AT LONG LAST NeXT

The NeXT system is not just a hot new box; it's a new paradigm. It illustrates many of the lessons Steve Jobs learned by counterexample from the Mac: Make it powerful. Get applications out there early. Leave room for expansion. Get some powerful second sources to establish the platform (something Apple never did for the Mac and still a controversial issue)...

And wow their socks off! NeXT has some lessons in turn for its competitors if they are capable of listening. Jobs has understood that there's more to user interface than pretty graphics: There's the user's development interface, the tools for the user or VAR to create his own programs and environment. With Objective-C and a rich class library, NeXT's NextStep is a grown-up's version of HyperCard -- its programmability, not its cuteness -- as well as Sybase, an industrial-strength database (Release 1.0, 86-6).

Overall, the NeXT machine is what we could have expected -- a superb packaging of most of the best technology of the next five years. As Jobs says, "NeXT is raising the least common denominator." However, there are also some lessons Jobs did not learn: What made the Mac great was the difference between it and the machines around it, not the characteristics of the machine itself. The NeXT machine enters a world of UNIX boxes, graphical and multi-vendor machine interfaces. By itself, each of the system's innovations, including the 256M optical drive and the mainframe-style I/O management, is wonderful but still merely an extension of things the other guys are working on. Everyone and his brother is experimenting with object-oriented languages and tools (Release 1.0, 88-9), and Objective-C provides a nonstandard but not uniquely valuable offering in this arena.

NeXT's uniqueness lies in the seamless combination of all these features, in a system that has got to cause some tough thinking at Sun and Apple. (Evidently, it has already had that effect at IBM.) The immediate impact of the NeXT machine is to make us think differently about the computer marketplace, as the Mac did. The long-run impact of NextStep, the development environment, may be to make us think differently about computers.

FORUM PLANS -- SEE PAGE 17
The IBM deal

Commercially speaking, NeXT's deal with IBM is the single factor most likely to make it successful, by luring third parties to write software for the system. The applications and tools announced, so far as we can tell -- Sybase, WriteNow, Mathematica, Franz LISP, Adobe Illustrator, something from Cricket and Lotus -- are all UNIX ports rather than software written with the NextStep tools. The availability of NextStep on IBM AIX platforms answers questions that ISVs might have about writing software for a machine targeted exclusively at the higher-education market -- and by answering them it raises the chances that NeXT will ultimately be successful enough to broaden its scope beyond the higher education market (by which time there will be a convenient medium for software distribution). Indeed, although we understand IBM is paying NeXT $10 million plus royalties for the honor, NeXT should probably have paid IBM for the support.

Much of what makes the NeXT unique -- the entire multi-media hardware platform, that is -- is currently NeXT's alone, but the development environment will now be available on IBM's range of AIX machines, including the PS/2 and a vastly souped-up RT III likely to appear next year. Although they may run slower and have limited access to data on-line and no multi-media, those applications will run essentially the same on the IBM boxes with a minor re-compilation (that's the promise, anyway).

Who's the user?

The immediate uses for the Objective-C-based NextStep environment will be simulation and modeling applications, such as Jobs and scientist Richard Crandall demonstrated at the announcement. How relevant is this to business? More than you'd think. The purported promise of end-user programming is that users will be able to model rather than program what they want, and have the system implement it. As the objects incorporate basic capabilities such as how to find data, send mail, determine values, etc., end-user "programming" will become the job of defining applications and sequences of actions for the computer to carry out.

But who programs? Perhaps we need a fundamental rethinking. What made the Apple II, the PC and the Mac wasn't applications, but tools: tools for analysts (VisiCalc, 1-2-3), tools for writers and document creators (PageMaker), tools for record-keepers and small organizations (dBASE). Perhaps what will make NeXT is not an application built in NextStep but NextStep itself -- a design and prototyping tool for the manager of the future. Just as pc tools were not general-purpose but were targeted at specific kinds of users, so is NextStep targeted at a specific kind of user -- students and, later, businesspeople who plan, design and manage business units.

NextStep will support a variety of class libraries -- call them half-completed applications especially designed to be easily customizable. As more and more of a business's operations are automated, the need for custom-designed software becomes greater and greater -- given that you're dealing with business policies rather than back-office logistics. NextStep will become the tool with which managers implement their business goals -- creating prototypes of business strategies and procedures instead of memos describing them. Other users, following behind just as users of 1-2-3 models and dBASE applications did, will use the NeXT and its successors to carry out the work or handle the information defined by builder-users.

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Behind it all, there will still be someone creating object classes beyond those found in generic libraries such as those in Stepstone's Objective-C, which include generic objects such as system resources, graphical objects and the like. These will be the VARs -- independent third parties or in-house techies -- who may do for NextStep what third parties did for other platforms before it, albeit at a higher conceptual level. A businessperson could model an application much as a student might model an experiment in an environment where gravity and various physical laws are already defined. But it will be more than just a simulation: Sybase and NeXT plan to develop an object-oriented toolkit for Sybase that will integrate it tightly into NextStep so that conceptual models can easily be transformed into production database applications. As building blocks, industry- or task-specific class libraries could include accounting items and structures, structured documents with display and layout rules built in (using PostScript, of course), and any other kind of software object useful for constructing an application.

PLATFORM WARS

The NeXT machine seemingly heats up the growing rivalry between OS/2 and UNIX for the standard of the future. In fact, it's ridiculous to assume there will ever be a single standard, although we devoutly hope that there will be a single UNIX.

No matter. The NeXT machine moves the war onto higher ground. What defines NeXT is not UNIX or Mach, and what defines IBM's AIX will not be UNIX. Rather, they will be defined by NextStep, the development and operating environment. Ten years from now everyone may be using something called UNIX/2 that bears some small resemblance to systems available today. The real battle will be over the development environment (including ON Technology's) atop that operating system and the object classes within it. There will be hot battles raging over, say, standards for revenue recognition and the appropriate class hierarchy to use for people in human resource systems. Since money will hardly exist other than electronically and people will frequently work as contractors and subcontractors, it will be hard for the complex financial transactions and intellectual-property accounting of the late Nineties to operate effectively if we don't all follow common rules in managing these things. (The slogan of the future: Open objects!)

Certainly, the NeXT software components could theoretically be hacked up on top of DOS (as can multi-tasking, memory extension and the like), but at some point force-fitting becomes ridiculous. The contribution of NextStep is to make it easy and "least-common-denominator" rather than merely possible. That will allow not just for a new kind of reality-matching models and applications but for a new kind of user who has always had the knowledge but never had the tools to create them.

The promise of NeXT is to deliver on the notion that every user can be a programmer much as every user can be a telephone operator -- not because the users have all become experts but because the systems have so effectively hidden their plumbing and allowed their users to deal with the world on a conceptual rather than networking level. (Vendors have reneged on that promise with the proliferation of access codes and inscrutable e-mail systems, which just shows what a problem lack of standardization can be.)
In short, the next generation of systems will be targeted not at the analyst who massages numbers, nor at the clerk who enters data, but at the manager and thinker who model and define their businesses conceptually -- people who until now have worked without tools because there was no easy way to represent an org chart, a chain of command, a policy manual, a sequence of decisions. Given that most of these people don't yet have computers, it's probably appropriate that NeXT is starting in the education market and IBM in the engineering/scientific market...

But even now NeXT has also paid appropriate attention to the humanities -- and implicitly to the value of text, e-mail, document management and the like -- with the the Digital Library, including not just documentation and dictionaries, but the entire works of Shakespeare and a powerful text-search facility. We expect these tools and others built with NextStep to manage large corporate text bases in the long run.

Unresolved issues/opportunities

NeXT's most obvious flaw is the lack of a medium for software distribution other than $50 optical disks. The assumption seems to be that you will download what you need from your college's on-line library. Well... If NeXT doesn't address this quickly, we assume some third party will. Meanwhile, the good news is that developers can save time and money by distributing documentation on disk, accessible through NeXT's full-text search.

How will IBM reconcile SAA and UNIX; Presentation Manager, Metaphor and NeXT? More on this in the future, from them and from us.

Why did NeXT use the 68030, a processor nearer the end of its life cycle and widely used elsewhere, instead of the more fashionable RISC? Perhaps cost. We're sure the kernel was built with future architectures in mind.

Color? First things first. The most important is to have a large, high-resolution screen. Color can be added later, as an option.

Timing? Well, we hope to have Steve Jobs and a close-to-finished product at our Forum in March, but nothing's out till it's out.

The show

The product announcement itself, despite all the hoopla that preceded it, was in classic good taste. Jobs and Co. made the sensible decision to let the system itself carry the day, without Talking Heads or dancing girls or any other distractions to insult the audience's intelligence. The music was grown-up and relevant -- a duet between the NeXT machine and a violinist. In a sense, the whole show mirrored NeXT's decision to abjure color in favor of higher resolution and low cost -- true power instead of flash. We only wish that some key figures from Apple and Sun (including the creator of the UNIX that NeXT is based upon) had been invited (following the excellent example of Ashton-Tate's Ed Esber, who recently presented an award to longtime opponent Wayne Ratliff).

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EIFFEL -- A TOWER OF OBJECTS

With the use by NeXT of Objective-C as the foundation of its NextStep application environment, object-oriented programming is moving into the realm of commercial acceptability. Other language vendors stand to gain from the halo effect even as they lose share to Stepstone's Objective-C. One such vendor is Interactive Software Engineering, located in virtual nowhere in Santa Barbara and founded by Frenchman Bertrand Meyer. Something of a cult language among its few users, Eiffel hasn't yet hit the bigtime, in part because Meyer stands outside the OOPS establishment.

Eiffel got its start when UC Santa Barbara professor Bertrand Meyer was trying to build Cépage, a language-specific syntax-directed editor. (Meyer had left a job with Electricité de France to study software engineering more rigorously than was possible in his role as manager of software engineering.) To do the job properly and create a generic tool that could be tailored to a variety of languages and their grammars, he discovered that he needed an object-oriented tool -- one that ultimately evolved into Eiffel and proved far more commercially interesting than its immediate product, Cépage. (The Eiffel environment includes an Eiffel-specific version of Cépage.)

What makes Eiffel so special? To start with, it avoids the compromises of most other C-oriented languages, which allow you to avoid objects at will. Of course, some people consider that an advantage. With an installed base of 120 licenses, Eiffel has only a small claim to commercial success (compared with Objective-C's and C++'s thousands each, to say nothing of a blessing from IBM or AT&T), but it has gotten favorable notice from Sun in its search for a language for the next rewrite of UNIX. Basically, C++ is an extension of C, and is not considered fully object-oriented by the people who care about these things (see Release 1.0, 88-9). Objective-C is not a cross between C and Smalltalk, but rather an amalgamation of the two with the all-important dynamic binding, mixing the two paradigms freely throughout a program. Smalltalk itself is truly object-oriented but lacks the performance and commercial acceptability of the C-oriented languages. Finally, there's Complete C, which faces all the marketing problems Eiffel does and then some.

Eiffel's syntax and structure are most like those of Ada, but it creates and manipulates objects in a way that keeps the purists happy. It generates C code primarily as an intermediate language, and supports encapsulated C subroutines from within an object-oriented environment whereas the C-oriented languages send messages to objects from within a C-oriented structure. A developer never sees the underlying C code: For better or worse, Eiffel regards C as a sort of portable assembly language rather than a development consideration. (One exception: When Eiffel is used as a cross-development tool to generate a self-contained C program that can be run on a non-Eiffel target machine.)

Perhaps Eiffel's greatest strength is its practice of what it preaches: It comes with its own object-oriented development/debugging environment built in itself, the Viewer. The Viewer, based on an incremental compiler that can compile a single class at a time, allows users to create and modify objects interactively. For Meyer, Eiffel's object-oriented language is only the implementation of a broader goal, a CASE tool to build reliable, correct
code, with facilities for trapping errors (assertions and exceptions). "It is not just a prototyping environment," he says firmly.

Cépage

Cépage is a generic tool customizable for a variety of languages. It does everything it can do so that the programmer needs to do only the unpredictable. The more structured the language, obviously, the more helpful Cépage can be. Cépage, for example, can generate the appropriate syntax and structure from the user's choice of a menu item or his typing of "if ..." The system will automatically create an entire "if... then... else..." sequence which he can fill in by tabbing from section to section. Needless to say, such expressions can be nested within others.

Also, Cépage can generate a smart "outline" of the code by collapsing not just lines indented a certain number of spaces, but the contents of certain (types of) expressions, leaving a program's structure but not its details visible to the writer.

Each implementation of Cépage is built with Eiffel, and treats the language clauses as objects. It endows them with behavior and structure (inherited according to the appropriate grammar) that the resulting implementation can easily manipulate. The user's typing in of a certain syntax or selection of a menu item is translated to mean "create such-and-such a syntactical object," which then knows how to display itself on the screen, and to accept the user's input as arguments or data for itself. (Similar capabilities, but for C only, without the object-oriented extensibility of Cépage, can be found in Sabre-C (Release 1.0, 88-8). Reasoning Systems has the beginnings of a similar capability in its C Language Subsystem, same issue.)

RELEASE 1.1: C++ THE PROMISED LANGUAGE

Bjarne Stroustrup of AT&T Bell Labs asks us to note that C++ is a compiler, not a pre-processor (as we described it in Release 1.0, 88-9 -- sorry!). That is, it does its own optimization and provides a far more coherent environment than a pre-processor. In a pre-processor, you end up with two programs going over source in series that understand only part of the program and give error messages relative to only that part.
Discussions between the Open Software Foundation (Release 1.0, 88-6) and the AT&T/Sun forces are heating up, with diminishing hopes of rapprochement. That would be very nice, but we're not sure how much it matters. While we hate to see fighting over spurious issues, we're not sure AT&T ought to join what looks increasingly like the world's most expensive PR organization. In the end, AT&T should either win right away -- by getting System V Release 4 adopted -- or walk away and work to get SV.4 adopted by the marketplace, which is where the issues will ultimately be decided anyway.

Should AT&T join OSF? Right now the sticking point seems to be the adoption of System V release 4 over IBM's AIX port, based on System V.2. AT&T is firm on this point, as well it might be. Why should it join an organization promoting a product with only tens of thousands of users (AIX) or none (if it builds a truly new kernel) over one upwardly compatible for a user base of millions? The issue devolves into a related disagreement over the addition of the AT&T camp to OSF's board, a move that would give that side a majority (if most of them pay their $13.5 million and join).

In fact, AT&T seems to have time on its side. A nonprofit foundation with mostly temporary staff faces a tough challenge in building a new operating system or even reassembling one from used parts -- and if it instead uses AIX as is, why should the other members go along with promoting IBM's product?1 Meanwhile, IBM's AIX is undergoing a substantial rewrite that should be completed next year. This Release 3 will be the basis of OSF's offering. We don't think it's impossible for OSF to overcome these disadvantages -- but it may take more time than the Foundation can afford.

Thrust and counterthrust

Thus it's becoming harder and harder to argue that OSF will have a product -- and that AIX is just a foundation for it. Indeed, divisions among members are inevitable: "IBM is starting to behave the way Sun did when it got into trouble," one interested observer tells us. "They're [strutting] around saying they've got the system of the future [in AIX]." Then it was Sun's ties with AT&T that riled everyone; now it's IBM's assumption of the mantle of industry leader. With its investment in the NextStep environment to run on top of AIX, IBM has also signaled an increasing aggressiveness in the UNIX market -- and cast doubt on its commitment to the interface OSF supports, although you could build any look and feel you want with a NextStep toolkit. (You pick our kernel, but we may not pick your interface.)

In this context, consider the OSF sponsors' interests in UNIX. Only three of them -- IBM, DEC and HP -- have a significant sunk investment in a particular brand of UNIX as expressed in development dollars expended on proprietary enhancements. Apollo is beginning to sell a lot of UNIX, but technically it and the other OSFers should be indifferent to which UNIX in particular they sell, since they resell a licensed port without altering it

1 One magic moment at the recent meeting of some 40 people from all camps, including OSF's technical staff: Sun's Bill Joy asks, "How many of you here have actually designed a kernel?" One hand besides his own went up -- that of AT&T's Jim Knowles. That may be a little unfair, but crack design teams are tough to assemble quickly.

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much; their current customers are mostly using SV.3 and BSD 4.3 (non-AIX) derivatives, and so they may have some interest in keeping their installed base happy. Thus only IBM itself (and some IBM-oriented third-party software houses) has technical reasons to support AIX; for the others, AIX is a counterthrust to SV.4. Now where's the counterthrust to AIX?

Note that in this discussion we have mentioned users only as a source of sales for vendors, and we have not mentioned third-party application vendors at all. In fact, the amazing thing about all this commotion is how rarely users' interests are mentioned, let alone addressed. AT&T's Bob Kavner says he is considering a direct appeal to users rather than to competitors. Although he doesn't have the flash of Vittorio Cassoni, he has something even more valuable -- a strong position, and the sense not to flaunt it. While OSF is working assiduously to remain nonpartisan and open to all vendors and is discussing its procedures for assimilating vendor input, AT&T could easily gain the high ground with the following hypothetical approach:

"Dear (potential) customers (including VARs, ISVs and unaligned hardware vendors):

"We apologize for our past mistakes; they were the result of ineptitude, not malice. We will work with other vendors to the extent that we can, but we are more concerned with producing a product that we can sell -- and that you will want to buy -- than with assuming a posture of civic virtue.

"We're not going to pretend that we aren't after your money, because we are. Our corporate charter says that we should make profits in order to serve the widows and orphans who own our stock. But we recognize that the way to be most profitable -- long-term -- is to serve you effectively, and that is what we aim to do. Since you number ten or more times the number of users of AIX, we assume you want us to continue enhancement of System V Release 4 -- but let us know! Also let us know what enhancements in particular you would like. Obviously we can't do everything each of you asks for, but we will listen to your needs and concerns -- if only because we want to keep selling you product.

"By the way, that is why we are continuing our skunkworks with Sun in Menlo Park to develop a wholly new version of UNIX for the early Nineties. This is a difficult project -- one that requires vision and guts, not consensus. There's no way a committee could possibly judge or manage this effort. We are building a totally object-oriented kernel and starting from the ground up. And yes, we're assuming a risk. We know we won't be able to impose this new OS on anyone. It's not an extension (although we'll try to make it upwardly compatible); it's an entirely new product that will have to succeed on its own merits and the support of independent third parties. The success of our efforts will ultimately be measured by you -- by the market."

This message, backed with a $13.5 million advertising campaign (using funds allocated to OSF membership, an alternative PR move), would probably sound pretty convincing to its intended audience, if not to AT&T's competitors. But the real proof will be the marketplace success of SV.4 and future versions thereafter. If other vendors want to partake of that success by licensing UNIX from AT&T, we're sure marketplace realities (read customer demand and public opinion) will lead AT&T to continue making profitable but not charitable licensing arrangements with its competitors.
COMMUNICATIONS AS PLUMBING

DCA/Intel's new CAS (Communicating Applications Specification) architecture is useful in itself -- it adds communications to each of a user's (appropriately configured) applications, rather than adding one more item to a roster of discrete applications. But CAS and its first implementation in Intel's Connection CoProcessor are also illuminating in the perspective they provide on two other issues: the utility of OS/2 and the utility of co-processors, courtesy of the next generation of buses -- either MicroChannel (MCA) or Extended Industry Standard Architecture (EISA).

Intel's new CAS standard is an applications interface that allows an application to call on communications services. It comes in two parts -- a (memory-) Resident Scheduler that talks to the application (or interface, if it underlies an E-mail package) and a Transfer Agent that manages the communications process. The Scheduler can operate in the background behind a regular DOS application; the Transfer Agent requires substantial facilities and needs either its own co-processor, a server or a separate process (as available under OS/2) to operate. Thus you can see where a bus that supports intelligent co-processors (as opposed to the AT bus, which permits them if they're very careful) could come in handy. Likewise, all the memory and task management problems would have been much easier under OS/2. Indeed, CAS is in part a way to extend DOS for a specific set of communication functions that would be much easier to integrate under OS/2 or UNIX.

CAS in point

The first implementation of CAS is Intel's newly announced Connection CoProcessor, which allows users to "print" a file to a remote Connection CoProcessor or Group III fax machine as easily as they can print to a local printer. CCP's Transfer Agent sits on an intelligent add-on board with a fax/modem chip and slots for other chips in the future (including a 2400-baud modem). CCP maintains a file of people/devices (on the user's hard disk) with whom the user communicates, so that most of the time the user doesn't even have to specify an address or a communications medium -- fax, MCI Mail, whatever -- once he has named the recipient. The best example so far is Symantec's Q&A, which fully supports CAS -- and thereby the Connection CoProcessor -- and allows users to do "fax merge." That is, you take the message with the fill-in blanks and the database, and send out as many personalized fax messages as you can afford. (That's why we don't publish our fax number!) WordTech will offer TimeScribe, a phone-management system that will dial numbers automatically and log the calls and user-defined time charges and subject indicators in a WordTech database -- ideal for people who bill for their calls and need to keep accurate records.

The value of CAS implementations will lie in their ability to operate as part of another application and yet independently of its system resources, relying on their own add-on or connected resources while the rest of the user's system goes on its merry way. This is not a unique capability, but it's one that has not yet been implemented in a general way. Indeed, only part of CCP's value is inherent in its design; the rest is contingent upon its adoption by a wide selection of application developers for significant numbers of applications (just like the Lotus-Intel-Microsoft spec for memory expansion). Support within Microsoft Works, for example, is nice to have but hardly redolent of wholehearted commitment from Bill Gates. (Microsoft

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Word 4.0 has a similar resident mail capability through Microsoft's own Mail, but it relies on a direct link rather than a general spec.)

And at the other end, CAS needs to -- and will -- support a greater variety of communications media beyond facsimile and its own message format. CAS should be easy for application vendors to support because it's small, taking up a minimum of RAM and almost no system resources. But even that shadow of inconvenience reminds us of how much easier such things will be under OS/2 and UNIX. Communications need no longer be a separate application that is either loaded or not loaded; it can simply be a function that is called as needed, with a single interface to a variety of communications devices. Having a standard protocol for that task is a benefit that will persist when the CCP is moved to OS/2, but Intel went to much more trouble to get it to work under DOS than will be required to do a similar product for OS/2 only.

E-MAIL TRADE: INBOX IN SYMANTEC'S OUTBOX, SUN'S INBOX

While we're on the subject of standards, Symantec and TOPS/Sun made a tidy trade last week, moving the e-mail business of Bedford, MA-based Think Technologies from one West Coast parent to another. (Think was acquired by Symantec last year.) The transfer makes a lot of sense both for marketing and technical reasons, because Think's InBox will dovetail nicely with TOPS Mac-oriented network software. (Says Symantec president Gordon Eubanks: "After we acquired it, Microsoft made a big entry into the market and it was clear it's easier to sell when it's bundled with a network operating system." Lucky for Microsoft Symantec didn't sell it to Novell, as Ashton-Tate almost gave rights to SQL Server to Novell.) In fact, TOPS' first move will be to provide the long-awaited version of InBox Version 3 to its 400,000 current Mac users in its next release of the software, due out next year. Compared to the 2 million installed base of Macs, that's quite a swing vote.

TOPS will also include InBox with the TOPS for PC upgrade, for an installed base of 130,000 users. The prospects for InBox and TOPS in the PC and Sun world are a little more problematical: TOPS will eventually be merged with (into, onto, over) Sun's Network File System, and presumably InBox will follow as an option, if not a standard. (Only a true hacker could love Sun's current E-mail interface.) Technically, InBox works as a desk accessory on the Mac, allowing users full access to their mail from within other applications -- they can create messages, receive and view messages, and store them all without leaving their current application (although they do have to save a file from their current application and select the specified file by name if they want to send it). The PC version of InBox, for now, isn't so handy: It runs as a separate application and isn't accessible while another application is running, unless you've managed to install InBox, a network, and a memory manager such as Windows 386. Like CAS, this just shows the need for multi-tasking operating systems and co-processors.

Long-run, E-mail will resolve itself into two components -- the interface, either as a mail package such as InBox or a programming interface to another application; and the message-handler, such as the CAS Transfer Agent, Sun's NFS, or Novell's MHS. With both components and a lead in the Mac and Sun marketplaces, Sun/TOPS looks well equipped to compete in an e-mail market unlikely to have a single standard.
AION'S LOSS; INTELLICORP'S GAIN

Marketing & sales senior vp K.C. Branscomb has just left Aion to join IntellliCorp as president and chief operating officer. Although her move looks like a defection to a competitor, in fact the two companies are about as different as any two "pure-play" expert system tool vendors could be. (The two companies could be extremely complementary as part of a single, merged entity.) Aion is tightly focused on the IBM market, and has gradually been changing positioning of its Aion Development System to that of a CASE tool with embedded expert system facilities, which builds modules for incorporation into production systems. For example, ADS is used by several insurance companies in underwriting applications and is part of Boole & Babbage's DASD Advisor, which monitors use of mass storage facilities in IBM environments.

IntelliCorp, by contrast, sells AI -- perhaps excessively so. While Aion's ADS is almost all rules, embedded within applications using traditional languages such as COBOL and Pascal, IntellliCorp's KEE eschews rules and concentrates on the use of frames, graphics, and rich data structures. KEE is primarily a tool for modeling and information representation, used by professionals and analysts who wish to understand their problems better. But that places KEE precisely where a lot of software companies are heading -- and where a lot of OS and hardware vendors (see Platform Wars, page 3) are looking for software that will distinguish their particular offerings. What is programming but modeling and expressing that model rigorously? And what is end-user programming but such modeling at an extremely high level, with powerful transformation capabilities underneath to turn those abstract models into file structures and executable code?

Thus IntelliCorp's technology is far more marketable now than it has ever been, and to a far larger market, if Branscomb can successfully do for IntelliCorp what she did for Aion and for Metaphor before that -- with sensitivity to the current culture and market each time. IntelliCorp is ready to move forward after a year of consolidation since the unfortunate ouster of Gene Kromer (now at Franz). The company has been managed and cost-controlled over the past year by former president (now chairman and still ceo) Tom Kehler and former chairman Ed Feigenbaum, who is eager to get back to academia full-time (and who has just published The Rise of the Expert Company). IntelliCorp's KEE and related products now run on stock hardware including Suns, VAXes, and IBM mainframes and PCs (under Windows, yet) and need only some careful guidance to find their way into a mainstream that is flowing their way.

Back at the rAionch

What now for Aion? With the departure of Branscomb, who joined the company on a temporary basis two years ago, Aion is likely to become slightly less aggressive in expansion, remaining instead solidly profitable (and closely held, with funding from Asset Management).
NEW LIFE IN OLD CATEGORIES

In a fast-changing business such as software, it's also easy to grow jaded quickly. Following are profiles of three products that we at first resisted examining because we thought we knew all about their categories -- personal financial management, portables and map packages. Moreover, the "fancy" technology each applies -- expert systems in Financial Insight, handwriting recognition and forms management in Linus's Write-Top and programmability and graphics in Mapinfo -- is in itself nothing new either.

For shame! In fact, each of the three products is an example of just how powerful technology can reawake a tired old category. The appropriate application of technology is still a worthwhile, too-rare achievement.

FINANCIAL INSIGHT: AUTOMATION BEYOND THE CHECKBOOK

Usually we hate personal financial packages because all they do is make us feel guilty (we really should be looking up our 1987 interest to tell our accountant instead of looking at this program or even writing about it), but Financial Insight is different. Written by Dennis Nicholson, a PhD in computer and information sciences who built and sold a power-plant management software company in the early Eighties, Financial Insight eschews double-entry bookkeeping, using a simple record-book metaphor instead. Nicholson intends eventually to build an expert tax advisor, but decided to do this product first (a pre-add-on), so as to collect all the data that the user will need to run his tax advisor.

Like its brethren, Financial Insight prints checks. It knows all about different kinds of income and transactions and does fancy calculations under the covers (and manages its own dBASE-compatible files with C-based tools), but what appeals most is the clarity and simplicity of its interface. As we've argued so many times before, the outline (brought to us by Dave Winer of ThinkTank fame) is more than just a writer's tool; it's a fundamental way to structure and present information. Financial Insight starts out with a Table of Contents that you can travel into instead of past (across; a tab page from the user's binder), moving to the right section or subsection to record your transactions. You can easily move them down (Is your pet gorilla an investment or an expense?) and consolidate items by looking a level or more higher in the outline.

Because Financial Insight is based on a database and each outline item is merely a view or a data-entry form, there's no danger of double-counting because each transaction is recorded only once -- when you type it in -- regardless of how much you copy it or move it around or put it in multiple accounts (both real estate and "bought through Billings Borings & Bloggs"). Unlike double-entry bookkeeping, which effectively forces data into a pre-defined, possibly irrelevant structure (assets and liabilities, income, expense, current assets), Financial Insight can keep related transactions together (such as a stock purchase, receipt of dividends, brokerage fees and related margin expense). Moreover, double-entry systems find it tough to analyze return on investment because they implicitly posit that every loss is offset by a gain, and throw away valuable information when they "close" the books and balance accounts at the end of a period. Although Financial Insight's ROI capabilities could theoretically be built into any system,
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SUBJECTS - each subject corresponds to a page in the book

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<td>Net Assets Summaries</td>
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'+' before 'Stocks' indicates 'Stocks' is composed of other subjects (i.e. 'IBM' and 'gold')

hidden detail below 'Bonds' can be displayed by selecting 'Bonds' and pressing either < + > key

'-' before 'Bees' indicates there are no other subjects below 'Bees' in the outline

'++' indicates reference to a subject defined in Journal or Funds section

Press ... To ...

< + > Show outline detail for selected subject
< - > Hide outline detail for selected subject
<PgUp>, <PgDn> View prior/next 'screen full' of TOC
<Left>, <Rt> Move highlight up/down one line
<Up>, <Dn> Move highlight up/down at same level
<Home> Move highlight up to higher level
<End> Move highlight to last subject at same level
<Ins> Add new subject to Table of Contents
<Del> Delete subject from Table of Contents
<space> Edit name of selected subject
<Alt> Move subject in direction of <arrow>
<F1> Display instructions
<F2> Turn to selected page
<F3> Display print options
<Esc> Exit program

Printing options:
Print report
Install printer

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they generally aren't found in personal financial systems; the software (de-
veloper) doesn't think that way.

The Financial Insight user can thus view his transactions and return on
investment by whatever category he defines. There are also the usual stan-
dard reports: One shows profit and loss for the year (including unrealized
gains and losses), with return on investment. Another gives you net worth;
yet another summarizes your tax situation, with data for each table as well
as the bottom line (in caps): "YOU OWE..."

We've seen lots of financial planning packages but none that gave us the
same sense of knowing where the numbers are going; you don't just enter them
and lose them until they show up on summary table or in some rigidly defined
format. Because of the database underneath, Financial Insight has the flex-
ibility to maintain the data for itself while showing it to the user in the
most convenient way (which is what databases are all about).

The product is in beta status right now. Author Dennis Nicholson (a.k.a.
Type III Software, a one-man company) talked to a couple of potential pub-
lishers last year but nothing panned out, so he went back to work on the
product. Thus, unusually for a beta product, it's completely finished, in-
cluding an elegant user's manual: Throw out the documentation, and use the
binder to file your financial reports. It's neatly tabbed for the purpose,
with explanatory material about each of the reports on the tab sheets. All
it needs is a publisher -- preferably before this year's tax treatment goes
out of date.

Countless financial planning packages come and go without a trace; only a
couple make it. One survivor is Quicken, from Intuit (see Release 1.0, 87-
9), based on the philosophy that people don't want enhanced check-writing
functions; they want the job over quickly. The philosophy of Financial
Insight is that you needn't tell it what to calculate. You tell it what
you've done, then you tell it what you want to know, and it shows you.

LINUS TECHNOLOGIES: NOT JUST 'MINE'S SMALLER THAN YOURS'

What can you do with a portable but make it smaller? That's what everyone
and his brother has been doing for the last couple of weeks, with a notable
lack of distinction among the competitors. But there's one competitor with
another answer: a clever combination of input technology and marketing
focus that renders its portable unique. Linus Technologies' Write-Top is
not a portable desktop computer but rather a movable peripheral for data
entry. It happens to use DOS because that's convenient and allows it to
subset the "parent" applications for data validation and minor calculations,
but the assumption is that Linus is part of an anchored host system. It
need not be a pc; Linus could talk directly to a mainframe in terminal mode,
or to a network server.

Write-Top still isn't the machine that's going to get that mobile executive
stepping out of the cab in the commercial to step up with his American Ex-
press card, but it will get out beyond the pc-toting analysts and account-
ants to people with specific tasks. While most of the vendors see their
portables as DOS pcs on a stick, Linus sees its Write-Top (for now) as most-
ly a data-entry device. Write-Top comes with a screen that can understand
handwriting person-specific and its own forms-building software, Forms-Write. The handwriting recognition is the most notable part of the package, but it's only part of a broader concept.

Write-Top costs $3000 for one, but Linus sells in quantity only -- to VADs and OEMs who configure multiple task-specific systems for customers who give them to employees or agents to use in the field. An application might be a screen-based form with a number of fields on it. As the user selects the name field, a large box pops up onto the screen for the user to write in a name. When he's done, the user presses "match" and checks the display, which shows the computer's interpretation of what he has written. If it's correct, he presses enter; otherwise he can rub out a mistake with a horizontal line or create a space with a vertical line, and write in the correct information. (Users with good handwriting can bypass the "match" stage and enter their data directly; they can still go back to edit mode if they see a mistake.) When the user gets to male or female, he simply selects the right answer with the stylus.

For example, Baxter Health Care has installed several Write-Tops in a pilot project at a Chicago hospital's emergency room, where nurses use it to record consumption of hospital supplies. Baxter, of course, takes great interest in the use of supplies and hopes eventually to hook Write-Top directly into a requisition system. For now, it looks as if the presence of Write-Top will cut unrecorded use by almost 50 percent, allowing the hospital to charge the appropriate patients (or their insurance companies). The nurses don't need to use a database or ordering system itself; they just need to do data-entry, filling in any of a limited number of forms with a limited amount of information -- but not so limited that they could just pick items off a menu.

Other early users of Write-Top include a Caterpillar dealer in Maryland who is outfitting his field service people with Write-Tops, and a real-estate appraisal company. We expect that many vendors will use Write-Tops as tools for salesforces and customers, performing revenue-generating and recording tasks and ensuring customer loyalty -- and vendor insight into customer behavior and consumption patterns. Linus and Write-Top are part of the general trend towards electronic link-ups between customers and suppliers.

One intriguing notion not yet explored is Write-Top as a graphics terminal for spatial rather than textual information. Write-Top doesn't have the resolution or "feel" to act as an input device for drawing applications, but for design, where a user selects and positions objects, or annotates, say, an architectural drawing as a user wanders around a construction site, it could also come in handy. We have given Linus's name to the people at MapInfo, below, and vice versa. (Do we get 10 percent?)

MAPINFO: MAP IT WITH MEANING

Last month we complained about the lack of meaning in so many graphics programs. We have been intrigued by a number of packages that provide graphical images as a way into data, starting with Telos Filevision (remember?) and more recently Roykore's Opus 1 and a number of hypertext-like packages -- click on a spot and see the data. Then there are the presentation mapping packages -- find some data and color a map or pinpoint some locations.
But in most of these packages graphical images serve merely as an index to the data; the packages have little capability for manipulation of the graphical data unless you're willing to pay thousands of dollars. Until now...

MapInfo, a vendor of a powerful PC-based mapping package, has a tough marketing job ahead of it, especially if it gets typed as desktop mapping -- its own designation and one that tends to trivialize its capabilities and focus on such features as WYSIWYG display rather than data manipulation capabilities. In fact, with MapInfo you get quite a lot more than you can see. Where most "desktop mapping" products are basically presentation tools with links between data items and designated coordinates on the screen, MapInfo is a fairly sophisticated mapping/spatial tool of a power now found mostly on packages an order of magnitude more expensive. (A map can be anything from a "regular" map to a floor plan, anatomical diagram or any other representation of two-dimensional spatial reality.) MapInfo is trying to do for mapping what AutoDesk has done for CAD.

To start with, MapInfo is vector-based, which makes it size- and display-independent. For any address in 5000-plus US cities, it can show the block and the correct side of the street. How does it know? Like most map package makers, MapInfo uses and resells so-called boundary and coordinate files supplied by a variety of government and other agencies and map houses (which it translates into vector-based representations). Perhaps the widest-used representation is Zip Codes; for more local info, MapInfo has address files for 330 SMSAs, as well as 40 sets of state boundaries, counties, and other data of demographic/geographic/marketing interest. (SMSA stands for Standard Metropolitan Statistical Area; the US has 330 of them.)

Behind the MapInfo displays are links to dBASE files which the system knows how to manipulate with its own language, MapCode, which manages spatial as well as textual data. (MapInfo estimates that 85 percent of all databases include locational information.) MapCode allows users to build real graphical applications rather than simply query the data and perform simple transformations such as: "Color all the states with population density greater than 50 per square mile red." MapInfo shines in more complex manipulations that require some geographical smarts: "Show all our customers within 25 miles of the San Jose airport and list their names, addresses and account numbers." For this query, which might have helped American Airlines in its recent decision to put a new hub in San Jose, the system matches the coordinates of each customer address with those of the San Jose airport, and returns the answer. Give it a list of addresses, and it can show you which routes pass which customers. (If you care to write an optimization program to do the calculations, MapCode can take care of getting you the data.)

Launched a couple of years ago when a project at Rensselaer Polytechnic turned into a company, MapInfo has been shipping its $750 product since 1987, and has just started shipping release 3. The company has sold 2000 copies to several hundred customers, many of them local governments and others including UPS and Federal Express (although they have by no means standardized on MapInfo). Resellers are now using MapCode to build systems for police departments to track crimes, and for other agencies to manage municipal facilities and handle responses during large-scale crises. Telemarketing is sure to follow. (That's why we may no longer publish our phone number either; see our response to fax merge on page 9!)
1989 PERSONAL COMPUTING FORUM: GET SET FOR THE NINETIES

The Personal Computing Forum will take place a month later than usual in 1989 (no nefarious reasons, just the availability of suitable hotel space), from March 19 to 22. We are moving back to our old haunts, Palm Springs, in search of good weather and morning alertness among West Coast attendees. Invitations won't be mailed out until after Comdex, so don't worry yet. (If you get your registration back to us by year-end, you should have no problem getting in.) The Forum will be managed by Daphne Kis, who has just joined us (thank goodness!) from Home Office Computing. We have just begun to invite speakers; we will publish a preliminary list soon.

We're sorry that this date conflicts with Purim (the feast of Esther!), but we had locked in the dates by the time we noticed the problem. Please come and celebrate in Palm Springs!

Note the dates: March 19 to 22!!
RESOURCES & PHONE NUMBERS

Harry Reinstein, Larry Cohn, Aion, (415) 328-9595
Bjarne Stroustrup, Paul Fillinich, AT&T, (201) 522-6664
Bob Kavner, Barry Campbell, AT&T, (201) 221-8089
Bill Filip, Lee Reiswig, IBM, (914) 686-1900
Rich Bader, Intel, (503) 629-7367/7394 or (800) 538-3373
Tom Kehler, K.C. Branscomb, IntelliiCorp, (415) 965-5500
Bertand Meyer, Interactive Software Engineering, (805) 685-1006
Scott Cook, Intuit, (415) 322-0573
Ralph Sklarew, Linus Technologies, (703) 476-1500
Sean O’Sullivan, Ken Harrison, MapInfo, (518) 274-8673 or (800) FAST-MAP
Steve Jobs, Conall Ryan, NeXT, (415) 424-0200
Alex Morrow, Henry Crouse, Open Software Foundation, (508) 683-6803
Scott McNealy, Bill Joy, Sun Microsystems, (415) 960-1300
Dennis Sisco, Stepstone, (203) 426-1875
Bob Epstein, Sybase, (415) 596-3500
Dennis Nicholson, Type III, (215) 933-8521

COMING SOON...

- Visual programming languages.
- Graphics standards.
- Document and file management.
- Constraint-based modeling.
- Comdex preview.
- And much more...

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RELEASE 1.0 CALENDAR


October 23-28  Monterey Classic - Monterey, CA. Where investors and companies discuss common goals... Contact: John Baumeister, (408) 987-4200.


October 24-25  Intertainment '88 - New York City. A conference on interactive entertainment for and by vendors in software, broadcasting, movies, videotex, CD-ROM, theatre, advertising, etc. Keynote: Nolan Bushnell. Also: Gary Arlen, Trip Hawkins, Robert Gehorsan (Prodigy), "Tamara," Ed Schlossberg. If you don't know these names, forget it; if you know them all, you must be a dilettante. Sponsored by Alexander & Associates. Call Sally Chin, (212) 382-3929.


October 26-28  Venture forum '88 - Boston. Sponsored by Venture Economics, the authority in the field. Talks by many VCs and by perennial supplicant Bill Poduska (Prime, Apollo, Stellar, ...?). Contact: Diane MacArthur, (617) 237-1121.

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October 27-29  Northeast Computer Faire - Boston. Sponsored by the Interface Group, for small systems users. Contact: Andrew Shapiro, (800) 325-3330 or (617) 449-6600.

October 28  Massachusetts Software Council meeting - Newton, MA. With Computer Associates chairman Charles Wang, the great acquisitor; and Banyan president David Mahoney on networking. Open to non-members (who should join this useful group). Contact: Joyce Plotkin, (617) 437-6279.


October 31-November 2  Autofact/SME - Chicago. Plenary speakers: John Sculley, Ken Olsen. The annual factory automation event, sponsored by the Society for Manufacturing Engineers. Contact: Jill Vanderlin or Becky Alsup, (313) 271-0023.


November 2  Quotron Reuters Telerate - New York City. The name says it all. A conference to examine these three electronic data providers, sponsored by Waters Information Services. Call Dennis Waters, (607) 772-8086.

November 2-3  TISC SEMINAR ON EMERGING SOFTWARE TECHNOLOGIES - Tarpon Springs (Tampa), FL. Targeted at chief technical officers of vendor companies, with a focus on implementation of new technologies such as cooperative processing (Paul Rampel, Orion/Apple), object-oriented programming (Dennis Sisco, Stepstone), expert systems (Harry Reinstein, Aion), software repositories and development workstations (Lou Mazzuchelli, Cadre), communications (Lew Shepherdson, Simware), and groupware (Esther Dyson), both for internal use and for products and services to be resold. Presentations will be brief and assume some knowledge of the topics; audiences will be small enough to allow for extensive interaction. Sponsored by Adapso Technology Information Services Committee. Contact: John Gracza, ADAPSO, (703) 522-5055.

November 2-4  Adam Green's dBASE R symposium - Woodland Hills, CA. Three-day conference of dBASE third parties, including clones, compilers and complements. Contact: Marny Peabody at Digital Consulting, (508) 470-3870.

November 2-4  CASE user conference - Monterey. With Vaughan Merlyn and user war stories. Sponsored by CASE Research Co. Contact: Elizabeth Skowronnek, (206) 453-9900.

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November 3 MICROPROCESSORS '89 - San Jose. Architects with vision from each major microprocessor vendor gather to discuss design, architecture and strategy. Speeches by SPARC champion Dave Ditzel; Nexgen’s Nick Tredennick, RISC critic and 68000 designer; Chris Rowen of MIPS; 88000 guru Mitch Alsup of Motorola. Targeted at people using, not building, chips. Sponsored by Microprocessor Report, an excellent newsletter. Contact editor Mike Slater, (415) 494-2677.

November 9-10 UNIX: Mainstream or myth - New York City. With Yankee’s Howard Anderson and Nina Lytton; the OSF president, whoever it may be; Larry Dooling, AT&T; Jim Bell of X/Open; Max Hopper, American Airlines. Sponsored by the Yankee Group. Call Melinda Stoddard, (617) 367-1000.


November 14-16 The software re-engineering symposium - New York City. Sponsored by Digital Consulting Inc. With Rich Currier, Panoramic; Charles Bachman; Eric Bush, LTI; Mike Lyons, Asyst; others. Contact: Dan Horgan, (508) 470-3880.

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

November 15-17 Neural networks and their applications - Nimes, France. A practical-minded workshop. Sponsored by a variety of mostly French, mostly academic organizations. Contact: Norbert Giambasi, (011) (33.1) 47.80.70.00.

November 16-18 Standards and the desktop - Boston. All about SGML (Standard Generalized Markup Language) and the power it provides to hypertext, database and documentation applications. Sponsored by the Graphic Communications Association. Chairman: Yuri Rubinsky, SoftQuad. Speakers include Haviland Wright, Avalanche; Janet Walker, architect of Concordia; Phil Lehman, Scribe; others.


December 5-7 Strategic issues forum - Cambridge. Sponsored by Decision Support Technology. Contact: Donna Kacin, (617) 354-6400.

December 5-8 CASEXpo - Anaheim. Sponsored by Arthur Young; chaired by Howard Yudkin, president of the Software Productivity Consortium. Contact: Rhoda Canter, (202) 956-6041.

December 5-8 Document Processing Systems - Santa Fe. Sponsored by ACM. With CD-ROM, hypertext, SGML, CALS, and object-oriented

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databases, documents are getting exciting! With Gerard Salton, Esther Dyson, among others. Contact: Rick Beach, (415) 494-4822.

1989

January 17-19

February 13-14
LaST Frontier Conference - Tempe, AZ. On software as intellectual property, with nine law professors, chaired by Milt Wessel (former counsel for Adapso). Sponsored by Arizona State University College of Law. Contact: Rosalind Pearlman, (602) 965-2124.

February 13-15

February 14-17
Software development '89 - San Francisco Airport. Sponsored by Miller Freeman, with speakers including Larry Tesler, Dick Gabriel, Terry Winograd, Bjarne Stroustrup, Ed Yourdon. Contact: KoAnn Tingley, (415) 995-2471.

February 28-March 2

March 6-10

March 13-18
Seybold Seminars '89 - San Francisco. The place to be published...er, seen. Contact: Kevin Howard, (213) 457-5850.

March 14-16
Interface and World Congress on Computing - New York City. Moved from Chicago, in search of more enthusiasm. Sponsored by Interface. Call Walt Heithaus, (617) 449-6600.

March 19-22
EDventure Holdings Personal Computing Forum - Palm Springs, CA. With the first annual EDwards for EDventurous performance. See page 17. Contact: Daphne Kis, (212) 758-3434.

March 28-30

April 10-12

April 30-May 4
CHI '89: Conference on human factors in computing systems - Austin. Sponsored by ACM/SIGCHI and a host of other groups. Contact: Claudia Raun, MCC, (512) 338-3798.

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<td><strong>PC Expo</strong> - New York City. Sponsored by PC Expo. Contact: Steven Faher, (800) 444-EXPO.</td>
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<td>July 31-August 4</td>
<td><strong>SIGGRAPH '89</strong> - Boston. Sponsored by the Association For Computing Machinery. The annual festival for visual, graphical thinkers. Contact Cindy Stark, (312) 644-6610.</td>
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<td>August 9-11</td>
<td><strong>Conference on object-oriented dbms applications</strong> - Santa Clara, CA. Sponsored by Santa Clara University. Contact: Mohammed Ketabchi, (408) 554-2731 or <a href="mailto:mketabchi@scu.bitnet">mketabchi@scu.bitnet</a>.</td>
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<tr>
<td>August 22-26</td>
<td><strong>IJCAI-89</strong> - Detroit. The international version of AAAI. Sponsored by the American Association for Artificial Intelligence. Contact: Claudia Mazzetti, (415) 328-3123.</td>
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<td>September 7-10</td>
<td><strong>Comtec '89</strong> - Singapore. The third regional microcomputer exhibition. Organized by ITP Services and the Microcomputer Trade Association Singapore. With 71,000 visitors (28,000 professional, trade or business) in 1988. Contact: Yong Mee Hiong, Singapore 2913238; fax 2965384.</td>
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*Please let us know of any other events we should include.*  -- *Maria Soler*
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If you have any questions, please call us at (212) 758-3434.

Daphne Kis
Associate Publisher

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