THE WONDERFUL WORLD OF TEXT

Quick! What applications do you think of when you hear the word "text"? Probably word-processing and mail-merge, maybe desktop publishing or text retrieval. E-mail perhaps. And that's probably it.

But there's much, much more. As with data (but 20 years later), there's a proliferation of text tools and applications based on client-server architectures -- a text store as a back-end, with text applications as front-ends. In other words, a text application doesn't load a file; it selects the text or data it needs from shared files that can be used concurrently by other users or applications. This offers the same assurances of integrity of text across applications and multi-user access as a database does for more structured data.

The first system described here is Xanadu, the 19-year-old global text-server project of hypertext guru Ted Nelson that has gained a poor reputation among many who were excited a few years ago but have waited too long in vain. Now there's visible progress at Xanadu -- mostly because of its 80-percent purchase by Autodesk, which has a practical application for this system created by visionaries. Autodesk is visionary enough to support Xanadu's long-term goals while insisting on short-term results.

Xanadu is building a back-end, which will come with its own front-end application and also support a more specialized system from Autodesk for managing AutoCAD data. The dream behind Xanadu includes the idea of "hypertext publishing," whereby people put their efforts into a giant text/database, and other people or smart agents help readers find and select only what they want. Early efforts in this direction include Anterior Technology's In Moderation, and Pinpoint's Computer Focus and Individual's First! customized newsletters.

Early text applications, most based on text/database servers, include support tools from Answer and Lysis, and a documentation generator from Solutron for resale by Index Technology. Finally there are application development tools, such as Syntactics' Crystal series.

HAPPY BASTILLE DAY!!
Deucalion's Tomahawk, both with interfaces to standard relational databases, and Lotus Notes, with its own proprietary textbase. All of them are exciting. They illustrate that there are many powerful ways to manipulate text without actually "understanding" it -- whatever that means. Drudgery can be reduced, mistakes of carelessness or omission eliminated, layout decisions and item selection can be automated, text bases can be automatically re-structured for efficiency. As with database, people are starting to understand the difference between interpretive tools, which let the user manipulate text, and development tools, which let users delegate work by building compiled applications.

But before you proceed, a caveat. Computers don’t (for now) understand text. They process input and generate "meaningful" output only as the result of criteria, rules and processes defined by humans -- and only for humans to read. Responsible vendors remember to point out that none of these systems design themselves: The layout rules must be carefully decided and expressed; the text-selection filters may need a lot of fine-tuning; template documents and boilerplate must be properly constructed and well-worded; answers to questions must be accurate and intelligible. These systems help to do things, but they must still be put into action by smart, sentient human beings.

Here is a matrix of text applications (a hybrid of one used by Lotus and one we published last June in an article on groupware):

<table>
<thead>
<tr>
<th>reference database</th>
<th>workflow management</th>
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<tbody>
<tr>
<td>structured E-mail</td>
<td>document generation</td>
</tr>
<tr>
<td>support databases</td>
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<tr>
<td>filtered news feed</td>
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<tr>
<td>unfiltered news feed</td>
<td></td>
</tr>
<tr>
<td>E-mail</td>
<td>desktop publishing</td>
</tr>
<tr>
<td>conferencing</td>
<td></td>
</tr>
</tbody>
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In essence, the matrix describes the interplay between the structure of the data and the power of the applications applied to it. (Hypertext publishing is not listed here because it can use -- or support -- almost any of these applications, and so it fits everywhere or nowhere.) The matrix doesn’t

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1 Text tools we have covered earlier include Persoft’s IZE (see Release 1.0, 86-5), Folio’s Views (89-3), MMB’s TEAMate (88-4), Oracle*Mail (88-5), Anselm’s Work Engine, due to ship this September (88-7), Agenda from Lotus (87-10), Third Eye’s Elexir and the Dow Jones project (88-1), and a collection of "hypertext tools" including Verity’s Topic, Knowledge Systems’ KMS, MCC’s gIBIS and others (87-11). Ones we haven’t yet assessed include a suite of tools from MaxThink and a variety of hypertext-creation tools such KnowledgePro, Cogent Software’s HyperBase, Cognetics’ HyperTies and Crowninshield’s MediaBase, as well as the IRIS project at Brown University.
make much distinction between whether the operation is done manually or by a powerful application, or whether it's accomplished on a client-server or a single-system model. The advantage of client-server, of course, is the ease of sharing a single text base (and data model) across multiple users and applications. The problem right now is that there is no single standard data model that everyone can use. Xanadu is proposing one standard, while Lotus is using its own proprietary model, which will be open but which the company is too sensible to propose as a standard as yet. (A vendor can be open, but only the marketplace can create a standard. And a standards committee can officiate.)

One's man's client is another man's server

Note also that "client" software need not sit on "client" hardware. Frequently a "client" application will sit on the server, managing and manipulating the text files for access by other client applications that are used by individuals at workstations. This turns the server hardware system into an application server rather than simply a database server. Then the client application sitting on the hardware server will look like a server application as far as the end-user applications are concerned. It's confusing, but this is the point of cooperative processing and peer-to-peer architectures.

XANADU

Xanadu will probably reach its 20th anniversary just about the time it achieves its first commercial incarnation. Xanadu, of course, is more than just a product: It's a dream; it's a mission; is it a mirage?

The full vision isn't likely to be realized anytime soon, but Autodesk has a habit of delivering real products, and it appears that at least the first instantiation of Xanadu is going to ship early in 1990. There are still a couple of technical challenges to handle, but they're questions of performance rather than feasibility. From Autodesk's point of view, the long-term promise of Xanadu -- a worldwide publishing medium -- may or may not be realized, but the system should be immediately useful as a means of storing and managing AutoCAD documentation and diagrams.

Xanadu Operating Company, the creation of Ted Nelson and implementer Roger Gregory, is still an independent, 10-person operation. It has its own offices (with ample beanbags, Jolt cola and whiteboards) in Palo Alto 50 miles south of Autodesk's Sausalito headquarters -- "close enough that we can drive there when we have to," says Xanadu vp of software engineering Marc Stiegler, "but not so close that they visit all the time."

The back-end

That first product will be a back-end for storing and managing chunks of data -- text, image or anything else that can be stored digitally, and pointers to things that can't be stored digitally. Xanadu provides access to any given chunk across a network of user- or application-defined links and links built by the system between versions or items split by the addition of new data. Because links run from point to point rather than from chunk to chunk, links are fine-grained even though chunks may be as large as entire books or government proposals. Nothing is ever lost, although it may be archived. Things are simply added and linked to earlier versions.

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The algorithms by which this is accomplished are complex, clever -- and secret. Stiegler, an aerospace systems designer hired after the Autodesk acquisition, says he's confident the algorithms will scale up -- but he's less sure of what the performance of any size system will be after fine-tuning over the next few months. Underneath, Xanadu is based on lots of indexes that float over the data, which is rarely moved once it is stored. We have been assured we could understand and believe in the technology in the space of six hours or so if we signed a non-disclosure. We may do so, and we'll let you know. Meanwhile, we can only cite the evident faith of the folks from Autodesk as testimony to its value.

Xanadu allows the user (or application) to define arbitrary link types, such as citation, cross-reference, endorsement, refutation, examples and problem-answer, as well as node types (book, document, etc.). In addition, front-ends can add executable routines, such as "move-to," "insert," "replace," and "execute," which would execute a subroutine rather than display data. (Of course, the execute command could be to display a particular kind of data.) Chunks could also contain -- or be -- objects.

Each time a data chunk is updated, Xanadu retains the previous version (to the extent specified by the user or system administrator). Technically, it is the changes that are stored, but the effect for users is the same. This is the basis of a comparison feature which works, of course, only to the extent that the user works with an application that is a true Xanadu front-end -- that he stays within the system, so to speak. Otherwise Xanadu will treat each new version of a document or image as a different one, without its old links. The advantage is that Xanadu can detect things that have been moved around (rather than mistakenly perceiving additions and deletions); the disadvantage is that it can't effectively compare two independent pieces of text (to detect plagiarism, for example, or compare two lawyers' contracts).

In the first release, Xanadu will be single-server, although the vision (see below) is ultimately to fill the world with connected servers so that all information will be accessible everywhere. The system (including the API) runs on Suns right now, but it has been rewritten in C for portability. The first front-ends will be PCs and Macs as well as Suns.

The API

The system includes an application programming interface that will allow developers and users to make use of all its facilities. Most basic is the ability to define, create and manipulate the typed links. As illustrated in A priori (page 11), an application could monitor the paths users took to get to a certain piece of information and then collapse those paths so users could avoid the extra steps. You could run a text-search program against a portion of a textbase, and create index links for specified key words, or you could link specified chunks to fields in a relational database through pointers, and then have all the power of the database to assign attributes and manipulate and find sets of data chunks.

Sensors detect whenever someone links to a chunk, with comments or alternate versions, and can be assigned to notify the author or assigned owner; the original version is always identified as such to all readers.

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The front-ends

Xanadu sees its product as the back-end to word-processors and other individual productivity tools, but at least in the beginning it will likely be used more as a storage and hypertext medium than as a general-purpose file system, if only because it's a more compelling as an environment for new applications than as a file system that would require rewriting of old ones. (And we're still skeptical about maintaining an audit trail of everything that ever happens.)

But eventually Xanadu applications, and textbase applications in general, should move beyond the current ones of storage and retrieval to more active manipulation. Xanadu will produce its own, a group-editing tool we believe, positioned consciously after MacPaint and MacWrite as an entry-level tool. Xanadu's goal is for it to make the system immediately useful and to demonstrate its possibilities without much limiting the opportunities open to developers.

Payment systems will be one key front-end applications, resident on the servers and managed by whoever owns the server/service. As an author, you may charge readers for that privilege, probably through some clearinghouse, or you may simply want to know, so that you can refute comments, elaborate on them or simply know what context your work is appearing in.

Other possible applications include almost anything you can do with text or images: document generation and workflow, documentation management, knowledge base management for such activities as user support, on-line corporate procedures and policy, and selection, editing and dissemination of information of all kinds.

The vision: hypertext publishing

For example, suggests Mark Miller, a longtime member (the proper term) of Xanadu and also formerly with PARC, there's the whole field of hypertext publishing. The goal, says Eric Drexler, linked to the project for the last ten years, is to have a database of "99 percent rubbish that appears to be 99 percent gold." At this point, we do what would be much easier if this were a hypertext publication, and refer you to Drexler's unpublished paper, "Hypertext publishing and the evolution of knowledge" (see Resources, page 25). The paper covers the potential and the problems of hypertext publishing at length. But the garbage issue bears redundant quoting here:

"An open publishing medium with links presents a major problem: garbage. If anyone can comment on anything, important works will become targets for hundreds or thousands of links, most...worthless or redundant. A [unfiltered] hypertext system would become worthless precisely where its content is most interesting. To deal with this problem, authors must have exclusive rights to unique names, so readers can use those names as indicators of quality. Readers must be able [ya, encouraged] to rate what they read, so that their judgments can aid later readers' choices...."

The vital obverse of hypertext's ability to make texts widely available is the ability of applications to let people cull the one percent of that broader base that is of interest or value to them. This is entirely feasible, just as it now happens with printed publications, where the difficulty
of getting published and distributed serves to keep out much of the junk, and individuals' own junk-detectors keep out the rest. (See Anterior Technology, page 10.) But it could happen much faster, and more effectively.

It will happen by means of filtering typed links. Those typed links, for example, could have both values and payments associated with them. Just as editors now select or commission articles and assemble them for readers, so could hypertext editors. Users could select from such assemblies. But there's more. Many people may not want to be editors, but might have strong and valuable opinions on what they read. Want a selection of what appeals to Henry Kissinger? Or Oprah Winfrey? Although privacy can be protected, Winfrey might be willing to let you in on her choices for a small fee.

On a more mass basis, readers in general could have the option to "vote" on what they have read. Other readers could ask for articles rated highly by fellow boat enthusiasts, or by single parents, or other demographic breakdowns. How will the money change hands? That's one of the issues that has not been worked out on a large-scale basis -- either by Xanadu or by society overall. But on a local basis, it can work any way the a Xanadu-based service provider cares to build it using the Xanadu API. Within a community, for example, some editors' judgments would be more highly prized and the editor could raise prices as he pleased; other editors might go out of business. People could publish their work for free or charge for it, as they please. The goal of all this is to provide some way for people to filter the huge amount of information that will be available but not necessarily worthwhile.

Other benefits include automatic access to a writers' sources, to refutations of novel ideas, and so forth. Quotes could be reviewed in context, rather than with only the quoter's spin. Easy access to old stuff would discourage repetition and possibly even encourage original new stuff.

Dividing the spoils

As usual, practice precedes policy and laws. Intellectual property issues will proliferate in the years ahead: What is fair use? Who gets paid for compilations of published materials? What rights do authors have to maintain the integrity of their work? What notice is required when Juan criticizes Alice's work? Must she pay to read his attack? Most customers won't pay to read her rebuttal, or does Juan have to subsidize it? What's the charge for a search that yields no results yet taxes system resources?

The vision: Dream or nightmare?

So what will all this feel like? Most of us are already suffering from too much information. Do we really want access to more, however well filtered? Will filtering prevent us from encountering new ideas? Will literature become the mere patching together of old text? How do new writers make a name for themselves?

As before, people will still write, and edit, and select. But by the time you see a Letter to the Editor, how often do you remember the article it references? Technology will make all these processes easier. Rather than repeat someone's argument, you can point to it -- whether to refute it, amplify it, or simply cite it with approval. In fact, technology does
change things. We will have the opportunity with hypertext publishing to become a vastly better informed society. Good ideas should reach acceptance, and bad ideas rejection, more quickly, with a quick, free flow of propositions, corollaries and counterarguments. What automation and databases and air express did for business, speeding up the cycles and increasing the overall level of efficiency (because many laggards disappear), networks and hypertext publishing may well do for thoughts and ideas.

Moreover, Ted Nelson's and Xanadu's wildest dreams to the contrary, hypertext publishing need not be a global effort to provide rewards. On a commercial basis, hypertext servers can increase communication and consistency of policies and information within a company, with beneficial results. On a societal basis, Drexler's and Miller's vision is that hypertext publishing will start as a practical but still scholarly medium, an extension of the Internet, say, for thinkers who can refine their ideas by sharing them and getting quick feedback. By searching indexes, you can avoid repeating others' ideas, and spend your time on something new. Which is why we now refer you again to Drexler's paper.

HYPERTEXT PUBLISHING: FIRST STEPS

Hypertext publishing isn't as far-off as it sounds. Aside from the three services described below, one early example of this kind of thing is the mass-voting scheme of the Zagats, whose restaurant guide business has now grown to encompass hotels and theatrical productions. These are not online, but come out in the form of guidebooks and, most recently, a list published in New York Magazine. But the principle of consumer voting is clearly gaining ascendancy. Meanwhile, the restaurant guides published by Agendaware as Lotus Agenda files could easily be turned to such a purpose, as customers buy them and add and share their own ratings with friends.

COMPUTER FOCUS: THE ONE TO READ WHEN YOU ONLY HAVE TIME FOR ONE

In partial fulfillment of the hypertext publishing dream, Pinpoint Information Corp. of Chantilly, VA, has just launched Computer Focus. This is the proverbial personally tailored daily newsletter, focusing on the computer industry, for $2100 per year (but a mere $1800 for charter subscribers).

As some Release 1.0 readers may recognize, this service is akin to one we ran -- and shut down -- some years ago, Computer Industry Daily. But there are so many differences that Computer Focus may succeed where we failed. For starters, CF is delivering by fax -- something hardly conceivable four years ago but routine today. "We've never come across a prospect without a fax machine," says CF sales manager Jeff Goldman.

The basic benefit -- lacking in CID's less-tailored, less-comprehensive service -- is the certainty that you didn't miss something on page 35 of Widget Weekly that could have changed your life -- or your posture on a deal. The service is an amalgamation of article abstracts from 120 publications (identified by source); puff-removed, value-added press release rewrites; and original reporting by staff and stringers. With fax delivery (vs. CID's use of MCI Mail hard-copy delivery), CF finishes its editorial day at 8 pm, letting it compete respectably with other dailies on important breaking news.
The nine (growing to 15) staff people who prepare the articles assign key words to them. These low-level key words -- individual product names, company names, etc. -- are the leaves of a massive 70,000-term hierarchy representing the computer industry, developed and maintained by CF specialists. Customers are interviewed by Pinpoint's telemarketers to determine their interest profile (usually using terms higher up in the hierarchy) and priorities. For example, "Macintosh" would belong to categories such as Apple and personal computers; "semiconductors" would include a long list of companies and terms such as RAM, microprocessor, surface-mount technology and chip.

Pinpoint's inhouse search engine matches subscriber profiles against the key words in each day's selection of 100 to 150 stories on a 386 and assembles the articles selected for each customer in an order determined by his priorities. Each individual copy is then laid out on a pc for delivery by fax. "We were concerned that people with few topics and low flow would find it low-value, but in fact it means they're getting exactly what they need," says Goldman. Those with lots of topics selected get only headlines when necessary to make it all fit in six pages. They can order full text of any article of interest, with appropriate royalties to the original publisher.

"We follow carefully the legal guidelines for abstracting, i.e. you can't quote more than one-twelfth of a given story, but you can paraphrase," notes co-founder and publisher Harvey Golomb. This is one of those practices that may come into question as hypertext publishing grows -- and as payment mechanisms become more fine-grained, more efficient and more pervasive.

The primary benefit is productivity, says the company. It has determined that the typical target subscriber spends five to six hours a week reading trade publications (four alone per month on Release 1.0?), while Computer Focus takes only five minutes a day...but not if you then refer to the full text of stories of interest, either from the pile on your floor or through CF's reprint service.

We suspect the ultimate determinant of CF's success will be editorial quality, unless CF can grow fast enough to drop its price to newspaper (not newsletter) level quickly. It's nice to have a news service tailored to your needs, but not $2100-nice for most people. One of CID's weaknesses was its lack of focus, which CF has solved, but another was that it didn't offer anything you couldn't get elsewhere for less money. It did have unique stories, as Computer Focus will, but quantity of stories is just what customers are trying to avoid -- unless they stories are truly groundbreaking. And what hotshot reporter wants to write for a limited-circulation publication? This lack of critical mass is the dilemma we faced and that CF faces.

For all that, Computer Focus is clearly the kind of service that will serve us all by 1995; the only question is whether it will belong to co-founders Golomb, Jim Rutt (formerly with the Source and Business Research Corp.) and Mike Walsh (also BRC), or to some existing publisher who knows how to sell enough ads to fund such a venture. No-ads is great, but a price below $400 is even better.

"This vehicle won't see ads," says Golomb, who sold his chain of stores to Businessland in 1983 and has been an entrepreneur since. "We hope to get to breakeven within a year [although it has VC funding to last well beyond that point], and then we might launch another one with ads. We've already had a

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couple of approaches concerning ads. But you have an inherent scarce resource with fax, which is the number of pages: What you sell, you don't want to sell much of."

The company has been in business in start-up mode since April 1988, and is just now launching a direct-mail campaign. (Check your mail!)

INDIVIDUAL'S FIRST! UNTOUCHED BY HUMAN HANDS

Individual Inc., a company funded and advised in part by Ed Fredkin of Reliable Water fame (see Release 1.0, 89-6), is a few months behind Pinpoint in going commercial with a similar but differently structured system. Individual's First! is designed to be much more automated than Computer Focus, from its reuse of text to its indexing techniques and its client profiles.

While Computer Focus seems to be selling mostly to individuals, Individual (oddly, considering the name) envisions its service as a departmental resource -- hence the emphasis on automated profiling and a focus on multi-copy discounts. Pricing is $1995 per profile per site per year, plus about $1 per person per month, and discounts on additional profiles. While the CF profiles are a short list of interests expanded through synonyms and hierarchies into a set of terms matched against key words created by human abstracters and classifiers, Individual runs its searches against the full text of a much larger number of stories untouched by human hands.

To build the profiles, Individual starts with templates for industry and functional areas (disk drives, spreadsheets, R&D, financial) that were initially constructed by hand but that will be refined automatically with user feedback. The technique is similarity ranking, using techniques developed by Cornell's Gerard Salton, who sits on Individual's advisory board. These techniques are also the basis of Third Eye's Elexir software, and are described in full in Release 1.0, 88-1. In short, they allow Individual to ask customers which stories were most appropriate, and use all the words in those stories as the basis of further queries, appropriately weighted. That is, each word is assessed on its relative frequency, so that only words that appear much more frequently in the sample good story than they do in the entire database will be used to construct the query. Location -- headline vs. body, topic sentence vs. last paragraph -- counts too.

Individual gets its news text straight off the newswires, with no abstracting or hand-indexing, for which it pays redistribution royalties to PR Newswire, Business Wire and McGraw-Hill News. It automatically scans 1500 or more stories a day on behalf of its clients, although many of them may be redundant across services or updates of earlier items.

Individual's software runs on a combination of Suns for indexing and searching, and pcs for data capture and generation of each customer's individual newspaper as specified by the software on the Sun. One Sun can handle approximately 750 customers, and one pc can handle 100, so the system can grow incrementally, while Pinpoint would have to add abstracters to cover new industries. Individual's next offering will be CBD Express, daily clippings from Commerce Business Daily, the daily 50-page listing of government bids and contract awards that is virtually impossible to scan by eye. This service will cost subscribers $1000 to $2000 annually; it will cost Individual the price of a daily tape from the government, since the information itself is public-domain.

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Flexing the hypertext publishing filter in a different way is Anterior Technology of Menlo Park, which is about to provide a junk-detector service called the In Moderation Network. It so happens that this service is performed by people, but it's just a foretaste of what we'll someday be programming agents to do. (We read a remarkably wrong-headed article on the service in the San Jose Mercury, raising fears of censorship, etc. This service is a form of editing, much like what they do at the Merc, except that for now content is merely selected rather than modified. Whole messages are either used or left out; if used, their entire contents are kept intact.)

In Moderation, for now, will provide selected messages from discussion forums on the Internet and USENET. This is not an automated topic-selection service so much as a garbage-collection and fluff-removal service: It will take out the "toxic waste of included text, personal attacks, overstuffed armchair postulations, conjectures and speculations [and] function as a sewage treatment plant," says founder Geoff Goodfellow. A former principal investigator of computer security and networking at SRI (1974-1986) and co-author of "The Hacker's Dictionary," he estimates the shrinkage at 80 to 90 percent. (His hope is that the very existence of his service will drive the real flamers away or induce them to clean up their act. Good luck!)

He has already signed up a number of moderators for such interest areas as protocols, Mac, IBM PCs, UNIX, telecommunications, logic programming, computer architecture, video technology, legal issues, and comic books and science fiction. Their compensation will reflect the popularity of the discussions they moderate, says Goodfellow. For now there's only one moderator per topic, but that could change, and users could pick the one whose choices they liked better.

Charges to the readers, subject to modification as the system matures, start at $60 per month per site; Hewlett-Packard in Palo Alto would count as one site, H-P in Cupertino as another. Individuals will pay around $10 per month. Goodfellow is also considering wholesaling the moderated discussions to other networks such as MCI bulletin boards, The Portal and the Well, a service sponsored by The Point Foundation (a/k/a Stewart Brand). The source material on Internet and USENET is public-domain, but Goodfellow is putting a compilation copyright on the In Moderation output, and users' contracts carefully restrict their redistribution rights.

In Moderation users' responses to the system will be limited to the In Moderation system by default, says Goodfellow, who is evidently hoping to create a higher-class paid service. (Of course, any subscriber can get full Internet or USENET by logging on the regular way.) But this exclusivity might end up isolating the In Moderation service from the general one to an excessive degree. Non-customers might provide useful feedback to customers' comments if only they had access. On the other hand, what happens if an In Moderation customer's responses are rubbish? It will be fun to watch as these questions and many others arise in a system that's a foretaste of an inevitable movement.

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While they're no guarantor of success, service and support will become primary differentiators as products and services become more complex and task-specific. There are now ways to automate support at least partially -- and the vendors who do so effectively will have important advantages in consistency, reliability, coverage and cost over their competitors. Their products will be more useful by definition, because well-supported customers will be better able to use them.

The implications for a vendor using such systems are exciting. Customers' questions can be answered more quickly and more consistently, saving time and enhancing customer relationships. This applies not just to computer companies but to vendors of everything from chemicals and engines to insurance policies, magazine subscriptions and travel services. In some businesses, support can bring in a third or more of revenues at low marginal cost. With automation the the job may be more pleasant. Happier customers lead to happier support people, which means less turnover and less training cost. And training should be easier when the information is easier to find.

Of course no system is foolproof. Sometimes a customer may ask a question in such a way that it's hard for the support person to find the right match -- or it might be such a tough question that it stumps even the specialist. Moreover, if the product is truly terrible, good support can't make up for it. Finally, like most automated systems, these help systems automate only the relatively easy, routine tasks such as locating and sharing answers. But that lets people concentrate on the really hard stuff -- figuring out answers to new questions and being nice to obnoxious customers with old questions who don't bother to read the manual.

User-friendliness can go only so far. Simple tasks can be automated, and complex systems can be made easier to use or fix, but ultimately the best way to make a complex product easy to use is to support it -- with real, live people who know what they're doing. These people are hard to get, hard to train, and hard to keep.

And they're invaluable. In a small support group, everyone knows all the problems, and difficult problems are handed to the topic expert. The support group quickly gets a feel for the most common problems, and can recite the answers almost by rote. Moreover, they can quickly understand what the problem is: Customers may think it's the software when in fact it's the hardware (and it's rarely the product whose vendor they're calling!). Nonetheless, you'd really like to be a friend to your customers (yes, it will pay off!), and so you'll help them regardless.

How do you maintain that illusion of knowing everything when there's so much to know that a single small, well-connected group can't handle all of the calls and all of the questions? Work has to be parceled out. What's to replace the daily updates at the water cooler and over beers after work? How can you ease the learning process and let novices share the common knowledge of experienced support people, and let experienced people share new problems and solutions?

The answer, of course, is a shared knowledge base. And that's what you find in lots of places. The simplest shared knowledge base is the traditional
collection of manuals, looseleaf binders with loose or missing leaves, on-line text files accessible by keywords or indexes and tables of contents, bug listings, updates, bulletins, cafeteria conversations on the dumbest questions everyone has heard lately, -- and so forth. The buzzword answer is hypertext -- a textbase full of cross-references that lead directly to the right answer. The problem is that hypertext is a result, not a tool. How did all those links get in there? Who's going to change them when the company announces a new product, when a customer discovers a new bug, when a third company announces a complementary product that works with yours -- but not quite seamlessly?

Answer servers

Two companies providing software to help automate the creation, operation and updating of support knowledge bases are Lysis Corp. of Atlanta, with Support Information System, and Answer Corp. of San Jose, with A priori. Both companies sell software packages for customer support organizations, starting at about $5,000 per seat (plus hardware). These packages manage databases of typical customer questions and appropriate answers for retrieval by internal customer support staff answering phone calls. Of course, as Lysis founder and president Deborah Fain notes, "There may be 50 ways to ask a question that all need the same answer." The support reps match the customer questions to questions already in the database using key words, indexes, and other techniques to narrow the search, and the database displays the correct answer.

Unlike other support systems, they not only provide support information to support people, but they get more efficient as they do so. The information in the answers initially may come directly from the vendor's manuals, but the databases grow as they are used. If a customer question is new (or so worded that it's not recognizable) the question is kicked upstairs over the network to a product specialist who either answers it or matches it to an existing question. That answer is now available to any support person using the system. At first, the customer sees no difference: He calls in and gets someone on the line who promises to help him. But that person is likely to be better informed.

Lysis already has some customers, including Manpower Corporation, which is using SIS to support its own personnel out in the field as well as some client staff as they use a variety of vendors' software. Lysis emphasizes breadth of coverage (lots of products on lots of platforms, like Manpower) and simple questions. "In fact," says Fain, "we see a big market outside the software business, in highly competitive mature industries where customer support is the only differentiator. We're talking to a valve company right now..." Lysis is also promoting SIS as a system vendors can resell to VARs to support the VARs' customers using the vendors' products, hardware or software. Ultimately, of course, there's no reason it couldn't go to customer sites, or travel around in a salesperson's laptop. The software itself fits into a 640K DOS pc; storage requirements depend on the quantity of questions and answers. (High-end SIS systems can use a VAX server.)

A start-up with $1.25 million in funding from Alpha Partners, Answer Corp. is just now putting finishing touches on its A priori system, which runs on Sun workstations and is targeted to high-end software and hardware vendors -- the kind who already have Suns. Answer's first customer is Interleaf,
soon to use a test version to support users of its Technical Publishing System software. "The only question was who would get it first -- us or our competitors," says Bill Grossman, vp of operations at Interleaf. Answer's edge is its automatic learning capability, which makes it ideal for expensive, complex products that come in many versions and configurations. Lysis's Fain comes from the PC business while Answer co-founders Tom Evans and Louise Kirkbride were in engineering.

The details

Both systems accomplish more or less the same task, and both vendors stress that they're not "expert systems," but systems that provide easy access to expertise. In broad terms, both begin with a database of answers. With the Lysis system, support reps "capture" new answers, and then "guide" them, or assign them by hand to appropriate categories for access by other support reps. (Lysis prefers to keep further details proprietary, and some of the vagueness in our description of A priori is intentional, alas!)

Answer's A priori is more automated; the genius of the system is to make its improvement an automatic by-product of its use rather than a separate, tedious activity. The first screen the support person sees allows him to pick from a broad support area, and lists the most common problems in that area for, say, the last three weeks, as shown on the next two pages. (All these parameters are adjustable by the system administrator.) As the support reps enter the problems they encounter (with short titles) or match them with existing problem statements, the system records their actions for use in establishing the hierarchies and links that make A priori's database so useful. When a problem appears to have no ready answer, it is routed to the domain specialist responsible for that area (who could be another support person with a specialty, a support specialist, or even the engineer who designed the product). He replies into the system, and that answer is posted as the solution to that problem, for all to see.

As shown, a single answer may be accessible in response to a variety of problems and by several paths. Ultimately, those that get used most frequently will bubble up to the top, just the way you might keep a crib sheet on your desk, a manual on the shelf and a full-blown reference work in the department library. Rarely encountered problems and solutions sink to the bottom -- and can be removed following support-group policy. (The answers, however, will generally remain just in case someone wants them someday.)

A priori also keeps customer records -- which products and which people are supported for each customer -- and data for management to monitor how long it takes to resolve questions, which modules of a product are most confusing or buggy, parameters of employee performance and other useful data.

The structure is the data

Sounds incredibly simple, but how does it happen? The initial set of answers generally gets into the system as text files that are chunked into "answers" and classified by the words in their headings. If the vendor already has documentation on line, so much the better. Otherwise, it can be scanned and OCRed. The system administrator then spends some time developing automated routines to build pointers and titles for the text chunks.

continued on page 16
A PRIORI IN ACTION

The customer support rep signs on to the system using the customer's name, "Phil Smith at CAE Systems," thus identifying with the customer, a neat way to foster good attitudes (1). It also spreads out the work so that line people identify with the customer, while specialists' knowledge can be shared across the organization and even across locations; ultimately, there's no reason customers couldn't be hooked up directly. The support rep in effect gets all the customer's privileges: He can see information about the customer's configuration, and the answers to any questions concerning that configuration. (That's a polite way of discouraging unauthorized use.) But he can't create or change answers; he can only state and define the problem, or select it from a list -- in which case the answer shows up automatically if available. He picks "open documents," so that he can see unresolved problems reported by CAE Systems (2).

Overall, the user has six ways to get at answers:

- Through an individual customer's problem list (2, above).
- A listing of the most commonly used answers, or "bubble-up" (3, above). If none of these looks right, the user can then select from an index category, such as "Tutorial," "Parts System," "AM1."

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• Listing as an "Also see..." item, basically a hypertext link. When "Also see" links are available, a button appears on the right (3, across).

• Through a logical index structure, with topics such as "AMI" (4, across). Options under "AMI" in additional to any of the bubbled-up listings include topics one level down, such as "Support Client," "Archive," etc.

• Through a symptom (key word) search system, using selections from a list (5 and 6, above).

• Direct access by document number, assigned by the system according to the customer's policy (not shown).

If the problem is new -- or the support person can't find it -- he sends a new problem report to the appropriate support specialist (determined by the product, configuration, and topic area), with attached files if appropriate (7).

The specialist must then determine whether it's a new problem, requiring a new answer or a synthesis of existing responses, or he can declare it a duplicate and ship it back along with the original and its answer. But no one may delete the problem; it must be paired with an answer (old or new) to be resolved.

[NB -- The system being supported here is A priori itself. In these screen shots, "Hard Copy" is always highlighted because it was selected to make them print out.]
Although A priori itself doesn’t support it, a topic specialist could also use text-search or a product such as IZE in building the index pointers to the answers.

Organize yourself!

Thus the initial set-up of the database determines its immediate usefulness, but it is self-correcting -- or self-enhancing, depending where you started from). It is yet another example of the self-organizing systems we discussed in the June issue of Release 1.0.

A priori keeps its data in tables that store short texts of problems and answers (with pointers to the actual answers which may include drawings, source code for patches or anything else), customer records, usage data, and the links among them built by hand and as a result of the usage data. (By contrast, Lysis’s SIS is basically flat text files riddled with pointers.) A priori also contains code modules -- call them agents -- which monitor activity on the system. At a specified time (overnight works well), they collect the usage data and reconfigure the system’s apparent structure by rerouting the links to reflect that usage. They create direct links to replace users’ roundabout paths and the system updates itself automatically as a by-product of the support process, rather than as a chore no one takes on. (Although this is a client-server system, the client applications that manage this process physically run on the server. Other client applications that manage user interaction with the system run on workstations.)

A priori makes most sense where there are complex products that come in many versions, with a solution set too broad to be known thoroughly by any single person. That means software and complex capital equipment (which probably has a fairly high software component). A high proportion of such vendors have Suns for A priori to run on, says Answer co-founder Louise Kirkbride, who previously founded a company called Cadri that resold time on CAD machines. Her unsatisfactory experiences with the CAD vendor’s support led to Answer Corp. Her co-founder Tom Evans, former vp of customer support at Tektronix, literally wrote the book on software support; its title is "The Software Support Handbook."

As it happens, A priori’s relational database was built in-house by Answer’s third co-founder, Rick Gifford, because he couldn’t find one to suit. We figure one such as Interbase, optimized for handling text, would work well in such an application and provide nearly automatic portability and continuing enhancements. In a few years, an object-oriented database would be appropriate. You could probably build a similar system around Notes instead of around a traditional relational database. Notes would probably give you finer-grained control over the appearance and arrangement of the answers, whereas A priori treats them as discrete, ugly chunks. Either approach would work, with Notes likely to appeal in environments with less technical people -- both because of its choice of platform (OS/2 server, DOS/Windows clients) and its attention to display and formatting. Also, Notes is a lot more flexible -- but would require a lot more work to build a full system such as A priori. For a company doing high-level technical support, A priori is a pre-invented wheel; for a company that wants to integrate support with other forms of customer tracking, Notes is a flexible toolkit of spokes and rims.

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Index Technology is widely regarded as the Ashton-Tate of the CASE world: Few people consider its Excelerator CASE tool to have the best technology, but its openness to third parties and its sales force combine to make it the most successful company in the field. (However, Index is avoiding some of the problems now besetting Ashton-Tate by totally rewriting its five-year-old product to ship in 1990 -- a feat that took A-T almost nine years.)

A case in point is Index's recent announcement that it will be remarketing a product called XL/Doc from Solutron of Alameda, CA. XL/Doc is a documentation generator, sort of a report generator that uses information in Excelerator's data dictionary to generate documentation, code frames and other useful texts automatically. (Mind you, this documentation is nothing like a user's manual, which should be written with wit and vision; it's more like a bill-of-materials for code modules with some extra information on what the materials are for. But the text files it generates can be used as the basis of something more readable.) It runs on a PC with DOS, the standard Excelerator environment. It's a client to the Excelerator database server; because it deals with Excelerator files rather than coexists with Excelerator itself, there's no need for multi-tasking or a more capacious platform.

While the analysts and designers do their work, they create huge bodies of knowledge which XL/Doc can mine for conversion into other useful forms. While XL/Doc could be handy for almost anyone, its most immediate application will be for benighted government contractors struggling to meet the Defense Department's 2167A standard, a detailed specification for documentation, down to how paragraphs are numbered. (Solutron's people come out of the real-time -- read military -- systems business.) The spec requires certain information in certain order, including code descriptions, cross-references between requirements and specs and code, and many other details.

When the government promulgates such specific rules, it's excruciating for people to create the documents by hand, let alone carry them around. But it's relatively easy to code the rules to generate documents that conform. They may not have much originality, and they may not be easy to read, but you can be sure they meet specs. As long as the target system has been designed according to the rules, with proper citation of what each code module does and how it relates both to other modules and the system requirements and specifications, XL/Doc can pull out the information to assemble an appropriate document. This works, of course, only to the extent that the proper information is in the dictionary in the first place. XL/Doc will notify you if it's missing, but doesn't notice if it's incorrect.

For regular folks, too

But there's more to it than just meeting military requirements. Even for commercial endeavors, it's handy to know what's in a system, especially if many people designed it and many others will use and enhance it.

The bulk of the smarts in XL/Doc is its specific knowledge of the structures in the Excelerator data dictionary and their relationships (and Solutron has an exclusive relationship with Index for this market). The Excelerator data dictionary isn't a simple set of tables, but rather a complex set of hierarchies, interdependencies among modules and links to diagrams and blocks of
text that illustrate or comment on the data and code elements, which may be used in original or modified form in many places. There are data definitions and control flows, branches and loops. (This is why Index is rewriting the whole product, currently reliant on C-Tree, using Ontologic's Vbase object-oriented database.)

This "understanding" of the Excelerator structures gives XL/Doc great flexibility. For example, it can describe and cross-reference the various components of a flow chart and the subtasks within it. It can refer properly to data elements in the many sections of a program that use them.

And it can do all this in the order prescribed by the government, or in the order specified by a user in Solutron's script language, a sort of SQL for the data structures in the Excelerator dictionary. The user could also specify the structure of the documentation: data definitions first, then a flow chart, and then descriptions and requirements analyses for each item on the flow chart, properly cross-referenced. Thus, he can run the same document structure against a variety of software systems, or he can get a variety of reports for a single system. For example, the same extraction and construction techniques can be used to generate code frames from specs, color-by-number units for programmers. They include the data definitions, titles, comments and other non-code elements that surround code, so that a programmer need write only the bare code itself.

More examples: Information Resources' exception reporting...

Another example, but with a less rigid rule-set, is an exception-reporting system, Coverstory, that's part of Information Resources' data-analysis tools. About six high-end customers (e.g. Ocean Spray, Cadbury-Schweppes) are currently using a pilot version of the system, which uses expert systems, trend analysis and other techniques to monitor vast flows of branded-goods purchase data for unusual patterns. Rather than produce print-outs or cryptic listings, the system dumps its data into templates; sentence structures vary randomly. It loads the resulting documents into Ventura to produce memos of highlights -- "Price war breaks out," "Alice's restaurant share is up" -- formatted according to some simple rules complete with bullets, headlines and charts. (You can get the reports in ASCII if you don't want to spring for Ventura, but the format rules work with Ventura only.)

...and KnowledgePoint's Personnel Policy Expert

KnowledgePoint uses an expert system (First-Class™) to drive a document generator that produces personnel policy manuals. Personnel Policy Expert is an example of the publishing medium of the future: It contains all the knowledge of an extensive reference manual with twice-yearly updates, and it lets users automatically generate manuals in accord with the policies they select in response to questions and accompanying explanations. Aside from the ease of producing and regularly updating manuals, users get an education as they go through the process of building the manual. They are asked questions that they may not have thought about, and can read background material before they make the choices that will be incorporated in the manual, which is basically cleverly assembled and cross-referenced boilerplate with user parameters. The system costs only $495 plus $95 yearly, because costs are spread across a growing base of 2000 customers.
BUILD IT YOURSELF: TEXT APPLICATION TOOLS

By contrast with the applications above, the smarts in the tools below are more general. The Crystal series and Deucalion's Tomahawk both work with most SQL databases, and can be used to build documents incorporating a wide variety of data. Crystal Production Mode can even change a document's structure depending on the data it encounters; in fact, you could probably use it to build something along the lines of XL/Doc. But for all that, what Crystal and Tomahawk do is produce documents and pages. Period. Lotus Notes, by contrast, can do a wide variety of things to and with text, but it relies on its own proprietary text database.

SYNTACTICS' CRYSTAL SERIES

Syntactics is a longtime UNIX office automation software vendor now expanding into DOS and beyond the basic word-processor. Its Crystal Document Management System runs on DOS as well as UNIX and lets you pull database data into a document to create everything from dunning letters or sweepstakes invitations ("Yes, EDventure, you may already have won! Imagine a bright shiny Ferrari Testosterone outside the Holdings family home ....").

While the design center of XL/Doc is creation of variously structured documents from a large, highly structured database, Crystal Document Management System is optimized for creating a large number of similar documents where the data but not the document structure varies. It's basically a powerful document-processor with mail-merge facilities that can paginate and lay out the resulting documents correctly. That is, rather than an actual layout, you give it design rules through a menu, so that, for example, you don't end up with the "Sincerely" on one page and space for the signature on the last page. (The command is "keep," which will keep designated text objects or number of lines together.) DMS can also easily incorporate user insertions and is oriented to a user who is preparing documents at the keyboard.

Syntactics is about to announce a follow-on product (code-named Crystal Production Mode) oriented towards mass production of documents such as wills, employee benefits reports, realty listings, personalized insurance policies and configuration-specific documentation. The person creating the document templates is probably not the one running Crystal P-Mode, which is a powerful application-development tool targeted towards VARs and MIS rather than an interactive document-preparation system. It includes a language that can identify and select text objects and a command language to arrange them, and uses DMS as its formatting engine. While DMS treats data as data, Crystal P-Mode can use imported data as parameters for commands. For example, you could express rules such as these, in more formal language: "Count the number of items and insert that number (spelled out) in the phrase 'the following ___ items'..." or "If sex = female, use she; otherwise, use he" in designated places. Crystal P-Mode can also easily incorporate tables (properly positioned and with headings repeated if a table spills over to additional pages), lists with bullets or numbers, and other complex structures.

Crystal P-Mode can be used in two styles: where the user sits inside the text-processor and mass-produces documents, as in mail-merge or document assembly, and a mode closer to XL/Doc where the user or application is manipulating data and can produce formatted documents as required. For example, a single database application might use any of a number of Crystal documents,
according to the data -- report card, notice to parents, letter to college admissions officer, letter to truant officer; or first notice, second notice, final warning, cement shoes requisition, letter to next of kin, insurance form fill-in. Other examples would include tasks such as generating a will by assembling the appropriate chunks of text with the blanks correctly filled in, where the system builds the proper document structure as determined by the data. In essence, the first mode is oriented to mass-production of one document for many records, whereas the second mode allows many documents from each record.

Crystal DMS runs on UNIX and DOS, while the newer product requires a UNIX environment for all its capabilities. Founder Erwin Morton stresses the openness of Crystal P-Mode: Developer/users can modify the language to add their own commands or subroutines, and it can drive PostScript systems as well as letter printers. However, it is targeted to office environments, not to high-end publishing operations. That's the province of Deucalion's Tomahawk, described below.

DEUCALION'S TOMAHAWK

Deucalion Resources Group, a longtime custom developer in the electronic publishing business, decided in 1987 to build and sell a tool for resale so that the company could leverage its knowledge while retaining its character -- 15 people in a large gabled townhouse in Ann Arbor. The tool, Tomahawk, is now in its beta release, and customers such as printer R.R. Donnelley and newspaper-system supplier CText are using it to add enhanced composition modules to their publishing systems.

Basically, Tomahawk is a language and data structure and objects for composition applications, or T/Ware, written in Deucalion's T language (with the syntax of C). It uses VAX servers and pc-based front-ends, although it's fairly portable at customer request. Developers can use it as the guts of a system to which they add user interfaces or hooks to their own applications. Tomahawk deals with such abstractions as fonts and lines, widows and orphans (bits of text that protrude awkwardly at the start of a page or a line, like this).

It also knows about pagination, handling blocks of text or image, incorporating data from databases, page numbers and cross-references, hyphenation and justification, and so forth. Most of these parameters are adjustable by user commands. It's up to the application developer to hide that with a user-friendly front-end or hooks into an application that does it automatically. For example, R.R. Donnelley will be incorporating the Tomahawk and T/Ware logic into the next release of Pulsar, a large-scale publishing system for catalogue operations used at Tandy and other major catalogue retailers. These customers design, copywrite, compose and assemble pages and proof on site, and can also generate different versions of the pages merging in, say, regional prices from a database. "All we do is add in the scanned color images and print," says Harold Evans, general manager of customer publishing systems at R.R. Donnelley.

This could be the start of something big for R.R. Donnelley. "We could see our customers wanting to do more and more things in house," says Evans, "so we decided to be proactive. We wrote a spec for inhouse development, because we couldn't get at the source code of our existing pc-based system.

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But then we ran into Deucalion, which had already built more functionality than we described, and designed it to be integrated with other things." The prices of the resulting system range from $150,000 to $3 million, and Evans sees sales growing to hundreds but not thousands of units each year. Not all the customers are printing customers too, and the system can't help but endear Donnelley to them. The company also plans to provide similar systems for customers in other groups such as magazines, financial printing and directories.

Newspaper system vendor CText co-developed Tomahawk (and shares resale rights) and is using it to build a new editorial system, Dateline, for the Chicago Tribune. While the Crystal and Donnelley systems import data from servers, Dateline uses a server to manage its basic inventory -- text files. The server in this case is a Tandem relational database, which performs much the same function SQL Server performs for Saros FileShare (see Release 1.0, 89-6). A database application manages copy flow, audit trails and other file management tasks, while the Tomahawk front-end provides the publishing capabilities. Tomahawk works mostly on the hardware server, but its hyphenation and justification software sits on the user's desktop, coexisting in OS/2 with an OS/2-PM version of XyWrite. Dateline will be ready in October.

LOTUS NOTES

Lotus Notes has been under development since late 1984 at Iris Associates, a separate company founded by Symphony developer Ray Ozzie; Lotus has exclusive rights to it. In short form, it's a general-purpose textbase with a forms-based front-end that gives users powerful text-manipulation and communication capabilities.

Each Note, or document, is akin to a database record, defined by the form used to create it. The Note can have a variety of fields, as in a database -- text or numeric, graphics or image, optional or required, items in a list with multiple or only single choices allowed. The Notes can be seen in views -- data selected according to field-based criteria such as dates or key words and selected fields in each form. As in an outline, you can see data in expanded or abbreviated versions -- headlines only or full text, and so forth. The result is something like an extremely flexible text database: It has the extract-and-select feel of a database, and the hierarchical feel of an outline.

As a result of its client-server architecture, it's networked and can work remotely (proved out by constant Notes-based communication between Iris and Lotus over past months), with facilities for messages, notifications and routing among users. There are neat little features that enable the automatic sending of mail outside the system through gateways on the server, etc. It will come with any combination of OS/2 and DOS for clients and servers, although we think the one that makes most sense except for trial versions is DOS clients and OS/2 servers.

Promise and perplexity

But it's likely to be a tough sell. It takes work to build a Notes application, and people can't quite understand it until they see it...although once they do it's a quicker leap of mind than Agenda. But all Agenda needs for a
sale is one person; Notes is designed for groups. Lotus itself recently had a crisis of faith on how to sell the product, and considered farming out the job. It has now decided to keep the product in-house. Evidently the thought of losing the product to some other marketer focused management’s attention, and they decided they couldn’t forgo the opportunity after all.

Possible applications include the kinds of support systems mentioned above (page 11), sales-lead tracking, publishing of dynamic information internally or for customers, task-force or project communication, any kind of application where people are doing semi-structured work and need to keep each other informed. Yes, that’s a broad area. If Lotus proves out the idea, it will have lots of competition, both from focused efforts such as A priori and Answer, and from other textbases, including Xanadu plus application tools.

A model of the model

Lotus Notes exemplifies many of the issues surrounding the business of client-server text applications. For performance and functionality, it was built on a proprietary text-oriented database. Could it have been built on SQL Server, like Saros? The project was started long before SQL Server was available -- and even now the promise of support for objects rather than data fields in most databases is still a promise. The balance of the server’s tips so far to other kinds of data structures and links that most of it needed to be written fresh anyway -- and it might well be possible to hook the relational database part of the server into some standard database servers one of these days.

The unavoidable problem is: If you do something genuinely new, it’s not going to be standard. (And only customers and even competitors can make it one.) That doesn’t matter so much if it’s an application, or even a tailored development tool such as Syntactics’ and Deucalion’s (which both front-end standard systems), but it’s a substantial disadvantage if you’re trying to build a platform for third-party development.

In the old days, these things happened gradually: dBASE was considered an application for years, and Ashton-Tate, it seems, was the last to discover the secret. But now everyone wants standards and platforms from the beginning.

Notes will be starting off as an application with a developer’s front-end -- a rich set of menu-driven commands that can take user-defined parameters to define fields and views and data flows. This product, to be released by year-end, will enable users to build substantial applications, but Lotus itself is already building applications for beta sites that require more intimate access to the Notes engine and linking with external C application modules. The customers should have the same chance, and they will eventually. The code, of course, is there, but the documentation required for Lotus to release the application programming interface as a product is still lacking. That will get Notes to the point of openness. The final question is: Will it be a standard?

(Disclosure: Lotus paid our expenses for a trip to London to talk generally to the U.K. press about groupware in connection with the launch of Notes.)
First, a straightforward correction: The price of 35,820 rubles in the picture on page 10 of our Russia issue (Release 1.0, 89-5) applies not to a single computer but to a 12-seat teacher/student set. That's the good news. The bad news is that they're low-power systems, non-compatible, and even the teacher system's storage is limited.

This was pointed out to us by one of the Russians mentioned in the article, who was here on a visit. He mentioned two other items, enhancements rather than bug fixes, that provoke thought.

First, he disagreed that there is a shortage of paper. How could we miss something so concrete, we wondered. "That is just a euphemism," he asserted. For political control? For what? But everyone we met said there was a paper shortage. Michael Brodie of GTE Labs, who was over there shortly after us (and came back with a much more optimistic view), notes that conference proceedings generally aren't published -- because of paper shortages. So...what's the truth? Probably there isn't really a paper shortage. There are lots of trees in the Soviet Union. Paper is theoretically available, but there's a little slip-up in the production and distribution channels -- to the extent that the Soviet Union recently signed a five-year contract with Finland to set up paper plants. In the end, if people can't get it, and arrange their lives on that assumption, does it matter if it's really a shortage or only inaccessibility? The point about life in the Soviet Union is not the lack of resources, but the inability of people to find and use them effectively.

But the greater point is the ambiguity of information in general. Right now, there is tremendous freedom. Meetings of the legislature were televised recently, until the powers decided the broadcasts were cutting into daytime productivity and the Soviet people had to get back to serious work. Or was that really the reason? What are the laws and what are the proposed laws? If the law says you can do something but a frightened bureaucrat stalls you to a standstill, then what is the law? How free can you be, and how can you invest, if you're not sure current conditions will last? Freedom and business climates don't exist for points in time: They're born of a history that teaches people how to take advantage and a clear future that gives the present meaning. To put it financially, the discount rate in the Soviet Union for anything other than tangible goods is close to 100 percent.

Finally, a more cheerful comment. "You missed an important point about the queues," our friend told us. "You realize of course that it is possible to save a place in several queues at the same time." In other words, if you go shopping with a friend, the two of you can comfortably hold places in six queues, dramatically increasing your efficiency. (As long as you don't get to the front of the take-away queue before you've gotten your receipt from the payment queue or made your choice in the selection queue!) And once you've done that, why not hold down three places in the same limited-amount queue? If a vendor limits you to, say, a kilo of grapes (a common occurrence), you can get three kilos by judicious queue-navigation.

The most aggressive jumpers may come up near to the front of a queue and ask to someone, "Can I have my place back?" When the innocent stander protests, the jumper says, "Of course I was here! I remember you, with that red shirt!" It works more often than not.
But it works only because the proportion of people playing the game is still low. This reminds us of Bernardo Huberman's work on the impact of intelligent agents in a population of mostly naive agents (see Release 1.0, 89-6). Generally, a small number of intelligent agents make things go more smoothly. But if you get too many of them, all second-guessing each other, the system disintegrates into chaos. How about it, Bernardo? Could you run a simulation, please?

RELEASE 0.5: HALF-BAKED COMMENTS

OUR FIRST (AND PROBABLY ONLY) AD...

Thinking about the free flow of information and efficient markets, we figured one of our readers moving to Boston might find the following genuine offer useful:

*Back Bay condominium for sale.* Commonwealth Avenue at Exeter. One bedroom, 1.5 bathrooms, 824 square feet plus patio in a century-old (renovated) brick building. Previous tenant liked it, likes married life in a bigger place even more. $155,000. Call (617) 354-6837.

A TRUE STORY...

A software guy we know (you know him, too) who came from the hardware business: "I don't understand what all this fuss is about quality control. Why don't they just test every tenth tape?"

TOLERANCE FOR TURKEYS TOO...

Let's honor the flag by supporting the rights of free expression it symbolizes. Burning the flag is generally a tacky, offensive thing to do, but it should not be outlawed.

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Larry Moore, CText, (313) 971-1011
Roger Giudici, Deucalion Resources Group, (313) 668-1333
Harold Evans, R.R. Donnelley, (312) 963-9494
Eric Drexler, Foresight Institute, (415) 948-5830
Bob Halperin, Index Technology, (617) 494-8200 x226
Yosi Amram, Individual Inc., (617) 734-4471
Jeff Stamen, Information Resources, (617) 890-1100
Bill Grossman, Interleaf, (617) 577-9800 x 6348
Michael Troy, KnowledgePoint, (707) 762-0333 or (800) 727-1133
Larry Moore, Lotus Development Corporation, (617) 577-8500
Deborah Fain, Lysis Corporation, (404) 373-3359
Jeff Goldman, Pinpoint Information Corp., (800) 767-3636 or (703) 263-0407
Richard Linsdall, Solutron, (415) 521-3338
Erwin Morton, Syntactics, (408) 727-6400
Mark Miller, Xanadu Operating Company (Autodesk), (415) 856-4382
Bernardo Huberman, Xerox PARC, (415) 494-4147

For further reading:

"Hypertext publishing and the evolution of knowledge," draft paper available from the Foresight Institute, above.


COMING SOON

- CompuServe, Prodigy, MCI Mail, USENET, Internet, et al. The only way we know to get around to getting online is to commit ourselves to writing about them...
- Network navigation.
- Patents and copyrights.
- Transaction processing.
- Object-oriented database status report.
- And much more... (If you know of any good examples of the categories listed above, please let us know.)
**RELEASE 1.0 CALENDAR**

**July 17-21**  
*CASE 89* - London. Sponsored by Index Technology and a host of academic groups, including London’s Imperial College. Contact: Elliot Chikofsky, (617) 494-8200, x 1989.

**July 21-23**  

**July 23-25**  
*Sun Expo ’89* - Santa Clara. Keynotes by Bill Joy and Scott McNealy. Sponsored by Sun Observer magazine for Sun users and resellers. If there is a hot UNIX box, this is it. Come see for yourself and meet the Sun community. Contact: Clayton Peters, (408) 296-7111 or (800) 828-EXPO.

**July 23-27**  

**July 24-26**  

**July 25-26**  

**July 26-27**  

**July 31-August 4**  

**August 1-3**  
Comdex Asia/Pacific - Sydney, Australia. Sponsored by Interface Group. Contact: Cheryl Delgreco, (617) 449-6600.

**August 2-3**  

**August 6-9**  

**August 8-12**  
*18th international conference on parallel processing* - St. Charles (near Chicago), IL. Sponsored by Pennsylvania State University. Keynote by Danny Hillis of Thinking Machines. Contact: Peter Kogge, (607) 751-2291 (content) or Ginny Stewart, (312) 584-6300 (logistics).

*Release 1.0*  
13 July 1989
<table>
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<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
<th>Details</th>
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<tr>
<td>August 8</td>
<td>*Software development law '89 - Boston. Sponsored by law firm Elias</td>
<td>Boston</td>
<td>Not just theory; Apple reps will talk concretely about such issues as use of the Mac name, HyperCard and HyperTalk, Apple software patents, etc. Speakers include Rachel Parker, Dan Bricklin and Dave Winer. Contact: Paul Goodman, (212) 421-6022 or Wes Thomas, (516) 266-1652.</td>
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<td></td>
<td>and Goodman to precede MacWorld; targeted at Mac developers.</td>
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<tr>
<td>August 9-12</td>
<td>*Macworld Expo - Boston. Keynotes: John Sculley, Jean-Louis Gassee,</td>
<td>Boston</td>
<td>Contact: Peggy Kilburn, (617) 326-9955.</td>
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<td></td>
<td>Alan Kay. Contact: Peggy Kilburn, (617) 326-9955.</td>
<td></td>
<td></td>
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<tr>
<td>August 9-11</td>
<td>*Conference on object-oriented dbms applications - Santa Clara, CA.</td>
<td>Santa Clara</td>
<td>Sponsored by Santa Clara University. Contact: Mohammed Ketabchi, (408) 554-2731 or <a href="mailto:mketabchi@scu.bitnet">mketabchi@scu.bitnet</a>.</td>
</tr>
<tr>
<td>August 16</td>
<td>*Adam Osborne at New York PC User Group - New York City.</td>
<td>New York</td>
<td>Call David Hoffman, (212) 674-2632, or a recording, (212) 533-NYPC.</td>
</tr>
<tr>
<td>August 22-24</td>
<td>Summer UniForum - Boston. The regional version, with lots of</td>
<td>Boston</td>
<td>Sponsored by /usr/group. Contact: Ed Palmer, (408) 986-8840 (tutorials) or Bob Linke, (312) 299-3131 or (800) 323-5155 (registration and exhibits).</td>
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<tr>
<td>August 22-26</td>
<td>IJCAI-89 - Detroit. The international version of AAAI.</td>
<td>Detroit</td>
<td>Sponsored by the American Association for Artificial Intelligence. Contact: Claudia Mazzetti, (415) 328-3123.</td>
</tr>
<tr>
<td>August 23-25</td>
<td>TechDoc '89 - San Jose. &quot;Publishing in the '90s...the art of</td>
<td>San Jose</td>
<td>Documentation etc., including hypertext. Keynote: Jim Barksdale, Federal Express. Sponsored by Graphic Communications Association. Contact: Patti Hill, (703) 841-8160.</td>
</tr>
<tr>
<td>August 24-September 1</td>
<td>*Eleventh World Computer Congress - San Francisco. With a focus on tools and application software this year; in the U.S. for the first time in 24 years. Sponsored by 46 IFIP member societies. Call Nancy Dana, (303) 696-6100.</td>
<td>San Francisco</td>
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<tr>
<td>September 6-9</td>
<td>Breakaway '89 - Orlando. Sponsored by ABCD, the microcomputer</td>
<td>Orlando</td>
<td>Keynote: Fran Tarkenton. Contact: Deborah Keating, (601) 977-9033.</td>
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<td>industry association (mostly dealers). Keynote: Fran Tarkenton.</td>
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<td>September 7-10</td>
<td>Comtec '89 - Singapore. Regional micro exhibition. Sponsored Microcomputer Trade Association of Singapore. Contact: Yong Mee Hiong, Singapore 2913238; fax 2965384.</td>
<td>Singapore</td>
<td></td>
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<tr>
<td>September 11-14</td>
<td>NetWorld - Dallas. Managed by H.A. Bruno. Contact: Adam Torres at</td>
<td>Dallas</td>
<td>(201) 569-8542 or (800) 444-EXPO.</td>
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September 13-15  *Conference on Computer-Supported Cooperative Work - London (Gatwick). Inspired by the successful U.S. events, but likely to focus even more on social issues. Contact: Lorna Meek, 011 44 (753) 73232.

September 17-21  Managing the corporate personality for the nineties - Martha’s Vineyard. Sponsored by Design Management Institute. With speakers from Xerox and Danish State Railways, among others. A broadening, useful conference. Call Nancy Barry, (617) 236-4165.

September 18-20  DataStorage - San Jose. Sponsored by DISK/TREND and Freeman Associates. Call Darlene Plamondon, (408) 554-6644.


September 19  Interface Design ’89 - San Francisco. Sponsored by MacWeek, in hopes of consistency if not necessarily standards. Contact: Cindy Koral at (415) 243-3315.

September 20  *Charles Wang at New York PC User Group - New York City. Call David Hoffman, (212) 674-2632, or (212) 533-NYPC.

September 20-23  Seybold computer publishing conference - San Francisco. Sponsored by Seybold Publications. The usual extravaganza, expanded from desktop publishing to include all electronic publishing. Contact: Kevin Howard, (213) 457-5850.


October 1-4 *ADAPSO Management Conference - Orlando. Mingle with your peers (and Disneyworld's nearby just in case). Contact: Sheila Wakefield, (703) 522-5055.

October 1-4 Alex. Brown Computer Services Seminar - Baltimore. The tenth annual... Contact: Rivka Hawk or Ellen Kempler, (301) 727-1700.

October 2-6 *OOPSLA - New Orleans. Sponsored by ACM/SIGPLAN. Come meet your fellow objects and share procedures. Send a message to Carole Mann, (407) 628-3602.

October 2-6 CD-ROM Expo - Washington, DC. Sponsored by IDG Conference Group. Contact: Dorothy Ferriter, (508) 879-6700 (registration), or Richard Winant, (617) 329-8090 (exhibits).

October 2-6 Interop 89 - San Jose. Interoperability made tangible, with tutorials, discussions, product demos and pitches. Sponsored by Advanced Computing Environments. Contact: Mark Belinsky, (415) 941-3399.

October 3-5 PC Expo - Chicago. Sponsored by PC Expo. Contact: Steven Faher, (800) 444-EXPO or (201) 569-8542.

October 10-13 Info 89 - New York City. Sponsored by Cahners Exposition Group. Call Frank Fazio or Kerry Gumas, (203) 964-0000.


October 16-19 Scan-Tech 89 - San Jose. Sponsored by Automatic Identification Manufacturers. On beyond retail bar codes, including integration with EDI, tracking materials in offices, etc. Scan-Talk: Munster punster (and Wall Street Week host) Lou Rukeyser. Call Bill Hakanson, (412) 963-8588 or (800) 338-0206.

October 18 *Rod Canion at New York PC User Group - New York City. Call David Hoffman, (212) 674-2632, or (212) 533-NYPC.


October 30-November 1 *Seventh annual Seybold Executive Forum - Boston. Sponsored by Patty Seybold's Office Computing Group. Contact: Deborah Hay, (617) 742-5200 or (800) 826-2424.

November 1-3 *UNIX expo - New York City. Keynote by noted UNIX fan Ken Olsen of DEC. Managed by National Expositions Co. Contact: Roger Halligan or Heidi Dethloff, (312) 332-4650 or (212) 391-9111.

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November 5-10  *Hypertext '89/SIGDOC 89 - Pittsburgh, PA. Much larger, for better or worse, than the first, wonderful hypertext conference in the fall of '87. Hypertext covers the first three days; SIGDOC the last three. Sponsored by ACM. Contact: Elise Yoder at (412) 327-8181 for Hypertext '89; Mike Dolhi or Adam Young at Scribe Systems, (412) 281-5959 for SIGDOC 89. (How about a joint committee on standards for the use of apostrophes?)

November 13-15  UIST - Williamsburg, VA. Symposium on user interface software and technology, sponsored by ACM SIGGRAPH and SIGCHI. Contact: John Sibert, (202) 994-4953.

November 13-17  *Comdex - Las Vegas. Also including MACdex. Contact: Jane Wemyss at (617) 449-6600 or (800) 325-3330.

November 13-17  *Supercomputing '89 - Reno, NV. Conveniently located near Comdex, if you tire of small computers and big hoopla. Contact: Ron Bailey, (415) 694-4500.


December 4-6  *First international conference on object-oriented and deductive databases - Kyoto. Sponsored by IEEE, MCC, many others. Contact: Professor Kiyoshi Agusa, 011 (81 75) 256-1677, or Won Kim at MCC, (512) 338-3439.

1990


January 28-31  **EDventure Holdings PC (Platforms for Computing) Forum - Tucson, AZ. Sponsored by us! New speakers will include Danny Hillis, Thinking Machines; Mike Slater, Microprocessor Report. Note that it's earlier this year. Contact: Daphne Kis, (212) 758-3434.

February 20-22  Computer science conference - Washington, DC. "Cooperation" is the theme, among processing units, technologies, disciplines. Sponsored by ACM. Contact: Barbara Kyriakakis, (703) 323-2318.


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March 5-9  *Seybold Seminars '90 - Boston. ...moves east. Call Kevin Howard, (213) 457-5850.

March 5-9  *Sixth conference on artificial intelligence applications - Santa Barbara, CA. Sponsored by IEEE Computer Society. Call Jeff Pepper, (412) 642-6900 (publicity), or Se June Hong, (914) 945-2265 (papers), or Elizabeth Saunders, (202) 371-1013.


April 10-13  *Macworld - San Francisco. Later this year. Call Peggy Kilburn, (617) 326-9955.

April 23-26  *First international conference on systems integration - Morristown, NJ. Sponsored by ACM and IEEE groups. Call Peter Ng, (201) 596-3387.

April 25-27  *Conference on office automation systems - Cambridge, MA. Sponsored by ACM and IEEE groups. Call Joan Staunton, (212) 869-7440, or Robert Allen, (201) 829-4315.

June 20-29  Design Automation Conference - Orlando, FL. Sponsored by IEEE and ACM groups. Call P.O. Pistilli, (303) 530-4333.

Please let us know about any other events we should include.

-- Denise DuBois

*The asterisks indicate events we plan to attend. Lack of an asterisk is no indication of lack of merit.
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Daphne Kis
Associate Publisher

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13 July 1989