THE DOWNSIZING JOURNAL

Dedicated to Downsizing & Distributing Critical Applications
Editor: Dr. George Schussel

In This Issue...

DOWNSIZING Outlook

Dr. George Schussel

WHAT'S WRONG WITH IBM?

In 1984, an associate of mine and I were discussing stock market investments over lunch. He mentioned that he had just sold all of his Prime Computer stock (a good move), and had invested the proceeds in IBM stock (selling at that time for about $120/share). I commented that nothing IBM was doing impressed me to the point where I would expect improved earnings, and therefore, a higher stock price. While I certainly wouldn't give anyone stock market advice, I still believe that IBM is not having much success in changing the fact that its industry influence and total market share are declining.

IBM's Recent Problems...

During the past year, IBM's layoffs and reductions in force (RIF) have been well publicized. According to the September 9, 1991 issue of Time Magazine, "IBM has pared 32,000 jobs from its payroll since 1985 and plans to reduce its work force by another 17,000 this year." IBM is clearly reducing its staff in an attempt to become leaner and more competitive. The "leaking" of

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The Time is Right for Downsizing

Tools and Applications are Becoming Available *by Barbara Bochenski*

While recently interviewing Dr. George Schussel, President of Digital Consulting, Inc., for Software Magazine, I asked him what industry developments would give impetus to the downsizing phenomena. He responded that an important factor in the downsizing movement would be when some of the large application software vendors made their products available on downsized platforms. He also mentioned the need for good application development tools.

The later of these deficiencies has meant that users who wanted to take advantage of a client/server architecture had to write their applications in the formidable C programming language.

Dr. Schussel's criteria are now being met by a new batch of 4th Generation Languages(4GLs). As this first crop of new 4GLs becomes available, it is obvious that there is a tremendous diversity among products. It will be important for any potential buyer to understand the differences between the tools so that the appropriate tools are used for each job. Three of the most obvious types of the new 4GLs are:

End user query languages

Systems for the occasional programmer

Professional programming environments

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Will You Still Need a Mainframe?

By Gerry Mawson and Mike McNally

Most large, North American organizations manage information systems with centralized mainframe-based computer systems. These are mainly terminal/host computing applications that are straight IBM SNA type networks. Even where PC or Unix workstations are used, the major business systems are often still based upon older mainframe computing systems.

Now, with almost daily advances in client/server technology, new opportunities to improve both end user applications and the cost effectiveness of computing are available to managers who want to plan for downsizing. But, what will happen to the mainframes that are currently so central to daily business operations? Will they have a place in a networked world?

Mainframe Networks

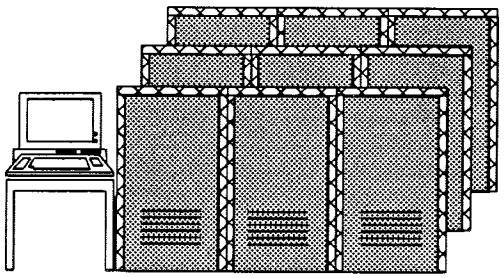
Nearly all existing mainframe networks implement IBM SNA protocols. The most common workstation in this setup is a member of the 3270 family, although in some industries, such as banking, other terminals may predominate.

The applications on these networks are quite centralized, usually being driven by either IBM CICS or IMS/DC. The networks are "hub and spoke" in topology, and virtually nothing happens without a central mainframe being involved.

These applications and networks are the "lifeblood" of a modern organization. When breakdowns occur, they are usually disastrous, grounding airlines, bringing banking to a halt, and almost always affecting customer perceptions of the enterprise. With so much exposure, a great deal of effort has gone into refining the management and reliability of these mainframe networks, to the point where they usually perform very well.

Mainframe Computing in a Client/Server World

Given the above scenario, what will mainframe computing look like in a client/server world? Will it even exist? Our answer is a resounding yes. Mainframes



will exist on newly designed, enterprise-wide data access networks; the mission critical systems themselves will take decades to replace with effective alternatives.

However, other less mission critical systems that serve only selected units of a business will move off the mainframe. This will take place in pursuit of improved economics and better functionality. We suspect that where serious efforts are made to replace major business systems with client/server approaches, the strategy will be driven by pursuit of improved functionality as well as significant operating costs savings.

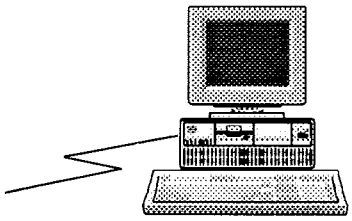
Client/Server in the Enterprise

The mainframe in a large enterprise will eventually run fewer applications: applications seen as being very important. The mainframes will be surrounded by networked client/server systems handling lesser applications. In many cases, advanced front-end client/server applications will add functionality to older systems without really affecting the core of their operations.

An example of this type of systems is American Airlines' Saber-Vision system in which local client/server systems provide the travel retailer with advanced function including full color pictures of resorts, ships, and accommodations drawn from a PC computer database. Behind this glitzy front-end sits the old, still very effective, Saber mainframe system which is ready to book seats, verify credit card payments, and perform other well-established functions. Agents with older terminal equipment are not affected.

In another example, at one manufacturing company, a massive mainframe system runs the order processing, shipping, and plants across the nation. The

financial accounting used to be on this mainframe simply "because it was there". But now the controller's office has a PC and

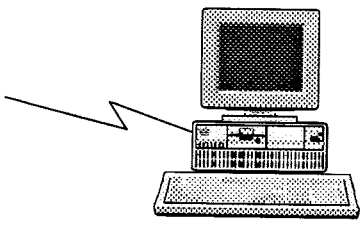


Novell server-based system devoted to their needs. It handles Accounts Payable, General Ledger, and preparation of budget and financial reporting. The system performs efficiently as users no longer have to compete with a mission critical application for computer time and resources.

There are examples of where departmental needs cannot be economically handled by mainframes (e.g. computer aided design). But, the bottom line is that at a departmental level, client/server is alive and well.

Making the Right Choice

This is a tough time in which to choose an enterprise wide networking technology. For example, not so long ago, Novell was a small start-up with a neat product capable of cabling a few PCs together to share disk space and a printer or two. Today, Novell is a $600 million company still growing at a rapid rate.



Can management pick winners in this confusing situation? Is it really their job? We know that not all the players in the field of technology will survive. Even IBM has been threatened by the pace of developments and their inability to obtain a strong market share in the PC and workstation field.

Avoiding Anarchy

In this confusing scene, IS management can be excused for a little foot dragging. Yet, when overseeing systems improvement, it is imperative that IS managers avoid "anarchy", a situation where every user has a different workstation, a "home-brewed" software collection, and a different networking system. If this occurs, inter-unit communication is very difficult to provide at an enterprise level. Thus standards and investment in "infrastructure" networks and systems are a prerequisite to maintaining control.

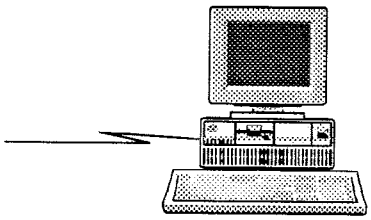
Interconnecting the Pieces of the Puzzle

People have clearly defined networking technology choices already available. In the Unix world, Ethernet based TCP/IP and it's OSI derivatives are the most popular choices. For large IBM sites, token-ring with either NETBIOS or Novell IPX are the main choices. The challenge for management is standardizing on a winning technology in a fast changing marketplace.

Summary

From a management standpoint, moving to a client/server architecture should mean moving a large proportion of the application processing logic off the mainframe to the "client" i.e. the workstation. In this scenario, there is nothing stopping the mainframe from being a database server. And what is needed to allow the most flexibility is a network that provides application designers the choice of using the mainframe or some other technology as the server component of their designs.

Such a network should support today's business systems, quite likely through 3270 access to ageing mainframe applications. It should also provide a wide range of enhanced network applications which may completely bypass the mainframe.



IT management has a significant task ahead in positioning their organizations for the client/server era. One of the key building blocks is the construction of the enterprise wide networks that lift client/server computing from being a local initiative to mainstream status. Developing and implementing a visionary approach may be one of the most important issues for todays senior technology manager. ■

Both Mr. Mawson and Mr. McNally are Senior Consultants with Currid & Company. Mr. Mawson is a former partner with Ernst &Young, and Mr. McNally is a former Senior consultant with Price Waterhouse. Currid & Company is a consulting firm that specializes in corporate computing.

Downsizing Outlook...

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John Akers' memo chastising IBM employees was an indication that top IBM management is willing to take tough measures in trying to turn business around.

It appears that IBM's marketing budget has also been cut; within the last quarter, their participation in many conferences has been eliminated. You know a company is in trouble when they cut marketing expenditures since marketing represents the next generation of sales. IBM's situation contrasts interestingly with that of Digital Equipment Corp., another company that has seen a sharp drop-off in growth over the last 2 years. DEC is normally perceived as having weak marketing, yet I have witnessed no decline in DEC's marketing expenditures during the same time that IBM has been retrenching.

IBM is rapidly losing market share in Japan, the world's second largest computer market according to Business Week. Recently, IBM has fallen to third place in the Japanese computer market, and is still sliding downward.

IBM's past successes have been largely due to its worldwide dominance in mainframe, commercially-oriented IS areas. I'm not suggesting that IBM's mainframe dominance is likely to change. Their problem is that the worldwide mainframe market is growing only very slowly. Some analysts are predicting that in dollar terms, the mainframe market will actually shrink in the future! Such shrinkage could be devastating for IBM since its market share in PC arena is diminishing, and its ability to set standards in this field is rapidly shrinking. In particular, Microsoft with its promised Windows NT operating system, and the ACE consortium being lead by Compaq and DEC, are each as likely as IBM to set the standard for the next generation of PC computing.

IBM's credibility in the PC market peaked in 1984 with the initial PC/AT deliveries. IBM enjoyed a large market share, and was perceived as a standards setter and technology innovator. Contrast that situation with the present: in 1991, IBM's PC hardware and software products are considered ordinary. The new innovators in the PC market that are setting standards and reaping great profits are companies like Microsoft, Apple, and Novell. In a display of excellent management decision making, IBM is rapidly making friends with this new generation of leaders in an attempt to produce interesting, market-leading products.

"IBM's reputation for software innovation in the PC arena is abysmal."

The Facts are...

IBM's reputation for software innovation in the PC arena is abysmal. OS/2EE Data Manager, a product that should be leading the charge toward client/server computing, has lagged well behind many other comparable software products in providing functionality to PC users. For example, even though companies like XDB, Oracle, Gupta, and Sybase have offered PC to DB2 access with their own gateways, IBM has yet to deliver support for this much requested feature. IBM's September 11, 1991 Information Warehouse announcement went part of the way toward fixing this problem with the EDA/SQL (Enterprise Data Access) product set. This technology, however was developed principally by Information Builders--the FOCUS people. The EDA strategy is basically a gateway technology for directed, decision support types of applications. This is a much easier problem to solve than support for true distributed database access with location transparency.

Another problem with OS/2EE Data Manager has been its lack of support (so far) for roll-forward recovery. This means that the product is usable only for decision support applications, and not for applications that require real-time updating.

In the past, part of IBM's delinquency in announcing products like EDA has been because IBM's culture is not oriented toward the idea of open systems with access to others' files, communications, and database services. In IBM's defense, I believe that they understand the internal lack of support for open systems, and seem willing to go after partnerships and outside technology (like the recently announced IBM/Apple joint development agreement).

Another partial amelioration of these knocks on IBM's software craftsmanship is that the company tends to concentrate on providing those capabilities that are important to the largest customers, but maybe aren't so sexy. Again, looking at various IBM database managers, the software may only offer average or below average functionality, but it is robust. By robust, I mean that IBM's products lead in the areas like security, recovery, reliability, and documentation--those features that

are a requirement for large industrial and financial customers.

It seems that for now, IBM plans to remain mainframe centric: there has yet to be an announcement for a Repository Manager product for the OS/2 environment. In an almost humorous turn of events, IBM's stance on this issue is that the Mainframe MVS environment with AD/Cycle Repository Manager should be used for CASE-oriented application development--even for those applications that will run on PCs and LANs. Almost everyone else in the world is rapidly moving toward the opposite approach--one of building mainframe applications on PCs with PC versions of mainframe software (either actual operating systems or emulators).

Most users consider IBM's older PC-based software systems like DisplayWrite or Top View to be dinosaurs. Newer IBM PC software products like OfficeVision have been delivered very late, and lacking an abundance of features. The best success that IBM has had in PC software has been with products jointly or mostly developed by partners (e.g. PC-DOS, OS/2, LAN Server). PC products unique to IBM (those developed internally without the cooperation of partners like Lotus or Microsoft) are almost universally considered technically inferior, and have failed to capture a significant market share.

Some IBM/Microsoft joint products, OS/2, LAN Manager/Server, and Presentation Manager have languished in the market for well publicized reasons. The point is, now that IBM and Microsoft have divorced, how believable is it that IBM by itself will do better with OS/2 and LAN Server? It would be remiss not to note here that at the time this article is being written (early September) several OS/2 beta sites have told me that OS/2v2 is running superbly within their organizations. Of particular note is that it appears that v2 can successfully and reliably run multiple, protected Windows and DOS sessions with apparent ease.

But, They Have Nice Hardware...

It would be nice if one could excuse IBM's spotty PC software history with the explanation that IBM is a hardware company. But, unfortunately, IBM's prognosis in the PC hardware market isn't much better than for their software. Remember, this is the company that invented the PC and has been the worldwide dominant computer company. Then why have they had so many PC hardware failures (remember the ill-fated PC jr)? More recently, I've looked at the L40/SX IBM Laptop/Notebook computer. It is not a bad machine, but its screen is only average, and its battery life is well below the average of the competition. AST and Toshiba sell comparable and probably superior machines at street prices 60% of IBM's!

In an attempt to improve its product line, IBM is looking for hardware technology manufacturing and development partners. For example, IBM has tapped Toshiba for technology to be used in building laptop screens. IBM certainly appears to have a good deal in hooking up with Apple to build a new desktop standard for its RS/6000 chip using Apple software technology.

What Does it Mean?

IBM is cutting jobs in order to bring its expenses and revenue into healthy alignment. This kind of strategy, however is only a temporary fix. The real problem isn't that IBM's expenses are too high, it's that the company isn't bringing innovative, desirable products to market (at least in the downsized end of the market). If IBM's current products aren't cutting it, then simple reductions in force won't help develop better products, unless its organizational and developmental processes change substantially. Computer Associates and some other companies have shown that reductions in staff and improved product development are not mutually exclusive.

I, for one, really hope that the optimism expressed by some analysts about the forthcoming OS/2v2 release is right. IBM needs a big hit, and a really hot new PC operating system would provide welcome competition for the gathering Microsoft juggernaut.

Historically, it has been beneficial for the computer industry to have a strong market leader like IBM providing technical leadership, establishing defacto standards, and providing a price umbrella that allows others to compete in various niches. However, leadership in the downsizing end of the mainframe market is now being provided not by IBM, but by companies like Novell, Microsoft, Sun, Compaq, and Apple.

I don't think that it will be easy for IBM to change the direction of events as put forth in this article. Unless the way the company does business is completely reformed, I don't expect IBM to be able to provide leadership technology at affordable prices in the small equipment market. This comment is true for both hardware and software products. The Apple/IBM "Power Open" agreement might encourage hope for a return of IBM leadership, but remember that these products aren't due until the 1993/94 time frame. By that time, Microsoft's Windows-based market penetration will be so large that the Apple/IBM

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The Time is Right for...

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End User

End user tools will be focused on personal productivity for the non-computer programmer. This will typically be the accountant or marketing person who is not formally trained in programming and isn't versed in SQL, but does understand certain applications and can effectively use a computer in storing and retrieving data.

Examples of products these users will be interested in are: Quest by Gupta Technologies, Oracle Card by Oracle, ObjectVision by Borland, Q+E by Pioneer Software. These products, like the others discussed in this article, were designed for a system where the application development environment is on a workstation, and the data resides in a SQL server database.

The Occasional Programmer

What can be called the mid-range of client/windows 4GLs is designed for the occasional programmer. This individual is probably a business professional who knows some programming. The desire here is to create personal or departmental systems that are non-mission critical, and are not oriented toward transaction processing. This individual wants to have the ability to generate applications quickly without losing all of the mainframe robustness. Normally, the application designed will be for a single user, and can be restarted without backup or recovery techniques.

Professional Programmers

The third category consists of 4GLs for professional programmers. These 4GLs should be thought of as complete computing environments: within the application development language, the communication and database environments are integrated, and support multi-users with full robustness.

The typical user of this environment probably has had mainframe or mini-computer programming experience, and wants a tool that will allow the downsizing and modernizing of mainframe applications without any loss in power or robustness.

To support this kind of programmer adequately, a full set of tools including comprehensive debuggers, and a utilities or network and database management, is required. Examples of products which allow mainframe types of applications to be built on networks are: Advanced Revelation from Revelation Technologies, SQL Windows from Gupta Technologies, Paradox and dBase IV from Borland, Ellipse from Cooperative Solutions, and PowerBuilder from Powersoft, which will be the focus for the remainder of the article.

The D&B Choice

Dun & Bradstreet Software--whose current product line resulted from the acquisition of McCormack & Dodge and MSA Software--announced recently that they will develop downsized, client/server versions of their mainframe-based application software using the PowerBuilder tool set. D&B said they will provide the new modules in a time-phased manner, allowing customers to incrementally adopt the new technology while maintaining current system investments.

D&B Software, part of the Dun & Bradstreet Corporation, is the world's largest provider of financial, human resources, material management, manufacturing, and higher education software products. The introduction of downsized products from such a large vendor should have an important, industry-wide impact; it will lend credibility to downsizing in the eyes of many cautious IS managers.

When asked, Dr. Schussel said that D&B's choice of PowerBuilder had not surprised him since his visit to Powersoft in early 1991. Dr. Schussel explained, "I was invited to visit Powersoft by Dave Litwak, Senior Vice President of Research and Development at Powersoft, an acquaintance of mine from the Cullinet days. Dave showed me PowerBuilder, and we chatted for a couple of hours about the capabilities of the product, and its future in a client/server world. PowerBuilder is one of the first of what is sure to be a very large, active, and diverse marketplace of windows-oriented, client application program tools."

A Short History

Many consultants believe that PowerBuilder represents what is to be the new generation of 4GLs. In the 1980s, there were application development products like Software AG's NATURAL, ADR's IDEAL, Cullinet's ADS/O, On-Line Software's RAMIS, and Information Builder's FOCUS. All of these 4GLs were products designed to replace 3rd GLs like FORTRAN and COBOL. They were called 4GLs because the products were higher level, and applications typically could be written in 80% fewer lines of code than in a language like COBOL.

Now we're entering a new computing paradigm and the ASCII or character-oriented terminal is no longer enough. What the industry now demands is the Windows environment with multitasking, pull-down menus, and a complete graphical computing metaphor. Building applications to run in this type of graphical environment is significantly different from the older char-

acter screen-oriented types of applications. In particular, with multiple overlapping windows, it is possible for one windows-oriented user station to accomplish the work of six to a dozen successive character-oriented screens.

The windows-oriented world is also event driven, the flow of the program can change in any particular moment depending on which icon is clicked on. It is clear that the older generation of 4GLs can't be used to build these new applications, and that new products and tools like PowerBuilder are necessary to satisfy this market.

PowerBuilder's Functionality

It is now clear that not only has Powersoft developed an outstanding new type of tool, but that the development engineers at Powersoft have given significant consideration to the kinds of capabilities that are to be expected within this new world of windows-oriented 4GLs. Litwak suggested a list of functions that any product in this arena should have:

- provide team-oriented support
- support shared repository and library management
- run under dominant graphic standards
- support multiple DBMSs
- integrate with and manages the SQL environment
- has a graphically-oriented code generator
- has an industrial-strength programming language
- provide a windows-supported debugging process.

(Editor's note: I think that this list is good, but I'd certainly like to hear from readers of ***The Downsizing Journal*** *as far as additional characteristics that are necessary and/or desirable for the new generation of windows-oriented 4GLs.)*

PowerBuilder's Versatility

Based on Schussel's comments, I decided to find out more about PowerBuilder. I was impressed with what I learned. The product was built with object-based technology, but retains characteristics that are familiar to the professional developer of the 1980s.

"One of the things that attracted us to PowerBuilder," says Larry Vaughn, Assistant Vice President of Systems Development with Frank Russell Company, a financial services company in Tacoma, WA., and a current user of the tool set, "is that it's designed to support multi-person development projects."

The initial version of PowerBuilder, released in March, runs under Windows 3.0. Future releases will support other graphical environments.

PowerBuilder has an "open systems" design permitting applications to be migrated to different database server environments. It currently supports Microsoft's SQL Server, Gupta's SQLBase, and Oracle Corporation's Oracle Server. Additional databases will be supported in the future.

Vaughn attests to its openness and portability. "The real magic comes," says Vaughn, "from the fact that if you stayed close to the ANSI standard portion of Powersoft's SQL, the application you've painted will run on Oracle, SQL Server, or SQLBase."

PowerBuilder's History

PowerBuilder evolved in an interesting way. Powersoft's original product, GrowthPower, is an integrated set of manufacturing and financial applications. When the firm searched for a development tool to create a client/server version of GrowthPower, they could not find one, so they decided to develop their own. Ultimately, PowerBuilder was created for in-house redevelopment of GrowthPower, but also as a tool to be marketed.

So, when Dun & Bradstreet Software went looking for a tool to help them create downsized versions of their application software packages, they were able to find one: PowerBuilder. D&B said that they will also distribute the PowerBuilder tool set with its applications, letting customers tailor the applications to fit their specific requirements. These actions will certainly go a long way in helping companies make significant strides towards downsizing. ■

Ms. Bochenski has been in the data processing profession for over 30 years. She is currently working for a Fortune 100 company researching inter-operability among heterogeneous systems and ways to cost-effectively migrate from existing production systems to new technologies.

If you're interested in products like PowerBuilder, you'll want to know that Digital Consulting, Inc. is sponsoring a new conference: Windows Workshop: Test Driving Today's Leading Client/Server Application Development Tools, which is to be held in Boston, late April, 1992. The purpose of the conference will be to evaluate and compare systems being built with the new generation of windows-oriented application development tools. Companies that will be participating in that conference include Powersoft, Revelation Technologies, Gupta, DataEase, Microsoft, and other leaders of the client/server windows movement. For more information on the conference, call DCI at (508) 470-3880.

Winners and Losers
October Edition

- IBM
- Information Builders
- Computer Associates
- Borland

Current Computer Wisdom

Dr. George Schussel

With the return of the school year, I'm feeling unusually optimistic, so this month, we're only picking winners, no losers. The first pick is **IBM** which gets one thumb up for its huge September 11th announcement, and its embrace of the information warehouse and open standards. There was a lot of vision and concept in these announcements. Now, IBM has to deliver a working product with adequate performance, and compete in an increasingly difficult marketplace.

The quiet but capable folks who brought us the pervasive FOCUS language, **Information Builders Inc.**, have become a key IBM technology partner with the conversion of their FOCNET technology into the basis of the Enterprise Data Access/SQL architecture for IBM. EDA/SQL enables IBM customers to use SQL to access diverse data sources such as IMS databases, and VSAM data sets, a problem that IBM's engineers couldn't solve. The result is that IBI should get a well deserved boost in public recognition.

The vacuum cleaner of software companies, **Computer Associates**, continues to suck up 1980's software stars with announced acquisitions of On-Line Software and Pansophic. The Pansophic merger is especially important as it brings the Realia COBOL environment and the TELON COBOL generator technology (important missing links in CA's software chain) into the CA software camp.

No doubt about it, CA is planning to compete across the board with IBM as an alternative source of software. And contrary to conventional wisdom, CA has shown that it is possible to take the faltering stars of yesterday and revitalize their products so that they are good for many more years of service and sales.

Borland's proposed acquisition of Ashton-Tate will vault it into the superstar computer company category. The combination of Borland's technology and superb marketing machine are going to make this company a strong force to compete with the likes of Oracle, Sybase, etc..

I finally had a chance to look at some video tapes that Philippe Kahn, President of Borland, sent me. I would especially recommend Kahn's "World of Objects", Borland's light-hearted introduction to the theories behind objects. In the video, Kahn shows us his musical talent by playing the saxophone with his band. No doubt, this video could be serious competition for MTV. One scene I particularly enjoyed featured Kahn driving a vintage Corvette; it brought back fond memories of my college days when I drove the same car. I'll never forget driving by Wellesley College late one weekend night, and discovering that my Corvette was capable of doing 100 mph in second gear... ■

Notes & Quotes...

At the conference, Revelation Technologies sponsored a dinner for consultants, and presented the concepts behind their new Open Engine architecture. Open Engine will allow RT's customers to pick and choose among application development tools and databases.

The consultants attending the dinner, which included **Amy Wohl** of Wohl Associates, **Frank Dzubeck** of Communications Network Architects, **Richard Finkelstein** of Performance Computing, **George Schussel** of Digital Consulting, Inc., **Portia Isaacson** of BIS Strategic Decisions, Inc., and **John Gantz** of Technology Financial Services, Inc., participated in some heated debates over which O/S standards will prevail in both the near and intermediate future.

It was interesting to note that Wohl and Dzubeck were strong advocates for OS/2 Version 2. Both have been running beta copies of IBM's promised salvation and were highly enthusiastic about their success in running multiple copies of Windows and DOS successfully. Wohl predicted that in the near future, she expects IBM to sell 3 million copies of OS/2 Version 2. When challenged, Wohl lowered her estimate for sales, but related to the consultants anecdotes from the conference where potential OS/2 users were tearing, stomping, and screaming in anticipation of the 1992 release of Version 2.

During Wohl's keynote address at the conference, she pointed out that many successful companies are starting to abandon cost justifications based on return on investment calculations as the reason for upgrading desktops. Wohl suggested that it is more reasonable to use a utility model in justifying the upgrading of the corporate PC environment. The idea is that there is a certain cost in bringing an employee on board. That cost should now include the cost of a graphical desktop environment. Wohl asked the group, "Do you justify the cost for a telephone for an employee? No, those costs are simply figured into the overhead."

(Editors Note: The new, clone PCs that are currently being purchased at DCI have a 386/33 MHz DX processor, 4 megabytes of memory, both 3 and 5 inch floppies, VGA screen, and cost around $1,700.)

Wohl also advised the audience to never be cheap when buying desktop machines; she has known many people who were sorry one to two years after they had bought low-end hardware technology. Wohl insisted that a 386 SX should be considered the absolute bottom of the barrel today, and suggested that companies give serious consideration to buying only the very fastest 386-based desktop machines, or when possible, 486s. Yes, Wohl commented, the 486 sounds too powerful now but in two years it won't be, and you will be glad you opted for the bigger machine; it is almost never a cost effective solution to go back and retro-fit older machines with upgraded disks and processors.

In a different keynote address, **George Schussel** presented an original method for evaluating and comparing the power of PC hardware to that of mainframes. He discussed an extensive benchmark of batch programs to calibrate and relate PC MIPS to IBM mainframe MIPS. Using the charts that resulted from the benchmarks, it was clear that on batch-oriented, mainframe type processing, a different ruler must be used in measuring the power of PCs and mainframes.

Contrary to the popular opinion that PC MIPS are **200** times cheaper than mainframe MIPS, Dr. Schussel stated that in more realistic terms, the PC is only **50** times cheaper on COBOL types of jobs. He said, "So, who cares? Workstations and networks are still so overwhelmingly superior that distributing and downsizing is the only reasonable alternative."

Bob McDowell, Vice President of Education and Consulting Services at Microsoft spoke to a

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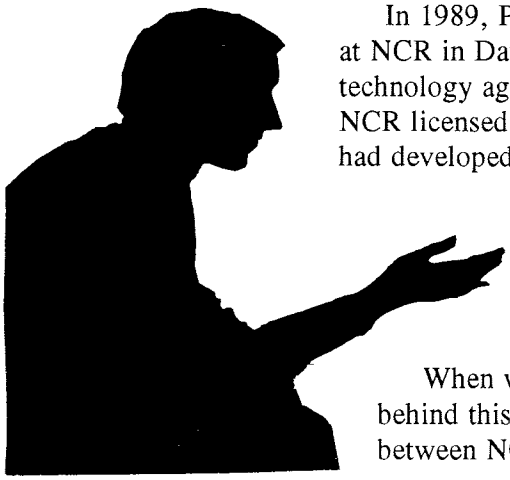
Articles based on sessions at the Downsizing Conference and Exposition will be featured in upcoming issues of **The Downsizing Journal**. In the next few months, be looking for articles by Larry DeBoever on LANs and connectivity, and excerpts from a panel discussion about the Apple/IBM "Power Open" agreement that consisted of some top industry experts including Dr. George Schussel, Arun Gupta, and Larry DeBoever.

Parallel Processing at NCR

An Interview with **Dr. Phil Neches, Senior Vice President of NCR** *by Dr. George Schussel*

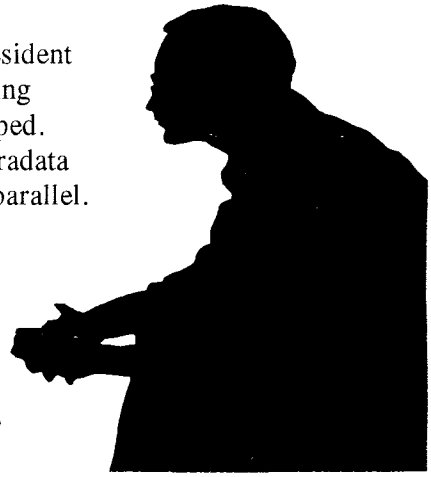
I've known Dr. Phil Neches for about ten years. During that time, we have traveled together all over the world, talking about a wide assortment of database issues.

During most of the 1980's, Phil was Senior Vice President of Technology at Teradata, the Southern California database machine manufacturer. Early in his career, Phil became committed to the idea of parallel processing as a way of effectively and inexpensively increasing computer performance. This idea became the basis for the technology used in Teradata's DBC 1012, a very fast decision support alternative to IBM's DB2.



In 1989, Phil left Teradata to become Senior Vice President at NCR in Dayton, Ohio. The following year, an interesting technology agreement between Teradata and NCR developed. NCR licensed some of the proprietary technology that Teradata had developed for connecting microprocessor engines in parallel.

Also in 1990, NCR announced that their future computer architectures would be built around parallel processing Intel x86 microprocessors--the same approach used at Teradata.

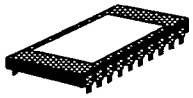


When we spoke recently, I wanted to see what was behind this interesting and unprecedented agreement between NCR and Teradata.

What can you tell us about the technology agreement between NCR and Teradata?

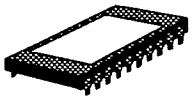
There are two basic relationships between the companies. The first relationship is a set of technology licensing agreements for Teradata's Y-net technology and for the software technology including the scalable relational database. These agreements are important for the 3600 program.

The second relationship is a joint development team consisting of people from both NCR and Teradata. This team is currently producing the 3700 machine.



How similar is the technology of the NCR 3000 series to Teradata's Y-net architecture?

In the 3000 series, it is only in the 3600 and the 3700, the message passing parallel computers, that there exists a relationship between the technologies. The 3600 is based on an implementation of Teradata's Y-net but with more advanced circuit technology.



Can you give us a reasonably succinct definition of what the Y-net does and how it works?

The Y-net is a special purpose network that connects all of the processors in a system allowing them to function as one coherent system.

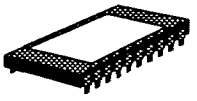
The Y-net differs from computer buses in the number of processors it is capable of connecting. Typical computer buses are aimed at connecting four to eight processors at most. The Y-net is capable of connecting hundreds of processors. In this respect, the Y-net resembles a LAN.

Amdahl's law states that adding more processors to a multiprocessor architecture will offer diminishing returns. Ross Bott of Pyramid has been quoted as saying that eight processors are the practical maximum for commercial processing. How is NCR approaching this problem in the Y-net design?

Amdahl's law applies to tightly coupled architectures. The NCR 3600 is loosely coupled. It's easier to think of a loosely coupled architecture as being analogous to a LAN. Each processor runs out of local memory, and sends messages to others over the interconnect.

In a loosely coupled system, every processor runs a copy of the operating system. Therefore, the processor is inherently a multi-tasked node and is insensitive to the latency of the network.

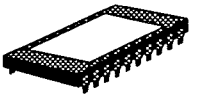
This is why message passing systems don't have a drop off in performance as the number of processors connected increases. In fact, in a loosely coupled system, there can be hundreds of processors connected with near-perfect linearity of performance.



Why did NCR choose the Intel x86 microprocessor as the engine of the new series, especially since most new server machines are being based on RISC chips such as SPARC and MIPS?

NCR chose to use a CISC chip for a number of reasons, the most important being that we found that microprocessor performance has nothing to do with the instruction set design or size, but rather with the machine implementation of the microprocessor. Over time, the performance of a processor family will not depend much on its instruction set architecture, but rather on how well the microprocessor implementations keep up with advancing process technology.

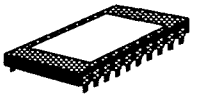
The other key factor in the decision to use CISC chips, was that the chips gave our series the ability to run all of the major open operating systems. This then gives users access to the largest possible body of existing applications.



Do you really think that UNIX based systems can be competitive with big IBM mainframes or Tandem computers in serious, large volume OLTP of several hundred transactions per second, while maintaining full robustness and security?

Absolutely. First, I think that people have to shake the thought that microprocessors are little, or small in power. A 50 MHz 486 chip is as powerful as the uniprocessor element of the current IBM 3090. It has at least 60% of the power of the fastest uniprocessor in the IBM System 390. With current microprocessor technology, we're now talking about a mainframe class processor element. That is quite different from the microprocessors of just four or five years ago, which is news to a lot of people.

Another aspect of microprocessor-based systems that people question is the robustness for high availability and quick recovery. The big piece of news here is disk arrays. Disk arrays make the system's storage just as fault tolerant as any special purpose fault tolerant machine.

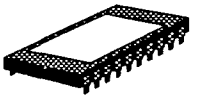


Can you give us a short description of disk arrays?

A disk array is the organization of storage across multiple drives. The distribution of data is achieved by using a special intelligent controller.

There are two main benefits derived from disk arrays. The first is that the controller can read and write multiple drives in parallel, which gives the system the appearance of a much faster disk drive.

The other benefit is that one of the disk drives in the array can be used for parity. This means that if any drive in the array fails, the controller can reconstruct the lost data in the hardware and remain transparent to the software. Then, once the disk drive is repaired, the controller can reconstruct the data on the drive using the same correction algorithm. The total effect being that the failure of a disk drive is invisible to the user.



When I was CIO for an insurance company in the early 1970s, I distinctly remember using a storage implementation that sounds exactly like what you just described. What makes disk arrays different from the technology that existed then?

Fault tolerance through deliberately managed redundancy is not a new idea. What is new is that disk arrays are designed so that the high availability features appear to the computer and operating system as if the array were a conventional disk drive.

The real benefit is user transparency. In all previous fault tolerant systems, either the operating system, the application, or both, had to be very carefully and deliberately designed to achieve fault tolerance. With disk arrays, fault tolerance is automatically provided for any application reading or writing to the disk drive. ■

Downsizing Outlook...

(continued from page 5)

standard will be far from a given success--even if the products are good and delivered when promised, which is a very big IF.

In some ways, this poor outlook for IBM is bad news for all of us. With many American industries such as automobile and oil in decline, computer technology represents one arena where the U.S. leads the world, and an American company (IBM) has provided much of that worldwide competitiveness and leadership. I am not happy to see this leading American company losing its worldwide leadership position. But, there is a silver lining in this cloud: where IBM is stumbling on the road to downsized technologies, other American, not foreign, companies are providing leadership. So emerging powerhouses like Borland, Microsoft, AST, SUN, and Apple appear ready and capable to pick up the mantle and carry IS product leadership into the 21st century. ■

Dr. George Schussel, Editor of ***The Downsizing Journal,*** *is a leading commentator on software technology and computing architectures.*

Notes & Quotes ...

(continued from page 9)

full audience about the lessons he has learned from downsizing case studies. McDowell's main emphasis was on the importance of GUI's in the new client/server computing world. He feels strongly that GUIs are more than just colors and icons: the use of GUIs in the corporate computing environment increases worker productivity, and improves user access to remote data.

To back up his claims, McDowell quoted figures from the Temple Barker Sloan GUI Research Study. This study showed that users on clients running GUIs completed 35% more tasks after attempting an additional 23% tasks. There were 16% fewer errors in jobs performed with GUIs, and ***the frustration level for users was decreased by 51%!*** ■

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UPCOMING **downsizing** Events...

A conference next month that will be of interest to IS managers is **Database World**, being held November 5-7 in Chicago, IL. At the Database World conference, there will be a conference track devoted to downsizing technologies and issues. Featured lecturers will include Dr. George Schussel, President of DCI, Herb Edelstein, founder of Euclid Associates, Dr. Richard Hackathorn, VP of Technology at Micro Decisionware, Inc., and Richard Finkelstein, President of Performance Computing, Inc.. Some of the topics to be covered include: IBM distributed relational database, creative politics and insights into successful data sharing. For more information call DCI at (508) 470-3880.

A new conference, Downsizing -- An Executive Briefing on the Technology and Management Issues, will be held in both Philadelphia on October 28, and Washington, DC on October 30. As well as covering many of the basic issues that a company's management would need to know when downsizing, this conference gives special attention to some of the sensitive management issues that can arise. Topics covered will include: downsizing technologies, Windows NT, OS/2 Version 2, ACE, UNIX, LAN operating systems, client/server computing, managing the move to downsizing. For more information call DCI at (508) 470-3880.