

DOWNSIZING JÓURNAL

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Downsizing Point-Counterpoint on 1993's Hot Issues as Two Industry Experts Go Toe-to-Toe

Stacey S. Griffin Managing Editor, SDJ



he following is a condensation of a point-counterpoint debate held at Downsizing Expo, February 16-17, 1993 in Chicago between Larry DeBoever and Jeff Tash. Both of these consultants are extremely well-known and respected in the field of downsizing. At the show, they went toe-totoe in discussing the hot (or not-so-hot) companies of the

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The Life and Times of Information **Builders**

n January, I had the opportunity to spend a day in New York at the Information Builders, Inc. (IBI) headquarters. I've known IBI, the developers of FOCUS, for over 10 years and have watched the company grow and diversify. IBI has always had the right attitude about developing and competing in the software industry.

Long before Novell introduced its idea of "coopetition"—cooperation and interaction among peers and competitors-IBI had taken the necessary steps to insure that the FOCUS

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1990s, and where they see these companies heading in the future. The companies discussed, Computer Associates, Powersoft, Microsoft, EASEL, Gupta, Santa Cruz Operations, Borland, Lotus, SUN, DEC, and Novell, appear in no particular order.

ul davidas a kinomo dala su	Larry DeBoever	Jeff Tash
Computer Associates "In general, I try to stay away from CA." —LD	If in your corporation's future, you are going to have to deal with distributed systems management, I would suggest that you obtain a copy of CA's Unicenter bro- chure—this product looks viable. The feature set, I have been told, really exists and is good. In general, I have heard very positive, solid things about Unicenter. Otherwise, I am not thrilled about CA or their past products.	1 Of all the traditional, mainframe software companies, CA has been the most successful in terms of handling the transition to down- sized systems. To keep up with to- day's market transitions, CA is moving their products from the mainframe to UNIX and VAX envi- ronments. You can take any of their products that run on the mainframe today, and literally put them onto a UNIX or OS/2 box—you can move these applications today. I really believe that CA is doing a fine job.
Powersoft "Grown- ups buy this tool! This is more power." —LD	1 This company produced 30 mil- lionaires in one day. I strongly rec- ommend PowerBuilder as an excel- lent tool to my clients. Powersoft is managed by mainframe people who took what they learned about main- frame rigor and adapted that knowledge for desktop technology. If you are a CICS COBOL pro- grammer and want something with a slick, GUI design interface, <i>and</i> you understand what transactions are, this is the product for you. I really like PowerBuilder and be- lieve that Powersoft isn't going to be a one-product company for much longer.	⇔ PowerBuilder has managed to capture its market. We're seeing lots of people buy this product. To- day, the market's perception of a winning combination for building client/server is PowerBuilder, SQL Server, and NetWare. Powersoft's biggest problem is that they are clearly a one-product company. There is a lot of competition already within this marketplace, and it doesn't take too much to break into the market. Therefore, if Powersoft has even one release with a major bug, they could be in trouble.

	Larry DeBoever	Jeff Tash
Santa Cruz Operations "SCO is, without question, the market leader." —JT	SCO really means Unix on Intel. However, if you want the best Unix on Intel processors, USL, not SCO, makes it: System 5 Version 4.2. I am pushing for USL/Novell to buy SCO. While SCO has made a real contribution to the industry, like many pioneers, they are heading out of business. They are now in a tough spot—directly in the path of the USL/Novell steamroller.	SCO is, without question, the market leader. There are more SCO Unix systems in the world than anything else. But, now they have both USL/Novell and SUN chasing them. I believe that SCO is too big to go out of business, but they're too small to become leaders. If Win- dows NT moves from Not There to New Technology, then SCO is going to sustain a real shock.
Gupta "SQL Win- dows is in a horse race with Pow- erBuilder in offering ob- ject-oriented features."	⇔ What I like about Gupta is that they continue to have very good ideas. Typically they also have had the first products on the market. But, they are never aggressive in pressing the advantage of being early to market. Therefore, other companies gain on them. For example, Team Windows is, again, a great idea, but I am concerned that Gupta is going to drop it and move onto a new product.	They are an interesting company—what Gupta offers that other companies don't is that they are a multi-product company. What they have now is Team Windows, a burgeoning control system and configuration management system. Team Windows is the best of breed that's out there, but that's because it is the only of its breed that's out there.
Borland "CA ought to buy Borland. That would be the perfect marriage from hell." —LD	↓ I hate these guys. This company bought Ashton-Tate which owned Interbase—the greatest database technology. Interbase is a fine, rela- tional engine. It was the first data- base system built from the ground up to be distributed. But Borland has turned out to be another retail pyramid scheme. They don't un- derstand how to either market or sell Interbase. What a waste.	↓ I worked on Interbase before it was Interbase, at the time that it was called JRD, Jim's Relational Da- tabase. I really think that Borland is going to fail with Interbase. This is because, basically, you don't sell In- terbase at Egghead Software. Bor- land has simply never demon- strated that they understand the necessary channel of distribution. The one channel that they are really good at is selling to retail outlets. If Kahn weren't in control, he should be hung out to dry. Borland could have owned the database mar- ket—had they come out with a 1992 Paradox for Windows, even if it were lousy, they would have won. How lousy could it be compared to dBASE? They would have captured the market.

	Larry DeBoever	Jeff Tash
Lotus "I'm not crazy about Manzi. I don't think he has run the company as well as he has handled it's technol- ogy."	♦ While I believe that Notes is a big winner, I still think that Lotus is in trouble. Actual revenues were down in the last quarter's numbers. They do now have John Landry, who I think the world of—he is world class, but I'm not sure if they are listening to him. Lotus's prob- lem is that they can't figure out the distribution strategy for Notes. That is my major concern. I really hope Lotus makes it.	Î I am really excited about Lotus. If IBM were at all smart, they would give OS/2 to Lotus. Think about that. Then, OS/2 might be successful. What Lotus has is some of the most successful technology, mainly Notes. Notes is son of E- Mail, and it is one of the most in- credible enablers and innovative solutions I have ever seen. While Microsoft has the best marketing, they are still really a technology company. Lotus, on the other hand, is clearly an applications company. I see them doing many good things.
EASEL "It isn't, who has the best technol- ogy, but it's who has the best chan- nels of dis- tribution. EASEL has a terrific sales or- ganization."	⇔ EASEL is one of those companies that got stuck with a good dance beat, but missed the latest musical wave rolling through. These people were exactly the best-positioned company when the PC wave hit. They hit it hard with their 3270 interface and code generator, and it was a great tool. Now they're trying to compete with Powersoft, and I believe that it is too late for them to do that. They can't make the transition to a full, development tools company. I tell people to hold on EASEL and look at other development solutions.	
SUN "OSF stands for Oppose SUN For- ever." —JT	1 I believe that SUN has a fundamentally different paradigm. What is so different about SUN is their notion of highly adaptive systems. People who buy SUN are building their corporate information systems differently then they would with Hewlett Packard Unix boxes. By buying SUN, users are saying, I'm going to completely re-engineer the business and information flow.	û SUN is what DEC should have been. SUN took DEC's strategy and ran with it. They are definitely just as proprietary as DEC, its just that they've found a way of appearing <i>open proprietary</i> . SUN is clearly the leader in scientific and engineering- based computing. Their challenge now is to reform themselves into a company that can successfully sell to commercial IS departments.

	Larry DeBoever	Jeff Tash
Novell "Noorda has a very clear vision. He under- stands that they have to push Unix." —LD	Îf there is anyone who will ever leave the computer industry to en- ter politics and run for President of the U.S., it will be Ray Noorda. I think that their purchase of USL was an outstanding deal. If any company is going to stop Microsoft, it is going to have to be Novell/USL. I really believe that we need more balance, more competition for Microsoft on the Unix/Windows NT front. Noorda understands that Novell has to push Unix. The problem is that Noorda's people basically want Unix to become an adjunct to Net- Ware. His people just don't get it.	Î NetWare's general claim to fame is performance. It will outperform any general purpose operating sys- tems such as Windows NT, OS/2, or Unix. The problem with NetWare is that it is extremely difficult to program for. There exist no tools for developing NetWare applications. Novell is positioning Unix as the <i>application server</i> and the <i>network</i> <i>server</i> . This is going to create diffi- culties for Novell in having to dif- ferentiate between three different operating systems. They have the technology, but do they have the strategy?
		1 The one thing Microsoft's Access database is really bad at is accessing data—I guess they figured that if they called it Access, no one would notice! Microsoft is, without question, the best marketing strategy company of the last quarter of this century. They understand that what drives this industry are applications. People don't buy operating systems, they buy solutions. How well Microsoft has done in competing against IBM and OS/2 is just phenomenal. From a marketing sense, buying Microsoft is warm and fuzzy. As far as Windows NT is concerned, I know Dave Cutler, and I'm of the firm belief that companies don't build software, people build software. I have tremendous faith in Cutler's ability to get that operating system out the door. I have no doubt that Windows NT will be delivered, but I also have no doubt that it will be late.

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Answers for your downsizing questions.





I have found ways to remove almost all of our applications off

the mainframe and onto our new LAN except for the user-developed reports. Our users have been employing Lotus 123, Excel, and FOCUS in addition to other products to create their own reports. We are not sure how many reports as such exist or how we can get these converted easily. What do you recommend?



The best approach I've found is first to inventory the reports and data fields most

often accessed by end-users. Then, as soon as possible, design a new series of query-only report databases to become the new source

for all user defined reports. These report databases should be stored on a file or database server, rather than on your old mainframe. Each night, data should be extracted from the mainframe database and loaded into the new report databases. Initially, users should be instructed to write all new reports using the new databases. They should also be encouraged to modify their old reports so that they may draw data from the new databases. As the old mainframe databases disappear, the new report files should get their nightly update from the new downsized version of the application.

Using this approach has many advantages. First, it "de-links" the report files from the mainframe system. Thus, changes to the system will be transparent to the end-user both now and in the future. Secondly, it does not force the user to make all necessary data changes overnight. Rather, the user is only forced to migrate the databases when each mainframe application is ported, and yet is free to migrate data any time before that occurs. Finally, since the files are loaded once per day, the reports should be more consistent than those generated from

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Nuts and Bolts is a question and answer column to which readers may send either technical or managerial questions on downsizing or related topics. Contributing Editor Ron Peri will reply to your questions here each month. Please mail all questions to: Stacey Griffin, *Schussel's Downsizing Journal*, 204 Andover Street, Andover, MA 01810. Questions may also be faxed to Stacey Griffin at (508) 470-1992. *SDJ* reserves the right to edit questions for both space and clarity.

A Note on Repositories

istorically, the development of mainframe and PC applications has differed fundamentally. The first PC products were the result of a single person's or a small team's development efforts. Conversely, typical mainframe applications were built by larger teams of analysts and programmers. For communication and control reasons, large scale development environments are much more challenging.

Now that PC/LANbased client/server applications are becoming mainstream (not mainframe!), some of the larger communication and multi-person development issues of older development styles are re-emerging as development groups grow in size. One of the critical issues involved is the ability to disseminate information on data definitions to all

members of a development or maintenance team. The information must be quickly updatable and be available to the network. A product capable of doing such a task is a "repository."

The history behind repositories

From the emergence of the earliest second and third generation languages, mainframe/minicomputer-based application developers recognized the importance of controlling data definitions. Over time, these data definitions were collected and stored in source libraries separate from the programs which relied on them. This allowed a large number of programs within a system or application to operate on common sets of data definitions. When changes to these data definitions occurred, all of the



With database management systems, the importance of data definitions became even more significant. Data definitions now had to be defined across applications. It was at this point that the first real data dictionaries emerged to aid database administrators in controlling database definition, access, and security. Data dictionaries tracked how data was defined and where data was used. They also maintained physical data characteristics as well as logical ones-characteristics such as space allocation, access frequency, and volatility.

Active versus passive data dictionaries

"Active" and "passive" were words that emerged as a way to describe the operation of a data diction-

ary. An *active* environment allowed changes to be made to the dictionary, which, in turn, would populate those changes into application programs. Active data dictionaries were very effective

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in preventing applications which hadn't been properly updated from using the wrong data and producing incorrect results. It would seem that active dictionaries certainly were better than passive, but that is not true given that passive was preferred when dictionaries were interfaced by several DBMS environments.

An important reason behind Cullinet's success with IDMS in the early 1980s was its rich and active data dictionary. A problem of this era, however, was that each DBMS had its own data dictionary, as did each 4GL, report generator, and CASE tool. CASE tools were especially significant contributors to this problem since they needed to maintain large amounts of new information about application/business semantics.

As the integrated dictionary world of the 1980s evolved into a world where users wanted to take advantage of various CASE technologies, the idea of a dictionary went through a metamorphosis into that of a repository. The repository concept has



been driven by two needs: 1) the desire to tie databases, programming languages, CASE tools, GUIs, and application generators together, 2) the necessity to integrate all existing data dictionaries. As the concept of repositories has evolved, the scope has expanded to include other functions such as program development (editing, compiling, testing, etc.), systems management, data warehousing, and distributing databases as well.

While each new class of application development tool (CASE, 4GLs, etc.) increased the developer's ability to solve a given class of problems, the increasing diversity also led to redundancy and confusion. By the late 1980s, it was clear that something more powerful than the available data dictionaries or source library systems was needed.

The repository's role

People have been talking about repositories for five or so years. In most cases, the repository idea was tied to a minicomputer or mainframebased time sharing approach. Objects would be checked out of and returned to the library system of mainframe

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repository files. However, a repository can be examined from a number of different viewpoints. It can be viewed as a "smart" data dictionary; one in which semantic as well as syntactical information about data is stored. It can also be viewed as a design database with which a system can build (and maintain) systems.

The great hope for "the repository" is that it will be the one place where all the data about data,

metadata, can be stored, managed, and ... most *la* importantly, shared *wil* between a *the* wide variety of CASE/AD tools. This goal for repositories is graphically shown in *Figure 1*.

The information model

The "Information Model" of which one hears when talking about IBM's or DEC's approach to repositories, is a generic data model and interface that would allow diverse CASE vendors to store design information. The concept here is that an open, published information model would allow different CASE vendors a method for supporting integration among diverse tools—as long as each vendor adheres to the common data model and interface supported. This central repository and information model concept as a theoretical idea is good, but is a concept that has not seen fruition or true implementation yet.

We are now entering the third generation of PC/LAN applications which can produce major, multi-user applications place. Certainly one critical, missing element has been the LAN-based repository that will allow data definition sharing between different application development toolsets and among multiple developers.

Do not be deceived—a single, common repository will not cause separately developed CASE and AD tools to suddenly work together easily and flawlessly. Various CASE tools, especially front-end CASE tools, are often

...One of the critical problems for most large organizations in the 1990s, then, will be control—especially the control of the computer networks and the control of data between the networked

applications....

with high performance, slick user interfaces and are quick to develop. Graphic (object-oriented) 4GLs and SQL client/server databases now offer major improvements in the area of application development. But while these new applications are user friendly, they—so far anyway—can be *developer hostile*. This is because all of the tools needed to complete the downsizing and client/server revolution are not yet in

based on very different assumptions and methodologies —even common elements like "entities" and "processes" can have multiple

meanings and attributes. These differences, however, do not mean that repositories can't be made to work over time, or that there is no real need for them. The need to communicate between large numbers of developers using different tools will continue to exist. Over the past few months, I have been involved with developers from both IBM and DEC who were

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studying the issue of developing a LAN-based repository.

One of the critical problems for most large organizations in the 1990s, then, will be control—especially the control of the computer networks and the control of data between the networked applications. This represents a significant challenge since application development and data administration have been proven formidable even in centralized IS shops that support only a limited number of languages, online monitors, and database management systems.

R&O LAN Repository

If you're interested in LAN repositories, you should check out Rochade, a product from R&O of Lexington, Massachusetts. *Figure 2* depicts the technology offered by Rochade. The product, Rochade, is capable of running on a LAN and providing dictionary and repository services across diverse CASE tools. As noted in the diagram, support is provided for Knowledgeware's ADW, Texas Instrument's IEF, and various Bachman Information Systems tools. Each of these CASE products has its own proprietary dictionary

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database management system and fourth generation language would be accessible to a wide variety of database managers, hardware platforms, and communication standards.

Whenever I would encounter Gerry Cohen, President and Founder, or Dave Kemler, Senior Vice President, they would query me about the latest industry trends and what they could do to improve IBI's market position. Dave once told me that it was part of the IBI culture to never take market position for granted; they always operate with the assumption that a new combatant might have the technology and market prowess to damage IBI's competitiveness or product positions. I have always believed that a company with that attitude would invest the necessary work to insure that their market position didn't deteriorate. And it seems to have worked, for IBI's sales have grown over 10-fold since the early 1980s to \$225 million—the current sales

level. IBI is one of the largest, privately-held software companies in the world.

Technological pioneers from FOCUS to EDA/SQL

IBI has never hesitated in being a pioneer and introducing new technology. FOCUS became the most successful 4GL of the 1980s. Users could build entire

...EDA/SQL can join data that is located in incompatible DBMS such as IDMS and IMS or DB2...[so that] customers can access data transparently through the EDA/SQL technology..

> applications in FOCUS, or could use the language to front-end other DBMS such as IDMS, ADABAS, IMS or DB2. The company rode the crest of the information center wave. IBI recognized very early in the 1980s that the PC would become a vital tool of computing and developed PC FOCUS well before its mainframe competitors understood that PCs could be used to

build and operate important business applications. Other leading software companies that competed with IBI, companies such as Cullinet, D&B Computing, Software AG, and Mathematica were all years behind in introducing PC products. With the exception of FOCUS, the other leading PC software products, were in fact, all being introduced by

> companies such as Lotus and Microsoft. IBI was just about the only mainframe company that recognized in time, the inevitability of the PC. It was, therefore, able to take advantage of the PC surge and maintain and increase market domination.

IBI is now becoming a force in network computing as its expertise in diverse database

access over networks has been channeled into a new product, Enterprise Data Access/SQL (EDA/SQL). EDA/SQL has been adopted by both IBM (as part of its Information Warehouse technology) and DEC (as its AccessWorks product) as a central technology for companies distributing

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access to information. IBI has sold approximately 150 mainframe licenses for its EDA/SOL technology. The product now comes with 50 tool drivers-125 more are currently under development. Although Oracle has trademarked the name "Glue" for its middleware technology, the term *glue* is most appropriate for EDA/SQL since no other connectivity technology supports more tools or databases.

The general EDA/SQL architecture is shown in Figure 1. EDA/SQL provides a mechanism for connecting a very large number of tools with most popular databases, whether relational or not. In fact, EDA/SQL can join data that is located in incompatible DBMS such as IDMS and IMS or DB2. Of course, a database administrator has to build the map of a hierarchical to relational database design for individual users (IBI provides automated tools for this process), but once that's done, customers can access data transparently through the EDA/SQL technology.

The data language of EDA/SQL is, of course, SOL. At the current time, that means ANSI 1989 level 2. Requests from the client tool are submitted in SOL and transmitted over the network. At the server. ANSI SOL is converted to the appropriate form for access to the necessary database(s). JOINs are performed as necessary to satisfy the information requested. For relational DBMS on the server, both retrieve and update are supported. Non-relational databases can be accessed, but not updated. The technology to update nonrelational DBMS can be built, but most IS managers

don't want distributed updates of their nonrelational production databases because of performance issues. For the user of a tool that generates SQL requests, such as DataEase, no changes are required (in usage) to access a remote EDA/SQL supported database as contrasted with a local file/database. For the user of 3GL such as BASIC or COBOL, SQL must be added to the requester program.

In addition to being open for tools and database managers, EDA/SQL supports most popular communications protocols



including LU 2, LU 6.2, IRMA, SNA, DECNET, TCP/IP, NETBIOS, IPX, and SPX. I have been told by IBI personnel that they expect TCP/IP (the defacto UNIX standard), and not OSI, to become the most important network protocol over the next several years. Novell's acquisition of USL probably highlights the truth of this assertion.

EDA/SQL—a middleware standard?

Most middleware architectures choose between two approaches, one of which requires the client to know the SQL type supported by the server (passthrough), and the other which requires the client to know the standard SQL type supported by middleware (translation). The pass-through approach offers performance benefits (and is the type used by IBM in its DRDA), while translation offers availability and connectivity benefits.

By translating to a standard middleware SQL, the application loses the ability to use specific proprietary SQL extensions which can take advantage of a vendor's additional capabilities, however. IBI is unique in offering the user the option of both technologies for EDA/SQL. In addition, remote, procedure calls, which allow precompiled serverbased procedure programs to run as a result of a call from the client, are supported. This is shown graphically in *Figure 2*.

In addition to being adopted by IBM and DEC, EDA/SQL is quickly becoming an industry standard as the connectivity technology for diverse, heterogeneous databases and tools in decision support environments. It's too early

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to determine if EDA/SQL can become a middleware standard for general business and transaction processing. But I wouldn't rule out a role for IBI's technology here either. After all, while FOCUS was niched as an information center tool, most customers were actually using it to build real production systems to run companies, except in situations where performance was world class or arduous. Most systems, even in larger companies, can be handled by technologies that are simple to use and don't deliver record breaking performance.

Currently, EDA/SQL doesn't support location transparency. This means that the client environment has to know the location of the data sought (even though EDA/SQL saves the user from having to navigate through the target database once it's located).

True location transparency will be provided in the future through an EDA/SQL router/server that can sit on a LAN and interpret requests from client workstations against the global dictionary that will determine data location. The software optimization will also run on that LANbased server. IBI plans to support multiple server types for this function: OS/2, Windows NT, AIX, Sun/OS, etc. This capability is part of

... True location transparency will be provided in the future through an EDA/SQL router/server that can sit on a LAN and interpret requests from client workstations against the global dictionary that will determine data location....

> EDA/SQL Version 3, which is planned for early 1994.

> IBI's mainframe background, its close relationship with IBM, its focus on EDA/SQL and Level 5 expert systems technology has caused a divergence in attention. This divergence has resulted in late market deliveries for a version of FOCUS for Windows. The

FOCUS/Windows product is not expected until late in 1993; an OS/2 version has been on the market for one year. Such late deliveries in a most critical new market could be fatal for an ordinary company, but IBI's excellent customer relations, its emerging leadership in enterprise networks, and overall financial health will see it through in fine shape. Still, the lateness in its Windows

> product means that IBI has lost the chance to be the dominant 4GL for Windows that it could have been. It is not necessary for corporate developers to wait for products to build Windows applications that access server databases; Approach, Access, FoxPro, Paradox, and DataEase are currently all

available.

Summing it up, it looks like IBI is continuing its record of winners. The company will focus more on networking and connectivity as the future rolls in, and I fully expect IBI to be there at the turn of the century when the honor roll of software companies is called. GS

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	Larry DeBoever	Jeff Tash
DEC "They are pigeon-holed as proprie- tary." —JT	DEC needs to rationalize a strategy, and then stick with it. DEC currently employs a very talented group of people, but they have no direction. I do have hope, however, that they can pull ahead and make it in the 1990s.	DEC's problem is that they have no corporate strategy, no direction. They have great power and great products, but are no longer looked to for leadership. I don't know if they can handle their overhead.

Larry DeBoever, an independent consultant, can be reached at (508) 264-0155. Jeff Tash, President & Founder, Database Decisions, can be reached at (617) 332-3101.

Nuts & Bolts...

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live files which change throughout the day.

We have found several report writers to be particularly good. Our favorite is R&R Report Writer from Concentric Systems. Versions exist for Btrieve, DBF files, Lotus files, NetWare SQL, Oracle, and other databases. The user interface is identical regardless of the format of the underlying data. Learning time for a typical Lotus user is under one hour. You may, however, wish to have your programmers write some standard reports as models for your users to modify and copy.

Various executive information systems (EISes) should also be introduced to your users if they are not now using them. Products such as Forest & Trees and Lightship's Pilot packages are excellent. By reading from the query file, rather than the real-time databases, you will, of course, trade off the EIS package's real time monitoring in exchange for upgradability. For most companies, this is not a problem since daily monitoring is more than adequate.

Happy reporting! *RP*

A Note on...

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repository. Rochade is able to automatically copy and offer integration services for those diverse CASE tools. In addition, with some customization, Rochade can also provide an information model format that will truly integrate the corporate development information being kept in the diverse repositories. Implementing this corporate integration information model is done on a custom one-by-one basis.

We are likely to see a LAN-based repository in the future from IBM. The initial IBM effort of the early 1990s around Repository Manager/MVS and a mainframe, DB2-based repository has been abandoned. But IBM is talking about a new effort code named AD/Platform that will provide LAN repository services. Delivery dates are unknown at this time. GS

UPCOMING downsizing Events...

Anyone interested in the areas of downsizing, client/server, and LANs will be interested in the expositions being held concurrently May 4-6, 1993 at the Metro Toronto Convention Centre—**SOFTWARE WORLD** and **CLI-ENT/SERVER WORLD**. Conference Chairmen George Schussel, Roger Burlton, and Ed Yourdon will be heading up these shows which together feature eleven conference tracks: *CASE and Application Development*, *Windows Development*, *Database Technologies*, *Object-Oriented*, *Emerging Technologies*, *Business Re-Engineering*, *Application Software*, *Managing a Client/Server Environment*, *Developing Client/Server Applications*, Networking and *Operating Systems*, *Open Systems*.

DATABASE WORLD and CLIENT/SERVER WORLD are once again being held jointly in Boston, June 14-16, 1993. There are nine conference tracks between both shows: *Object-Oriented Technology Conference, Database Technologies Con*- ference, DB2/Information Warehouse Conference, Xbase Conference, Database Connectivity Conference, Client/Server Databases Conference, Managing the Client/Server Environment Conference, Client/Server Networking Conference, Building Client/Server Applications Conference. Keynotes are being delivered by several renowned industry figures including: Chris Date, Michael Stonebraker, George Schussel, Larry DeBoever, and William Zachmann. In addition, Philippe Kahn of Borland and Charles Wang of Computer Associates are to be plenary speakers.

In addition to these large shows, DCI is also offering several one and two-day downsizing seminars throughout the spring with such industry notables as Cheryl Currid, Herbert Edelstein, Larry DeBoever, Richard Finkelstein, and George Schussel.

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

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