest emanated from computer magazines as the scribes realized that they would have to spend thousands of dollars to expand the memory capacities of their machines. The new requirements posed a serious threat to the writers' wallets—many writers have free use of PCs, since the vendors send them "evaluation units" which then remain at the writers' desks forever. However, no such luck in getting the memory necessary to run OS/2 with PM "for evaluation." Reaction in the world of business was quite different. Yes, there would be additional expense for memory for those complex applications that could take advantage of OS/2's multitasking and large RAM capacity. However, corporate microcomputer managers and their bosses realized that the new computers and operating environment had advantages that outweighed the additional cost. In particular, large companies that depended on mainframe-based information systems realized that new classes of distributed applications could be developed, while still maintaining true allegiance to Big Blue.

A new application of the philosophy that PS/2 and OS/2 are opportunities, not drawbacks, comes from Pittsburgh-based Mellon Bank. To beat the competition from other banks, Mellon's new Executive Workbench is the bank's entry in the business and technology battle of the 1990s—the battle over the customer's desk.

Mellon and other major banks are linking their broad base of industrial customers to the banks' disk farms. Think of their programs as a combination of a real-time inventory system and electronic data interchange, both accessible by their customers. Other firms and industries—American Hospital Supply in health care and American Airlines in transportation—have already placed their hardware in the customer's offices, and the financial services industry has been moving in the same direction.

The key obstacle until recently was the diversity of the financial industry's computing resources. Systems were written around products, not customers. A loan system might reside on an IDMS file, while a credit card bill processing system was on IMS. Servicing any one customer might involve a dozen databases with different formatting conventions and residing on different hardware platforms. And, to complete the digital Tower of Babel, each bank would try to place a different and incompatible desktop system with its clients, the corporate treasurers.

Initially, the banks distributed dumb terminals to their customers. When corporate treasurers objected to having a dozen different terminals plus the company PC on their desks, the terminals were consolidated into a personal computer. However, even the late and unlamented PS/20 was not up to the job—it could not easily link to a dozen different databases on varying hardware platforms, and the 640-Kbyte memory limited the types of analysis that could be performed. The goal of improving the

Using the new operating system to access vast internal company data

The natural language user interface and seamless access to databases and decision support software make Mellon Bank's Executive Workbench easy to use.

productivity of white-collar professionals by giving them sophisticated tools became a joke—nobody outside the data processing department could understand the system, let alone use it to squeeze a few more dollars of profit from better managing the funds of the bank's customers.

Officials of Mellon's master trust fund saw the new PS/2/OS/2 combination as an opportunity rather than a burden. "A PC was not powerful enough to hold and manipulate all the information," explained a Mellon official. "A workstation from Sun could do it, but it wouldn't have smooth mainframe access." The trust officials asked the support staff to develop a workstation they could place on the desks of their clients, the pension fund managers at major companies. The workstation would have to include a seamless interface to 13 different databases within Mellon—including data on 100,000 different stocks and bonds.
and the investment performance of the top 300 money managers — and several external databases, such as Dow Jones News/Retrieval.

With the data, pension fund managers could review the performance of prospective money managers who would invest the corporation’s pension funds. Not only would the pension fund managers be able to track the status of their money managers’ investments, but they could also evaluate different investment philosophies to determine which supplier of money management services had the best performance. “We wanted to develop a system that would not just distribute data, but would facilitate the investment decision-making process,” explains a Mellon official. “We wanted to build a system that would appeal to the senior financial officers of large companies.”

Producing the software interfaces to link the corporate financial officials to computers running IMS, DB2, and other databases required a complex PS/2 configuration: the top-of-the-line Model 70 running on a 25-MHz 80386, with 6 megabytes of RAM, a 120-Mbyte disk drive, color monitor, mouse, and a 9600-bps modem. The initial release of the Executive Workbench was built around Quarterdeck’s DESQview 386, but Mellon plans to roll out version two with OS/2 Extended Edition in March. Version three, due in early 1991, will be a real technical triumph — a PS/2 system based on DB2 and SAA, accessed via Presentation Manager (at press time the designers were not sure if additional RAM would be necessary for version three). Mellon officials say the move to OS/2 and Presentation Manager was worth the effort — the OS/2 team delivered an alpha version in less than a year — because of the improved response time and ease of use. Usability of the system is especially important, since the bank’s clients are not about to sort through arcane DOS codes.

Executive Workbench was developed at a cost of more than $10 million, the second largest technology project at the bank, according to a recent article in Institutional Investor magazine. “The system is elaborate and expensive, and we are putting our Lebenshoud into it,” noted George DiNardo, executive vice president of information management at Mellon and a well-known mainframe champion until the PS/2 and OS/2 were available. Users will amortize the cost of the development by paying a flat fee each year of up to $65,000, depending on the databases accessed. Pension fund managers are happy to pay for this type of service, report Mellon officials, because they can use the data and decision-support software included with Executive Workbench to make better investment decisions. “A manager told me that one correct investment decision would cover the cost of the workstation for a year,” claims a Mellon official. The firm expects that about half of its master trust clients will be using the system within a few years.

So what’s the lesson for the rest of us? System developers should think of OS/2 and PM as a means of offering their company’s customers access to vast internal data — specifications, delivery dates, and so on. For example, all the talk about just-in-time inventory systems requires extremely close coordination between supplier and manufacturer, and a PS/2-OS/2 link may provide the seamless interface that makes end users on both sides happy. While the typical manufacturer and supplier may have second thoughts about paying $65,000 per year for the service, the improved efficiency could be more than enough to offset the cost of the system. If every nonproprietary database in your company’s mainframe disk farm were available to customers, wouldn’t they be willing to pay a premium if such access reduced their costs?

Larry Marion is a senior editor of Institutional Investor, in charge of covering technology and trading. He was formerly an editor of Electronic Design and Datamation and a writer for Business Week, Forbes, and Financial World.
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HOW ARE DATASETS USED

1. Large batch computing jobs
   - Data flow is important
   - Ease of use is critical

2. Personal browse
   - Use routines like NCAR graphics

3. System browse
   - Use data in image analysis routines
   - Unidata graphics
   - GIS systems, spreadsheets, etc.

Comments:
For 1: People should not have to learn a big system to use the data. System overhead should be very small.
For 2: Use data in a variety of routines
For 3: Not one big system. User should be able to feed data into a variety of routines. The user should be able to choose the routines
One of the main obstacles to Unix becoming the multitasking operating system of choice is the lack of a coherent and consistent graphical user interface. Since my operating environment of choice is the Macintosh OS, this lack is especially painful to me. I am not inclined to spend more time learning cryptic command sets than it will take me to do the tasks I need to do. One of the most important things that must be done in the area of system software is to combine the power of Unix with the usability of the Mac OS.

With that in mind, I unpacked my beta copy of Open Look, AT&T's graphical windowing environment for its Unix System V/386. With no widespread multitasking windowing system available for PCs (please don't even mention Windows/386, as I'll explain later), I was interested to see if AT&T had come up with something that would change this picture.

Open Look was developed for AT&T by Sun Microsystems, which is also committing to the product by offering it as a no-cost option on its SPARC- and 68030-based workstations. Also, AT&T, Sun, and other companies joined together last year to form Unix International, which is acting as a liaison between Unix System V users and developers. This organization has a number of corporate members who have developed, or intend to develop, System V-based products, and Open Look is an important part of their strategy. This will undoubtedly act as a catalyst for Open Look, making it a potential standard in the graphical interface market.

Exploring the Features
Once I gathered together the necessary hardware, Open Look was surprisingly easy to install and boot up. The only problem I had was that I was unaware that the Network Utilities Package had to be installed on Unix System V/386 first. After feeding Unix the six disks that make up the Open Look end-user system, I got back a message stating that the Network Utilities Package was missing and that the installation was canceled. I hope that for the commercial release of Open Look this condition might be tested on the first disk rather than the last. The other software package required was the mouse driver from AT&T. Once this was taken care of, however, Open Look was up and running with ease.

When you enter Open Look, you are first presented with a blank screen (in a color of your choice), which changes to one of the many ready-made windows and icons. Icons are used throughout the system, and they are easy to use and understand. The windowing system has a large library of window styles and colors that can be selected from a pallet of 32.

Mac users will feel right at home in Open Look, with a number of added features that may make them not want to go back.

With Open Look, a variety of windows, dialog boxes, menus, and icons can be active on the screen at a time.

BY PETER D. VARHOL

Open Look's intuitive graphical metaphors are evidence that a good deal of quality work went into the design of its interface.