INFORMATION FLOAT

Just read the news: There are some things you'd simply rather not know. Knowledge may be power, but it isn't always an unalloyed blessing.

We've been thinking about this lately in connection with data bases and project management systems: Computers offer the promise of letting us know everything, real-time and in detail. But more is not necessarily better. Sometimes complete information is a surfeit, a waste of machine resources and a waste of human effort spent looking at and discarding it. Until we can develop sufficient AI capabilities to assess and reject "junk" information, we're probably better off simply leaving some information uncollected, unassembled, unrefined. Sometimes we're better off unaware of changes other people have made in information that concerns us peripherally.

Unfortunately, generating useful information is not as simple as consolidating small items into big ones -- 3,482 paychecks issued equals one line on the income statement, 48 steps completed equals one project, 345 data bases joined equals one big data base, 12 tools combined equals one development environment, five drafts reconciled equals a final document. In a future issue, we'll talk about a better way of handling this problem -- object-oriented data bases -- but here we will simply discuss the implications for existing products.

Data base management

Theoretically, and mathematically, a perfect distributed data base is simply a single large data base with its information spread out. But each location provides its own data and has total access to all the other data, with no knowledge of where anything resides. Since the data is represented only once, it is theoretically clean, consistent, and real-time.

Mathematics and theory are all very well, but perhaps it's not necessary for everyone to have access to all the data. It may be unduly costly to keep all the data on-line, and to have everyone perpetually hooked up to everyone else. Yet there's no other way to maintain complete integrity. (Or perhaps it's

CONGRATULATIONS, STEWART!
not even possible: Consider the typical scene as an overbooked flight is handled. In the end, rather than rely on a ticket-count or a computer summary, airline personnel board the plane to count the empty seats.) Such continual communications costs are expensive, and most people want only summaries anyway. In January and February we don’t want details; we want the big picture: How much did you sell? How much did you earn? We need to define the data: Does revenues include interest income? What’s net income? What’s extraordinary? How do we value our inventories?

The determination of what and when to report at present is left up to system builders. Which assumptions can you rely on? Which do you have to check constantly? Double-bookings on airlines, discrete purchases in a Nordstrom store, typically don’t matter beyond their local area. Yet if we truly had distributed data base management, that would all be de rigueur. Just as old technology keeps our account from being debited the moment we write a check, so does old technology keep us from being overwhelmed with data. With luck, by the time we get truly distributed data processing, we will also have enough intelligence to save us from it.

Of course there are times when absolute, real-time integrity is handy (automatic teller networks, for example), but more often than not consolidations are good enough (cash register sales, for example). Frequently, data bases can be as misleading as spreadsheet models: The spreadsheet assumptions may be false, and the data may be false. People lie every day when they overbook airline flights, provide salary data, and enter incorrect numbers into terminals that are corrected later. Appealing as the notion of a truly distributed data base is, we expect that in the real world customers will still prefer good local performance to worldwide integrity.

PROJECT MANAGEMENT

In project management, we face the same issue of knowing too much, too soon. While we want to control the project, how much does a manager really want to know? Should he know each time a module is late, or only when an entire task is off schedule? A construction project manager doesn’t want to base his forecasts on a sunny day in April, or a stormy day in February. Not even artificial intelligence can do the job, unless the computer is hooked up to prescient weather reports. Lack of knowledge insulates us from worry about trivial fluctuations. Each time Alice reassigns a pr writer she won’t necessarily want to let the staff-short documentation group know about it. If she’s fooling around with her assumptions to see what would happen if she gave Juan a two-week paternity leave, she doesn’t necessarily want that reflected as the personnel manager checks his files to plan a salary review.

Ideally, a project management system can solve the problem of intelligent knowledge-sharing, so that things that should be apparent to another party are presented to him and others are not. First, we don’t want Juan and Alice each separately inventing the same wheel, or even slightly different ones. One could borrow from (or reuse) the other’s work. We want them to be using common designs, the same modules, the same market research, the same brand of cement, etc. Yet how much knowledge about the other’s work can each of them handle?
Thus project management requires understanding of the tasks involved and how they fit together. But for the most part that still depends on the ability of the project planner to structure the project correctly. A good project management system will start with a description of the tasks to be done, not with their time dependencies.

How does each subtask depend on others? These issues grow in importance with the development of resource management systems. These are scheduling systems that don't divide the world up into discrete projects, but rather see it as a continuum. Resource allocation does not work toward a convergence, with all the tasks concluding, but rather requires ranking of priorities, interactions among resources, cost estimates, etc. Ideally, a multi-user project management system gives each user his own separate space within which to optimize, strategize, hypothesize, without scrutiny by other users. Yet at the appropriate time (or level of granularity) each individual's projects, resources and tasks are consolidated, coordinated and combined.

How much can the priorities and resources be controlled by individuals, and how much must they reflect the overriding concerns of the larger unit? While these problems have easy technical solutions, each customer will have to decide for itself the cultural organization that the software it uses will reflect. How closely do people work together? Do people report only upwards, or do they attempt to coordinate with others? With paper systems, privacy and local control were a given; now they are merely an option.

**Primavera's Expedition**

On the other hand, project "management" also has a lack of information problem. Most project management systems are in fact project planners and reporters: They let a manager schedule a project and allocate his resources as he sets and continually revises his assumptions. As time passes, he may use the planner to report progress and consumption of resources. But it does not manage the nitty-gritty information: Where are the pickaxes? Who had the piping just before we found we were 18 feet short?

Thinking about these issues are the founders of Primavera, Bala Cynwyd, PA, president Joel Koppelman and vp technical development Dick Faris. Primavera sells project management software primarily to the construction, software development and aerospace communities, and has just launched a new product called Expedition for construction project managers. As yet, Expedition has only limited links with Primavera's main product, Primavera Project Planner (P3), to which it can send batch files. While P3 plans projects, Expedition is concerned with carrying them out -- expediting them. P3 is for managers; Expedition is for the people in and around the trailers who actually do the work. It records the work it performs -- preparing orders and bids, writing letters, recording workers' availability and contractors' activities, etc.

Other attempts at project expedition have suffered from the "out-of-the-loop" problem: When push comes to shove, are we going to record our progress, or are we going to get on the phone to collect our receivables? As it happens, says Koppelman, 80 percent of all construction projects lead to litigation, which requires good records. Thus, Expedition is addressing a market of people used to filling in forms to keep meticulous track of things, and convinced of the value of doing so. (As more and more "work" is carried out on or through computers rather than reported to them ex post facto -- or not -- this problem will diminish.)
"You used to make 18 copies of everything and throw them in as many drawers as you could think of, and hope you could find them when you needed to," says Koppelman, who has planned several rapid-transit construction projects. Worse, if you wanted to update one, you were obliged to hunt for the other 17. Expedition makes it easier to manage such day-to-day paperwork, and easier to trace things afterwards, by computerizing it. It offers fill-in forms for recording everything that happens on a construction site, and holds new items in an in-basket until they are handled by a responsible person (as identified in the "BIC" or ball-in-court field) and the appropriate records are updated. Built around a network data base (soon to move to SoftCraft's Btrieve) of 24 different kinds of files rich with cross-references, Expedition is a rich system that embodies a huge amount of practical knowledge (but not reasoning capability) about standard procedure in the construction business.

Born to be a multi-user system, Expedition ($1295) now runs on a pc in single-user mode. It implicitly assumes that a single person will do most of the data entry, and answer questions of others who peer over her shoulder asking, "When did we send out that purchase order to the lumber company?" and "What contractor was providing the crane the day we poured the cement for the second floor?" Long run, instead of generating proposals, bids, responses and reports to be mailed, Expedition will be able to transmit orders, etc., directly to the other entities involved, and provide a real-time link to the plush offices where the project manager's manager sits.

Linked to a project management system, preferably P3, Expedition will eventually prescribe as well as describe, and on a level micro enough to be of use to the guys on the site: "What should Joe be working on today? What do we need to get approval on today so we can place the order for next week? This problem with the wallboard is giving us fits; what could we be doing instead to make up time?"

VERSION MANAGEMENT

In addition to the notion of real-time data integrity, coordination of projects, data, software modules across a universe, consider coordination across time, or version management. (Cooperative work afficionados call this communicating with yourself across time.) As something is updated, what do we do with cross-references to it? A new version of something can refer to an old version of something else.

Here again the technological issues are easy: You can state a default approach, and your software will follow it. The question is, What do we want to do? How much are we willing to store in our archives? How do we determine what to throw out? Which set of changes constitutes a global change?

As shown across, at time 2, At2 has changed from At1, but it still refers to B. Should it refer to Bt1, or Bt2? And if it still refers specifically to Bt1, what of B's reference to C, especially when B refers to "current C"? And version C3? Which versions of the components does that refer to? At3, Bt1, and Ct3? Or At3, Bt3, and Ct3? From C3's perspective, the third version may be C3t, B3t, and At2.

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Until we get really sophisticated, those questions will be answered ad hoc by a designated administrator, or by rules put into the system -- e.g., create a global version of all current versions each Friday, or just before each management review, or when a certain milestone in a major component is reached. Do you really want to know every time someone changes a comma? Or just every time you ask for a fresh draft?

docuFORUM

These issues are addressed by a number of CASE tools such as Nastec’s Life-Cycle Manager, and by a number of high-end publishing packages such as Atex. And they are central to docuFORUM (from Network Technologies International, or NETI, in Ann Arbor, MI), a new version of a prototype product we saw and dismissed a couple of years ago. Now ready to emerge from beta version, docuFORUM has grown up nicely, with an improved user interface, embedded comments, word-processor integration facilities, and other enhancements.

In essence, docuFORUM is a higher-end implementation of the editing management facilities found in Broderbund’s ForComment (Release 1.0, 31 October). docuFORUM is considerably richer, and correspondingly pricier at $1495 per server, plus $145 per pc. Worse, the system requires UNIX, but it has just recently been ported to Xenix, which lets it run on pcs as well as UNIX machines. Interestingly, says marketing vp Jeff Elpern, who co-founded Simtec, an ill-fated high-end retail venture in Dallas, customers didn’t mind the UNIX, but they did mind the systems it ran on.

The central part of docuFORUM works in UNIX/Xenix, including consolidation and distribution of the users' input and management of the versions, while the user interface and editing functions operate on the user’s own pcs under DOS -- a nice implementation of a model we expect to see more of. For the moment the pcs are hard-wired to the UNIX machine (a LAN version is coming).

docuFORUM provides a variety of editing and annotation-tracking features, and also manages different drafts of a document. As in ForComment, different "editors" are identified on-screen or in a printout, and users can comment on each other's comments. Sections of the text can be copied to an editing window, and marked up with a fairly rich editor or with the user’s word-processor of choice (which must be loaded each time). Unlike ForComment, which consolidates files at the command of an administrator, docuFORUM operates in real time, making the comments and changes of each user immediately available to all other authorized users. Segments can be revised separately, but once a new draft (incorporating several segments) is

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started, the previous draft is stored and "closed," although any or all of it could be copied into a new draft. (But docuFORUM does not catch inconsistent cross-references within the text.)

Moreover, docuFORUM manages the process. Not just a passive repository for editing changes, it lets users print out or display only certain people's comments or only those comments entered during a specific time frame, highlights with flashing numbers comments not yet reviewed by any particular viewer, allows the viewer to look at those comments by number or in the order they appear in the text, compare any two drafts, etc. With the use of memoFORUM, an add-on not yet priced, people will be able to carry on private conversations around the document.

Beyond the document

docuFORUM can also be used as a library to control, say, perpetually changing online documentation, where the goal is not to produce a final version but to nurture a perpetually changing, "living" document rife with versions. Or it can store boilerplate for continual reuse and modification in a legal office or a magazine ("Let's do our annual disk-drive round-up"). It could also work as a project-centered communications system, where the focus is the users' comments -- conversations centered around the launch of Astro-chicken Burgers, say -- rather than a final document. The "document" is in fact a structured, active record of the interactions about the launch. The segments of the "document" define the various subtopics of conversation -- promotions, pricing, advertising, timing of the launch, competitive moves, regional variations in seasonings, etc.

Of course, the canny user will quickly recognize that docuFORUM is all about the creation of a richly structured outline with some elements of hypertext -- or a living document of which a printout is merely a snapshot. Working on a notion that most conversations are about something, the living document organizes and structures those conversations, and enables participants to refer to things in context.

Cooperative work

Although the product has not been released yet, NETI president Chris Green-dale, formerly marketing and sales director for DunsPlus, and Elpern both sense that the market is far more willing to accept docuFORUM than NETI's other two products, eFORUM and Participate, both positioned as conferencing systems. (eFORUM is NETI's own UNIX-based system; Participate, an acquisition, runs on mini/mainframes under VM (IBM) and VMS (DEC) and has a rich underlying data base.) Together, they have thousands of users, but fewer than 100 installations in three years, we estimate. "Selling computer conferencing is an uphill battle," allows Elpern. "The users are zealots, but you can't market it to people who don't know about it." By contrast, docu-FORUM is a straightforward, tangible, task-oriented product. "It continually returns them to the point; conferences tend to wander off into the ether," he says. In short, you need a purpose to keep people from feeling funny about what they're doing -- just as people find it easier to meet people while admiring art in a museum than while admiring each other in a singles bar.
CASE MANAGEMENT -- REUSABILITY AND SHARABILITY

Reusability: At the recent CASE conference sponsored by Index Technology and a number of universities, hardly a speaker could avoid that word. Computer-aided software engineering is the process of moving from abstraction to implementation -- from requirements to specs to design to code, or down the "life-cycle waterfall" -- by modifying and assembling chunks of pre-existing, reusable code (Release 1.0, 32 December 1986). As that process is automated, so the promise goes, it will become possible to maintain the specs, not the code. Better yet, as it becomes possible to move back up the chain from existing code to overall design, it will become possible to enhance or reimplement old systems without the need to look at the code.

How does this work? Key to it all is reusability. At one extreme, one can say, "give me an accounting system," buy one off the shelf, and "reuse" it. At the other extreme, one could write a totally new accounting system from scratch, in assembly language, perhaps reusing only some low-level function calls.

So, reusability is a matter of degree. The greater the granularity of the pieces used, the more room there is for optimization, choice, close match to specs, etc. But also, the greater the granularity, the more choices the implementor must make, and the more it must know. (The implementor could be an analyst, a programmer, an automated system following built-in rules, or any of these working together.) A major purpose of CASE is to automate the complex, numerous rules that allow us to reuse finer-grained code -- so that the reusable components constitute not just the raisins but the flour.

Thus, a CASE system also allows us to reuse and modify our specs -- a level we find much easier to deal with than the minutiae of code -- and then help us transform those specs into fine-grained arrangements and modifications of existing code. Indeed, any given CASE tool can be enhanced to generate a better, more optimized implementation, or perhaps one for a new environment, from the same specs. The same reused specs may generate totally new code.

Share me...

The power of CASE lies in that base of reusable specs/software and the knowledge of how to reuse them. (The greater the system's knowledge, the more abstract the specs can be.) Countervailing that power is the reality that most CASE tools perform only part of the job -- and most of them tend to use their own abstractions and data formats to represent the low-level implementations. Each CASE tool may do a good job on its own, but often the human work required to translate the output of one tool for use by another is so great as to offset the benefit of the tool in the first place.¹

Obviously, this is ridiculous. We could certainly design an expert system that could bridge this gap. Or more simply we could set up some global standards and protocols. This is the goal of a number of committees

¹A related story: Our friend Brian, who happens to have a Ph.D. in electrical engineering, recently designed the wiring for the new house he's building. The real-world electrician hired to install the circuitry couldn't make head or tail of Brian's charts, and so Brian ended up doing it himself.

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CodeSmith

Also attempting to solve these incompatibilities is CodeSmith of Santa Clara, vendor of a CASE substrate system to underlie an integrated project support environment with a variety of tools. CodeSmith (a wonderful name soon to be changed to Atherton Technology) is trying to get its partners and competitors to plug into its "software backplane" and to agree on common protocols and data structures. Founded by several former Daisy executives, CodeSmith is too small to flatter itself that it can do the whole job itself, and so it is attempting to round up a group of fellow vendors to create a de facto standard for representation of data models.

Although it will attempt to support the work resulting from the various standards committees, CodeSmith is hoping to win by default by defining a practical, workable solution that beats them to the punch. People may not like everything it proposes, but do they have anything that much better to offer?

CodeSmith's "standard" doesn't need certification or formal approvals; it just needs people to use what it offers. To do the best job it can, CodeSmith is soliciting input from other vendors, of which it gathered a crowd of close to 30 people at the recent CASE conference. Its current roster of "friends," attracted by the public-domain nature of the proposals, includes Interactive Development Environments (San Francisco), Index Technology (Cambridge, MA), Sun, and DEC. Obviously, CodeSmith stands to gain if its protocols become a standard -- but it will lose its edge if its products don't at least match those of other vendors, whom it has invited to follow the same standard. That's how the market should always work.
"When you're disabled, life is details."
-- Alan Brightman, Apple

Do you know about Section 508? It’s yet another of those obscure government pronunciamentos likely to trip up people who don’t pay attention to it. The costs of paying attention are slight; the costs of ignoring it may be exclusion from government markets -- de facto, most markets. In short, Section 508 of the Rehabilitation Amendments Act of 1986 mandates that as of September 1988, office automation products purchased by government units must conform to a set of guidelines for access by disabled persons.

Heretofore, the computer community’s view of the disabled has been: an untapped market for niche companies, a civic duty, a source of workers, and perhaps a market to turn to when traditional markets are saturated. Section 508 will give them a whole new perspective: Many of their customers have disabilities, but they are not a separate market.2

While the guidelines strictly apply only to computer products sold to government agencies, they are likely to affect virtually all products sold, since it will likely be cheaper to make everything to the same specs -- and many other buyers will probably follow the government’s lead. The required features should generally be small and relatively inexpensive, and easier to incorporate across a product line than to add on a selective basis.

The aim is not to make every piece of equipment or software "accessible," but to provide hooks for the necessary devices and facilities and the flexibility to configure systems appropriately. The impact on mainstream vendors should be minor: Most of the features likely to be required or recommended -- such as the ability to operate the keyboard with one hand, the ability to get read-only access to screen contents (for voice synthesis), accessibility to alternate I/O devices, redundant beeps and flashes, and general configurability of systems -- are of value to almost everyone, add little to costs, and aren’t intrusive to people who don’t need them.

Much as we usually decry government intervention, this program makes a lot of sense. It’s about details, and details that can solve them. Just try to turn on your computer, load a piece of software, and type a letter without using your hands. Or close your eyes and try to type and format that letter. Try to reboot by pressing control/alt/delete with one hand.

The work of conforming to these guidelines will fall mostly on the substrate vendors -- makers of hardware and operating systems -- since the major issue is access to systems through alternate I/O channels. By all accounts,

2In the U.S. there are probably some 35 million disabled people, tough to count and tough to define. Of these, about 10 million are hearing-impaired, visually impaired, or physically disabled (quadraplegics, paraplegics, and people with cerebral palsy, ALS, multiple sclerosis, muscular dystrophy, and a variety of other conditions). For the moment, few older people use computers, but as time passes age-related disabilities will affect more computer users. (Making computers more accessible to the mentally disabled is a vaguer, less tangible goal also included in the government’s directive, but harder to address.)
Apple, IBM and Honeywell are most active in working on such features, with Tandy and DEC close behind. These companies are working in concert with the voluntary Industry/Government Initiative, co-chaired by Gregg Vanderheiden of Trace R&D Center in Madison, WI, and Larry Scadden of the Electronic Industries Foundation (an arm of the Electronic Industries Association). This group, founded in 1984 to generate what it calls "design considerations" (as opposed to "guidelines") for industry, is also sending its findings to the government groups (NIDRR/GSA) charged with developing the guidelines.

Notably missing in the line-up so far is Microsoft, which has just found out about S. 508 (courtesy of Adapso). The company is now investigating to figure out what it should do, says president Jon Shirley.

The issues

In one sense, the government's timing is good, in that computers have now turned from dp machinery into extensions of human capabilities. Access is genuinely an appropriate concern of personal computing vendors.

In another sense, the timing is unfortunate, since much of the work on a substantial new generation, IBM's PS/2, is already done. Part of the problem is simply the change-over to a new product line: The dislocations for mass-market add-in board makers are troublesome; the dislocations for the smaller companies who supply disability-overcoming devices have greater relative impact, since these companies spread their development costs over a smaller customer base. Many input and output devices will all have to be adapted to work with the Micro Channel and the PS/2's new slots.

But the more important issue is OS/2. Unlike DOS, which let developers deal directly with the screen contents and the keyboard input signals, OS/2 takes control of everything. It is specifically designed to keep developers from adding their own patches and gaining direct access to the I/O portions of the system which are so key for alternate access for disabled people.

Most difficult is the problem of providing external access to screen content -- both images and text -- so it can be translated by special devices into some representation helpful to blind people, generally voice output.

Character-based text can easily be converted into computer-generated speech, but screen images are tougher to handle: Page-description languages provide some way to "describe" a page but bit-map images are virtually impossible to convert to something meaningful. The notion is of special-purpose add-in software (not likely to appear in the guidelines) that could understand a page description and say, for example, "Box in upper left corner contains this text: 'New! Improved! Now with AI! See page 4.' Box in center contains ..." and so forth. Meanwhile, the ability to display images and text in large size inherent in the new graphics-based systems is useful for those with impaired vision.
See me, feel me, touch me, heal me

While there are similar problems with the Macintosh OS, Apple has shown far more interest in resolving them. For example, the new standard Mac OS includes a program called Easy Access, with Sticky Keys and Mouse Keys which make it possible for many physically disabled people to replicate the function of a mouse or a multiple-key sequence. For people who have trouble depressing keys quickly (and tend to get lllleetttteeerrsss all over the screen), the Mac also lets the user define the keys' reaction time or shut off the repeat-key. You can also change beeps to flashes.

Extending the limits

One of the less appealing characteristics of the high-tech community is its generally low involvement in civic and charitable affairs. True, the justifications hold some truth: I'm employing lots of people by growing my company fast, and when I'm really rich I'll be glad to give some of it away.

Meanwhile, companies such as Apple and IBM, which do have active programs to hire, serve and support disabled people, are so big that their good health does indeed depend on the general level of welfare and education: Computer illiterates, let alone illiterates in the traditional sense, make neither good customers nor good employees. (Smaller companies too benefit from the country's overall welfare, but they have more flexibility to find unaffected niches and less opportunity to change their environment.)

Although company managements may bemoan the costs and the compliance bureaucracy the guidelines will entail, the prevailing attitude is cheerful acquiescence, as long as the same rules apply to everyone. Meanwhile, the actual implementors within companies tend to consider disabled customers (not their own managements) to be their constituency, and are genuinely devoted to making their products accessible. As Vanderheiden notes, "The challenge is to get the mainstream product guys interested." To be sure, there will be disagreements over the details of implementation, but there's probably less than the usual cynicism engendered by government policy.

A variety of issues will be germane to each vendor. As a priority, it makes little sense to make all products available to all people: The hearing-impaired probably have little interest in a musical package, and a blind person might not want a CAD-CAM program. But a blind programmer might need access to a software-engineering program that normally makes use of diagrams. Working in the other direction, a blind person might wish to generate text for formatting by a command-oriented package such as Ventura Publisher (as opposed to PageMaker, which works more on the basis of direct manipulation of text and graphic elements on the screen by a person wielding a mouse). The goal is to avoid needless barriers, and to let computers perform their proper function of extending human capabilities. Disabilities are relative; all of us might be considered handicapped by an alien species from some other planet.

The better the job of defining and providing accessibility that the vendor community does now, the more likely it is to be left free to do a superb, imaginative job, rather than to conform to a series of tightly defined specs that improve on current practice but may inhibit future, better solutions.
THE HIGHEST-LEVEL LANGUAGE OF THEM ALL

Eschewing the hullabaloo of Comdex, Microsoft went to a Boston Computer Society PC User Group meeting to announce a $1 million investment and undisclosed licensing deal with Natural Language Incorporated of Berkeley, CA. That's right -- no comma in the name. The notion is that natural language should be incorporated within applications rather than considered a separate application by itself. All this fits in nicely with NLI's techy orientation, which makes it an excellent builder of NL technology but likely to be less effective as a large-scale vendor of applications. The company's founders, Jerrold Ginsparg and John Manferdelli, come from Bell Labs.

NLI has met with more success than it expected in selling direct to end-user organizations such as TRW. Nonetheless, says president Bob Bozeman, its general approach is to strike deals with software houses rich in applications expertise such as Saddlebrook Corp., a Cambridge, MA-based vendor of systems for thrift institutions and mortgage banks. NLI's DataTalker software generates SQL queries, but its value is not in translating words into queries but figuring out which queries to generate and what programs to run, where the data is and what data to get.

DataTalker also incorporates substantial reasoning ability. For example, "Salespeople who exceed quota may fly first-class" could be a rule used in a corporate environment. This is the kind of information you could not easily put into a system any other way. You don't want to waste the resources to run an application to check quota status each week. A data base management system with triggers such as Sybase's (Release 1.0, 1 July 1986), could attach a trigger to the quota field in the data base, but that's still not as elegant or straightforward as simply stating the incentive as a rule.

This reasoning ability makes DataTalker a much richer tool in dealing with applications, as opposed to competing products which tend to do little more than query a data base. DataTalker can also do a good job of handling conversations rather than single queries, determining antecedents for example, as in: "List the top five real estate agents in Nantucket." "Valerie, Chuck, Hank, Will, Susi." "What about Martha's Vineyard?" "Muffy, Biffy, Ted, Fred, Ned."

DataTalker accomplishes this by combining a natural-language parser with a rule interpreter and other symbolic processing constructs that enable it to handle domain-specific concepts and relationships beyond those found in a typical data base, as well as time, quantification, tense information, etc. What it still lacks in its standard form is the ability to drive an application (although most applications consist of a series of data base-like manipulations anyway). The users of the system build up its base of knowledge -- rules, relationships, concepts, as well as synonyms for specific data fields and attributes. This takes a lot of work; people who want primarily a data base front-end are likely to turn elsewhere, such as Artificial Intelligence Corp.'s Intellect.

Not just another HAL

To the extent that anyone has even noticed this deal (Microsoft seems to be downplaying it and slipped it in with the announcement of its new C tools in the Borland-Microsoft stakes), people are guessing that Microsoft will use

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it to take on Lotus’s HAL. In fact, that’s highly unlikely. DataTalker’s value comes from its richness and breadth, which depend on the use of the entire system rather than a subset that could fit onto a pc in conjunction with, say, Excel. HAL is a sleek, small, specialized front-end with deep but narrow knowledge about spreadsheets in general and 1-2-3 in particular, whereas DataTalker is broad and needs a lot of developer input and should have the power to span several applications.

In fact, we wouldn’t be surprised to see DataTalker incorporated into a shell around OS/2 (but not for several years; currently Microsoft is just exploring the technology). The power of OS/2 -- its ability to run a variety of cooperating applications -- implies that many users will need help, as in the "softer software" that Bill Gates has frequently talked about. Imagine typing "Write a letter," and having "OS/Talk" automatically load your word-processor as it searches your agenda for mail to which you haven’t yet responded. "Here are the people you have to write letters to:" the system might say, presenting a list. "Please pick one of these, or type in another name." When the user selects the name, OS/Talk would automatically format a letter for response, while querying the data base for information about the intended recipient.

We would have here more than a system that understands English. It also understands business procedures, and probably has rules such as, "If user wants to write a letter, select from agenda files names where correspondence status is 'open.'" This idea is not new, but the possibility of implementing it commercially is just beginning to emerge. For the moment, such intelligent shells take too much space and operate too slowly to work on a "personal" machine, and the job of supplying them with information and rules about the operating system and applications will be enormous. But it certainly is what "softer software" is all about -- not just English, not just rules, but an integrating environment that could do for OS/2 and OS/2 applications in general what HAL does for 1-2-3 in particular.

Obviously, NLI’s technology could be put to use in many other Microsoft products, particularly its rumored dbms from Sybase. DataTalker currently works on Suns ($10,000 list) and DEC VAXen and some 386 machines running UNIX; it runs as fast on a Compaq 386 as on a Sun-3/160, says Manferdelli. It shouldn't be that difficult to port to the new OS/2, although it’s unlikely to get any smaller than its current 4.75 megabytes. However, the integration of the technology and the applications expertise remains a serious process involving corporate effort, not something one would expect every data base user to do. However, we could see DataTalker as an ideal product for Microsoft to provide to pc VARs, just as NLI does for higher-end VARs.

NLI has total funding of about $4 million, including $2.1 million from Glenwood, Asset Management, and Brian & Edwards. Microsoft’s $1 million for about 9 percent of the company gives it a total valuation of $11 million.

Release 0.5

As Microsoft makes deals with companies whose products run on Suns (this one and a rumored link with Sybase), it’s interesting to speculate on the shifting marketplace. Last week Dave Norman complained at Comdex because Compaq is overdistributing its 386 machine (that is, not limiting its distribution to support-intensive dealers such as his own Businessland). Sun-style software is showing up on pcs. Pc-type prices are showing up on Suns...

Release 1.0

12 June 1987
Microsoft isn't the only mainstream company interested in enriching its line with an infusion of artificial intelligence. Information Builders Inc. of New York City, the vendor of Focus, has just signed a letter of intent to acquire Level Five Research of Indialantic, FL, developer and vendor of PRL3 and Insight 2+, functionally compatible expert system tools for the VAX and pc environments, respectively. (A Mac version is in development.)

For those who care, this is exciting news: IBI's 300,000 users (2500 mini/mainframes and 60,000 pcs) represent a significant base of potential converts to the expert system religion. With 5000 users, Level Five Research used to claim the largest base of pc expert system tool users (about on a par with Texas Instruments' Personal Consultant), but Adam Osborne, with 10,000 copies of VP-Expert out there, has now handily surpassed that.

Level Five is clearly a successful expert-system tool company, but its market presence and impact pale next to Information Builders' -- and IBI's -- resources. Focus is the most widely used end-user fourth-generation language, offering access to a wide variety of mainframe data bases (including IMS, DB2, IDMS, Adabas, SQL/DS, Datacom, and VSAM), RDB and Oracle on the VAX and dbase on the pc. With it, individuals can build end-user applications (as opposed to transaction processing systems). IBI president and founder Gerry Cohen estimates that half of his users have gone through Focus training either from IBI or from qualified third-party or in-house trainers and are capable of using Focus as a tool as well as Focus applications. These same people should be able to use Insight or PRL3 as easily, after training in one of IBI's 14 support centers nationwide.

The synergy between Focus and Insight/PRL3 should be considerable, since they are both "decision-support tools," and the reasoning capabilities of Insight/PRL3 should serve to enhance the data-manipulation capabilities of Focus. Cohen, who was one of Insight's first hundred users back in 1984, aims to build an interface between the two right away, and then to combine the two into a single integrated product. IBI will also build an IBM mainframe version of Insight/PRL3.

IBI is private (an eternal challenge to some investment bankers we know) and generated profitable revenues of $95 million last year. Level Five Research, founded by brothers Henry and Karl Seiler in 1984, is also private. Terms of the pending deal are undisclosed.
EVENTS AT INFERENCE

Don Putnam, chief operating officer of Inference for 10 months, recently resigned to start his own investment-banking and venture capital firm in Los Angeles. In doing so, he is returning to his roots in the financial community. For six years prior to his stint at Inference he ran a division at SEI, selling financial and consulting services to portfolio management customers. Somewhat like Larry Geisel at Intelligent Technology Group (who recently hired Inference chief scientist Paul Haley; Release 1.0, May 12), Putnam is looking for ways to apply AI technology to financial services, competing with Coopers & Lybrand and a host of other companies. Clearly, a number of people see a market...

Back at Inference, president and CEO Alex Jacobson is handling sales and marketing and finance, while EVP and chief technical officer and co-founder Chuck Williams has taken over customer services. The company still faces a challenge in getting its new C-based version of ART for the VAX into stable form. About 60 customers are using the initial release, and Inference is working to understand some difficulties they are reporting. Meanwhile, the American Express Authorizers’ Assistant (Release 1.0, 4 August 1986), based on a LISP version of ART, has finished its evaluation by American Express and successfully met specifications for speed and accuracy.

RELEASE 1.1

The final name for Persoft’s TNET is IZE -- as in prioritIZE, organIZE, summarIZE, categorIZE... This product, discussed in our May 12 issue, is the text base management system that does more than just give you a location so that you can find a piece of text. In addition, it provides a hierarchical "map" of your text, so that you can know what you have and where you are.
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COMING SOON...

• Neural net notes.
• Natural-language processing.
• Object-oriented data bases.
• Hypertext.
• Announcements from Ashton-Tate, Apple, Lotus, Microsoft.
• Nitty-gritty experts.
• The Forum transcripts.
• And much more...

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RELEASE 1.0 CALENDAR

June 14-15  Communications and information systems - San Francisco. Meet the people behind many computer & communications companies. Sponsored by Alex. Brown and targeted to financial analysts. Contact your rep or Stephanie Morrison at (301) 727-1700.

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

June 16  CEO roundtables of the Massachusetts Software Council - Burlington, MA. Get together with your peers to talk about strategic alliances and dealing with adversity. Contact: Joyce Plotkin, (617) 497-5716.

June 18  Export issues: Distribution alternatives - Burlington, MA. Sponsored by the Massachusetts Software Council. A morning meeting. Contact: Joyce Plotkin, (617) 497-5716.


June 23  ADAPSO computer software & services industry financial forum - New York City. The fourteenth annual, and still worth it. Contact Sheila Wakefield at ADAPSO, (703) 522-5055.

June 24  Inside today's venture capital financing - New York City. Meet the VCs, including Ed Goodman of Hambro, George Sing of Merrill Lynch, Tony Sun of Venrock, Gordon Baty of ZeroStage, and Harvey Wertheim of Harvest Ventures. Sponsored by MIT Enterprise Forum of New York and CAMIT. Call Mary Havlin at (212) 532-8181.

June 29-30  Microcomputer Managers Association meeting & show - New York City. By and for micro managers; meet your customers. Contact: Annie Zdinak, (800) 237-0316 or (201) 569-6916.


July 12-16  Information Center conference and exposition - New Orleans. Sponsored by Information Center magazine. With MIT's Sherry Turkle, others. Contact: Julia Stasio, (617) 542-0146.

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.


August 5-7  Seybold conference on desktop productivity - Boston. The usual roundup. Sponsored by the Seybold Group. Contact: Beth White or Larry Magid, (408) 297-0888 or (213) 320-9151.


September 1-3  PC Expo - New York City. Topics, exhibits for micro managers. Sponsored by PC Expo. Call Steve Gross, (800) 922-0324 or (201) 569-8542.


September 14-16  DataStorage87 - Santa Clara, CA. Sponsored by DISK/TRENDS and Freeman Associates. The conference in the field, with Larry Boucher of Adaptec, Ryal Poppa of Storage Technology, and others. Contact, Cartlidge & Associates, (408) 554-6644.


September 21  Fall membership meeting of the Massachusetts Software Council - Newton, MA. With a program on fourth-generation languages. Contact: Joyce Plotkin, (617) 497-5716.

September 20-24  Design management conference - Martha's Vineyard, MA. Sponsored by the Design Management Institute, with special attention to product design and packaging -- but not just computers. Contact: Betsy Speer, (617) 236-1315.


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.

September 29  CEO roundtables of the Massachusetts Software Council - Newton, MA. Get together to talk about common problems. Contact: Joyce Plotkin, (617) 497-5716.


October 4-8  OOPSILA '87 - Orlando, FL. The second annual conference on object-oriented programming, sponsored by ACM and chaired by Adele Goldberg (ParcPlace) and Chet Wisinski (PPI). With Kurt Schmucker, Mike Nastos, others. Contact: Jerry Archibald, (914) 789-7695.

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October 20-22  Networld - Dallas. Sponsored by Novell. Contact: Annie Zdinak, (800) 237-0316 or (201) 569-6916.

October 21-23  IFIP conference on computers and law - Santa Monica, CA. Issues that just won't go away: Copyright, contracts, taxation, computer crime, legislative actions. Sponsored by IFIP and Los Angeles County Bar Law and Technology section. Contact: Michael Krieger, (213) 208-2461.


October 27-29  UNIX expo - New York City. Managed by National Expositions. Contact: Don Berey, (212) 868-2727, or (212) 391-9111.


November 2-6  COMDEX FALL - Las Vegas. Needs no introduction... Contact: Jane Wemyss, Interface Group. (617) 449-0600.

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November 13-15 Hypertext '87 - Chapel Hill, NC. Sponsored by IEEE, ACM, and other worthy groups. Contact: Frank Halasz, co-author of NoteCards, (512) 338-3648, or John Smith, (919) 962-5021.

December 1-3 Optical Information Systems - New York City. Seminars and exhibits, focusing on CD ROM, sponsored by Meckler Publishing. Contact: Marilyn Reed, (203) 226-6967.

1988 (PLAN AHEAD!)

February 21-24 PERSONAL COMPUTER FORUM - Naples, FL. We moved it in search of variety and better weather. Registration forms will be mailed to subscribers next fall. For further information, please call Sylvia Franklin, (212) 758-3434.


February 25-27 Workshop on technology and cooperative work - Tucson, AZ. Sponsored by Bell Communications Research and the University of Arizona. Contact: Robert Kraut, (201) 829-4513 or Jolene Galegher, (602) 621-7477.

March 16-23 Hannover Fair CeBIT - Hanover, West Germany. Contact: Donna Peterson Hyland, Hannover Fairs USA, (609) 987-1202.


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

Please let us know of any other events we should include.
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Sylvia Franklin
Associate Publisher