Schussel's

DOWNSIZING JOURNAL

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In This Issue:

Report from CLIENT/SERVER WORLD and DATABASE WORLD

DATABASE and CLIENT/SERVER WORLD, held in Boston mid-June this year, were the most successful conferences and expositions ever sponsored by DCI. During my attendance, I focused on the conferences. In this, the second article in a two-part series, I'll summarize interesting points from both my keynote presentation and that of Mike Stonebraker, UC Berkeley.

Stonebraker on databases

Mike Stonebraker has always been a favorite at DATABASE WORLD. His excellent, in-depth grasp of

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Downsizing: The *NEXTSTEP* at Chrysler Information Systems

An Interview with Mike Adelson, MIS
Chrysler Financial Corporation

Chrysler Financial Corporation is on the leading edge in large client/server system design and deployment: they have in the past year re-engineered the entire corporate system architecture that supports their 100 branch offices.

The architecture that is being replaced is a UNIX-based environment employing AT&T 3B2 servers with 615 dumb terminals. This environment, of course, limits end-user flexibility and capability. Chrysler

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Financial decided that a GUI, relational database on a client/server architecture was the architecture they wanted to use as a foundation for their systems.

After evaluating the OS/2 and Windows worlds, they found that NEXTSTEP was going to be the best environment in which to build and deploy.

Following is an interview with Mike Adelson, MIS Project Manager at Chrysler Financial Corporation.

GS: Tell us about your applications, and how your corporate system was set-up before the new client/server architecture.

MA: The old architecture, which we are still in the process of replacing, employs AT&T 3B2s in each branch office. Each 3B2 has 615 dumb terminals hanging off of it. Eighty percent of the time, the terminals are used for mainframe access to host applications. The remaining twenty percent of the time, the terminals are used to run applications that reside on the 3B2 and office automation applications.

Our applications support the credit application process, as we;; as wholesale and retail loan financing, just to name a few functions. Currently, almost all of the data is mainframe-based. Local nodes are serviced by the 3B2s, which are, in a broad context, cluster controllers for access to the mainframe. Very few applications actually run on the 3B2.

GS: In your end-users' views, what were the limitations of this older architecture?

MA: Our old systems only allowed users to work on one application at a time, as is true with most dumb terminals. Therefore, if they were servicing the needs of a customer while they received a call from another customer, they would have to log out of their current application, log onto a different application, etc.

In addition, eighty-percent of the time, the users were dealing with the mainframe, the speed of which is governed by communications lines. We realized that this environment was the working world to the users who sat in front of terminals everyday. Anything we could do to improve their environment was going to help them to do their jobs better.

GS: In looking at client/server and object oriented technologies, what features have you found to be superior to older technologies?

MA: At the front-end, with our PCs running NEXTSTEP, the environment is much easier to work in—you can multitask which allows our end-users to service customers quicker and better. Generally, users are becoming more productive by multi-tasking—using many applications concurrently.

It is easier to train people for such an environment, and it is easier to have interaction between applications within a GUI environment: if you're working on a mainframe application and you have data that you'd like to send in a letter to your customer, you can cut and paste that information into the letter and then print it, or even fax it out directly.

End-users now have quicker response times—we have 56 KB communication lines as compared to the old of 9.2 KB, and we're noticing right off of the bat that we are receiving faster responses from our mainframe. With E-mail, we can interact with other people in the office without having to leave our desks. If I need to share a WordPerfect document with someone, or turn in a report to my management, I just drag and click the document, and off it

goes into E-mail. I now interact with my vendors over the Internet. You can actually send and receive documents much faster with our new system than Federal Express ever could deliver.

However, the bottom line is that this new architecture also delivers important, intangible benefits. It allows us to service both our retail and our wholesale customers better, such as being able to fax literature to a customer, or provide on-line help to an end-user. It provides better information quicker, and enable us to react and make decisions faster. The underlying architecture will enable users to do things in the future that we didn't think of when developing this architecture, or that we haven't even thought of yet. The robustness of the system is much more than we ever envisioned.

GS: Once you decided to use a client/server architecture with a GUI, can you describe the process that led to you choose NEXTSTEP instead of OS/2 or Windows.

MA: When we started looking at the front-end software for the user and developer interfaces, we set down four basic requirements.

- ☑ It had to be a good user interface—this was critical. It had to be easy to use, clear, resolute and, hopefully, multi-tasking.
- ☑ The interface had to be flexible—something that developers could easily work with in developing good, adaptable applications quickly.
- ☑ It needed to hook into a Sybase database via point and click or some other easy access method.
- ☑ It was very important to have remote administration capabilities—we did not want to have local administrators at every branch office throughout North America.

We found that with tools such as ObjectView, Object1, Ellipse, and PowerBuilder (which performed the best of those mentioned) good developer environments were provided, and somewhat good user interfaces also existed. But, we still needed some underlying remote administration capabilities. With the tools I just mentioned, we would have had to rely on Windows, Windows NT, or DOS for system administration, and that just didn't make us happy. When we looked at NEXTSTEP, we saw everything that we had specified on our list in one package. NEXTSTEP provides the following environments:

- ☑ object oriented development
- ☑ remote administration
- ☑ transparent networks
- ☑ office automation
- ☑ multi-tasking

We performed some financial analyses and discovered that by the time you package all of these applications together for the Windows world, it would costs more money per user than did the NEXTSTEP environment. Besides, NEXTSTEP is one tightly bundled package of software that was specifically designed to work together—it was the one-stop shopping we were looking for.

GS: You say that NEXTSTEP offers good remote administration capabilities. Please explain in some detail the advantages of NEXTSTEP in this capacity.

MA: When you have UNIX running on both your server and the clients, you already have your communications network; UNIX was built as a network protocol operating system whereas DOS was not. We have TCP/IP-based LANs and a WAN with UNIX running throughout North America. If I need to get into a machine, no matter where it is

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or where I am, I can telenet right to it with just a few keystrokes and I can be inside that machine. If someone is having problems, I can be in the background of their machine, tracing what they're doing, and helping them through the problem.

There is a product that runs on NEXTSTEP called Screen Cast that, if installed on both machines, allows the technicians to look at what the user is doing, while they are doing it and participate—they can move the mouse on the user's machine and see exactly what problems are happening. If its an underlying UNIX problem, with the product, the technicians can see that too.

GS: I know that you modified and customized the standard NEXTSTEP environment for your offices. What exactly did this entail?

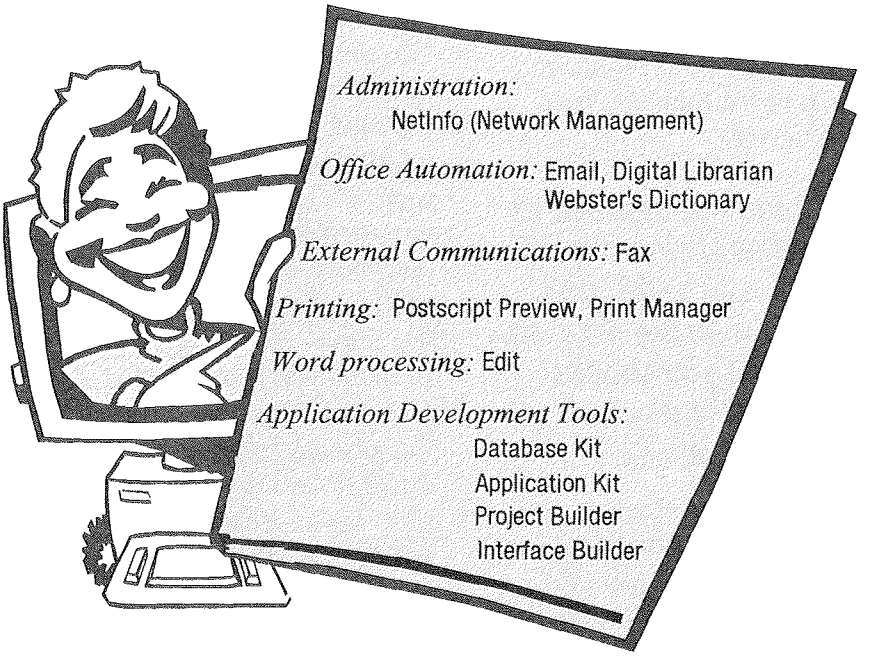
MA: Our operations management did not want to give the entire NEXTSTEP package to all of the branch users. It is a very robust environment and there are certain things in the package that allow interface flexibility. We did not want the branch users changing colors, keyboard maps, etc., and possibility getting themselves into trouble. However, we ended up taking out very little system functionality—just enough so that with the customized version, users can't get themselves bogged down. In the home office, we haven't disabled anything, but that's because we're only a few hundred people who are located in the same building as the technical help. But, when you're talking about 2500 users spread out across the U.S., that's a lot of potential problems we wanted to prevent.

GS: NEXTSTEP on the Intel x486 platform was important to Chrysler—how much did your user set-ups cost, and how are they configured?

MA: Each user has a 486 DX2 with 20 MB RAM, 170 MB hard drive, 15 inch monitor, and complete NEXTSTEP software. The cost for these set-ups were just under $3,000 each. If we had gone with proprietary machines, the price per user would have been closer to $7,000.

GS: Have you found any disadvantages to working with the 486 platform?

MA: We haven't found any disadvantages. The only difference is that with the 486 machines, we did not buy sound cards. However, for $120/machine, we can upgrade and add sound to the machines at any time.



Chrysler's NEXTSTEP Package

**These are some of the NEXTSTEP applications currently being used by Chrysler MIS.*

GS: What type of application might you use that would require sound?

MA: Training software would be more helpful if sound were included. We are going to research setting up a multimedia training program that will lead users through software demonstrations.

Another use for sound would be conferencing over the network. But, for everyday use, we determined that sound was not necessary. In fact, sound is the only thing that we didn't buy. These machines run faster than the black box, the monitors are just as clear, and everything certainly works just as well.

GS: The NeXT monitor, is that a mega-pixel monitor?

MA: The monitors we bought are 1024 x 768 pixel, for about $430. It is almost as clear as a NeXT station. Twenty of my people used NeXT stations for eight months during development, and have now switched over to the Intel stations. Of these, maybe 50% could pick up the slightest of clarity difference. The monitor we selected was right at a price break: they become very expensive when you try to move up to 1280 pixels.

GS: Describe for us your server environment.

MA: In the branches we have NCR 3445s, 486 DX2 Intel boxes, with anywhere from 32 to 64 MB RAM depending on the size of the branch, 4.2 gigabyte hard drives in the small branches and 5.25 gigabyte hard drives in the large branches. Our primary software is NCR UNIX System 5 Level 4, and we use Sybase as the database. The servers don't have GUIs. Our final goal is to have such systems running in over 100 branches. The only people who will work on the servers are DBAs and UNIX technicians from remote logins in corporate headquarters.

GS: To turn this new system on, you don't need to have the mainframe connectivity piece of the puzzle solved?

MA: We fully have the LAN and WAN architecture in place to support mainframe connectivity. What we are now working through is rightsizing the data. We are establishing new PCs, new servers, new TCP/IP LANs and WANs, and we can connect over that structure to the current mainframe data applications that still run. At first, users will still use the mainframe applications with a 3270 package running on NEXTSTEP that will allow multiple windows into the mainframe. As we rewrite our applications and downsize our data, they will use NEXTSTEP to access the data on Sybase.

GS: Tell me about the impacts that all of these changes have made on your personnel—specifically your IS developers and the branch end-users.

MA: The IS personnel, we determined, was to be a retrain situation. When you're moving from COBOL and DB2 to object-oriented, that's quite a shift with a huge learning curve. It doesn't matter what you use, whether it is NEXTSTEP or not, moving into the object-oriented paradigm is the major issue. Our developers had to learn C and UNIX, and they needed to fully comprehend the object-oriented paradigm.

GS: How many months of retraining were involved?

MA: I'd say that for our developers that were already working with C and UNIX, it probably took six months for them to feel comfortable with the object-oriented paradigm, and then fourteen months total to be at full speed. For the developers without C or UNIX experience, it took eight to ten months for complete training and to get into a comfort

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zone, and then probably eighteen months total to feel very confident with the new environment. This is a significant amount of time, but that time investment is minuscule compared to the savings that we're going to realize over the next decade.

Chrysler's attitude from the beginning was to keep the existing staff and retrain them for the new environment. We have had an excellent response from our IS staff. The key to success in this area, I have learned, is to make sure that the staff takes ownership of the project. They should be involved in the plans from the beginning—don't just plop down the responsibility on their desks; we tried to involve everyone from the get-go. Its their new world and they are willing to work hard to learn it. It is also a lot more fun this way. With the team spirit, communication is improved: better involvement with the developers breeds better feedback to the management.

For our end-users, they needed teaching—the majority of these people had never even used PCs. They needed to learn about GUIs and using a mouse. That part of the training only takes about one-half hour. After that, when they see how the system really works and how it will help them—they just love it.

GS: What has been the time elapsed since the beginning of the project?

MA: From October 1991 through September 1992 our time was spent doing management evaluations and system selections. The various decisions that had to be made included nine months of software evaluation, six months of hardware evaluation, time spent defining the LANs, the WAN, the clients, the server, etc. Prior to these definitions, we had to perform return on investment studies among other research studies.

In putting all of the chosen pieces together—developing the software, running the cable—all of these tasks took less time than the preparation process. We were able to establish the majority of the system between September 1992 and May 1993. Of course, there are still odds and ends that need to be done.

GS: Are there any hidden costs or surprises that you ran into that no one has been talking about, but you feel that people should be aware of?

MA: When you move into a client/server environment, no matter which system you go with, there aren't going to be as many controls as exist in the mainframe world. A lot of people end up worrying about security and back-ups; there are a lot more security holes and risks with UNIX, so you have to fill those holes. Unfortunately, there aren't many control packages available on the market. Client/server is so new that third party vendors haven't yet written applications to support the architecture.

When building a client/server system, watch your support carefully. You now will have a need for network support that didn't exist previously. There are more pieces in this much larger puzzle: there are routers, concentrators, PCs, etc. Whenever there are more pieces, you have more chances for failure.

Otherwise, we hit a lot of bumps in the road because there weren't many companies out there for us to go to and say, "Hey, how did you do your North American-wide client/server architecture?" Companies had done smaller projects, but nobody that I could find had done anything of this magnitude. So, if you're a pioneer, you're going to get hit by some arrows. But, we did the research, and the project has gone very well. GS

Technologies for Business Re-engineering

Herbert Edelstein
Euclid Associates
Part I of II

In days gone past, drawing blood from a stone was considered a miracle. In modern times, miracles are considerably more practical— consider this example: if you downsize, your company will save hundreds of thousands of dollars in the first day, you'll be able to convert enormous, complex applications that took 22 calendar years (4,000 person years) to implement, and it will only take one day and two people whose only previous experience was with word processors. In this way only, is downsizing so eloquent and successful.

If you haven't already guessed, my role here is of resident skeptic.

In this article I want to discuss business re-engineering, because essentially, when you look at downsizing, there are really only two things people are talking about: re-hosting or re-engineering. With my IBM mainframe, I'm doing "mainframe computing"—I have a single, large, central resource which multiple people access concurrently through dumb terminals (display devices). When I take this ten-year old mainframe technology, throw it out and replace it with modern technology for continued "mainframe computing," that is re-hosting. The bulk of the savings in what people call downsizing is achieved through such re-hosting.

...If you haven't already guessed, my role here is of resident skeptic....

The second meaning of downsizing, and the definition that I believe to be more important, is the move to distributed architectures and client/server computing. In fact, if I compare a client/server solution to a re-hosting solution, at best, they are roughly equivalent in cost. And, at worst, client/server computing will be more expensive because there are little things that client/server still does not address well—like systems administration.

Re-engineer or re-host?

What really begins to save a company's money in massive amounts is not "downsizing." If I have a $5 million investment in computers, and a $2-3 million computer operating budget, what is the most amount of money that I can save annually? Only, $2-3 million right? (since that's all I spend). Business re-engineering says that, there may be a better way to save money, and it has nothing to do with looking at technology—technology comes last. What comes first is looking at the procedures and processes of the business and saying, "in light of the technologies that are available today, what is the best way to run our business?" It may be that mainframe computing still makes sense for your company, or it may be that client/server or imaging are more appropriate. Look at your current business needs *in conjunction* with today's technology. Information technology is the key to making business re-engineering work.

The gentleman who really deserves credit for making business re-engineering so popular is Mike Hammer of Hammer Technologies, Cambridge, Massachusetts. He wrote a

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paper for a 1990 issue of the *Harvard Business Review*. One of the famous quotes that emerged from this article was, "Don't automate, obliterate!"

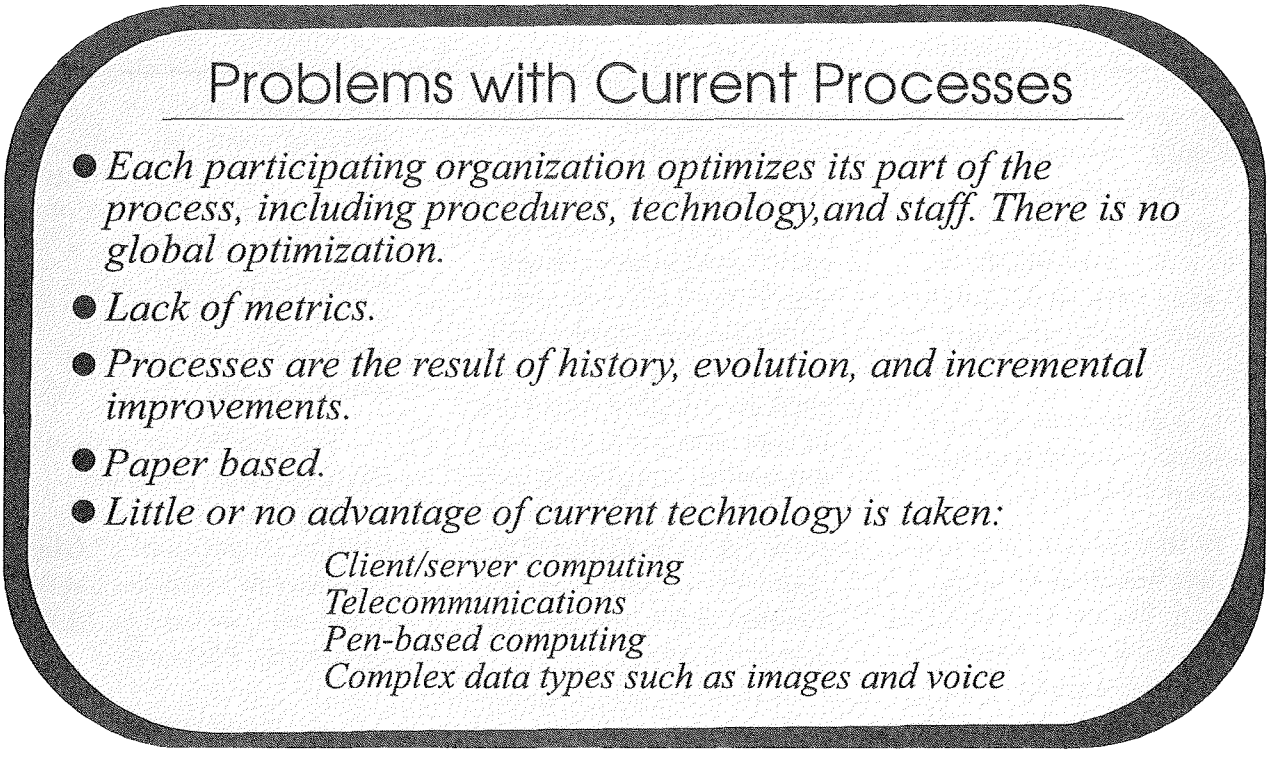
A statistic from the April 29, 1991 issue of *Business Week* is that, between 1973 and 1991, factory productivity climbed 51% while office productivity dropped 7%. What these numbers reflect is the fact that manufacturing underwent an era of re-engineering in the 1970s and 1980s. Now that computer technology is so pervasive, white collar work and service businesses have to re-engineer also. The way that companies currently use their computers, the real emphasis is on task, not productivity—we all know that person who likes to spend two days on a half-page memo getting the fonts and borders just right.

Some problems with current business processes

Business processes are sets of logically related tasks that provide a product or service to *customers*. I use of the word "customer" to indicate internal, as well as external, customers—if you and I work for the same company and I have to produce something for you, then you are my customer. Business processes frequently cross organizational boundaries in this manner.

What is not often examined within firms, but should be emphasized, is a focus on *corporate* global optimization—not departmental goals. In addition, the metrics that are used tend to be departmental metrics—most companies don't establish corporate units of measure for the company as a whole. And, the surrogate metrics usually used, such as earnings per share, leave something to be desired.

Business processes are frequently the result of history that is no longer relevant. It is always interesting to go into a company and ask somebody, "why are you doing this?" People will usually say, "gee, that's a good question, we never thought of that." This is ex-



actly the type of internal examinations companies need to be doing.

Most modern business processes are based on the use of paper. The underlying assumption is that paper is the corporate medium of storage as well as communication. However, paper has become more than a storage medium—it has become the basis for fundamental organization transactions. In fact, the passage of paper is key to starting and stopping organizational operations, and yet we often don't need paper to get the job done.

Because of all of the above mentioned problems, little or no advantage of current technology is taken at most companies. Most corporate computer technology has been centralized into an IS department. Over the last few years, we have moved to disseminated computing on everyone's desk, and people use the machines on their desktops for doing their jobs. There is no thinking about how to use the technology to affect corporate-wide change.

Why business re-engineering now?

All of this re-engineering is happening now for two reasons. The technology that we're dealing with today is significantly better and cheaper than it was five years ago. And over the next two or three years, we are going to see as much improvement as we've seen over the past five or six years. Today, you can have on your desktop a 66 MHz 486 Intel with 16 MB RAM and 500 MB hard disk storage, all for just under $3,000—that's not too shabby. I currently have an already obsolete 33 MHz 486 with only 8 MB RAM, for which I paid $5,000 two years ago. Now, I'm going to try to sell it to my neighbor's kid for $800—he's only thirteen and doesn't know better.

Technologies are tools, not solutions.

The size limitations of today's computer is the size of our fingers. I see people all of the time now with electronic pocket day timers and I love watching them type on the tiny keyboards.

We have now reached the point where LANs actually now work—they have become very reliable. Networks can now support greater bandwidths. Within two years, we will see our desktop communication moving at the speed of 100 MB/second. WANs are evolving from private T1 and T3 lines to public access networks based on frame relay and cell relay. Within five years, network speeds will be running at 600 MB/second between organizations. These are radical changes; the change in communication bandwidth will be the biggest single change of pace in the next few years—more than the processing changes.

All of these technological advantages inspire new business demands which, in turn, require new technologies. We all are in very competitive environments. Everyone has pressures to perform: product competition, profits, personnel downsizing, high demands for quality, increased demands for customer service, etc. Today, we are asking the question, *"how can we use our information systems to meet these demands better?"*

The enabling technologies

Client/server computing is certainly a fundamental enabling technology for business re-engineering. But, there exist other important technologies such as distributed data, imaging,

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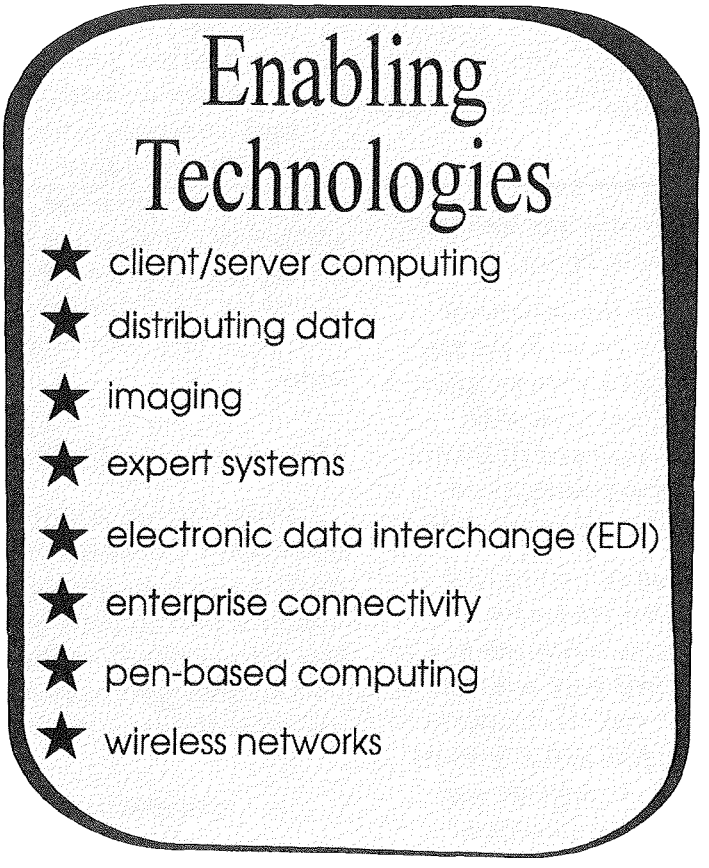
expert systems, electronic data interchange, enterprise-wide connectivity, pen-based computing, and wireless networks. But remember, *technologies are tools, not solutions.* Solutions come from analyzing business practices and determining what the ideal system would be, and then seeing which technologies you need to get to those goals. Further descriptions of some of the important technologies that will come into play with business re-engineering are as follows:

Distributed data— Distributing data is an essential part of most re-engineering plans because you want to keep the data being used close to the person using it. Technologies exist today that make this option possible. A few months ago, Sybase announced System 10, which includes the "Replication Server." The use of the word *replication* in the product name is an important recognition by a software vendor that today, what is frequently most important to the user is access to data.

Image—Imaging Systems are essentially distributed systems with complex data types. An image system enables users to insert non-electronic documents into their computer system. Documents that are generated external to a user's organization can be made an integral part of their system. For example, the Clinton administration uses a resume application that scans all incoming resumes—OCRs them—extracts key words, and then presents the resumes for review.

Text retrieval—Text retrieval is the ability to identify documents using complex conditions on their content. It is becoming increasing important with the proliferation of large text databases of publications such as books, magazines, and newsletters. *HE*



Next week's article will finish the discussion of enabling technologies and focus on the prerequisites for success when business re-engineering. This article is based on a presentation given by Mr. Edelstein at DOWNSIZING EXPO this past spring. Edelstein is a principal of Euclid Associates, a consulting firm specializing in database management and document image management. Edelstein consults to both computer vendors and users, and teaches professional seminars on a variety of topics. He is consistently rated as one of DCI's top speakers. Edelstein is reachable at (301) 983-9550.

I'm From the Government and I'm Here to Help You.

Everyone has heard about the world's "greatest lies." Typically, *"the check is in the mail"* is what comes to mind whenever I hear a great lie. The title of this short article, however, has always been my favorite fib. It popped into my head as I was reading about our federal government's decision to withdraw the existing 60% tariff was placed on the importation of active matrix color screens for laptops.

Last year, against the wishes of most computer makers, the Commerce Department decided to levy this tariff on color screens that were imported (but not on computers that contained those color screens). The idea was to encourage a domestic industry in this technology. No domestic industry existed in 1992, and none does in 1993.

That's why I was pleased to see that our government has decided to lift the tariff as part of preparations for further negotiations with Japan on import restrictions. However, it's not true that the tariff did not accomplish anything. It caused the manufacture of high-end laptops, such as the Compaq 4/25C LTE that I'm using to write this article, to be moved out of the country. My Compaq would normally have been built in Houston, but because of government meddling, it was built in Japan. The Compaq Contura with a color screen is built in Singapore. Various estimates that I've read say that the total effect of the tariff was the elimination of several hundred jobs in the United States.

Although the elimination of the tariff is good in that it will result in lower prices for computers with active color matrix screens (in the long run), its elimination is not going to bring jobs back from the overseas factories where these machines are now being built. Companies such as Compaq that moved their factories overseas, are not now going to move them back—at least not until a new generation of products arrives.

When the tariff was first instituted, there wasn't much controversy or discussion about what it's effect would be. Most analysts understood well the impact, and so forecast it. It's just that for various reasons, that may include inflexible policies, governments are frequently constrained to illogical actions.

Speaking of active matrix color, a shortage of this component is severely limiting manufacturers' abilities to supply the market. There are only two companies in the world that currently make these screens: Sharp and the IBM/Toshiba joint venture. The Compaq 4/25C LTE was backordered by six weeks in December of 1992 when I purchased my current machine. I have been on the waiting list at two stores for a second machine or its slightly faster sibling, the 4/33C, for over three months now. The stores where I've placed orders say they have no information on further availability and it may be months before more machines can be built to meet market demand.

Interestingly, within the Compaq product suite, the Contura 4/25C, which has the identical internal components to the 4/25C LTD, but is packaged in an ugly case (intentionally?), is $1,000 less and more readily available. GS

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database issues, his academic background from life at University of California, Berkeley, and his real world experience gained from founding companies such as Ingres, together make Stonebraker one of the most qualified observers of the database scene. In his keynote, he updated some points he has made in the past, as well as making a few new observations.

Stonebraker began by quoting "Joy's Law" *(Bill Joy, Sun Microsystems)* that processor capabilities double each year. The principal technologies driving this trend now are: 1) faster clock speeds, 2) superscalar architectures—processing more than one instruction in each cycle, and 3) multiprocessors combined with operating systems such as UNIX and Windows NT which take advantage of symmetric multi-processing. Based on Joy's Law and current technology, it's likely that 500 MIPS processors will be widely available at the $100,000 price point in the 1994/95 time frame. This implies a number of things:

1. The tuning of computer systems is becoming less important. Most people are beginning to use brute force to solve performance problems. Over time, hardware problems in the design of application systems will become less and less important.
3. Almost any transaction processing problem will be solvable, and will exhibit decreasing price points.
4. The use of higher level languages such as 4GLs will be mandatory because the penalty attached to lower performance will become almost negligible.

At the same time that transaction processing systems are becoming easier and more achievable, Stonebraker surmised that decision support applications will become much more demanding. Stonebraker called this new type of application *"data mining."* Once databases start storing more complex and rich data types such as audio, maps, and graphics, there will be the need to handle much more complicated queries. Stonebraker used employee photos as a data type example and postulated various queries that would search for different face types and identify "a nice smile." His conclusion was that these decision support system applications would become very challenging from both the hardware and

Microsoft/Sybase SQL SERVER

SYBASE SYSTEM 10

- *Massively Parallel Systems*
- *Client/Server with 1,000's of TPS*
- *Replication services with sychronization options*
- *Automated two-phase commits*
- *Support for mixtures of DSS and TP*
- *Mainframe qualiity utilities*
- *Meta server repository*
- *Transparent access to multiple vendor's DBMS*
- *Convergence with Microsoft SQL Server*
- *SQL Server/NT is likely to be a killer application*

2 - 3 Times OS/2 performance on single processors

Figure One

software point of view. The types of DBMS that would be necessary to solve these problems will have to support very complicated data models and more closely resemble object-oriented database structures.

Adjustments that companies should be making to prepare themselves for this new world include spending time and money updating data design, database design, and bringing new training to the management staff.

Stonebraker on software

Stonebraker doesn't see any silver bullets on the horizon to solve the software and database design problems of the new generation of applications. He suggested viewing software as a depreciating asset and making continuous investments in its improvement.

His conclusion was that the good news of easier hardware solutions will be complimented by the bad news of no magical solutions for the ongoing software problems. Some things will get harder, some easier, and we all get to keep our jobs—as long as we keep our skill sets current!

Schussel on database and client/server

My keynote ranged over a number of topics that are currently hot in database and client/server computing. My first point was that client/server computing is real and companies are moving both decision support and mission critical computing to this new paradigm. Server databases from Oracle, Informix, Ingres, Sybase, and Cincom, among others, are becoming mature, stable, and well-adapted for larger application environments. Especially newsworthy is the new functionality of replication services and support for large numbers of processors through symmetric multi-processing database engines.

Figure One is an overview of the new functionality provided by Sybase's System 10 DBMS engine. Various pieces of this functionality are being delivered throughout the 1993 calendar year.

The ability to support data replication with updates through store and forward logic allows distributed database support without having to live within a two-phase commit protocol. Many conference attendees felt that many of their applications could be distributed more efficiently and reliably with this store and forward approach than with a two-phase commit. There are very few working examples of two-phase commit-based applications live today.

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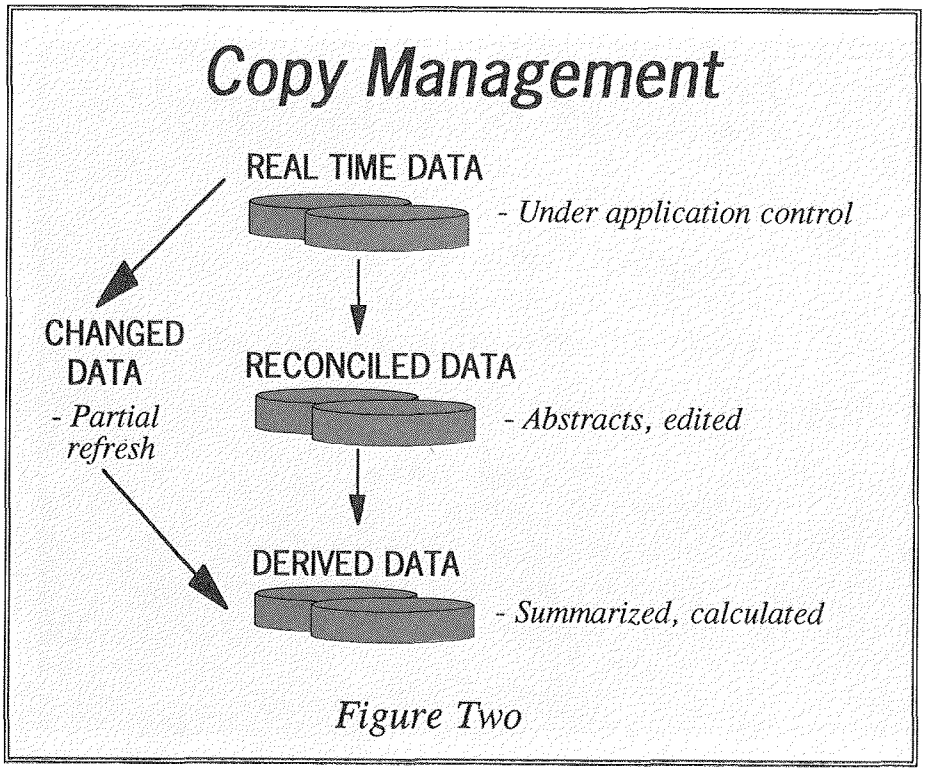


Figure Two

Report from CLIENT/SERVER...

(continued from previous page)

The combination of relational database engines that can take advantage of symmetric multiprocessing (SMP), the new SMP open operating systems such as Windows NT and UNIX, and the new generation of open SMP servers from companies such as IBM, NCR, Sequent, and Compaq, together present a formidable transaction processing potential for companies to consider. The really interesting thing about these combinations is that they promise performance at price points that are only about 10% of the costs typically associated with proprietary systems.

Another type of technology widely discussed at the conference which caught my attention was enterprise connectivity. IBM has published its specifications for the Information Warehouse. These specifications include several options for managing data copies. IBM feels that most of its customers would rather not let end-users directly access live data. An alternative approach that IBM offers includes the ability to manage data in real time, reconciled, and derived forms. The information architecture can support a "multiple schema" view of decision support data.

In addition to IBM, other major vendors such as Hewlett Packard and DEC also have announced Information Warehouse initiatives.

In my keynote, I was able to demonstrate a simple example of connectivity by using a client Windows machine and KnowledgeWare's ObjectView connected to a server running OS/2 and both FOCUS and DB2/2 database managers. I pulled data down from both database managers and inserted them into an sample ordering application. From the user's point of view, it seemed very simple—a change in data structures or DBMS required no change in the application on the client side.

The impact of objects

Object orientation is having an important impact on the way applications and tools are being designed. I decided to spend a major portion of my keynote discussing the implications of this paradigm.

The proliferation of Windows as an operating environment is the strongest single factor driving the move to object orientation. The use of objects on the client side, and relational on the server side, seem to be a natural team. And, that's exactly the point—these two technologies are not at war, but have come from very different backgrounds to be married. *How to successfully marry them is the issue.*

Objects & Relational

Objects ascendant

- *Relations = Object classes*
- *Relation is a type of object*
- *Behaves with select, project, and join*

Relational ascendant

- *Domains = Object classes*
- *Columns = Classes*
- *Object insistence = Relational cell*
- *Objects are handled inside of tables*
- *Tables can be objects*

Figure Three

Exactly how to accomplish the conjoining of relational and object concepts is the big question to be decided over the next few years.

As illustrated in *Figure Three*, it seems that there are two approaches on the table for discussion. One camp is proposing that relational models and the SQL language be handled as a special kind of object with Select, Project, and Join methods. In this instance, the easiest way to conceive of the mapping is to map a relational table into an object class. This is the approach put forth by people with an object background.

Another approach proposed by Chris Date at DATABASE WORLD, purports that objects be considered within the relational model. Date suggested that the SQL language suffers from the fact that it is an inadequate implementation of the relational model. In particular, SQL should support the concept of domains, which are relational data types. It would be possible with a relational system that supported domains to map object classes directly to relational domains. This would allow objects to be handled within the tabular construct of the relational model.

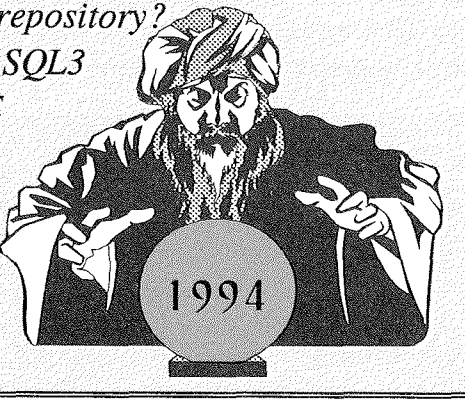
Are objects going to become relational or will it be the other way around? No one knows at the present time. This topic is sure to become prime debate fodder for consultants and vendors over the next few years.

I concluded my opening keynote with a summary of interesting technologies that will become real over the next two years (please refer to *The Futures Index* below).

Of particular interest was my speculation that the CASE industry has been written off far too early. CASE got caught in the technology warp. It's products, for the most part, used workstation technology to create mainframe applications. What people want now is to use workstation technology to build client/server applications. From what I saw at DCI's last CASE WORLD show was that software vendors are busily redeveloping their products to support client/server deployment. Many mission critical applications are just too complicated to develop without team-oriented, engineering methodologies. It's a reborn CASE industry that is going to deliver exactly those methods. *(Editor's note: The next CASE WORLD is being held this fall in Boston, October 12-21. For more information on this topic, refer to "CASE is Dead. Long Live CASE!" in the June 1993 issue of SDJ.)* GS

The Futures Index

- *100 MB LANS*
- *Cheap multiprocessing*
- *Multimedia: audio in, image & video out*
- *Massively parallel DBMS & 1,000s TPS*
- *Enterprise client/server architectures*
- *Meta server - one central repository?*
- *SQL with OO extensions - SQL3*
- *A new generation of CASE*
- *Enterprise object DBMS*



UPCOMING downsizing Events...

DOWNSIZING EXPO is teaming up with a new show, OP/EN EXPO, *The Open Operating Systems and Enterprise Networks Conference and Exposition*, for September 13-15, in Toronto. Some of the various topics that will be covered at these events include: downsizing technologies and architectures, client/server computing, managing the downsizing process, life after downsizing, business re-engineering, and enterprise servers & midrange computing. Co-Chairmen George Schussel and Larry DeBoever will preside over each three-day event.

A new seminar being this winter, December 16-17 in Washington, DC, is *Analysis and Design for Client/Server Applications*. Instructor Jim Davey will be covering a new design methodology, event driven client/server development (EDC/SD), that will help to resolve the mainframe/PC culture clash.

One of DCI's most popular seminars has been updated for its fall dates; *Cheryl Currid: Implementing Downsizing* will be in San Francisco, September 9-10, and in Orlando, November 11-12. In this two day seminar, Currid covers downsizing vs. rightsizing, approaches and strategies for downsizing, the link with re-engineering, downsizing case studies, organizational and political issues, downsizing products and technologies, networking options, and client/server databases.

Finkelstein's Practical Guide to Client/Server DBMS Computing, being held in Philadelphia, September 30 -October 1, and in Ottawa, November 17-18, has also been recently updated. Course instructor Richard Finkelstein will be covering the topics: building a client/server DBMS, evaluating database servers, database server guidelines, middleware, client/server tools, and merging object oriented and relational technologies.

Herbert Edelstein's two-day seminar, *Implementing Client/Server Applications and Distributing Data*, will be in Philadelphia, September 28-29, and in Ottawa, November 15-16. The perfect preamble to *Finkelstein's Practical Guide to Client/Server DBMS Computing*, this seminar will cover the topics of: client/server computing, open systems, networks, relational DBMSs & SQL, database integrity, and distributed data.

A favorite conference among DCI attendees, *Client/Server Workshop–Building Client/Server Applications for Windows, OS/2, Macintosh, Motif, and OpenLook*, is being held this fall in Boston, September 27-29. Conference Chairman Jeff Tash will help attendees get started building successful client/server applications through three days of helpful insight and practical advice. There will be live demonstrations of client/server products, and several leading software tool developers will share their company's strategic client/server visions.

The three day seminar, *Business Process Reengineering*, teaches attendees how "using information technology to renew the business" can be beneficial to any company's bottom line. In San Francisco, October 25-27, instructors Roger Burlton and Brett Martensen will cover topics including: case studies, process renewal methodology, enabling technologies, managing workflows, tactics for success, the change implementation phase, and techniques and tools.

For more information on any of these classes or conferences call DCI at (508) 470-3880.

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