THE APPLE SUIT

Just when you thought it was safe to get back to work...

Apple’s suit makes Microsoft and IBM look like nice guys. And it makes Apple look afraid that it has slim hopes of winning the next battle -- networking and groupware -- and so must keep on fighting the user-interface battle. (Apple’s motives may include a perceived fiduciary duty to shareholders, although we doubt this suit is in their long-run interests.)

We can’t make a legal determination, but from a business and moral standpoint, this suit has a different flavor to it from Lotus’s suit against Paperback Software and Mosaic Software. Unlike the alleged purloiners of Lotus’s property (Mosaic’s product was called Twin), H-P and Microsoft do not promote their products as Macintosh knock-offs. Microsoft borrowed and extended some good ideas -- as Apple did those of Xerox -- whereas Paperback and Mosaic attempted to trade on 1-2-3’s marketplace success. At least Apple picked on someone large enough to fight back.

Legally, the case will turn on contract issues, and on what some particular court will consider a unique expression and what it will consider to be ideas that have infiltrated our view of the world so inextricably that they no longer qualify as anyone’s property.

The first issue is whether the 1985 contract between Microsoft and Apple is valid; there has been some subsequent communication between Microsoft and Apple which casts doubt on it. If it was valid, is Microsoft limited to using what was specifically enumerated in the contract? Or does the contract simply define one set of elements whose ownership by Apple was acknowledged by Microsoft? The acknowledgment that such intellectual rights could be owned, regardless of the status of the contract, is an "interesting" item.

It leads to the fundamental question beyond contract particulars: Is the Macintosh interface -- or some elements thereof -- fair game? It boils down to

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whether the Mac is a unique expression of some general ideas, or a general embodiment of some fairly specific but still public-domain ideas -- such as trash cans, scroll bars, and the like. Moreover, while a single element may not be protectable, a specific selection might be. How close is Windows to the Mac? Close enough that a judge or jury might find them substantially similar, although a computer industry veteran could probably cite prior art for each element and make a case that these are "ideas," not expressions, that have been floating around the industry for years. Could you implement these ideas any other way from the Mac/Windows way? AT&T's Open Look shows that you can -- and technology adds the complication that almost any interface tool can be used to build screens that look like the screens of any other interface. (They do not feel -- or operate -- the same, but try explaining that to a jury.)

The resolution of this suit should certainly clarify the issues -- and perhaps move the industry to support some legislative action if the result is too unpalatable. Clearly Apple is interested in making a point, not just in winning redress -- or it would have taken the trouble (and had the manners) to let Microsoft know before it filed this suit.

The business case

In the end, there's a separation between what's legally permissible, which we do not pretend to predict, and what makes business sense, which is what this newsletter is all about. Apple certainly can (and has) put some confusion into the market (they used to call it FUD, for fear, uncertainty and doubt, when IBM did it). Apple's chief goal seems to have been to throw sand into IBM's eyes more than anything. Microsoft and H-P are just tiddly-winks in the real battle against IBM and Presentation Manager, and Apple has focused more attention on NewWave (Release 1.0, 87-12) than H-P could ever have won on its own.

The suit may also help the cause of AT&T and Sun by driving innocent bystanders to develop for UNIX/Open Look rather than either OS/2 or the Mac. AT&T and Sun have gone to extraordinary lengths to avoid copyright problems, both by building an interface substantially different from the Mac's, and by securing a blessing from the ancestor of them all, Xerox. The net of it all is that Apple may achieve its short-term goals by stalling development or adoption of OS/2 and diverting some resources to Sun/AT&T. Regardless of whether Apple wins or loses the interface battle, the real war is raging elsewhere. We believe that Apple ought to work on improving MultiFinder instead of trying to protect its past achievements. Such legal maneuvers merely indicate to customers that IBM and Microsoft must have Apple matched in the interface contest.

OPEN LOOK: OPEN FOR BUSINESS

And now, to make a neat segue to the newsworthy news...

We hope AT&T and Sun will avoid one mistake, among many, made by Apple in its recent lawsuit: focusing too much on look and feel, and not enough on the facilities needed for the next generation of software -- multi-tasking, communications, availability of source code, openness and all those other features the UNIX community takes for granted. Those are the unique selling

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points of the would-be UNIX standard; a strong, well-defined graphical user interface is merely a necessary check mark.\textsuperscript{1}

That said, we'd certainly agree that Open Look is a super piece of work -- perhaps even super enough to overcome the disadvantage of having a minuscule installed base of workstations. Much too proud to copy the Macintosh (even if it were legally permissible) or the Xerox Viewpoint or Smalltalk interfaces, the creators of Open Look have learned from these efforts and from some of their own studies of user behavior with prototypes, and combined them into a unique new implementation on a would-be mass-market platform. The guiding principles of simplicity and consistency (supported by object-orientation) mean that all objects -- within the environment or within applications -- behave similarly. The same techniques select, display, move, resize, close everything. Extensive help sits behind every object, and is comprehensible: A little magnifying glass shows you what the help is about, so that you know you have selected the right feature to ask about. Another guiding principle is efficiency, so that menus pop up near the cursor (or can be pinned to the screen by the user) rather than halfway across the screen. In short, the distinguishing achievement of Open Look is feel -- a sleek and efficient feel behind the now-standard icon-rich look.

Best of all, Open Look is object-oriented from the bottom up, and will come not just with guidelines but with reusable implementations of its graphical and functional design elements when it ships at year-end. This should make it simpler for developers to follow Open Look design rules than to flout them. (If you provide red bricks free, most people will build their houses of red brick, yet each house will have its own floor plan.)

Layers and lawsuits

Recent events have raised some delicate questions. As architectures grow more layered (or as interfaces grow more standard and open), different software components can easily replace each other technically, and sometimes legally. But what makes business sense? For example, should Microsoft write a version of Presentation Manager to sit on top of the new UNIX standard? Or alternatively, should Microsoft build versions of its applications that support and use UNIX and Open Look, since Microsoft sells UNIX, and is working with AT&T towards a common standard? ...at least officially.

As it happens, Hewlett-Packard's NewWave is designed to unify not just DOS and OS/2 applications, but to provide a common interface for UNIX systems as well, so that H-P is in fact putting a NewWave interface, built on a PM-like interface, on top of UNIX -- Apple notwithstanding for the moment.\textsuperscript{2} All comers are invited to license this unifying interface-cum-object manager. Meanwhile, H-P is building LM/X, a UNIX version of Microsoft's OS/2 Lan Manager, in collaboration with Microsoft for re-license to resellers such as AT&T. The accounting issues, let alone the strategic ones, are challenging.

\textsuperscript{1}The fact that Open Look can be built upon both Sun's NeWS and MIT's X.11 windowing systems elucidates its nature: It is less a tangible product than a spec for how the interface should look and work. The initial two toolkits for creating Open Look applications will rely on these two "interfaces"/windowing systems for UNIX, which are in fact simply facilities for building interfaces such as Open Look or Presentation Manager but which have no specific look and feel of their own.

\textsuperscript{2}We took great care in wording this sentence.

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ISV support

There is a delicate tension between inherent capability and positioning. User acceptance of UNIX will certainly influence vendors' enthusiasm for it, but vendors' enthusiasm will also influence users' acceptance. It matters whether Microsoft supports UNIX (as it mattered when IBM supported DOS over CP/M), because OS/2 and UNIX are close enough in capabilities that nuances have impact. Until now UNIX has been positioned in the engineering/scientific ghetto by the OS/2 forces, but the cycle of growing mutual enthusiasm of users and applications vendors is moving it into financial houses.

As for Open Look specifically, traditional DOS application vendors' commitments so far are fairly weak: Ashton-Tate (wisely) did not give a firm date, and Lotus announced its support for UNIX in general but was noncommit- tal about its choice of interface. "We would run 1-2-3 on top of dead mushrooms if that's what the customer wanted," notes Jim Manzi. Both Lotus and A-T have warmed to UNIX for the usual reason -- the prospect of a large government contract. We suspect they're also glad to see someone counterbalance Microsoft and IBM's sway in the platform business.

But the prospects for Open Look are better than this lack of fervor would indicate. UNIX ISVs we've talked to support Open Look fiercely, even though some have yet to see a proper demo. This doesn't mean it's a vaporware announcement; on the contrary, it indicates just how strong the demand is for a common look and feel. It's a nice benny that Sun and AT&T have done a good job, but the market really cares more about "bandwagons than quality," to quote Sun's Bill Joy. We can learn anything, they feel, if we have to learn it only once. As for the UNIX vendors who resent AT&T and Sun's assumption of the lead in defining UNIX: You can rarely beat something with nothing, and all the UNIX people lukewarm about Open Look have nothing specific (and certainly nothing generally acceptable) to offer in its place.

So, will it succeed?

Will the new UNIX standard succeed? Yes. Will it wipe out OS/2? No. Will it benefit the world? Absolutely.

In our society competition is a perpetual process. Competing entities rarely vanquish one another; rather, they force one other to innovate to stay alive. Ten years from now both UNIX and OS/2 may still be in the marketplace, but neither will bear much resemblance to what it is today. Aside from temporary advantages one way or the other (multiple threads for OS/2, mature networking for UNIX) the greatest factor in UNIX's favor is its hardware independence, whereas OS/2 for the moment is inextricably tied to the Intel architecture. OS/2 is open in that anyone can buy it and resell it, but it still comes from a single vendor and is tied to a single hardware architecture -- for which, yes, it can be more effectively optimized.

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3UNIX is slightly better than OS/2 for multi-user applications, and slightly less good for server applications, because it treats each process as if it were a discrete user, with all the overhead this entails. But UNIX will get lightweight processes, the equivalent of OS/2's threads, in System V.4, the merged UNIX we're all awaiting.
In addition, to the extent that we are dealing with Sun’s own architecture, SPARC, that too is freely licensable by others (and has been). Thus competition within an architecture as well as across architectures will aid the evolution of the hardware platforms underlying UNIX (which happens to include the Intel architecture, as in Sun’s new 386i).

Be open, not supine

There’s one other point to make clear. We see a big distinction between openness, or an invitation to all comers to compete, and the unrealistic notion that the industry should get together to design the next standard. Standards are best developed by small, creative groups; honed by competition; and ratified by customers. Confusion of these roles leads only to inefficiency, bureaucracy and political wrangles, and hands the market over to outsiders.

Sun and its new planet

While AT&T announced Open Look, Sun announced the 386i, a 386-based workstation that will support (of course) the UNIX ABI, and that can run multiple DOS sessions (but not OS/2) as tasks under UNIX (using Phoenix Technologies' VP/ix). This is a stunning system, and it won’t require DOS users to give up their old favorites (including the fish-school program). The big issue for this box is Sun’s ability to enter new distribution channels at a time when most vendors are pressuring resellers to reduce their lines, and when the challenges of support are growing. Who needs a new computer that may or may not be successful?

As it happens, most of the vendors gathered at the Sun announcement were existing Sun ISVs who had simply ported their products over to the new platform (typically in a matter of days) with the notable exception of WordPerfect. But that’s not so terrible: It would be rather silly to go to the effort of porting 1-2-3 to the 386i when you can already run it on the 386i under DOS. Yes, a future UNIX version of 1-2-3 could benefit from larger memory and other advantages, but we’d rather see a new product such as Notes under UNIX.

Indeed, the edge of the 386i won’t be its ability to run DOS software (that is a requirement, not a benefit), but its ability to do so cheaply, and meanwhile to bring into the channel a new array of powerful publishing, graphical, analytical and most of all multi-user programs. We have long wanted to use Knowledge Management System, profiled in Release 1.0, 87-9), now available from Scribe Systems standalone or as part of HyperScribe, for example, rather than XyWrite warmed over for the Sun. Resellers likewise have little interest in a redundant addition to their line, but could conceivably find some room in their hearts and shelves for a system that could meet their customers' escalating needs for power, groupware, and the kind of software now identified with UNIX. Just as the Mac succeeded not by cloning the PC but by bringing its users into a new world, so will Sun and AT&T succeed by extending their customers' reach.
METAPHOR METAMORPHOSES (--> IBM'S "Open Look"?)

Sometimes a small deal has influence beyond its size. Such is the strategic alliance of Metaphor and IBM, financial peanuts to IBM but a big event for Metaphor and potentially the shape of products to come. IBM has taken an equity position in Metaphor (a sign of serious commitment to Metaphor, not just its current products), and has the right to use its software technology broadly in all its office and decision-support products. Yes, if you were wondering, the deal has been in the works since last May -- well before Metaphor's aborted October IPO and Apple's lawsuit. But we can't help noticing that it gives IBM a potential alternative to Presentation Manager should IBM want to use it.

Metaphor, a technologically prolific company, has been selling solutions with some success since it launched its product in September 1984 -- to the cheers of an article in Release 1.0. Among the technological underpinnings that made Metaphor's system a powerful tool for data analysis and presentation were early support of SQL, query by example, meaningful graphical displays of database structure just now beginning to show up elsewhere (wait till next month), a visual programming system (application capsules), transparent data transfer and dialogue design tools.

Presumably, these same facilities will now be incorporated into a PS/2- and OS/2 EE-based workstation which will be compatible with Metaphor's existing proprietary 68000-based line, and which will be sold by IBM's salesforce to a far broader market than Metaphor has so far reached.

More interesting will be the use IBM may make of Metaphor's technology across its entire office systems and decision support line. IBM has developed OS/2 and Presentation Manager with Microsoft; Metaphor will give it some exciting stuff to put inside PM, at the least. Specifically, this agreement should enable IBM to compete effectively with Lotus's forthcoming line of graphics-based database manipulation tools, as well as with a variety of mail, forms, analysis and other tools from a variety of vendors. Most of IBM's existing line of office applications supports clerical rather than professional and managerial workers.

Like everything fashionable these days, the Metaphor system has its antecedents at Xerox PARC, where its two founders and several other employees formerly worked. Unfortunately, there was one technological decision that sharply limited Metaphor's market -- its use of a nonstandard hardware platform, a 68000-based workstation that the company builds itself in a small assembly facility at its Mountain View headquarters. And there was a marketing decision that coincided: Metaphor sells direct, and works closely with its customers in setting up links to host databases and developing custom applications. From an originally diffuse focus the company targeted the marketing business -- marketing executives at banks and ad agencies and companies such as Procter & Gamble and American Express -- and forged valuable relationships with A. C. Nielsen and Burke Marketing, whose data it resells for use with the Metaphor workstation. All in all, Metaphor built a strong presence in a small market, and is now ready to move outwards, with profitable revenues of $40 million last year. Technology has changed, so Metaphor no longer has to rely on a proprietary platform to get the graphics and performance it needs. Its financial and other resources have increased, so that it can venture into a wider range of markets. And it has this deal...

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SHARED INTELLIGENCE: YOUR HUMBLE SERVANT

Below we describe three new products, each one early with a differentiating feature that will become routine in a couple of years. They all display a curious humility, especially compared with the AI-enriched systems we frequently write about here. They know their place. They don't try to do everything. They understand that their job is to automate routine stuff, but that there's a bandwidth for humans (the nuances of an image or the intonations of a spoken message) that machines are nowhere near comprehending. They realize that they are just vehicles for messages and implications that they don't understand.

Should we hire this guy? There's richness in a job application -- the handwriting, the style of the resume as well as its contents -- that tells more about the candidate than any ten items in a checklist. The ultimate decision -- whether to hire the guy, the salary and start date -- will be comprehensible to a computer, but not the factors that went into it.

What's the conclusion of Alice's memo on Juan's market study? It can't always be reduced to data in fields or keywords. Maybe the best way to help people find and understand things is to let them browse, with manually created titles and an outline structure as a guide.

What do the numbers in this multi-dimensional spreadsheet indicate? The numbers can be displayed in a way that's easy to grasp, but their ultimate meaning...that's for a market-experienced executive to decide.

These are the sorts of questions that neural nets (see Release 1.0, 87-7) may one day help us handle, but for now they're best left to humans. The proper role of computers is to provide power without reducing richness, which is what these systems do.

DOCUMENT TECHNOLOGIES: IMAGE DISPLAY

With all the advertising, there's probably no one in the computer business who hasn't heard about WIIS, or Wang's Integrated Image System. How can other vendors compete? They can bid FileNet or Plexus, they can make their own, or they can go to Document Technologies. "We like to talk to people who've already tried to do it themselves," says sales and marketing vp Mike Florio, formerly with Palantir. "Then they have an appreciation for how hard it is." The fundamental marketing pitch of DTI, which sells mostly to OEMs and VARs, is to help people compete with Wang and FileNet with a lower-priced, standards-oriented product.

The fundamental product pitch is to enable people to manage their documents/images more effectively by storing them electronically. It's an old and painful joke by now, but anyone who's ever seen our office has seen the perfect "before" picture for this product, an archaeological excavation site with documents piled around in time-based strata. Using scanners, clever compression algorithms and a stunning 400-dpi screen, DTI's 400 Series could store our documents and keep track of them electronically. Each item could have not just a single location (whether five inches down within a labeled folder in a file cabinet or in an unlabeled pile, third to the left by the
window), but could be reached through a variety of keys. That is, you could find an article about UNIX under UNIX, Sun, and AT&T (and an increasing number of other vendors, too!). This is hardly unique to the DTI system, but it's an important argument in favor of image-storage systems in general.

Unlike some competitive products, DTI's document image workstations use specialized systems software underpinnings on top of an 80286 or 80386 (low-end or high-end versions), but integrate nicely into a standard office systems environment.

The system runs under a proprietary OS called XMOS (Extended Mode Operating System) which manages the image storage and retrieval, and allows for a simultaneous VT220 (VAX) or 3270 (IBM) terminal session that shares the screen with the image display. XMOS-specific software for image management and retrieval can be developed under DOS or VMS to run on the DTI workstation. The XMOS software handles the image-specific functions, such as storage, indexing, retrieval and data entry, and image manipulation, but as yet lacks the facilities of FileNet's WorkFlo, a development system to design pre-set routines for the flow of documents in a worksite. Currently the DTI line requires the "intelligent" paper- and data-handling part of the system to be handled by host-based user applications. (The images themselves stay on a local-area network, thus avoiding mainframe bottlenecks.)

At first DTI left us with an uncomfortable feeling. Why? Because it does not do anything with the information it collects, stores and displays. It treats the images as inert objects. All the system does is catalogue them and present them on command. The user can integrate the DTI system into his existing applications, which see the DTI images as data objects. When an application commands the object to be displayed, the DTI software takes over and displays or prints the image.

But we had forgotten the cardinal metric here: Is it useful? Will it help people do their work? We think it will. Why should some poor clerk spend hours typing stuff into a computer if a human is going to use that same data, unmassaged, to make a decision. Encoding the data is necessary only if you want to consolidate data or manipulate it in some way. Yes, it might be nice in the future to have an expert system make all the decisions, but right now... The window for user intelligence may last a lot longer than we'd think.

For example, staffware developer Tony Kobine (see Release 1.0, 87-12 and 88-2) is now looking to start a company to develop his next-generation groupware development tool, Calypso, and says that at least half the potential customers he talks to are interested in tying his product to image-management systems. In other words, vendors want to apply intelligence to the management of paper-shuffling, but they're happy to let the user do paper-handling himself, interacting directly with the images on the screen. The human user can derive lots of information from those images with no need for computer "intelligence." Then, to shuffle the paper onward, the user needs to encode only a limited amount of data to categorize the image/document sufficiently for manipulation by the system -- Calypso, WorkFlo, or the custom applications DTI VARs and customers will build.

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4It could be converted into text via OCR, but that's another story.

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TEAMate: A FRIENDLY DIRECTORY

When Lotus Notes hit the papers last February, Bob Baskerville hoped that his time had come. Chairman and founder of MMB Development Corp. and a former evp of on-line services at Computer Sciences Corp., he sells a product that sounds a lot like Notes: It's a multi-user text management system with the appearance of an outline.

Unlike Notes, MMB's TEAMate is available now, and has garnered 100 customers (roughly 1000 nodes) since late 1985. Unfortunately, it is correspondingly first-generation. Unlike Notes, for example, TEAMate's hierarchical structure doesn't extend into the individual files, and it doesn't provide for automatic structuring or filtering of information inside a file except for the headers/envelope. It's like a database management system with no programming language.

TEAMate was originally designed as a next-generation bulletin-board system to provide both local and remote access rather than to support activity. As such, it is a multi-user file system that looks like an outline. It allows multiple users access to the same files either as terminals to a UNIX system, remotely or through a LAN, with authority as determined by the system administrator or each file's owner. In addition, TEAMate adds 20 fields to the standard DOS or UNIX directory, so that files can be classified by date created or stored, author, subject (with all words keywords), and so forth.

A TEAMate file can be a standard ASCII text file, displayed with or without headers at the user's option, or any kind of binary information, such as an application file which can automatically load its application when the user selects it (as set up by the system administrator). That is, selecting the subtopic "budget" under the "WonderWidget department" might automatically load a spreadsheet plus the budget worksheet. However, you wouldn't want TEAMate if you were doing application-intensive work: for example, consolidating the WonderWidgets budget with the WimpyWidgets budget to get the entire division's budget. (Because of memory limitations, you can't run 1-2-3 along with TEAMate under DOS. The UNIX version, of course, works only with UNIX applications, unless the user has a DOS-UNIX system.)

TEAMate is more flexible and easier to use than most bulletin board systems, and works effectively as a multi-user access system. Executives at ARCO (100 nodes), for example, use it to monitor and distribute operating information worldwide. Despite its limitations (or opportunities for enhancement by MMB or others), TEAMate is here now, and it meets one essential criterion of groupware: It gives to users the power to explore what's on a system and share it, rather than limiting their reach to a small subset of the system.

COMPETE!: CONSULTANT IN A BOX

Ceteris is never paribas; all other things are not equal when you try to measure the effect of a single action. If you lower prices on your New York-to-San Francisco flight you may gain market share...or your competitors may lower their prices too and everyone loses -- except the customers, but they may also lose if you can no longer afford to invest in new aircraft (or maintenance!). If you open a new route from New York to San Jose, you can bet your competitors will respond.

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If we’re going to give business people a way to build models that approximate the complexity of reality, the software will have to do a lot more work for them than your standard spreadsheet (even one with wizard graphics) without taking away their flexibility. EFS’s Compete! is a good start. Best but still inadequately described as a five-dimensional spreadsheet that can read 1-2-3 and Excel worksheets, it is closer to being a set of models with cross-dependencies already instantiated. It covers a company’s financials, product line analysis, market analysis (customers and sales), and competitive analysis (pricing and market share), all over time. It was conceived by a group of former Boston Consulting Group consultants who found that their spreadsheets still left them with a lot of work to do and fostered two-dimensional thinking: "This versus that," rather than, "this modifies that which reduces that other thing and also lowers this fourth thing while increasing..."

Compete! started out in 1983 as a prototype built in IntelliCorp’s KEE, and has gone through several iterations to reach its present PC incarnation. "We discovered we didn't need AI, but just its benefits, such as rapid prototyping," says chairman Bill Bane. "We needed a pre-structured spreadsheet. At BCG we always did certain things that were slow and laborious -- segmentation analysis, reconciliation to make sure everything added up without too much 'other,' what-ifs on product-line or restructuring, competitive analysis and scenarios." In a word, there's a lot of repetitive work, and the goal of Compete! is to do everything that can be done by rote, and leave only the specifics up to the user. The user manipulates business entities rather than rows and columns, and the system knows how to consolidate, decompose and otherwise manipulate them. Compete! can also do something that makes users sigh in awe: "Five-way footing."

The cross-dimension dependencies are built in but modifiable, so that managers can model their businesses themselves, with the system prompting them to consider side-effects. For example, component costs may go up as the market expands because more companies are competing to buy a finite pool of raw materials. Or they may go down, as an expanding market enables suppliers to cut costs. Or either may happen at different points in the cycle, as we're seeing right now in the memory business. (Would Compete! have helped a pc vendor predict this? It might have spurred him to think about things, but it would still have left the assumptions up to him.)

Compete! performs some pretty interesting mathematics to help the users build consistent and powerful models, in essence allowing them to manipulate data objects (a cell plus all dependent or contributing cells, in spreadsheet terms) and planes (a column or row stretched across another dimension), rather than just rows and columns. For efficiency, it doesn't save all its formulas, but rather creates them on the fly based on system-wide rules. Compete! costs $20,000 for a single copy, dropping to $10,000 in volume. As you might imagine, EFS sells direct, and has sold more than 50 copies since launching Compete! in January.

We see in Compete! some of the richness of Palladian's Management Advisor, but without its LISP orientation or heavy overlay of "wisdom." Like the other systems in the trio discussed here, it presents data and then encourages the user to do his own thing. In fact, Compete! looks as simple as a spreadsheet when you're using it. It's just that the power behind the cells is far greater than in a spreadsheet.

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CASE IN CONTEXT

Vendors of applications software have enjoyed a booming market over the past few years, but they will soon face a recalcitrant customer base. It's all very well to sell accounting packages off the shelf, but how can vendors expect customers to purchase a mass-produced system that's supposed to differentiate them from their competitors? Successful software vendors of the future will be those selling development tools that allow their users to build custom-designed systems, while applications and even database management systems will descend to the status of commodities (all databases now pay homage to IBM's DB2 and its Structured Query Language).

The CASE market is promising, but there are still some flaws:

- Most CASE systems are unintegrated. You may use one to solve a particular task, but now you face a new task -- how to feed the output of that tool into the next tool you want to use. The best paradigm for integration is a common information repository -- a central database with rich structure and metainformation -- that all the tools can use to store and retrieve program elements, rather than doomed attempts to establish one-to-one links among a subset of the universe of tools.

- Most CASE tools address only 20 percent of the problem. They focus on building new systems, rather than re-engineering old ones. While you want to do new things, you want to do them with the data and automated procedures already in place. As Language Technology's Eric Bush puts it, software should be reincarnated, with the soul (business wisdom) returning in a new body, a more efficient reimplementation of the old system. For all the lip service, few companies are doing anything strategic with their computers because they're buried under their existing systems. (Have you ever asked your dp department to change something? Are you out of your mind?)

- Most CASE tools ignore the existence of PCs. Some CASE vendors sell their own systems to run on PCs, most notably Index Technology, which sells a PC-based design and analysis tool called Excelerator. But few have addressed the issue of how you build an application with components designed to run cooperatively -- partly on mainframes and partly on PCs. (In general, the design tools, which ignore implementation details, neither support nor disallow such an architecture.)

- Many CASE tools use AI, but few produce runtime systems that use it. If AI is good enough for systems designers, why shouldn't it be good enough for real people? The results of most CASE systems are still old-style COBOL-based systems that consider 3270 terminals the latest thing in interactivity.

- Finally, CASE tools still don't give to business people the power and simplicity of typical personal computer tools. EFS Management's Compete!, which allows real businesspeople to model their businesses, is a model to follow -- except that a CASE tool would allow people to model business processes, and automatically turn them into implementations.

Key to addressing all these points (as it is key to CASE in general) is a central repository. It can, of course, provide the integrating back-end for
a variety of tools; it can receive information from existing applications as well as input from new CASE tools, and assist in their transformation into new implementations; it could, indirectly, provide the bridge between PC and host environments; it could hold AI application rules and objects as well as data, code and CASE logic; and it can accommodate the higher-level representations that are intelligible to computer-naive business sophisticates.

The central repository is as fundamental to CASE as database technology is to most current-day applications. You can build a single application without a database, but it's hard to enhance it, or use its files in another application. Similarly, you can build a CASE tool or two without a central repository, but you'll run into trouble when you try to extend them into new environments or link them to other tools developed independently.

The CASE world desperately wants to rally round a standard information repository (or encyclopedia, in James Martin's terminology), and would welcome proposals from a successful vendor -- rather than a standards committee. As it happens, there is a standards committee working on the so-called Information Resource Dictionary System (IRDS). The IRDS committee, called X3H4, is sponsored by CBEMA and accredited by ANSI. The committee standard is designed for easy implementation on top of an SQL database; it has a command language and panel interfaces, conventions for IRD-to-IRD data exchange, and other features. This standard, however, is a least common denominator, and has almost nothing to say about the content or its representation within IRDS. The committee has approved a preliminary standard that remains to be ratified by its parent committee X3, currently in its cumbersome voting process. Then it will be up to the vendors to implement the standard. Committee members include ADR, Cincom, Cullinet, DEC, GTE, IBM, MSP, Pansophic, Software AG, Unisys and Tandem.

Marketplace contenders include Pansophic with Pan/RD and Pan/IRDS, IBM (mid-year is the current rumor), Manager Software Products with Data Manager, and Asyst (below).\(^5\) Pansophic's Pan/RD is now in internal use, and should ship in early 1989 both in Pansophic products and to OEMs. It's an implementation of the ANSI standard designed as a back-end to Pansophic's Telon code-generator and CMF (Change Management Facility), as well as Cadre's Teamwork design tool (see Release 1.0, 86-5). Later, a more general version will allow other tools vendors to hook in. Pansophic is also working on Pan/IRDS, an end-user version slated for late 1989, that will allow users access to the entire repository -- much as a query system allows a user to get at all the information in a database.

Meanwhile, as we wait for the ultimate repository, two new CASE efforts deserve mention.

**ARTHUR ANDERSEN'S FOUNDATION: HOLISTIC SOFTWARE**

Last week, Arthur Andersen announced Foundation, a soup-to-nuts CASE environment (but without re-engineering) that builds on the firm's internal methodology. It differs from other companies' efforts in some key respects: It is integrated, built around an information repository (although the imple-

\(^5\) Atherton Technology's Backplane is more oriented towards the scientific market; we will address it separately in the future.

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mentation of this is still in two pieces). Foundation comes from a large firm with credibility with other large firms (and relationships with many of them), and its components are already in use by many of AA's 12,000 management information consultants. The system runs on PCs, not just on mainframes, and will eventually recognize the need for cooperative applications running on a combination of PCs and hosts (although that's more a promise than an announcement).

We're happy to believe that the system works and will do wonders, but we're most interested in the company's attitudes towards standardization. We got a mixed response on this issue: Partner and Foundation product director Glover Ferguson is pretty darn proud of his technology, and considers it a competitive advantage he'd rather not share. But AA's partner and technology spokesman Mel Bergstein, who spends a lot of time out in the real world, recognizes the value of launching a standard (if AA should be so lucky). As a two-billion-dollar company with a billion-dollar consulting practice (roughly), AA is well-positioned to be an industry leader if it can start thinking of itself that way and rally a cadre of third-party supporters. The more this industry can put smarts into software, the more people will become the limiting resource. Implementing CASE requires not just technology but management commitment, training, and the discipline to pick a particular methodology and stick to it. Bergstein recognizes that software productivity is becoming more and more of a strategic management issue -- and one a people-rich firm such as his is uniquely qualified to address.

SOFTWARE LAUNDRY: ASYST

While Arthur Andersen is taking a broad-brush approach that befits its size and potential, Asyst, a two-year-old spin-out from dp consulting firm Atkinson-Tremblay of Montreal, has a narrower but more focused perspective -- dealing with history. Most companies large enough to use CASE tools already have quite an inventory of existing systems that the new systems have to accommodate, extend or modify. To do that, the systems designer must first understand them. A number of companies are addressing this "retrofit technology," including Language Technology (Release 1.0, 86-4), ViaSoft (86-12), Bachman Information Systems (87-10), IBM, Amdahl, and KPMG (the former Peat Marwick Mitchell CPA firm), with products acquired through its merger with Catalyst Corporation. Asyst, the most recent entrant, is run by Mike Lyons, a co-founder of Catalyst who left KPMG late last year (on friendly terms).

What is involved in software re-engineering? In short, you have to understand the data, and you have to understand the code. Then you can fix it, re-use it, whatever. But to do anything like this on a massive scale, you need a repository to keep track of all the extracted information. That repository can then provide the input to the CASE design and coding tools.

Using technology developed mostly at Atkinson-Tremblay, Lyons plans an ambitious array of products directed at re-engineering software (which of course includes the capability to engineer it first time around). One signal advantage of the Asyst line-up is that the tools will feed into each other via an on-line DB2-based central repository, CRF. Asyst, which sold $2 million worth of products and training services last year, has sold four copies of CRF at $50,000 each since its formal release in February.

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Around the repository, Lyons wants to array a suite of tools, both internally developed and from third parties, that will assist users in the process. They include code restructurers such as Catalyst's Structured Retrofit or LIT’s Recoder, and data normalization tools such as KPMG's, which does pattern-matching to recognize redundant data and files and derives their structure. Much of the data these tools help clean up is unbelievably messy and redundant -- a mass of scar tissue from perpetual fixes, additions, new applications that use the same data defined differently, and so forth. Lyons estimates that there is a 4-to-1 redundancy in file definitions and a 20-to-1 redundancy in data names. (If people had consistently used proper methodologies and CASE tools from the start, there would be little need for software re-engineering, but that's dreams, not reality.)

Still to come (and far from reality) is the miracle tool, Business Rules Extractor, that will extract business rules from the cleaned-up code and data. Asyst is working on such a tool, hoping to produce it by 1990. In its absence, products such as Asyst's will still make the software maintainer/enhancer's job much easier because they will present him with mostly tidy systems to inspect.

Lyons is modeling his company after Index Technology, a strong marketing company that recognizes its limitations and is willing to extend its products by cooperation with other vendors. Lyons is similarly agnostic with respect to design methodologies; his interest is in providing tools and training, whereas Arthur Andersen, by virtue of its close contact with customers, is more willing to take an affirmative approach to get a job done.

AUTOMATIC PUBLISHING

As we've noted from time to time, the software industry requires vendors to work with each other as well as with customers. One imaginative and useful example is AutoPub, a working system that is still vaporware in terms of marketing plans (in contrast to the usual situation). Conceived by dBASE expert Adam Green and built by Ken Skier of SkiSoft, it is a rule-based system that uses the facilities of two other programs to generate documentation for Dbase programs automatically. All the user does is give AutoPub the name of his Dbase source file, and the system produces a laid-out set of pages complete with front page, table of contents, source listings, and tree and flow charts. AutoPub doesn't generate text, to be sure, but it combines flow and tree charts generated by Clear Software's Clear (see Release 1.0, 87-10) with source listings, and assembles and lays out the whole thing using Byline, a product Ashton-Tate sells under license from SkiSoft.

LOST VISION..... If you think you may have left your glasses (women's, pink rims) in our office last month, look no further (if you can see at all)! Please just give Anita Fowler a call at (212) 758-3434.

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Life hasn't been easy for companies selling nonstandard hardware, even when it provides demonstrable advantages. The good news is that sometimes things get so bad that it's easy to force changes. That has been the case at Symbolics, which seems to have narrowly avoided the fate that befell LISP Machine Inc.

Unlike some other companies we could mention, Symbolics has good reasons for existing. While it may not have the same favored position as Cray Research with the government, it does offer technological capabilities not easily available elsewhere. Its customers appreciate its products and may show fierce loyalty if called upon to do so. Many of them are facing pressures -- both budgetary and political -- to operate on standard platforms, and are eagerly beckoning Symbolics to join them there. The transition is not easy, but we believe Symbolics has been through enough trauma so that it will more easily accommodate a change of direction than might a company not so seriously threatened. In other words, it's easier to follow the doctor's orders if you feel really sick than if you have a dangerous but asymptomatic disease. Symbolics, with six quarters of losses and a recent management upheaval that saw the departure both of co-founder and chairman Russell Noftsker and of Brian Sear, the cost-cutting president he brought in, has symptoms aplenty. Maybe they will spur new president Ron Derry (formerly in charge of West Coast operations) and his company to take their medicine and emerge healthier next year.

To be sure, Symbolics' future is still uncertain, but the company has legitimate hopes of surviving with a new focus on software and co-processors that will enable its customers to benefit from its products without leaving their traditional hardware environments. We're sad to say this, since we believe firmly that within a few years the standard-hardware issue will diminish, replaced by the standard-interfaces issue. With the proliferation of platforms fostered by Sun and AT&T (page 2) among others, customers will rightly care only that their systems work together, not that they work alike. Meanwhile, IBM's MicroChannel, optimized for co-processor architectures, will further hasten this approach in the pc world.

The products

Last week Symbolics announced a set of software offerings, including Statice, an object-oriented database; Joshua, a rule-based extension to LISP; and Concordia, a documentation tool. All three of these products enhance the Symbolics Genera development and operating environment. None of them is compelling enough by itself to get someone to move from a standard environment to Symbolics' LISP-based one, but each enhances Genera's stature as the premier LISP development platform.

- **Statice** development was led by Dan Weinreb, a Symbolics co-founder who has been active in shifting the company's focus towards software. Statice is an object-oriented database management system that solves the problem of letting multiple LISP applications (concurrently or serially) use the same sets of data. Traditionally, LISP applications are all intertwined with their data, and the two are loaded together (with the help of virtual memory, of course, which lets application and code swap in and out of whatever real memory is available). The
object base management system improves performance and lets "persistent" rich data objects reside outside a specific application (just as a traditional database management system does for traditional data).

Statice shares much of the LISP syntax and integrates nicely with the Genera environment. Although it can communicate with standard environments and traditional databases, it fits in best with Genera, supporting LISP-based systems. It pays careful attention to concurrency, so that multiple users can get at the same files simultaneously, and maintains data integrity by locking out other users from altering a relevant data set during a transaction (and ensuring that transactions complete or roll back). Unlike other object-oriented dbms, Statice does not automatically manage "long" transactions, such as when a designer might want to maintain control of a particular object for a week as he works on refining it. The appropriate constraints for such a "transaction" vary from system to system, notes Weinreb, so that this is best left up to each set of applications sharing a database.

With Statice, Symbolics solves one of the fundamental problems of LISP-based development -- the implicit assumption of one person, one application, one data set. The existence of Statice isn't going to move people to LISP (or Genera) wholesale, but it will solve a problem that might have driven many existing users away just when the size and complexity of their programs got interesting.

• Joshua is a macro language extension of Common LISP that is to an expert system shell what a database programming language is to a database management system. It's as if you were to write a Dbase language that was an extension to C rather than to start fresh, gaining the familiarity of C and at the same time avoiding redundant effort; so does Joshua gain acceptability and power from the use of a LISP foundation. Some Genera users who currently use commercial expert system shells with limited custom languages and templates are frequently constrained from expressing exactly what they mean, and are thus forced to drop into LISP; other developers use LISP and spend a lot of effort constructing almost-standard program elements that Joshua offers pre-built and optimized but easily modifiable and extensible. Joshua is not going to convert many C coders into LISP hackers, but it will delight many Symbolics users who will now be able to pick their way more precisely with a tool lets them finesse dynamically the trade-off between defaults and custom coding.

• Concordia is what some folks might mistakenly call a desktop publishing tool. In fact, it's closer to a full-scale publishing system such as Context's Document Management Environment (see Release 1.0, 88-2). It is designed primarily to help people writing systems within Genera create, maintain and publish documentation, both on-line and in hard copy. It helps a user assemble text elements (chapters, diagrams, insetes, headings and other items) into a lengthy document, all the while maintaining cross-references, indexes, and tables of contents. The creator can then print out a neatly "published" set of documentation, with the system linking all the elements into their place and supplying the proper formatting (not just fonts but also numbering.
schemes, latest-version diagrams and text). Using Symbolics' Document Examiner™, a reader can also have access to the documentation as hypertext, with links from one point to another, and a browser so that he can see where the text he's reading fits into the scheme of things.

Alcoa uses Concordia to make available online documentation for a rolling mill, in the same manner that other people use CD ROM and hypertext from vendors such as KnowledgeSet (see Release 1.0, 87-9). While the two are interchangeable in that guise, Concordia has the potential advantage of integration with an expert system, so that the ES could diagnose a fault, and Concordia could display the appropriate documentation, complete with cross-references. Three customers are preparing to use the combination of Joshua and Concordia to build such systems, bearing out our notion that some expert systems resemble executable hypertext, or that hypertext is one way of representing some expert systems.

For the moment Symbolics' entire document-management system has its own data management system and cannot easily manage multiple versions of a documentation set, a capability that should be easy to offer if (when) it is ported onto Statice. Concordia was developed by a collaboration of technical writers and software developers, who used it on itself from the start. Among them was Janet Walker, who recently left Symbolics for DEC's new R&D center in Cambridge, just down the street from the Symbolics building.

* * * * *

IN MEMORIAM

JOE HARMON

* * * *
LEASE 0.5: HALF-BAKED NEWS

LOTUS LINKS

Lotus has had a string of bad luck lately, which may actually help the company look like a nice guy (the opposite of what has happened to Apple). Since all this has been amply covered elsewhere (but for the record, we think the company is unlucky, not crooked or stupid), we'll concentrate on Blueprint, a rich data exchange protocol that does not compete with Microsoft's Dynamic Data Exchange but rather extends and complements it. In essence, Blueprint is not a facility for data transfer, such as DDE or named pipes, but rather a specification for how data can be represented so that it will be correctly interpreted by all Lotus programs and other programs that use the specification/format. Since many of the most "interesting" programs already exist, this means that vendors wishing to tie into the Lotus world will have to write translation or conversion routines (Lotus calls them drivers), just as word-processor vendors do to import and export files to other wp programs. Vendors already signed up include a number who have already built 1-2-3 add-ins and know 1-2-3 intimately, including Oracle (Oracle for 1-2-3), Synex (SQZ!Plus, 4VIEWS, Cambridge Spreadsheet Analyst, sold by Turner-Hall), and Personics (@BASE). Lotus itself is writing a driver for dBASE, so that users can link dBASE data directly into their Lotus spreadsheets, databases, and other programs.

The toolkit to build these drivers will be available in the fourth quarter for $250. We trust that low price means that Lotus has made it so easy to use it won't need to provide any support. Or does it simply mean that Lotus is willing to give it away to anyone willing to support the Lotus standard? Either way, it's a smart move.

TED TRIUMPHS

For all the fuss about hypertext, there has been little market activity. In fact, this is appropriate, since "hypertext" generally is neither a product nor a market, but a capability that can enrich other applications, such as Symbolics' Concordia (page 16), or file managers (e.g. HyperCard) or text-oriented packages (e.g. Agenda). However, there is one pure hypertext product, Ted Nelson's Xanadu Hypertext System, which has now gained support. In an announcement graced with the loveliest mug shot we've ever seen -- Ted Nelson grinning in front of his Sausalito houseboat -- Autodesk revealed that it has purchased 80 percent of Xanadu Operating Company and will hire Nelson as a Distinguished Fellow. The company acknowledges it will take 18 months or so to produce anything tangible, so we'll have time to do Nelson and Autodesk justice in a future issue. For the moment, congratulations to both parties!
RESOURCES & PHONE NUMBERS

Glover Ferguson, Arthur Andersen, (312) 507-6478
Mike Lyons, Asyst, (312) 416-2990
Eric Lyons, Ted Nelson, Autodesk, (415) 332-2344
Vadim Yasinosovsky, Clear Software, (617) 232-9788
Mark Potts, Document Technologies, (415) 858-0372
Bill Bane, Clifford Chirls, EFS Management, (415) 598-9090, (203) 359-9397
Jim Manzi, Tom Smaldone, Ed Belove, Lotus Development, (617) 577-8500
David Liddle, Metaphor Computer Systems, (415) 961-3600
Jon Shirley, Bill Gates, Microsoft, (206) 882-8080
Bob Baskerville, MMB Development, (213) 545-1455 or (800) 832-6022
Ken Skier, SkiSoft, (617) 861-1190
Eric Schmidt, Scott McNealy, Bill Joy, Sun Microsystems, (415) 960-1300
Dan Weinreb, Symbolics, (617) 621-7540

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April 27-29  Seybold Technology Forum - Cambridge, MA. "Distributed network computing: A journey into the future." Sponsored by Patricia Seybold's Office Computing Group. Discussions ranging from communications protocols to computer-supported cooperative work. Call Catherine Cooper, (617) 742-5200.


May 3-4  Managing DEC-IBM integration - Chicago. Sponsored by DeBoever & Associates and Software Magazine. Speakers include Jim Mullen, Orion; Paul Hessinger, Computer Task Group; Sonny Monosson, himself; Amy Wohl, herself; Lew Shepherdson, Simware. Call Ken Burroughs, (703) 845-1657.

May 3-5  Expert systems and the leading edge in production planning and control - Charleston, SC. Nitty-gritty experts par excellence, with talks by Tom Kehler and others. Contact: Libby Shropshier, (803) 777-5766.

May 3-6  CASExpo - Dallas. Managed by Arthur Young & Co. Contact: Ken Burroughs, (703) 845-1657.

May 4-6  AI Long Beach - Long Beach, CA. The most commercial AI show around, for better or worse. Sponsored by Tower Conference Mgt. Call Caroline Jackson, (312) 469-3373.

May 9-12  Comdex Spring - Atlanta. Peaches and PCs. Contact: Jane Wemyss at the Interface Group, (617) 449-6600.

May 10-12  Computer services and consultants executive conference - Palm Springs. IBM mingles with its third-party support cadres. By invitation only. Contact your own contact or call Elsie Chapman, (914) 749-3389.

May 11-13  Quality Week - San Francisco. Workshops and talks by QA experts from Lotus, Federal Express, other quality-minded outfits. Sponsored by Software Research, Inc., a longtime vendor of quality assurance services. Contact: Dan Zimmermann or Marilyn Wylder, (415) 957-1441 or (800) 942-SOFT.

May 12-13  Computer Law Institute - Los Angeles. The ninth annual, sponsored by the University of Southern California. Panels on intellectual property in the U.S. and abroad, new applications, the IBM/Fujitsu case, liquidity for high-tech companies. Contact: Jerry Wiley, (213) 743-2582.

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June 1-3 | CASE Benchmarks - Dallas. Rather than just present companies and tools, moderator Vaughan Merlyn controls the proceedings and compares the various tools on a common scale. Sponsored by Digital Consulting. Call Scott Dor- man, (617) 470-3870.

June 6-8 | Expert communication 88 - San Jose. Sponsored by Graphic Communications Association. Applying AI to design, content, process, etc. Call Marion Elledge, (703) 841-8160.

June 7-9 | Executive information systems conference - Houston. Sponsored by Office Sciences International. Contact: Joel Levy, (201) 750-0085.


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<th>Date</th>
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<tr>
<td>July 12-15</td>
<td>CASE '88 - Cambridge, MA. Second international workshop on computer-aided software engineering</td>
<td>Pamela Meyer, Index Technology (organizers), (617) 494-8200, x454.</td>
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<tr>
<td>August 1-5</td>
<td>SIGGRAPH - Atlanta. Sponsored by IEEE, ACM and SIGGRAPH.</td>
<td>Adele Newton, (519) 888-4534.</td>
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<tr>
<td>September 7-10</td>
<td>SPA fourth annual conference - Washington, DC.</td>
<td>Jayne White, (202) 452-1600.</td>
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September 25-30 OOPSLA - San Diego. Object-oriented Programming: systems, languages and applications. Sponsored by ACM. Contact: Allen Otis, Servio Logic, (503) 644-4242 or Barbara Noparstak, Digitalk, (213) 645-1082. (The conference section of OOPSLA is Wednesday through Friday (28-30), so you can catch most of CSCW first if you miss the OOPSLA tutorials.)

September 26-28 Second conference on computer-supported cooperative work - Portland, OR. Sponsored by ACM. Contact: Suzanne Sylvia, (617) 225-1860.

October 3-5 Adam Green’s dBASE® symposium - Burlington, MA. Three-day conference of dBASE third parties, including clones, compilers and complements. Contact: Marny Peabody at Digital Consulting, (617) 470-3870.


October 11-14 Info Show - New York City. Contact: Frank Fazio, Cahners Exposition Group, (203) 964-0000.

October 23-28 Monterey Classic - Monterey, CA. Contact: John Baumeister, (408) 987-4200.

October 16-19 ADAPSO MANAGEMENT CONFERENCE - Dallas. The software and services industry’s premier gathering. Contact: Sheila Wakefield, (703) 522-5055.


November 2-4 Adam Green’s dBASE® symposium - Woodland Hills, CA. Three-day conference of dBASE third parties, including clones, compilers and complements. Contact: Marny Peabody at Digital Consulting, (617) 470-3870.


November 14-18 Comdex - Las Vegas. The one and only, sponsored by the Interface Group. Contact: Jane Wemyss, (617) 449-6600.

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