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Theoretically, anything that will discourage this industry's unfortunate tendency to second-rate imitations rather than exciting new products is a good idea. There's a big difference between a clone and a new product that may use the same interface to let the user reach something new and better -- Symantec's Q&A, for example, which uses the pfs interface in front of a generally new and more flexible product. These days (we hope) no one would sue over a competitor's use of one's file format, but rather accept the homage with grace -- it's the first sign of becoming a standard.

New wine, old bottles

That's an optimistic view of the recent Lotus suit against Paperback Software and Mosaic Software. The darker view looks at history, not theory. What is to ensure that the law will make that fine distinction between clone and improved classic, that it won't be stretched to discourage genuine innovation? Like IBM, Lotus is creating an atmosphere of Fear, Uncertainty and Doubt. Most industry veterans are afraid that neither of the accused has the resources to fight this one out, and to create some clear precedents for what is and what is not shameful copying. They may settle -- and other folks tempted to build new products using old forms may be deterred. Lotus will argue, correctly, that Paperback's VP Planner and Mosaic's Twin were blatantly marketed as copies and passed off as equivalents when they weren't, but that's a fine distinction when you are considering of risking your own and your family's savings on a new venture. (And venture capitalists won't even consider taking a copyright risk.)

In this case it's not a question of the legal issues, but of the practical implications. In the case of VP Planner and Twin, certain issues seem straightforward: The vendors' own claims posit their products as one-for-one substitutes for 1-2-3 (with enhancements). But will Lotus go after Lifetree's Words and Figures next? Even if Lotus doesn't -- and we hope they have the discretion not to -- who knows who will go after whom, and on what spurious claims? To a small company, such a suit could mean bankruptcy regardless of the likely legal outcome.

INNISE
COPYRIGHT CHAOS 1
Fear, uncertainty and doubt.
WHO OWNS dBASE? 3
Ashton-Tate.
And the others.
NITTY-GRITTY EXPERTS 8
What I sell is not what you sell.
Aion/B&B's DASD Advisor.
IntelliCORPS's KEEconnection.
Apex Client Profiling.
REPORT FROM MACWORLD 15
Lots of business products.
Tempo.
RELEASE 0.5 16
Symantec: M&A.
Lotus: Did you see l(c)?
PHONES; CALENDAR 18/20
1987 PC FORUM SPEAKER LIST 19

HAPPY NEW YEAR!
In this case, we expect that ADAPSO and other industry groups will chip in with amicus curiae briefs and perhaps with funds to make sure that the issues are clarified -- something that has been on ADAPSO’s mind lately. (ADAPSO’s Software Protection committee meets again next week.)

The potential implications are enormous, for Lotus itself, for Ashton-Tate/Multimate (a copy of Wang’s word processor), for Symantec, for Apple and Microsoft and their use of Xerox’s Star and other ideas, for Oracle with its DB2 clone, for most companies with the sense not to reinvent the wheel. (Meanwhile, if the person who wrote the first message on a pull-down window-shade would care to contact our lawyer...)

Benign watchers hope Lotus’s intent is -- or at least the outcome will be -- to define the distinction between substantial similarity (old interface, old functions) and incidental similarity (old interface, new functions) more cleanly. Earlier, Lotus had opposed a notion raised within ADAPSO of vigorous action to support taking Whelan vs. Jaslow to the Supreme Court to resolve ambiguities and lessen its scope -- perhaps with this suit in mind. However, Lotus itself is vulnerable should any copying at all be forbidden: Consider 1-2-3’s similarity to VisiCalc (which Lotus now owns with its purchase of Software Arts), or Symphony’s borrowings from ThinkTank. (Perhaps Lotus just wants a licensing deal such as Apple’s, which did nothing to clarify the overall issues.) Close observers tell us that the judge scheduled to hear the case is fully capable of understanding the complex technical issues involved, and won’t render a careless or uninformed decision.

In fact, we assume that the current industry uproar over this suit will have an appropriate salutary effect, with amicus curiae briefs or more partisan input guiding the judge to an "acceptable" decision. If not, the same process will surely recur in the Supreme Court. And if that fails, ADAPSO, SPA and ad hoc groups led by rightly concerned citizens such as Dan Bricklin will lobby Congress into some appropriate action. The alternative would be unthinkable. As Lifetree’s Camilo Wilson says, "Jim Manzi has pushed the button. But maybe we can call the missiles back."

Shameless copying of existing products is a waste of resources when developers could be doing something better. But making it illegal risks throwing out the good with the bad. For the users’ sake, we should retain imitation simply because it makes new products easier to learn. "We all steal from each other," notes Dan Bricklin, "just adding a little bit here and there." Generally, incremental improvements (read confusing changes) are all that users will accept. They prefer their new wine in old, familiar bottles.

Patents are designed to protect people for the time it takes for a product to get established. Sheer time may do the same for software developers in a fast-paced market. And just remember, no one’s going to copy your product until it’s successful! Social censure, rather than legal precedents that can be carried too far, should be enough.

(We will hold a special session on this issue during the PC Forum, to be led by lawyer Roger Borovoy of Sevin Rosen. Discussing the issues will be Dan Bricklin of Software Garden, John Doerr of Kleiner Perkins, Camilo Wilson of Lifetree, and of course the audience itself. We will also arrange a demo room with live copies of VisiCalc, 1-2-3, Twin, VP Planner, SuperCalc IV, and Words & Figures so that attendees can experience the "look and feel" of these products firsthand. Other entries will be welcomed.)

Release 1.0

26 January 1987
Successful products are like children: It's a pleasure to own them as they grow up, but eventually they gain a life and a will of their own. Just as IBM no longer owns SQL and AT&T no longer owns UNIX, so does Ashton-Tate no longer own dBASE. (By dBASE, we mean the entire family: the original dBASE II, dBASE III, dBASE III Plus. By Dbase, in accord with industry convention, we mean the language itself as opposed to the dBASE interpreter/database product.) From a personal application, dBASE has grown into a developer's tool. And the Dbase language, for which Ashton-Tate offers only an interpreter (within dBASE itself) has become a standard: Compilers sold by third parties are creating Dbase applications never touched by dBASE itself.

Despite continuing strong sales spurred by the release of dBASE III Plus late in 1985, the dBASE standard is only tenuously under Ashton-Tate's control. To its disadvantage, A-T never milked its own line in the way Lotus is milking 1-2-3. (Technically Lotus's effort makes less sense than would a similar move by A-T, but the business case is compelling for either firm.) Yet while Ashton-Tate has lost power over the market, it has not ceded the power to anyone else. The power has dissipated rather than shifted. Potentially, therefore, it may be more easily won back.

The story thus far....

As it now stands, the market consists of dBASE, with about 1 million copies sold (plus a few hundred thousand illegal copies, minus a few hundred thousand lost or inactive copies). There are some clones: Most notable are FoxBASE and FoxBASE+ (the III Plus version) from Fox Software of Perrysburg, OH, with 15,000 copies. But the major part of the market, about 40,000 units so far, is dBASE compilers, notably Clipper from Nantucket Corp. of Los Angeles (30,000-plus) and Quicksilver from WordTech of Orinda, CA (3000, plus 7000 of an older version). In addition, there are a number of program generators, notably Genifer (5000) from Bytel of Berkeley, CA; QuickCode/QuickReport from Fox & Geller of Elmwood Park, NJ (55,000 users since 1982); and (soon) UI from WallSoft of New York City (200 beta users at $75 each).

These third-party tools overall have probably generated another few hundred thousand data bases/applications in addition to the ones built directly around dBASE. In addition, there are numerous add-ons and utilities, such as Fox & Geller's QuickSort and QuickIndex (now outdated by A-T's inclusion of comparable facilities in more recent releases), WallSoft's The Documentor and dfLOW, Tom Rettig Associates' Tom Rettig's Library of add-in functions, and mostly complementary products such as Concentric's R&R and Alpha Software's ALPHA/three (12,000 copies in use). Finally, A-T itself recently launched a line of tools under license from J.T. Cooper & Co.

Most of these products have been offered to A-T and turned down. Many come from former A-T employees who saw needs the company wasn't meeting; many others come from former customers and developers whose needs weren't met.

Power shift

Ashton-Tate's problem, in short, is that dBASE itself is simply an interpreter and a skeleton structure, one instance of a myriad of compatible databases that can be created by the Dbase language. The language gives you far more flexibility (albeit requiring you to make more choices) than does dBASE.
itself. While many end-users still build data bases with dBASE, most people who build Dbase applications for a living have long since switched to Dbase compilers. Aside from the flexibility, speed and other technical considerations, it's cheaper. With one copy of a compiler (typically $700), you can build and sell as many applications as you want.

All that would have been okay if Ashton-Tate had recognized its true market: a small group of technically savvy developers influencing a larger group of naive end-users. Instead, A-T sold to those naive end-users directly, with advertising and "easy-to-use" features (such as Assist in dBASE III Plus). It pretty much ignored the needs of the developer community, which has now grown to include in-house corporate VARs as well as independent developers.

When asked why Ashton-Tate doesn't sell a compiler, chairman Ed Esber's answer is that it doesn't have one.* But why not? Several efforts were started and then shelved, probably because of the feared impact on dBASE revenues. But cannibalization is preferable to feeding someone else.

Of course that has occurred: A-T has lost not just revenues from sales of dBASE and runtime to developers, but the replacement revenues it could have earned from a compiler. Now, just as the market at the high end is being eroded by the tools sellers, the low end is being eroded by Software Publishing, Alpha Software, Symantec, Ansa and others who offer power combined with appealing end-user facilities still lacking in dBASE. For customers who don't need to build applications but just want to use a data base, these systems are more appropriate and easier to use and cheaper. A-T is fighting back with RapidFile. It doesn't read dBASE files directly, but the version shipped last week is considerably faster than the beta versions many people have seen.

**Trickle-down standards**

Most important, A-T is losing overall control of the market it created. Developers are not just a small part of the market, but its scouts. The small amount of revenues they replace directly is dwarfed by the revenues they influence. At the recent Developers' Conference, surveys indicated that the attendees were responsible for 20 applications each.

An obvious question arises: Why did Ashton-Tate miss this point? Blame management turmoil (the most recent departure is cfo Norman Block's; the most recent change is development manager Harvey Jeane's move into R&D). Blame an unresponsive development organization within Ashton-Tate. Blame too close attention to Wall Street's urgings for diversification. Blame all the hoopla over the retail pc business, which overlooked the fundamental difference between dbmses (developer's tools used to build applications), and file managers, word-processors and spreadsheets (individual productivity tools occasionally stretched to build models that might be shared). Developers' cries for support and development tools were dismissed as the complaints of an unrepresentative minority.

*Ashton-Tate has made at least four forays at offering a compiler, says one insider, but none came to fruition. In the distant past A-T hired consultant Jeff Cooper to build a compiler, but it paid Cooper off before the project was finished for reasons that vary by historian. Cooper is now J.T. Cooper & Co., developer of A-T's dBASE Tools, and also sells a line of rich-interface utilities and tools for dBASE called Envisioneering.

*Release 1.0	 26 January 1987
On A-T's agenda, says Esber, is a compiler for the coming 80286/386 dbms, but by now the company considers the original dBASE market as history and won't field an entry there. Meanwhile, it is supporting RapidFile, a file manager that can't read dBASE files directly (see ALPHA/three for that); dBASE Mac, a nice product that can't execute dBASE applications (see Nantucket's McMax for that); a desktop publishing product, fast but outside A-T's range of expertise; a strong graphics line from Decision Resources; and Multimate, a word-processor tied to another struggling standard, Wang.

Compatibility issues

Why aren't dBASE Mac and RapidFile code-compatible with the Dbase language, rather than merely capable of importing dBASE files? Esber offers a couple of answers. First, a lame one: These products were built around foundations bought from outside, and there's only so much you can do... The second answer pertains more to dBASE Mac: A-T wanted to make a better product, and sacrificed some compatibility to do that. "Do you really think that the interface and the user-friendliness of dBASE III Plus represent the wave of the future?" Esber asks with a twinkle. Fair enough, but we're not convinced that adoption of the Mac interface required straying so far from the Dbase language; it didn't for Nantucket's McMax. As for RapidFile, it's not supposed to sell directly against dBASE... Certainly it's true that only the market leader can ever get away with incompatibility: Compaq has always been more compatible than IBM; VP Planner is compatible with 1-2-3 version 1A while 1-2-3 version 2 is not.

A-T also faces a more subtle compatibility issue that will make it hard to win developers back: user-created incompatibilities. The compilers allow builder-users to create their own routines (UDFs, or user-defined functions). These are extensions of the language that builder-users incorporate into their compilers -- and that dBASE can't handle. With J.T. Cooper's dBASE Tools ($80 each) and Tom Rettig's Library ($100), the dBASE interpreter now also has such facilities. But, illustrating the differences, Rettig's Library comes out in two versions, one for dBASE, which is a little more cumbersome to overcome the difficulties of working with an interpreter, and one for Clipper. The Clipper version is selling faster.

Catching up is tougher than staying ahead

How much can Ashton-Tate change/improve dBASE as it moves onto the 80286/386, without leaving much of its market behind? Can it stand the dishonor of stooping to imitate or incorporate the advances made by Clipper and Quicksilver? We should see the first intimations of the answers by the end of this year. Because there is no alternative standard-bearer -- if A-T acts before Clipper or Quicksilver gains too firm a hold -- it has a reasonable chance of regaining sway. (We're not prepared to believe that A-T suffered any great loss with the departure of Wayne Ratliff, whatever the legal issues to be resolved; what A-T had at the time of Ratliff's departure last May won't amount to much in the new world of 80386es, workgroups, SQL, and distributed data base architectures.)

Friendly overtures

After years of neglecting the developer market and then feeling threatened by that portion of it that has shifted allegiance to Clipper and other third-party tools, A-T has come to the conclusion that the compilers help to
support the dBASE standard against inroads by Microrim, Ansa, and the SQL boys -- Oracle, TRI, Informix, Unify. Moreover, manager of developer services Mark Whiteside estimates that more than 50 percent of compiler sales ultimately lead to the purchase of a dBASE interpreter, i.e. dBASE itself. But FoxBASE and WordTech are beginning to break into that market.

The Ashton-Tate developers' conference last fall, attended by 600 people paying $500 to $600 apiece, marked a turning point in A-T's attitude towards developers (even though its new fondness for developers is not totally required). The conference itself was a significant gesture to third parties, and it gave developer proponents within Ashton-Tate further grounds for pleading their case with management, says one attendee. One memorable moment: dBASE wizard Adam Green asks an audience of two to three hundred how many use Clipper. Ninety percent of the hands shoot up. How many would use an A-T tool if A-T sold one as fast as Clipper? Sixty percent. In other words, yes, they're straying... But they're straying only because A-T isn't satisfying their needs.

While A-T has lost marketing and technical control, it's working hard to regain the presence accorded to a strong keeper of the flame. Most notable is the Developer Registry, a heavy book due in April that will list virtually every dBASE product or service available. For $75 per page (one item or service per page), developers can be part of a $19.95 tome that will be sold to anyone who asks. (The last such listing was three years ago, and was free to developers.) While the goal is to win loyalty from third parties by helping customers to find them, the book will also let the compiler and tool makers sell to their builder-users, occasionally bypassing A-T. But A-T can only gain from any cohesion of the marketplace this effort may foster.

The other players: Bytel

Genifer, from Bytel of Berkeley, CA, is probably the most widely used dBASE III application generator, with 5000 copies sold. (Ashton-Tate's AppGen, included with dBASE III Plus, is more widely sold, of course.) Delivered in the summer of 1985 by a programmer-oriented company that sold COBOL tools (mainly Cogen), Genifer has sold more units than all Bytel's other products since it was founded in 1981, says marketing vp Jim Porzak. It's the sort of product A-T ought to offer itself: Microrim, with its new Applications Express, offers an equivalent. In essence, Genifer is a not terribly flexible system that enables users to build dBASE applications. It captures people who are smart enough to be dBASE programmers but not experienced enough to have built up their own code libraries and opinions about how to do things. In its next release, due in a few months, Genifer will both be easier to use (with a novice mode that offers more guidance or fewer choices, depending on your point of view) and an expert mode that gives the builder-user more flexibility.

WallSoft

As Bytel's Genifer moves upscale, it may run into The UI Programmer from WallSoft, based near Wall Street on Broadway in New York City. (No, it has nothing to do with high finance despite the pinstripes on the packaging -- we ignored you for a long time because of those pinstripes, Marty!) "UI is a propeller-head's application generator," says Bytel's Porzak. Precisely. WallSoft chairman Marty Rinehart figures that Dbase programming is a high-end market, and he wants to be its leader with a product that sings. UI,
$195 until April, when it goes up to $295, provides a framework for the
developer to build his own routines and assemble them into Dbase appli-
cations. Its name stands for User Interface and its specialty is interface
design, with facilities (lacking elsewhere in the dBASE world) for pop-up
windows, bounce bars, stacked boxes, and other such niceties. Moreover, the
developers can build an application using UI's high-end and not-so-easy-to-
use facilities, and then deliver the product to a customer along with a copy
of UI that will enable him to redesign the screens by simple direct manipu-
lation without having to know anything about the underlying code. WallSoft
was founded in 1983 and got its start selling The Documentor (2500 copies
sold) and dFLOW (3000), documentation and debugging tools for Dbase.

FoxBASE from Fox Software

"FoxBASE is a remarkable piece of technology," says an A-T employee we know.
An incremental compiler (a cross between a compiler and an interpreter), it
generally beats the other products hollow in benchmarks. Moreover, it's
fairly close to dBASE with a few exceptions, and a few enhancements. Ship-
ping for only six months, FoxBASE+ has already sold 10,000 copies. Multi-
user FoxBASE+, a multi-user version compatible with dBASE III Plus, started
shipping last Friday, should add to its momentum. FoxBASE+ costs $395 list,
and offers runtimes at $300 for 10 copies, or $500 for unlimited use.

The founders of Fox Software developed FoxBASE (a dBASE II clone, 5000
copies sold) for internal use in 1983, and then decided it was so good they
should build a company around it. Fox Software now has 25 people vs. 12
last summer. Many of them are graduates of Bowling Green State University,
where company president David Fulton founded and was chairman of the com-
puter science department. FoxBASE continues to sell, mostly because unlike
dBASE II it has multi-user facilities in both a DOS and a UNIX version.

The compilers

Nantucket's Clipper ($695), first delivered in 1985, holds a clear lead over
Quicksilver from WordTech. Built by a bunch of renegades from Ashton-Tate,
Clipper isn't totally compatible with dBASE III Plus (because of differences
in index structure), although it's becoming more so. Nantucket's most re-
cent foray -- now that it's learned the value of compatibility -- is McMax,
a dBASE III-compatible for the Macintosh shipping in March for $295. Not
only can McMax import dBASE files, as can Ashton-Tate's own dBASE Mac; it
can also execute dBASE code (and dBASE can execute its code). The product
looks to be a handy product with wide appeal to dBASE developers.

WordTech, by contrast, espoused compatibility from the start, although its
UDF facilities enable builder-users to build in their own incompatibilities.
Shipping only since October, its Quicksilver dBASE III Plus compiler, faster
than previous versions, has gained almost a tenth of the compiler market.
Quicksilver has window-building facilities and competes respectfully with
Clipper on speed. (FoxBASE still beats everything in sight.) WordTech is
now moving downmarket with dBXL, a dBASE III Plus clone with easy-to-use
menus plus the window-building tools and other extra features, listing for
$169 and scheduled for shipment next month after a slight delay. At the
other end of the spectrum, WordTech is working on dBSQL, a DB2-like dbms
that also takes dBASE III commands and supports query-by-example, likely to
be released in 1988.

Release 1.0

26 January 1987
Getting into the "mainstream" is a major concern for AI tool vendors, particularly as the LISP-machine-based backwaters look less and less inviting. But there are differing visions of what that means. Is it a question of hardware environment? Of data access? Of underlying language? Aion, which offers virtually identical systems written in Pascal and assembler both on IBM mainframes under MVS and VM/CMS, and on IBM PCs, has never ventured away from the mainstream; likewise, Distribution Management Systems delivers its tools and applications on IBM mainframes and DEC VAXen.

IntelliCorp is addressing the problem with KEEconnection\textsuperscript{TM}, described below, which enables builder-users of expert systems to establish automatic links to "mainstream" SQL data bases. Without user intervention, current data can be gathered and transferred in realtime into a knowledge base for manipulation by an expert system.

Apex's first product, PlanPower, runs on a LISP machine; its second, to be announced today (page 13), runs on a VAX linked to PCs -- and its inferencing engine is written in DEC's LISP.

Now let's consider a third approach, writing expert systems in C. This has gotten to be a big issue among analysts, who raise it with the tools vendors every chance they get, but it's actually a decoy for the real issue among customers: Will it run on machines I'm familiar with? Customers don't mind LISP as much as they mind LISP machines. With LISP's from Franz, Lucid, Gold Hill, and others proliferating on Suns, VAXen, and a range of IBM equipment, it's now becoming possible to stick with LISP even on standard hardware.

The major argument for writing in C or COBOL is not that LISP systems can't talk to C or COBOL programs or to standard data bases (this is an important issue but it's not dependent on the use or avoidance of LISP), but that lower-level languages execute faster. Performance is an issue at runtime -- the issue in transaction applications. For development, speed is something of an issue, but what C, COBOL and especially assembler programs gain in speed they may sacrifice in flexibility, ease of use, and graphical richness. Just as one size, one operating system, or one kind of hardware does not fit all, neither does one set of trade-offs in performance.

Transaction systems or realtime systems such as those favored by DMS, Aion, and Inference are appropriately written in standard high-level languages or assembly language. But for interactive systems where the application itself is in a sense development -- decision support (the archetypical "expert system"), generating queries in response to a user's curiosity, software design, or expert systems in general rather than standard applications with embedded expert systems -- LISP continues to make sense.

One man's meat, another man's poison

At our instigation, and at management's invitation, Distribution Management Systems chairman John Landry attended IntelliCorp's announcement of KEEconnection\textsuperscript{TM}. Rather than quake in his boots or call up his development people to start a new project, Landry cheerfully noted that KEEconnection proliferates redundant data without regard for integrity and, because it stores data temporarily in its knowledge base during a consultation, doesn't deal with realtime data. Of course, that's not what it is designed to do.
IntelliCorp sells expert-system applications that occasionally grab data from a database for use in a knowledge base, while DMS sells transaction applications that occasionally use embedded expert systems to collect, derive, or determine pieces of data for use by the application. While DMS's market is clearly larger in the short term, IntelliCorp is selling pure value-added while DMS is selling tools to add a little value to existing applications. To generalize, IntelliCorp represents data in interesting ways to make it more malleable and meaningful for humans to look at; DMS takes numerous mundane little rules about data and hides them away in its applications so humans frequently don't have to look at the data at all.

As time passes, all these companies -- Aion and IntelliCorp, DMS and Inference, Teknowledge and Carnegie Group -- will be more clearly defined and distinguished, and observers will start to believe them when they say they rarely see each other in the marketplace (just at conferences). Of course, they will compete eventually, but the market is still large enough, and the tasks to be accomplished varied enough, that vendors should worry more about finding customers than about fending off competitors.

**NITTY-GRITTY EXPERTS: KEEconnection™ and IntelliScope™**

Forget the difficulties of formulating a query in computer language, and consider the difficulties of formulating a query at all when you're exploring a subject where you're not even sure what there is to know. "Tell me what you know" is the typical starting query in demos of natural-language data base query tools; it usually generates a list of files, but it's not rich enough to get most people going. In Paradox, for as many files as fit, you can use query-by-example to see a list of fields and check off the ones you want to see joined for a given constrained set of records -- all employees who work for Juan, for example. Back with a natural-language query system, you can find all employees who earn at least 10 percent more than Alice (which you can't do in one step with QBE).

Now imagine a far richer data base, and a far richer means of navigation and analysis -- "retrieval by reformulation." In essence, as you see the results of a query, you can reshape the query, and reconfigure the universe it's examining. IntelliCorp's IntelliScope, available next fall, front-ends knowledge bases managed by IntelliCorp's KEE (Knowledge Engineering Environment). It enables you to set up a knowledge base describing the data in a standard SQL relational data base in richer fashion -- with rules and frames and complex relationships, instead of relational tables with keys and indexes. The initial implementation will work with Oracle, RTI's Ingres, and Britton-Lee dbmses; a DB2 version is on the way.

SunSimplify (Release 1.0, 31 October) is a version of a standard relational data base with extra pointers embodying richer relationships; IntelliScope takes this idea one step further and offers a tool for its creation (KEE-connection, below). Using IntelliScope, you can look at a single object, then explore the attributes of that object. By showing you examples, the system encourages you to understand distinctions you may not have been aware of. From Eric's cat, you can move to Eric.

To explain: A cat is a kind of animal, and shares some attributes with all other animals. Different kinds of cats share some attributes, and differ in other respects: color, lifespan, tail length, etc. Some cats are pets, and
share attributes with other pets, such as dogs and birds. As pets, they are also a kind of possession, and have owners, prices, etc. Thus a single object may "inherit" attributes from more than one superclass, and have relations to others -- for example, Eric, the cat's owner, has an independent identity as a software developer and a relationship to several software companies, each of which have relationships with their employees, with hardware manufacturers, and with other independent software developers. Moreover, Eric's computer, a possession for him, is a location for his cat, who likes to sit on top of it.

After considering Eric and his cat and discovering that Eric writes in Forth, you might decide to focus on software developers who write in Forth -- a factor you did not consider when you first asked about Eric. But when you saw that information, you began to wonder: Do Forth programmers congregate in smaller companies, and on the West Coast? As you explore the data, you can refine your query or broaden it, all the while discovering more about the data base you're examining. (Why do typical relational data bases top out at about 20 fields per file? asks IntelliScope designer and Intelli-Corp vp product development Mike Williams rhetorically. Not because the software or the hardware can't handle it, but because it's too much for a human to grasp at one time. And why aren't all the interrelationships represented? Most are -- in tables that link other tables -- but not in a way very accessible to people...until now.)

IntelliScope's value lies not in its ability to recreate a data base in a knowledge base, but in the ability to make the db's structure apparent to a user, and to link it to other knowledge bases which may not ever be in dbms form. A relational data base typically contains some tables (relations) that do little more than specify links between data. Those tables underlie many of the relationships IntelliScope knows about. But in a dbms the user has to know enough to ask that the various tables be joined, while IntelliScope clarifies those relationships and lures the user into exploring them.

A Metaphor with meaning

IntelliScope also offers browse mode, histograms, graphs, tables, derived slots (like calculated fields, but generated by reasoning), and other analysis tools. Consider it akin to Metaphor Computer's analytical workstations -- but with meaning. That, of course, raises some interesting points about marketing. Metaphor is now doing very well, but it had a tough couple of years getting there. In particular, it faced the obstacles of nonstandard hardware, high prices, and general resistance to anything new.

IntelliScope, with an entry cost of at least $30,000 excluding development time and LISP machines, will face these problems in spades. Indeed, we consider IntelliScope more a proof of concept of the original work (called Rabbit) done by Williams at Xerox PARC, than a commercial proposition, at least until the system can be moved over to KEE's PC-Host configuration (VAX plus PC workstations) or even onto, say, an 80386, with pricing to match.

Manual magic

Where does IntelliScope get its meanings? Well, someone has to tell it. Underlying IntelliScope is KEEconnection™, available this summer, a tool for describing a data base's structure in a knowledge base so that data can be imported automatically from the data base into the knowledge base as

Release 1.0

26 January 1987
required by a user's or an application's needs. The knowledge base then holds the structure as well as the rules for generating queries to fill up that structure with the appropriate data on request. It can link data bases to a knowledge base already set up in KEE, or an existing data base can be transformed wholesale into a knowledge base. For example, you could create links among discrete data bases, such as accounting data, manufacturing data, and a knowledge base about about product design and quality control.

KEEconnection is a tool -- an expert system, in fact -- that helps users do the mapping, mostly by diagramming the connections. It assists the user in mapping unstructured data within a data base into a richer structure that includes hierarchies, classes, rules, and other information that controls the manipulation and even the "meaning" of the data elements it holds. (Relational data bases by definition avoid structuring their data into anything other than flat tables so as to increase flexibility, ease of maintenance, and data integrity. Yes, any time a data base is restructured with the addition of tables, equivalent changes must be made through KEE-connection to the linked knowledge base to maintain structural integrity.) Thus, as indicated below, you can envision a data element not merely as the intersection of rows and columns (an entry in a field which may or may not be an entry in another file) but also as the mingling of information found in several hierarchies...

The process of mapping a data base can fairly complex. But it need be done only once (ex changes in the underlying data base), and the data and structures are available for any user. It's much like setting up an applications repository, which contains not only data but data relationships, application procedures, and the like -- in other words, information about itself. (See our 32 December issue.) Keeping everything in a single data base provides consistency, but knowledge bases such as IntelliScope offer more support for design tasks. IntelliScope could be a handy tool for software engineering.

While KEEconnection makes it looks as if you're mapping the data base into the knowledge base, you are also de facto building an overlay of relational structures to be used in constructing queries against the original data bases, which may not have explicit tables recording all the relationships.

The KEEconnection reads the data dictionary in your data base and creates a mapping between the relations in your database and objects it generates in KEE. After specifying in the editor the database's primary and foreign keys, you may want to customize your mapping by, for example, creating KEE objects that combine information from multiple relations. And, you may want to rename the fields in your database for clarity. For example, note that the "cnum" field in the sites relation became "customer contact" in KEE. You also can translate database values.

Release 1.0 26 January 1987
Founded by a couple of ex-IBMers who worked on IBM's mainframe-based expert system tool, Aion sells an expert system development tool that runs identically on mainframes and PCs. The founders met their lead venture capitalist, Fitch Johnson of Asset Management, through their mainframe-expert friend Jack van Kinsbergen, chief technical officer of another Asset Management investment, Boole & Babbage of Sunnyvale, a supplier of mainframe software. So it's no surprise that Boole & Babbage turned to Aion to smarten up its line of dp center management tools. The first of these efforts, DASD Advisor, takes the output of B&B's DASD/RM (for Direct Access Storage Device/Response Manager) and turns it into something meaningful. What used to be an arm-tiring sheaf of print-out is now a series of interactive screens highlighting problem areas, disk overloads, data-transfer bottlenecks, etc.

DASD Advisor is just the first in a series of Performance Advisors, all built with the Aion development system, that Boole & Babbage plans to launch over the next few years. The incorporation of the Advisor module will about double the price of DASD/RM from its current $12,000 to $16,000 range -- and will probably do even more than that for its competitive standing.

Scheduled for shipment in the second quarter, DASD Advisor works in a combination of batch and online modes. The batch part, the original DASD/RM, works through a collection of performance statistics (typically a day's worth) and analyzes the data concerning utilization and throughput of a center's data channels, control units, strings of disk drives, and disk drives. But rather than print out these data, it feeds DASD/RM's summaries into DASD Advisor, an expert system which analyzes it for problem areas.

The user can examine the data from three viewpoints: system balance, to see where bottlenecks in access time and throughput are occurring; workload, to see the performance of the system components being used to accomplish a particular processing job; and volume, to examine a particular set of storage devices. He sees the problems and responds to suggested solutions. (In the next release, slated by yer-end, the likely results of these actions will be simulated.) The user may reject the system's advice because of rules that aren't in the system -- because they're temporary (a certain big job has priority) or inappropriate (the boss must never see a delay of more than 5 seconds on any interactive request).

A proper "advisor," DASD Advisor takes no action itself but rather suggests actions and consequences to a human who remains firmly in control. We can foresee a point where the humans might grow to trust the system's judgment enough that they give it a specified range of actions to take without human intervention -- which is no more than people do with supposedly non-expert systems that work with more deterministic algorithms to behave in given ways in given circumstances. At that point, DASD/RM could simply feed its information directly into the renamed DASD/M (for Manager), which would directly reconfigure the systems it managed to optimize performance according to criteria set earlier by its human managers.

Infrastructure

DASD Advisor also doesn't require human intervention to gather its data, which it receives direct from the source. What could be easier for a com-
puter to measure than computer performance? By using data that are already available in electronic, summarized form, DASD Advisor avoids a serious, if diminishing, obstacle to the general adoption of expert-system technology: The other-end-of-the-phone-line problem. Where is the electronic data for these systems to reason about? We mean not just bank statements and invoices, employee ages and hire dates, but also phone messages, travel preferences, correspondence, customer contact/qualification reports, etc. (Systems such as the Coordinator and especially the Information Lens, discussed in our September 24 issue, should help.)

For the moment, Aion's great competitive strength is its intimate knowledge of the IBM environment. It's a full development system for application development incorporating expert system modules, rather than an expert system shell that builds a standalone expert system. It provides ample facilities for building screen interfaces and dialogues, and for mapping function keys, testing code, etc. Moreover, the mainframe and PC versions work alike and can trade with each other. Some might argue that the mainframe capabilities impose performance penalties on the PC version and vice versa, and this keeps the system from being optimized for either environment. True, but it's optimized for users who want to operate it in both environments -- quite a large class.

NITTY-GRITTY EXPERT: APEX CLIENT PROFILING™

In October of 1985 we wrote about Apex's PlanPower, a high-end ($48,000) software package that runs on a LISP machine (the Xerox 1186, included) and generates detailed financial plans for wealthy individuals with incomes of $80,000 and up. So far as we know, PlanPower is the leading commercially deployed expert system application (not tool) -- 120-plus copies sold through Travelers and directly to Peat Marwick Mitchell and others -- but the hardware, the price and the focus on high-income individuals all reinforced each other and have kept the market limited to 7000 financial planners with a "deliberate" buying cycle.*

This week Apex will announce Apex Client Profiling, the democratic version of PlanPower. "Experience with PlanPower persuaded us that the [low-end] market is there and probably more appealing," says director of product management Bruce Henderson. Apex Client Profiling runs in batch mode on a VAX (where its expert system operates), with input and output going through humble PCs and HP LaserJets. (The VAX could reside at headquarters or a service bureau and trade data electronically or by disk with PCs in dispersed locations.) The target market is some 340,000 licensed agents, indirectly addressing approximately 12 million end-customers, with the initial focus on the top 100 insurance companies and banks. Apex Client Profiling will sell for $150,000 per site, plus $150,000 per year for up to 5000 plans, scaling down to $10 per plan above 24,000 per year.

*For unrelated reasons concerning its own ability to deliver appropriate financial products and a declining interest in tax shelters due to recent tax law changes, Travelers is closing the subsidiary that resold PlanPower; its customers will be supported directly by Apex. Travelers remains a significant minority investor in Apex, which it helped start up in 1983.
The same person's finances produce different advice from the two systems: PlanPower assumes the person wants to invest his money to make more money, and Client Profiling figures that he's investing it to meet needs such as a college education or a home, and must trade off one need against another under significant constraints. Obviously, the client's stated goals can moderate the disparity, but the default perspective is notably different from one to the other.

Sales power

While PlanPower supports a service -- financial planning and investment advice -- Client Profiling directly supports sales of specific products. While the client gets a 15-to-20-page report, the sales rep who works with the client gets his own 4-to-6-page "Field Representative's report" which matches specific products, customized for the sponsoring institution, to specific client needs. In the typical scenario the client fills in a 10-page form which is later keyed into a PC, but the use of data banks such those owned by TRW (another Apex investor as of last spring) could save client and rep the trouble. Indeed, the customer report could be used as a vehicle for cold calls: We could imagine Client Profiling producing lists of customers who might be in need of specific items such as a college savings fund, second-home insurance, or even an "Easy-Pay Second-Start Education" loan for laid-off steelworkers or recently divorced housewives. (The aesthetics and ethics of such practices won't be addressed here.)

Second time around

As a second system, Client Profiling was far easier to write: "We knew the market needs upfront; we had a clearer picture of what we were trying to do and an experienced team, so we could get cracking and build something," says Bruce Henderson. (Of course, PlanPower would have enjoyed the same benefits had it been the second system, but the lack of LISP on the VAX until recently dictated this order, and the initial focus was guided by the Travelers, which saw a need for upscale service.) It uses the same proprietary Apex languages as PlanPower, but only 2000 rules to PlanPower's 6000-odd. The "expert" part comprises three components -- a knowledge base of standard knowledge about financial situations, instruments, ratios, tax laws, etc., that accepts the client information; an inference engine that "runs" the kb to generate conclusions and advice; and an intelligent text generator that turns the conclusions into a hard-hitting plan for the client and a coordinated plan for the salesrep with specific suggestions for products to fulfill the plan ("$3000 worth of Safe'n'Happy term life," for example) rules.

While the logic for PlanPower is more complex and broad (dealing with a wider variety of situations and financial instruments), Profiling's text generator is more complex, since the output is shorter and has a higher ratio of content to fluff ("lean, with a minimum of 'boilerplate'... clients find specific answers to their questions without having to absorb extraneous information"). PlanPower runs interactively, and iteratively, on the assumption that the planner will meet with the client periodically and update the data as the client's situation changes and his investments perform well or poorly. Profiling, by contrast, produces a one-time report that focuses on specific, near-term actions (or sales, from the rep's point of view).

Subtle status query of the future: Did you have yours done with PlanPower?

Release 1.0 26 January 1987
The big news about Macworld was that it was so mainstream as to seem almost dull. There was a profusion of data base management systems, ideal for accounting. Great Plains was there too, although it won't show its multi-user accounting system for the Mac until this week, at the Seybold Desktop Communications extravaganza. There were lots of word processors, file managers, etc. In fact, there was too much to choose from -- the situation that makes all the people making the same choices feel that what they're choosing must be the best of a large field. And there were also the wonderful graphically-rich programs that shine on the Mac -- desktop publishing, design tools, and the like.

Superficially, they all looked alike. That factor, in sharp distinction to copyright protection, is one key to the Macintosh's success. Since developers can't effectively compete on look and feel, they tend to compete on functionality. Moreover, users who have learned one Mac program have less to learn for the second one.

Tempo

One of the more interesting products was Tempo, from Affinity Microsystems Ltd. of Boulder, CO, a cross-application macro-builder that does for the Mac what batch exe files do for the PC, and more. Through simple keystroke recording amplified with conditional branches, it lets you build routines that work within or across applications, both simplifying any procedure you do frequently or allowing your Mac to work unattended -- downloading files at midnight, for example, or reformatting and transferring files from one application to another.

While the idea behind Tempo is simple and the execution didn't take genius, it did take a lot of work and painstaking attention to detail. The system has all the obvious but hard-to-find features -- facilities for prompting and reading user input, branching depending on user response, moving data from application to application, etc. Imagine being able to select pre-specified portions of an Excel spreadsheet, graph some of the figures, move the results into a MacWrite or Word 3 form letter with selectable texts according to the figures, and send the letters correctly formatted to the LaserWriter. In the morning you will find your sales reports embedded into ten letters to your salespeople, along with an appropriate message for each: "Dear Juan, Your sales were up 10 percent. Good job!" Or, "Dear Alice, Your sales were down 4 percent. Let's discuss this!" (If you're really high-tech, of course, the messages will print out locally in your regional sales offices...)

Tempo, of course, isn't a standard programming language, but a sort of meta-level interpreter that enables users to string together application routines in a way that's even more powerful (if less flexible). Affinity was formed in 1985 by Rick Barron, like Mitch Kapor a refugee from the radio business. In 1983 and 1984 Barron syndicated Random Bits, a series of radio vignettes about computer users, sponsored by ComputerLand. He dropped that to write the Club Mac News newsletter. As editor, he attended the Jazz rollout at Comdex in the fall of 1984, and there Steve Jobs, a Club Mac fan, introduced him to Mitch Kapor. Kapor arranged for a demo, Barron noticed that Jazz lacked macros, and there it all began...
Symantec rumbles... Symantec, one of the few PC software start-ups to gain critical mass in recent years, is expanding that mass with the acquisition of Breakthrough Software, vendor of the Time Line project manager. With a slightly skewed approach to the mass market, Symantec managed to sneak fairly successfully into the crowded world of file managers and word processors -- by improving both, borrowing a familiar interface from pfs, and adding a friendly natural-language query front-end to the file manager.

Now, Symantec is acquiring a product that could lead it smack into the middle of the next big market -- active project planners for use by real people. That will require a combination of network technology (available), natural language (Symantec's forte courtesy of founder and NL wizard Gary Hendrix), and marketing skills -- also a demonstrated ability of Symantec. The amalgamation of these approaches promises something special, if the company can pull it off. As attentive readers will note, we consider active project management (not the passive project planning offered by current project managers, including Breakthrough's Time Line) to be one of the most natural applications for the coming Year of the Workgroup.

To be sure, it's not unusual for a company to be successful with its second product, but Symantec, founded in April 1982, has an unusual history anyway. Q&A was not its first product (that was the Wiz, built for A.B. Dick in 1982). Nor is the current management its first round of leadership. So with luck the next product (some time away, to be sure) won't be the traditional unsuccessful follow-on.

Acquired infatuation developer's syndrome

Symantec, through its Turner Hall publishing subsidiary, is also building a 1-2-3 aftermarket add-on business. Turner Hall, publisher of 1-2-3 add-ons SQZ! and Note-It, has just added to its line 4Word, an add-in word-processor for 1-2-3, and Cambridge Software Collaborative's Spreadsheet Analyst, Macro Analyzer, and Spreadsheet Comparator. Rival Computer Associates, which has just bought Consumers Software's Spreadsheet Auditor and offers 1-2-3 work-alike SuperCalc IV, is apparently also looking at other entries for this market. Both companies recognize the truth that Lotus is propounding: Although technically it's just a tool, de facto 1-2-3 has become an operating/development environment, as 1-2-3 fanatics use the product to do tasks for which it may not be well-suited. The add-on vendors are going with the flow. (This points up the futility of the many technical arguments about the virtues of UNIX vs. DOS, dBASE vs. SQL, SuperCalc vs. 1-2-3, etc. People cling to what they're familiar with, because, like their mother's cooking, it's what they learned first; not even the best chef can compete. Software is an acquired taste that's almost impossible to change.)

1-2-3 garners add-ins...

Unlike Ashton-Tate (page 3), Lotus has made a point of encouraging third parties, even though 1-2-3 technically is far less suited to be the foundation of applications than is dBASE. Earlier this month it held a small festival for the 1-2-3 add-in developers (using beta copies of the delayed add-in Developer Tools) to show their wares.
The range of applications was somewhat disappointing, consisting of a number of word-processors and data base add-ins, plus some other utilities. Certainly the ability to pull in and examine data kept in an SQL data base (Informix Datasheet Add-In) is useful, as were the data-management functions of @base from Personics. The word-processors were handy and represented a nice range of functionality for those who insist on staying within 1-2-3 for everything; surveys generally show 50 percent or more of 1-2-3 users do word-processing with it, although not exclusively). The real benefit here will come with the use of add-in word-processors not to write memos or letters, but to enhance 1-2-3 output itself. (4WORD can do this easily; we’re not sure of the others’ capabilities in this regard.)

We were more enticed by the products that seemed appropriate to integrate into 1-2-3 -- products such as Enfin Software’s Goal Solutions, similar to What’sBest? but with more options; and Applied Decision Technology’s "condiment" for 1-2-3, CatSup (for Catalogue Supplement). CatSup doesn’t do much of high-tech interest, but it enables you to catalogue your 1-2-3 models, and various versions thereof -- very handy, and intimately linked to the use of 1-2-3.

Did you see 1(c)?

More interesting than the products by far was the little contretemps over clause 1(c). That’s the clause that says you can’t use Lotus’s add-in tools to import data from any foreign source. Ed Belove, MC-ing the event, had never heard of the clause. Nor had CEO Jim Manzi, who had properly ceded the glory of the event to Belove and was watching from the back. After some consultation, they decided that the purpose behind clause 1(c) was to warn developers that this was reserved ground; that is, Lotus might (and has, with T-A-C and Signal) enter this market and developers might not want to compete directly against Lotus. Thanks, Lotus!

Since one of the companies at the event, Informix, had done precisely this, representative and founder Laura King was asked what she thought of 1(c). "Well, we discussed it with Lotus, and now we don’t have any problem." In short, Lotus removed the offending clause for Informix. The reasoning was legitimate, but the handling was clumsy. We guess the lawyers must have been busy preparing the copyright suit (page 1), and neglected to warn management.

In the end, developers should have the right to decide where to compete and where not to, on the basis of whatever information they can glean. If Lotus wants to warn them of its intentions, that’s nice, but there are clearer, more elegant ways to do so (if we couldn’t guess already). Lotus argues that because the Developer Tools are not public-domain and include source code and other goodies, Lotus should have the right to decide whether to license them for competitive purposes. But we feel that if you sincerely want to encourage third-party vendors, you have to open up all the way -- and then let the market decide.

Release 1.1

Jan Koontz has become president of Transform Logic since our last issue. However, his name has always been Jan, not Jim. Sorry for the mistake!
PHONE NUMBERS

Ron Palenski, ADAPSO, (703) 522-5055
Rick Barron, Affinity, (303) 442-4840
Harry Reinsein, K.C. Branscomb, Aion, (415) 328-9595
Richard Rabins, Alpha Software, (617) 229-2924
Fred Luconi, Bruce Henderson, Apex, (617) 492-7322
Mark Whiteside, Ed Esber, Ashton-Tate, (213) 329-8000
Jack Van Kinsbergen, Boole & Babbage, (408) 734-9550
Andrew Layman, Breakthrough/Symantec, (415) 898-1919
Jim Porzak, Dan Pines, Bytel, (415) 527-1127
Abraham Poznanski, Computer Associates, (408) 942-1727
John Landry, Distribution Management Systems, (617) 863-5000
Jeff Cooper, J.T. Cooper, (513) 752-4554
Jake Geller, Fox & Geller, (201) 794-8883
Janet Womack, Fox Software, (419) 874-0162
Rebecca Patton, Tom Kehler, IntelliCorp, (415) 965-5500
Ed Belove, Lotus, (617) 577-8500
Ed Brassard, Nantucket, (213) 390-7781
Dan Bricklin, Software Garden, (617) 332-2240
Gordon Eubanks, Vern Raburn, Symantec, (408) 253-9600
Tom Rettig, Tom Rettig Associates, (213) 272-3784
Tom Byers, Turner Hall/Symantec, (408) 253-9607
Marty Rinehart, WallSoft, (212) 406-7026
Michael Gardner, WordTech, (415) 254-0900

COMING SOON...

- Natural-language processing.
- Software metaphors.
- Support for accounting software.
- Text data bases.
- Expert systems in use: Evaluating mailing lists, etc.
- And many more...

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Release 1.0 26 January 1987
The Tenth Annual Personal Computer Forum will take place February 22 to 25 in Phoenix. The theme this year is "The Personal Computing Marketplace: Building the Aftermarket" -- with such products as 80386 machines... Subscribers who would like to attend should call Sylvia Franklin at (212) 758-3434.

Confirmed speakers are listed below.

Victor Alhadeff  
Bob Berland  
Gordy Campbell  
Rod Canion  
Doug Carlston  
Rich Carpenter  
Vittorio Cassoni  
Ed Esber  
Deby Fain  
Bob Flast  
Bill Gates  
Fred Gibbons  
H. D. Gruppenzusammen  
Alan Hald  
Philippe Kahn  
Ed Kfouri  
Scott McNealy  
Bob Metcalfe  
Tom O’Leary  
Bob Orbach  
Ron Posner  
Vern Raburn  
Wally Rhines  
Rick Richardson  
John Roach  
Ben Rosen  
Mort Rosenthal  
John Sculley  
Eric Vogt  
Dave Wagman  
Lee Walker  
John Warnock  
Ron Watkins  
Tony Wolff  

EggheadDiscountSoftware  
IBM Information Systems  
Chips & Technologies  
Compaq  
Broderbund  
InTech  
AT&T  
Ashton-Tate  
Micro Support Resources  
American Express  
Microsoft  
Software Publishing  
Vienna Institute  
MicroAge  
Borland International  
IBM ESD  
Sun Microsystems  
3Com  
North American Philips  
47th Street Photo  
Ansa  
Symantec  
Texas Instruments  
Arthur Young  
Tandy  
Sevin Rosen Management  
Corporate Software  
Apple Computer  
Micro Mentor  
Softsel  
PC’s Limited  
Adobe Systems  
MBI  
Tony Wolff & Co.

The developers' roundtable will feature Paul Allen, Asymetrix; Dan Bricklin, Software Garden; Robert Carr, Forefront/Ashton-Tate; Bill Gross, Lotus/HAL; Jerry Kaplan, Lotus; Larry Tesler, Apple; and Dave Winer, Living Videotext. A special session on copyright litigation will be led by Roger Borovoy Esq. of Sevin Rosen. Company presentations will include some listed above, plus Aion, Aldus, Anser Systems, AST Research, BPS, Centram/3Com, Computer Associates, 800-Software, Gold Hill, Great Plains, Hercules, Intel PCEO, Intellicorp, Lucid, mdbs, Metaphor, Micro D, Microlytics, MicroPro, Network Innovations, Odesta, Phoenix Technologies, Q.W. Page, Proximity, Softguard, Software Funding, Sybase, Think Technologies, 3Com, Wallsoft, Video-7, and WordPerfect.

Release 1.0  
26 January 1987
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>January 31</td>
<td>Norsk Data at the analysts' - New York City. Sponsored by the NYSSA. Contact: Valerie de Benedetto, (212) 344-8450.</td>
<td>New York City</td>
</tr>
<tr>
<td>February 2-6</td>
<td>Third international conference on data engineering - Los Angeles. Sponsored by IEEE, with keynote by Jerry Kaplan of Lotus and panel with Win Royce of Lockheed and Geo Wiederhold of Stanford. Contact: Hamideh Afsarmanesh, (213) 516-3398.</td>
<td>Los Angeles</td>
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<tr>
<td>February 9-12</td>
<td>Emerging growth conference - San Francisco. Sponsored by Robertson, Colman &amp; Stephens. Call Toni Cooper, (415) 781-9700.</td>
<td>San Francisco</td>
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<tr>
<td>February 9-12</td>
<td>Communication Networks '87 - Washington, DC. Sponsored by CW Conference Management. Call Louise Myerow, (800) 225-4698.</td>
<td>Washington, DC</td>
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<tr>
<td>February 12-14</td>
<td>Boca V: Beyond niche marketing - Boca Raton, FL. Sponsored by Information Industry Association, on &quot;convergence of content and communications.&quot; Call Gini Nelson at (202) 639-8262.</td>
<td>Boca Raton, FL</td>
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<tr>
<td>February 14-15</td>
<td>Softeach - New York City. Still going strong, a handy way to learn and sample lots of products in one weekend. (And there are lots of free T-shirts!) For information, call (800) 325-9189, (314) 225-1724, or (416) 629-2222.</td>
<td>New York City</td>
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<tr>
<td>February 22-25</td>
<td>TENTH ANNUAL PERSONAL COMPUTER FORUM - Phoenix. For complete information, see page 19.</td>
<td>Phoenix</td>
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<td>Date</td>
<td>Event Description</td>
<td>Contact Information</td>
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<td>March 4-7</td>
<td>Hannover Fair - Hanover, West Germany. Contact: Diana Hyland at Hannover Fairs USA, (609) 987-1202.</td>
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<tr>
<td>March 7-8</td>
<td>Softech - Santa Clara (also Washington, DC, March 14-15). and March 14-15</td>
<td>Call (800) 325-9189, (314 225-1724, or (416) 629-2222.</td>
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<tr>
<td>March 29-April 1</td>
<td>ADAPSO SPRING MANAGEMENT CONFERENCE - Orlando, FL. Worth flying from Oakland to Orlando for. With a panel on development tools moderated by Paul Hessinger of Computer Task Group, a panel on AI tools moderated by Lou Odette of Apex, a panel on the 80386 moderated by Esther Dyson, as well as panels on software maintenance, micro-mainframe links, and other compelling topics.</td>
<td>Call Sheila Wakefield, (703) 522-5055.</td>
</tr>
<tr>
<td>March 30-April 2</td>
<td>Interface '87 - Las Vegas. Sponsored by the Interface Group, for corporate, government and institutional users.</td>
<td>Keith Westerman or Linda Hanson, (617) 449-6600.</td>
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Release 1.0 26 January 1987
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<th>Date</th>
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<tr>
<td>April 6-8</td>
<td>Facsimile and image communications systems conference - Boston. Sponsored by CAP International. Contact: Jean O'Toole, (617) 837-1341.</td>
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<tr>
<td>April 8</td>
<td>AI Satellite Symposium - your place. Third in a series, with a focus on &quot;AI productivity.&quot; Speakers include Ed Feigenbaum, TI's own George Heilmeier, Alan Kay, Herb Schorr, Doug Lenat, James Martin. Sponsored by Texas Instruments. Call Karen Lieberman at (800) 527-3500 for information on hooking up.</td>
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<tr>
<td>April 22-24</td>
<td>AI Long Beach - Long Beach, CA. Contact: Jim Hay at Tower Conference Management, (312) 668-8100.</td>
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<tr>
<td>April 25-26</td>
<td>Softeach - Chicago. Sponsored by Softsel. For information, call (800) 325-9189, (314) 225-1724, or (416) 629-2222.</td>
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<tr>
<td>May 18-21</td>
<td>Navy Microcomputer Conference - Virginia Beach, VA. Sponsored by the Navy Regional Data Automation Center. Contact: Karla Rowlett at (804) 444-8486.</td>
</tr>
<tr>
<td>May 21-22</td>
<td>TECHNOLOGICAL SUPPORT FOR WORKGROUP COMPUTING - New York City. Sponsored by NYU. Call Marge Olson, (212) 285-6077.</td>
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Release 1.0 26 January 1987
May 27-29  CASE '87 - Cambridge, MA. "First international workshop on computer-aided software engineering." Sponsored by InTech, Purdue and Northeastern Universities, Boston ACM; real-world but nonpartisan. Call Elliot Chikofsky, (617) 491-2100.

June 1-3  SPRING COMDEX - Atlanta. Incorporating winter Comdex, by popular request. Contact: Linda Yogel, (617) 449-6600.

June 15-18  National Computer Conference - Chicago. Sponsored by AFIPS and a host of other societies. Contact: Martha Byrne at at (800) NCC-1987 or (703) 620-8925.

July 13-17  AAAI-87 - Seattle, WA. So good, they made it earlier this year. Contact: Claudia Mazzetti at the American Association for Artificial Intelligence, (415) 328-3123.


September 21-23  Conference on software maintenance - Austin, TX. Sponsored by several professional societies. Contact: Roger Martin, National Bureau of Standards, (301) 921-3545.

September 27-30  ADAPSO management conference - Colorado Springs, CO. Contact: Sheila Wakefield, (703) 522-5055.


Please let us know of any other significant events we should include.

-- Lynn Frankenbach
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