INSIDE! TAKING A HARD LOOK AT SQL SERVER FUNCTIONALITY

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Cover Story

.NET for Real

36 With the official release of Microsoft .NET, we can't help but wonder, did Microsoft get it right this time? Stay tuned, but the Redmond colossus now has a stronger story to tell against competing mainstream products. And it certainly makes it harder to justify putting a lot of time into proprietary MultiValue development environments: .NET will make it easier to program with industry standard technologies against MulitValue and other legacy systems using standard middleware techniques. by Steve Backman and Jim Butler

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CORRECTION NOTICE: In the article "An Independent Review of the MultiValue Database Industry" (See May/June Page 20) in our last issue, the article stated that jBASE software sold 3,000 licenses in 2001. It was actually over 26,500. International Spectrum regrets this error and apologizes to jBASE Software for this error.

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Under the Heading of:

All Good Things Come to He Who Waits

I think I smell some potentially good times ahead for MultiValue (MV) VARs with solid business applications.

As most of you know, there are many new software tools that will let any MV vertical market software package operate in the world of Internet commerce without changing a single line of code or sacrificing a single hard-earned business rule.

That's great news in itself, but now none other than Microsoft and Oracle have been directly sniffing around the MV market (yes, they are actually using the word "MultiValue") to see how they can entice the owners of our seasoned applications to run under their environments.

Scott Mayo of Microsoft was the featured speaker a few weeks ago at our MultiValue Conference in Chicago (his title is actually Senior .NET Evangelist), and he spoke about Microsoft's new .NET (dot.net) Server software.

EDITOR'S NOTE: *In 1993, International Spectrum magazine trademarked and coined the term "MultiValue" in conjunction with its technical advisory group, and donated it for the exclusive use by users and vendors of software built to operate around the UniVerse, UniData, D3, jBASE, UniVision, JOI, Open Insight, mv*BASE, mv*ENTERPRISE, Reality, and Native PICK databases. The masthead on this magazine illustrates the intended use of MultiValue as a convenient reference name for software products belonging to this compatible set of databases produced by several independent providers, much like the "Dolby Surround-Sound" symbol.*

Everybody in the audience—including yours truly—was very interested in what Scott had to say for a couple of reasons. First, Microsoft has over six years of development in this super server software built around XML standards (which, as one of our Spectrum delegates aptly noted, is like EDI on steroids for the Web). No matter what your feelings are about Microsoft, it would seem prudent for any application developer to become familiar with .NET, because many businesses will embrace this technology in the future.

The other compelling feeling we all had was this: here was Microsoft telling the MV market about a product that they thought could really benefit us. The new .NET Server software provides an environment that will let any MV vertical market software package operate in the world of Internet commerce without having to re-engineer it. (You can read more about .NET on page 36: ".NET For Real," by Steve Backman and Jim Butler.)

The implications of this are too far-reaching to cover in this short article, but the example given was that of Dollar Rent-A-Car and Southwest Airlines. Even though Dollar and Southwest's systems were coded in two completely different languages, Dollar wrapped its software in a .NET Server, allowing Southwest's customers to book a car rental. It's all handled seamlessly as though they never left Southwest's Web Site.

Oracle, on the other hand, is rumored to be even more overtly interested in the MV market. Oracle's interest began with the impending merger of MV-On (formerly Blacksmith—developer of the new MV-on-Oracle product) and Cue-bic Systems (an MV VAR with substantial Oracle skills). Now, insiders say that Oracle will not only aggressively enter the MV market in partnership with these companies, but they will also establish a separate operating group to specifically target the MV VARs.

In both the Microsoft and Oracle scenarios, the MV database and the application will look and feel exactly like it did before it was migrated to these new environments, which means the value of a person's MV skill-set will be preserved and presumably, once again re-born.

Stay tuned. In the meantime, download the MV logo from our Web Site **(www.intl-spectrum.com)** and include it in your product literature. It's free, and some day you might be glad you did!

— GUS GIOBBI, CHAIRMAN, IDBMA, INC. —
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The "Industry's Best Kept Secret"

BY GUS GIOBBI

As previously mentioned in the last installment of The History of MultiValue (see Spectrum, May/June 2002), the MultiValue system was the exclusive property of Microdata from 1970 to 1978.

But sometime in 1979 or 1980—in a classic dispute over the affections of a woman—Microdata CEO Don Fuller and Dick Pick locked horns in a bitter dispute worthy of a soap opera.

Even though they collectively controlled the undisputed lead in the minicomputer technology race, Dick Pick and Microdata split, and Pick set off to market the system on a broader basis on his own. A lawsuit over ownership rights followed, and is cited by many as the unfortunate beginning of the system's reputation as being the "Industry's Best Kept Secret". Although the lawsuit was settled out of court in 1981, a tremendous window of opportunity had been squandered—never to be recovered again.

Under the settlement, Microdata retained the exclusive rights to "Reality" and its development on the Microdata hardware. Pick and Associates obtained the rights to develop and port the system to other manufacturers' computer hardware.

In what would eventually prove to be the final nail in the coffin for industry visibility, Pick's eccentricity and well-known "loose" lifestyle did not put him in a position to insist that early purchasers "brand" the system as the Pick Operating System. Therefore, licensees began the trend of calling the system by their own proprietary name, which still persists today. (For example, "Zebra," from General Automation; "Mentor," from Applied Digital Data Systems; "Ultimate," from The Ultimate Corp., etc.)

Pick and Associates' early licensing policy was also a deterrent to rapid and full-scale porting of the system, a factor which changed in 1984. Prior to this, a license reputedly cost $1 million or more, and each license was structured differently in terms and fees. A new policy established in 1984 set a one-time fee of $50,000 per licensee and a royalty of $50.00 per user (port).

As the plot thickened, and in an attempt to compete head-on with Microdata on the hardware side, Pick and Associates began to import the 8-bit Multi-6 minicomputer from Intertechnique, the French company previously contracted to manufacture and supply the firmware board that was so integral to Microdata's Reality system. The Multi-6, in turn, was based on the Microdata 1600 CPU.

Pick then implemented his Operating System on the Intertechnique hardware and marketed it in the U.S. as the Evolution System. In Europe, the system was marketed by Intertechnique.

During Pick & Associates' period of involvement with Evolution, the system was also ported to Honeywell Level 6 minicomputers for The Ultimate Corp. Since the Intertechnique machine was, for all practical purposes, an exact copy of the Microdata machine, the port to Honeywell is considered by many to be the first of many true ports to come from "true" PICK.

Honeywell marked a turning point for the system. For the first time, PICK was running on a well-known computer. It could now support more terminals and handle larger applications than previously, proving to be a highly successful venture. It was an instrumental move in encouraging other hardware manufacturers to offer PICK on their own systems.

The Honeywell Ultimate port was closely followed by the second porting to the ADDS Mentor machine (ADDS was the Applied Digital Data Systems company later acquired by NCR). **is**

NEXT ISSUE: **Revelation emerges; UniData and UniVerse enter the fray; Pick licenses the world.**

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THERE IS NOTHING MORE IMPORTANT RIGHT now than SQL Server. If there ever was an alternative database that could push "MV" into the Smithsonian, it is "SS". So it's appropriate to interrupt the normal sequence of this rant to rave, or complain, or to just observe.

True to its parentage, SQL Server' is volunteering to become the industry standard. Many people, or maybe most, have an opinion, but there are no point-by-feature comparisons. After all, SQL Server is supported by twenty billion dollars of geniuses at the Microsoft R&D center. It's the big kid on the block, and what's the point in razzing the bully?

At best, bashing Microsoft means a quiet exit of the more prudent friends, slinking away to less dangerous alliances. In a corporate showdown, it usually results in a political bloody nose. So perhaps the better course is to muddle along, quietly content with old-fashioned MV. Right?

IMHO

BY STEVE VANARSDALE

Nah. If that were our style, we probably wouldn't have hung out with Multi-Value in the first place. Now that MV is our bud, and pays at least a portion of the bills, we ought to stand up for 'im once in a while.

I'll start. I say that although SQL Server is pretty popular these days, it's pug ugly on the inside. Maybe there is a better way to say it, but SQL Server always seems encouragingly similar to MV, but works out disappointingly different. Those differences go a long way toward explaining why SQL Server seems so damn slow.

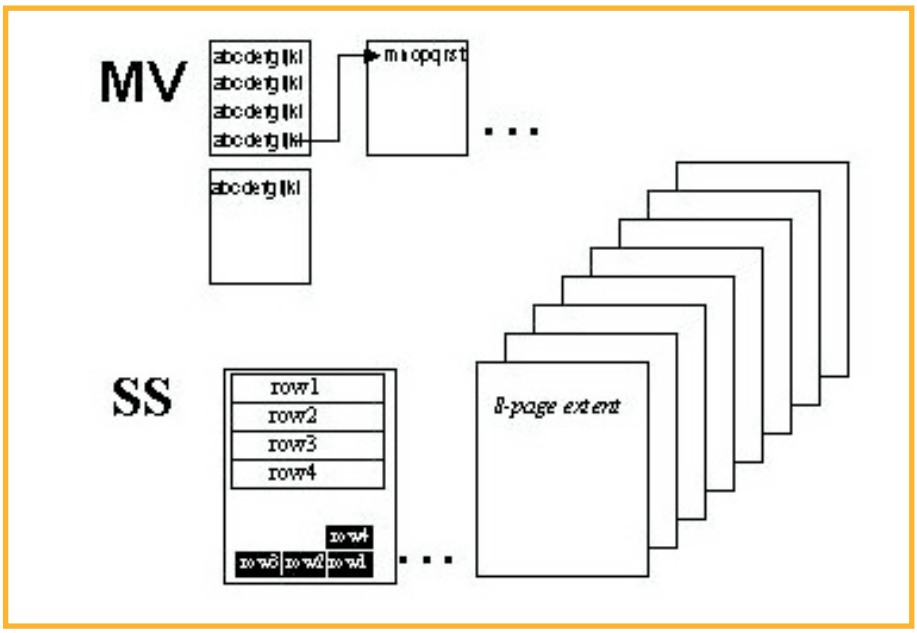
From the inside: SQL Server data is stored in tables; these tables are stored in Windows files, in primary and overflow NTFS file spaces. This is similar to the MV structures (files > frames > pages / blocks > NTFS clusters). But it is surprisingly less efficient in SQL Server, which could certainly be considered "native" to the environment. In contrast to 2K MultiValue frames, SQL Server continuously tosses around relatively large chunks of disk space for tables: 8K per page and default allocations of 1 megabyte at a time.

Breeding tells. Apparently a child of its environment; SQL Server was clearly built when disk space is sold by the gigabyte, while MV was invented when disk space was sold by the byte. The first observation is:

1 That it don't look on the inside like it does on the outside. It is easy to underestimate the complexity of what appears to be simple column and row data. Making SQL Server tables perform well requires much more forethought than your typical read-and-write MV application, and a serious investment in the design of the tables. We'd better look a little closer.

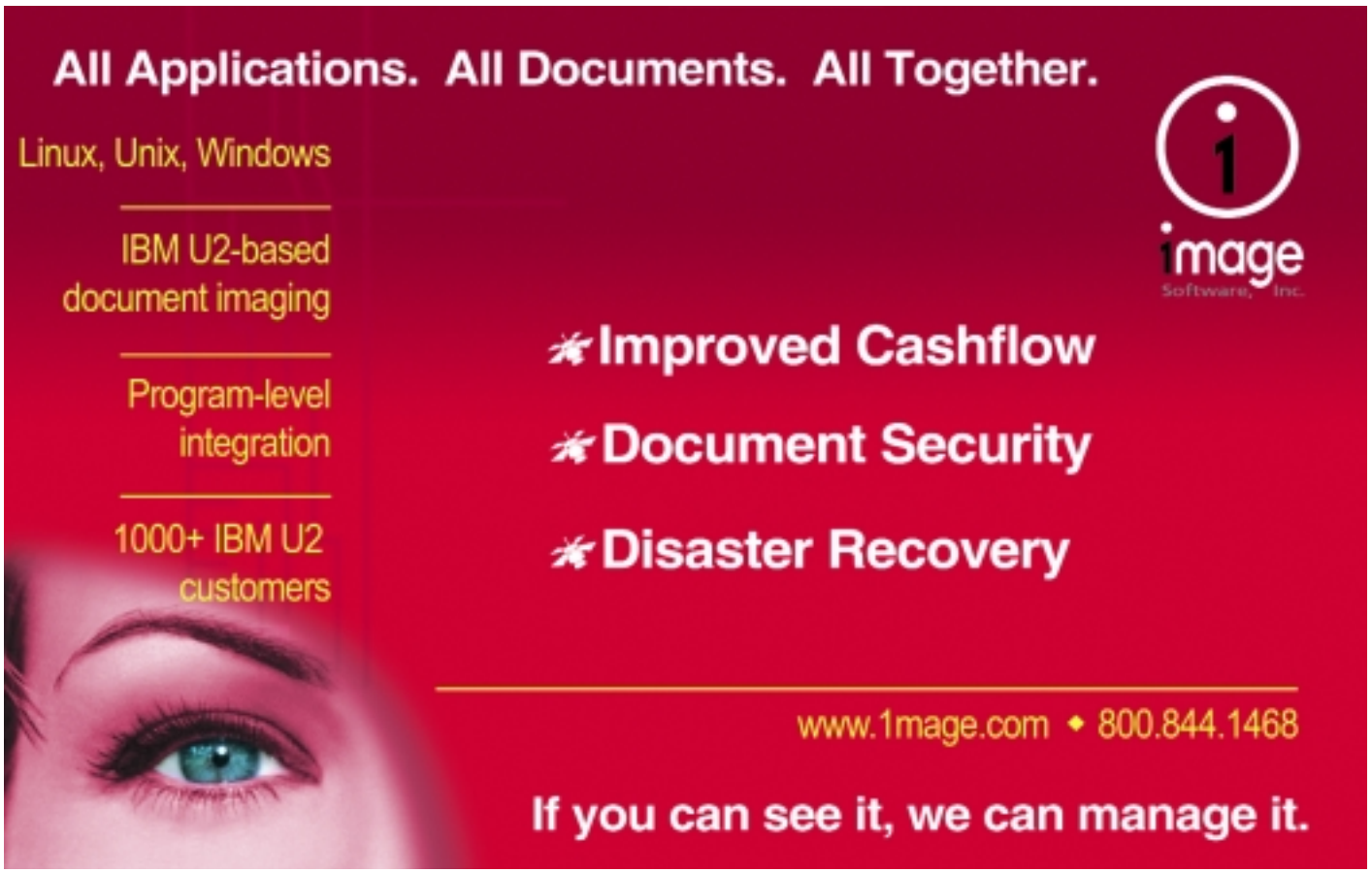
2 Physical data storage in SQL Server is, in a word, wasteful. It has a familiar layout, but it works goofy. Within NTFS files, SQL Server tables are stored in 8K pages, with a 96-byte header on each page, just like a giant MultiValue frame. Perhaps praise by imitation. However, this is where the similarity ends. As we know, MV items are hashed into lists within a frame, and frames are added when a row reaches the end of a frame, as in figure 1, where one item in the first frame of a file overflows…

FIGURE 1



In contrast, data on a SQL Server page is stored by the "row". Rows are stored in lists, sequentially in the page. There is a "row offset map" at the end of the page; basically a reverse list of the byte-count offset of each row into the page. Obviously, a page is filled when the data of the next row bumps up against the map that is simultaneously growing from the other end of the page. The Microsoft geniuses must have been sleepy the day this scheme was invented, because this architecture imposes two fundamental constraints from the git-go. First, a row cannot extend beyond a page, and consequently, there is an inherent limit on the size of any row. (Could

Continues on page 12



IMHO

Continued from page 10

this be the reason that a SQL Server page is so big?) To compensate, untyped text, ntext, and image data are ripped out of the row and stored in a completely different type of page, in a file "extent", sort of like an MV pointer-item (more praise by imitation) except that…

3 A SQL Server "extent" is the fixed basic unit of storage allocation, composed of a whopping eight contiguous 8K pages. (Figure 1) An extent is either "uniform" and allocated all to one table, or "mixed" and shared by multiple tables. An extent is added to a file as the table within the file grows, like MV overflow, only a lot less efficient. Adding this 64K extent to a file as it files can be an expensive task, absorbing both time and a relatively large amount of data movement memory. Moreover, each uniform extent is relatively large, so retrieving and writing are disk-intensive and a page takes an average of twice as long to scan. Finally, a mixed extent will undoubtedly suffer locking contention when attached by concurrently used tables. And I'm still trying to figure out what constitutes "contiguous" and what happens to non-contiguous pages. Perhaps the "non-contiguous" pages may be the cause of the fragmentation that is so common to SQL Server and Windows?

4 Looking at internals from the next higher step: SQL Server tables are stored in files within file groups. A SQL Server file group has at least three files:

- one or more "secondary" files (*.ndf), which actually contain the pages, which contain the rows, which make up the tables. This looks like the data portion of a MV file.
- a "primary" file (*.mdf) which acts like the MultiValue dictionary… plus the MD, and plus the master MD file, or the VOC in the UNIX emulations. It also acts as the backup for the SQL Server "master database" which has another copy of all the primary file stuff, and more.
- finally, there are also one or more "log" files (*.ldf), which have information, required to re-create the primary and secondary files.

The bad news: all the files are laboriously updated when a table row is added or deleted. Apparently, this is a necessary and appropriate safety measure while trying to do serious database work in Windows—due to the wild and wacky things going on—the downside of being too pretty and too rich on the job. (I.E., too graphical, and too many convenience features).

5 Then SQL Server adds still more overhead. An excerpt from the online documentation reads: "The first page in each [primary and secondary] file is a file header page containing information about the attributes of the file. Several of the other pages at the start of the file also contain system information, such as allocation maps. One of the system pages stored in both the primary data file and the first log file is a database boot page containing information about the attributes of the database." Whoa. During an update, there's disk I/O all over the place, on the same drive, in the same file. That's why your old 486 in the corner running MV seems so much faster than the Pentium 4 running SQL Server. Once all these pages are serviced, then the data can be stored. If there's room. Otherwise it's time to add that 64K of extent pages to the file, at 8K per page, and 8 pages per extent.

6 To be fair, adding the extents to the file has a good side. (Finally the bully gets a point.) With its dynamic extents, SQL Server has addressed the file sizing issue that plagued UNIX databases for the last 20 years. Daily file sizing chores have been eliminated, or at least deferred, like with MultiValue.

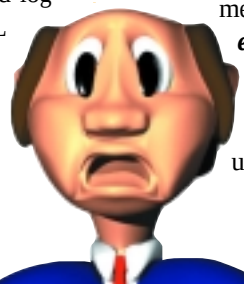
Maybe. The mechanism is not as graceful as 3-tiered overflow; it is instead more similar to that introduced in the dynamic files in UniVerse and UniData. SQL Server extents are simply automatically added to the ends of primary, secondary, and log files as the table grows. The SQL Server system user can still have a catastrophic crash, at the point that the database exceeds available disk space (like MV), or a file group exceeds the arbitrarily assigned growth parameter.

Not monitoring the ratio between table and file size would be like playing tennis with a grenade.

So, the time-honored job of monitoring disk drive allocation is secure in SQL Server, where table files are grouped so that "…files that make up the tables of a database [can] improve their performance by controlling the placement of data and indexes onto specific disk drives." (Although it seems that they would be faster with rows and indexes on different drives. Or intrinsically striped, like MV.) In any case, SQL Server uses a lot of sequentially arranged disk space.

7 Which leads us to the ultimate déjà vu of SQL Server. Who says that those Microsoft geniuses don't have a sense of humor? They re-introduced the sequential file.

File indexing is now only a minor difference between MV and SQL Server, not as great an issue as between MultiValue and other databases of the past, where an index was required to retrieve data at all. Where indexes were always optional in a MultiValue database, they are now also optional in SQL Server. Table rows can be stored in a random order, called a "heap", and have what are called "non-clustered" indexes, which are tables containing the index key and the key to the original data row. They work just like indexes used on MultiValue files, simply to improve performance. The new development is that SQL Server has a file type that is intrinsically indexed, and is read "random", just like a MultiValue file. Here's the surprise: These SQL Server tables are configured with what is deceptively called a "clustered" index. "Clustered-index" tables simply have each row stored in strict key sequence. On a read, once the key is supplied, the database engine streaks down the key column in the linked list to find the data row. It's a little like MultiValue, which interprets the item-id to find the proper frame and reads all the items listed… except that according to its documentation, ***SQL Server reads the entire file.***



What are they thinking? Considering the relative speed of using the CPU for item-id inter-

pretation versus the disk I/O to read down a table column of keys to locate a row…and the overwhelming overhead involved in inserting a row during a write… the performance trade-off certainly seems to favor hashed files. And since MultiValue has been doing this since before most of the Microsoft geniuses were born, it's certainly no secret. One wonders if Mr. Gates is getting his money's worth.

Let's assume that the documentation is wrong. Or that's what we can expect proponents to say in the court of public opinion. At least the SQL Server "clustered index" is intrinsic, and that's a step closer to the intrinsic efficiency of the MultiValue hashed model. Unless of course, the table key is not particularly well formed. Forewarned is forearmed, reader: Regardless of the extra effort, indexed tables are going to usually be the best for SQL Server applications with files larger than 64K. Seek expert advice.

8 **There is excellent** help available in SQL Server: There's a cool Index Tuning Wizard that takes as input the log file of how the table has been used, and suggests the appropriate index changes to increase performance. There are also embedded mechanisms to keep track of the contents of file groups, (the Global Allocation Map or "GAM", and the Shared GAM or "SGAM") and essential tools to administer the file groups and recover empty space on a regular basis (i.e., SQL Server's "auto shrink" feature).

Better limber up the checkbook, however. It's time for an experienced (expensive) and independent (tyrannical) database administrator. Otherwise the only known alternative for a SQL Server database that a user can administer alone is very large amounts of redundant, mirrored disk space. One had better also get a whale of a processor chip, because at least two production sites that I follow report that SQL Server can give new meaning to the term "on-your-knees, terminally-slow, resource hog". Enough genetic bashing. It's time to start looking at tables:

9 **SQL Server tables** are designed to be accessed solely via SQL statements, rather than with an editor, user commands, or program code like MV. (Given the name "SQL Server", I've been wondering why this was such a surprise? I should get out more.) SQL Server table data is therefore always referenced by a column name within a table. Sets of column names make up a "view". Again, this seems similar in concept to MultiValue. A view seems to correspond to a set of MV attribute definitions…or an alternate set, maybe in a second MV dictionary pointing to a data file.

Not quite. Similar again, but different. A SQL view is actually a stored SELECT statement that can be referenced like a table. When accessing a table via a view, the select is performed, and then the query is performed. For that kind of huge processing cost, there must be a whale of a compensating tradeoff, right?

There is. The first clear point for the bully. A SQL view can be a rigorous subset of the population of the table. If the MV user is to access only a subset of the file's items, their MV query must be somehow explicitly restricted, or the MV population must be explicitly segmented, such as multiple data file segments. Furthermore: the SQL view is restricted to those columns / attributes specified for the view. In the absence of L/RET and L/UPD codes (and who uses those anymore?), an MV user, for the most part, can access any data attribute for which he or she can find or guess the name. More controllable in SQL Server.

10 **It's new. It's popular.** It's the greatest. But it ain't necessarily fun. In succinct example:

Here are the commands to define a file in MultiValue:

```
create-file MYFILE modulo modulo
edit dict filename attribute1 attribute2 attribute3 …
    (…followed by editor commands to create the
attribute definitions…)
```

Continues on page 14

For your large-scale project:
"...organizations spend two to ten times what they should for data processing, based primarily upon the recommendations of those who are direct beneficiaries."
- Steve VanArsdale, International SPECTRUM, 2002

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IMHO

Continued from page 10

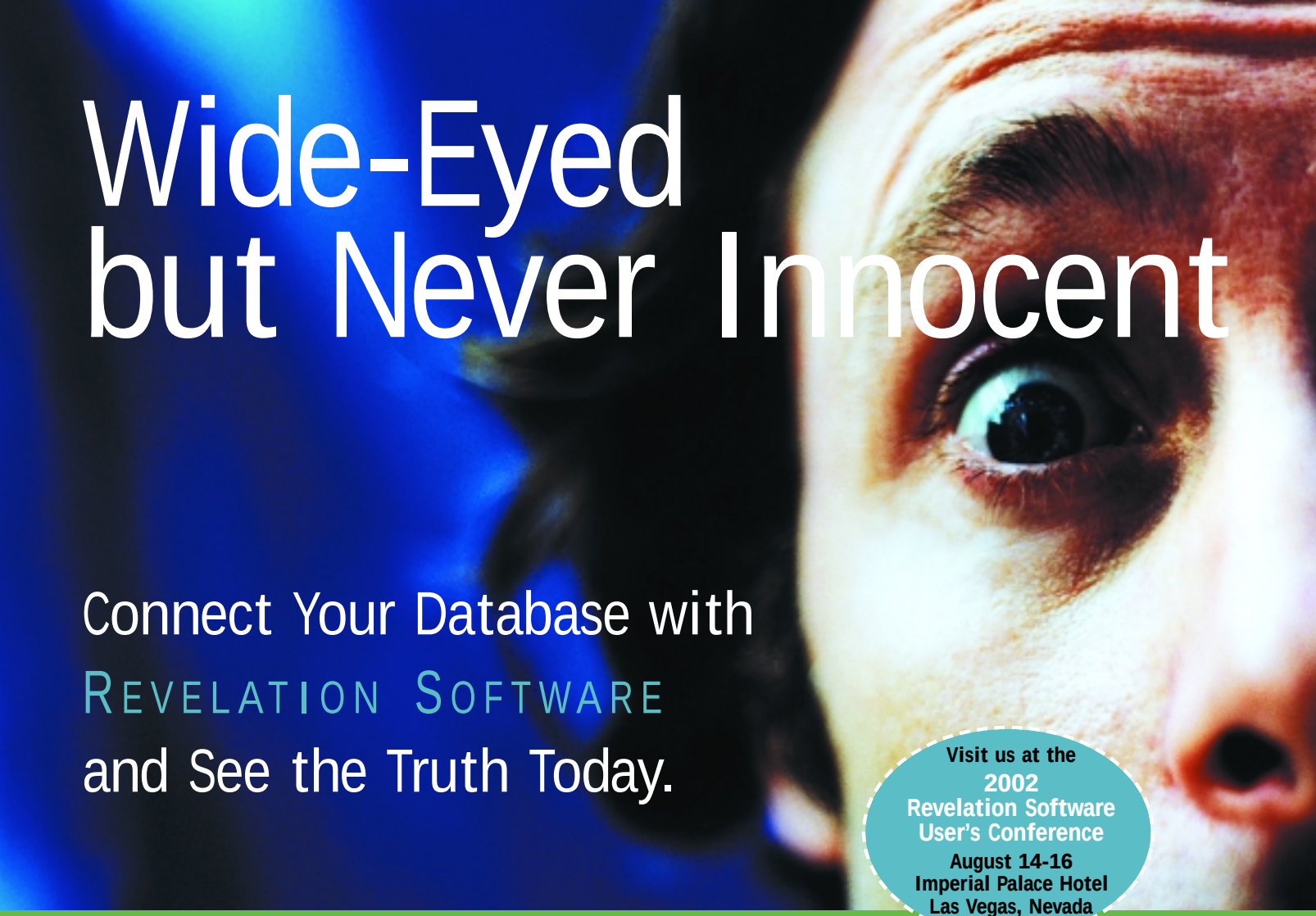
Here are the commands to do the same tasks in SQL Server:

```
USE master
GO
CREATE DATABASE MyDB
ON PRIMARY
 ( NAME='MyDB_Primary',
  FILE NAME=
    'c:\Program Files\Microsoft SQL Server\MSSQL\data\MyDB_Prm.mdf',
  SIZE=4,
  MAXSIZE=10,
  FILEGROWTH=1),
FILEGROUP MyDB_FG1
 ( NAME = 'MyDB_FG1_Dat1',
  FILE NAME =
    'c:\Program Files\Microsoft SQL erver\MSSQL\data\MyDB_FG1_1.ndf',
  SIZE = 1MB,
  MAXSIZE=10,
  FILEGROWTH=1),
 ( NAME = 'MyDB_FG1_Dat2',
  FILE NAME =
    'c:\Program Files\Microsoft SQL erver\MSSQL\data\MyDB_FG1_2.ndf',
  SIZE = 1MB,
  MAXSIZE=10,
  FILEGROWTH=1)
LOG ON
 ( NAME='MyDB_log',
  FILE NAME =
    'c:\Program Files\Microsoft SQL Server\MSSQL\data\MyDB.ldf',
  SIZE=1,
  MAXSIZE=10,
  FILEGROWTH=1)
GO
ALTER DATABASE MyDB
MODIFY FILEGROUP MyDB_FG1 DEFAULT
GO
USE MyDB
CREATE TABLE MyTable
 ( column1     int   PRIMARY KEY,
   column2     char(8)
    . . .followed by the commands to define rudimentary columns...   )
ON MyDB_FG1
GO
```

IMHO – There is nothing to fear. The industry standard is our friend. Yep, it works goofy and looks inefficient. But it's got great glitzy tools. SQL Server is probably the best-documented database that ever existed. It's good news for disk hardware vendors, database administrators, programmers, and empire-seeking MIS managers. And it is easy to learn, and can fulfill a useful role in an organization's strategy. As the replica database server in front of the real application system on MultiValue. ***=/srv***

That was fun. But the thorny stuff remains in integrating SQL Server tables. These will be observed in both rants and raves in upcoming columns. Thanks for listening.

STEVE VANARSDALE is an MV industry analyst, writing for *International Spectrum* and various research and advisory companies in Chicago. Criticisms, complaints, or commissions, always welcome at steve@vanarsdale.com or www.mvconsultants.com



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newsmakers

Modular Information Systems Joins jBASE Software's Value Added Reseller Network

Modular Information Systems of San Ramon, California, has signed to become a Value Added Reseller (VAR) of jBASE Software, allowing it to draw on jBASE's full line of products for its client solutions.

Modular Information Systems provides comprehensive IT services and solutions to over 200 MultiValue-related customers in 15 different industry sectors. "We have seen a growing interest in jBASE, and after our own careful evaluation, we think this technology has a very strong future," says Lisa Corbett, president of Modular Information Systems. "We are excited to be a reseller, and we have already had several of our clients inquire about the jBASE database."

Modular Information Systems **Opens New Office in Salinas**

Modular Information Systems has opened its new office in Salinas, Calif. According to Bruce Corbett, chairman and CFO for Modular, the company has seen an increase in business in the Monterey/Salinas area with its Information Technology Services, including its growing Help Desk Service.

Corbett went on to say that Modular Information Systems' success in Monterey County comes at a time when small and mid-size businesses require more efficient technological resources. "They do not have the resources to hire and keep a trained and full-time internal IT department in an era of ever changing technology," he explained. Modular Information Systems is a full service IT consulting company offering a complete range of professional services and products for businesses using Microsoft, UNIX, and Novell computing solutions.

The new office will be located at 1355 Abbot Street, Suite 2B, Salinas, California, 93901. The Salinas office will also serve as a sales office for Monterey County wineries interested in TSM Vintage Winery Management Software, which is distributed and supported throughout North America by Modular Information Systems. ■

FOR MORE INFORMATION, visit Modular online at www.miscorp.com

Dave Bryant, President of jBASE Software, Inc., says, "I'm very pleased that after taking a long, hard look at jBASE, Modular has chosen to add jBASE technologies to its offerings."

Modular Information Systems has been receiving considerable attention recently for an exhaustively researched comparative study of current MultiValue industry companies and their products. The continuing study, as detailed in a white paper on its website at www.miscorp.com, was initiated to answer questions for Modular and its clients about which technologies to plan for and invest in, and which vendors to depend on. ■

FOR MORE INFORMATION, visit www.jbase.com or www.miscorp.com.

WEBster Says:

Tired of being annoyed by Microsoft's stupid paper clip office assistant? In most versions of Microsoft Office you can right-click on the twisted pest and choose a much more interesting office assistant. In Office XP, Rocky the dog is my favorite!

ViaDuct 2000 Now Available for jBASE from @Better Results

Via Systems, jBASE Software Inc., and @Better Results, Inc. have announced the immediate availability of Via Systems' ViaDuct 2000 for jBASE customers. @Better Results has been named the exclusive North American distributor of ViaDuct 2000 for jBASE.

The ViaDuct 2000 terminal emulation package offers many screen options and PC integration features to give users the Windows-like features and connectivity they expect. ViaDuct 2000's Windows Explorer-like interface allows users to drag and drop files and items from a MultiValue account into the Windows environment, and interchange data with popular PC file formats. ViaDuct 2000 supports the major networking protocols, including TCP/IP, and offers over 40 terminal emulations along with the ability to create custom emulations. Since its original release over 10 years ago, ViaDuct has become the emulator of choice for over 150,000 end-users.

Along with distribution responsibilities, @Better Results will be providing support for ViaDuct 2000 for jBASE throughout North America. Jeff Jakus, vice president of Sales and Marketing for @Better Results, says, "In addition to providing the support functions, @Better Results will aggressively pursue new ViaDuct 2000 sales, support, and installation opportunities throughout the entire North American jBASE database market."

The president of Via Systems, Robert Catalano, adds, "We are very excited about the addition of @Better Results to our team of software distribution experts. With the addition of ViaDuct for jBASE, Via now has all of the major players in our market covered, and is positioned to take advantage of the steady growth of jBASE."

Dave Bryant, president of jBASE Software, Inc., says, "We're always happy when a leading product is qualified to run with jBASE, and ViaDuct enjoys a great demand with jBASE customers. This was a cooperative effort that will benefit our users, as well as all three companies." ■

FOR MORE INFORMATION, visit www.jbase.com or www.via.com

Temenos Installs First Temenos Globus Sites Utilizing **jBASE Database Technology**

Temenos, a global vendor of integrated banking software that supports international banking, announced it is installing Temenos Globus (Globus) based on the jBASE data management system at three sites in Europe. This follows a six-month period of intensive training and education for the worldwide Temenos organization, resulting in a smooth and timely implementation.

"We are very pleased with these initial installations," said George Koukis, Chairman of Temenos. "We need to maintain the high level of support and service that the leading financial institutions in the world expect from Temenos. The professionalism and determination of both jBASE and Globus personnel at Temenos has resulted in a first-class product offering."

Koukis also said that Temenos will continue to support existing sites that are running UniVerse, but all new installations will be based on the jBASE RDBMS product. Internally, its development, training, support and QA departments are now using jBASE to support their operations.

"In addition, and perhaps more importantly," continued Koukis, "jBASE has allowed us to expand our technological view significantly. For example, we are now able to take advantage of Java technologies to provide interoperability and scalability options. Further, we can now provide Globus on Oracle and DB2 databases and on the full range of IBM e-servers. None of this would have been possible without jBASE."

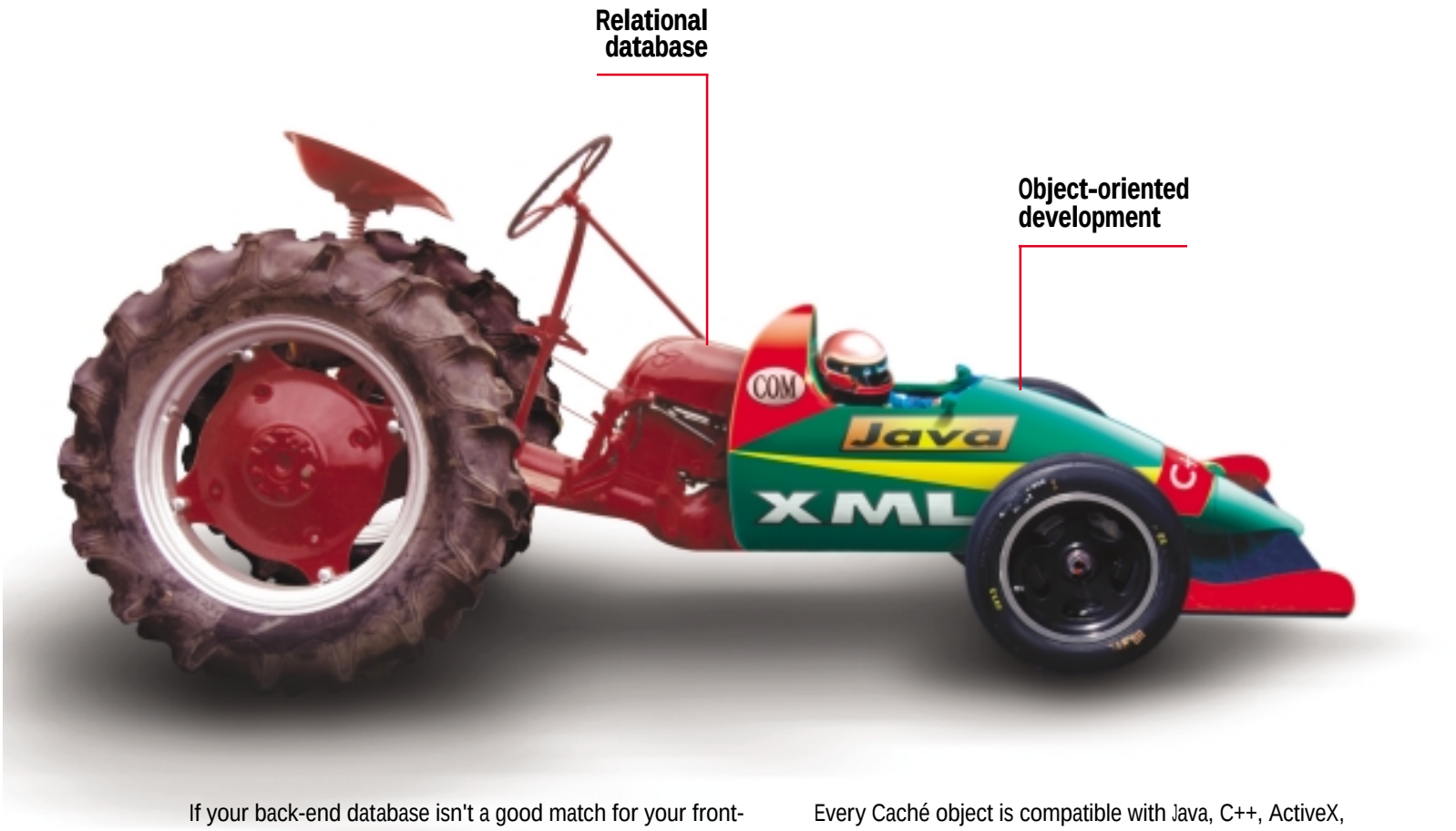
"We are very pleased at the ease of conversion from UniVerse to jBASE", said Clive Ketteridge, managing director of jBASE Software. "We have worked with Temenos personnel just as we have with all our major partners to ensure a smooth transition of technology platforms for their applications. Working with a world-class application development organization like Temenos allows us to validate our technological direction as well as provide a deep understanding of the concerns of our VAR partners."

Globus is an integrated, modular international banking system with full functionality including retail and wholesale banking, trade finance, and treasury modules. It supports multi-company and multi-bank environments and is global in scope, incorporating both multi-currency and multilingual capabilities. In addition, Globus contains robust risk management and security features that provide a flexible, user-friendly environment while allowing institutions to have complete control over their financial systems.

For more information, visit www.tenemos.com or www.jbase.com.

WEBster Says:

Ever glance at your server console and ponder how the heck someone seems to be accessing a web page that was scrapped eons ago? No doubt it means that somebody in IT doesn't realize that if you copy one web page to use as a foundation to build another, it doesn't matter what you name the new page, your server still thinks it's the old page name. Use your HTML editor on the offending page and you'll see the old name somewhere in the first few lines. Change it!



If your back-end database isn't a good match for your front-end development, you need a new database. Caché, the high-performance database from InterSystems, is a powerful fusion of today's mainstream technologies: objects and SQL.

Unlike Oracle and other relational databases, Caché takes advantage of its efficient multidimensional data engine to implement an advanced object model. It doesn't try to hide a cumbersome relational engine beneath object-like wrappers.

Every Caché object is compatible with Java, C++, ActiveX, and other rapid development technologies. And thanks to Caché's "Unified Data Architecture," every object class is instantly accessible as tables via ODBC and JDBC.

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Getting to 100% with Revelation Software

BY ROBIN WOODLAND

All that caffeine is paying off. You've been pulling all-nighters to build a new app for your client—hooking their MultiValue database to a glitzy new Web-based front-end. You've coaxed them through the process of specifying the rigid requirements. You've patiently explained that it's "GUI with a U-I." You've crunched a mountain of code. Now, it's time to unveil this masterpiece.

Barely five minutes into giving the client team the grand tour, it starts. "You know, we forgot about a field for the call-back status." "Now that I see how it works, maybe we need another button over here." "Can we change the order of the way these things appear?"

The good news: you've brought them 90 percent of the way. The bad news: if you're like many developers, getting that last 10 percent is going to be a problem. The client either needs to break out a change-order form and squeeze the piggy bank for another fifty grand—or they'll have to live with software that almost works.

But when Jim Butler hits that point in the process with his clients, he says, "Sure, we can change it around—no problem. Just give me a few minutes."

Jumping into a dynamic creative exchange, Butler and his clients conjure up new screens and buttons—adding functions they never thought to spec. In the time it would take to figure what to say on the change-order, it's done. Everything clicks into place, and the client has a Web application that does 100% of what they need it to do—and they're 100% satisfied.

Getting his clients to 100% is why Jim Butler has been so successful, and he credits the tools he uses from Revelation Software for making it possible.

Developer Jim Butler counts on Revelation Software's GUI and Web features to get his clients all the way there

From Scuba Gear to Software

Butler's first taste of success as a developer came through his love of scuba diving. About 15 years ago, he saw a need for point-of-sale software customized for the scuba industry and decided to build it himself. Butler looked around for the best database development tool available and chose Advanced Revelation (ARev) —Revelation Software's award-winning DOS development environment noted for its flexibility and robust, multi-user data access. He used ARev to create ScubaWare, and quickly captured 53 percent of the market. ScubaWare is still the dominant product in the industry today—and still operates in ARev.

Butler's next brainchild was EQUALS International, Ltd. (www.equals.net). Launched in 1993, EQUALS is an integrated airline management, aircraft maintenance and logistics support system designed for small to medium-sized airlines. Again, Butler used Revelation to build it—starting with ARev and then migrating to OpenInsight, a repository-based development environment that facilitates easy Web deployment and full integration with GUI front-end tools.

EQUALS handles everything from passenger reservations and tour package management to aircraft maintenance and warehouse operations. It's now installed in small airlines from Alaska to the Cayman Islands and tour companies like GrandCanyon.com—even the Colombian Air Force is using it. And every EQUALS installation is fully customized to suit the unique business practices of each of client.

Give 'Em What They Want

For independent developers, the key to success is being able to give your clients what they want: applications that are full power, full function, rock solid, low cost and flexible.

Butler says that flexibility is absolutely critical. "The training I had in college emphasized getting all the rigid requirements nailed down up-front during the specifications phase. But in practice, it doesn't really work that way. In 20 years of writing code for a living, I've learned that a client cannot sit down and anticipate everything they'll need in the system if their life depended on it. They just don't think that way.

"My view is that software is, by definition, soft. It should adjust to fit the needs of the business, not make the business adjust its practices to fit the software. So you really need to have a development tool that's very quick at modeling and mocking-up systems for people. Revelation tools have that kind of power."

Revelation: Fast and Flexible

Working in OpenInsight enables Butler to create application prototypes in real time. That's how he works with his clients to get the software to do 100% of what they need it to do.

"Most companies never get to that last little 10% because they were so locked into designing the application up front," Butler said. "Once it's delivered, any rework is really expensive. But with Revelation, you can build a prototype and let the client play around with it—and then you can refine it and modify it without major rework. So we can easily go back and forth to get that last 10% comfort level.

"I can prototype a system far faster in Revelation than any other development tool. And that's why we aren't too worried about our competitors in aviation software, because they're all writing in C or SQL Server or the other development languages of the past. They're either not robust enough to be able to scale up, or they're too rigid and inflexible to accommodate changing business needs. We can make those changes easily, and that's really our competitive advantage."

> "Software is, by definition, soft. It should adjust to fit the needs of the business, not make the business adjust its practices to fit the software."

Web Wonder!

The biggest advantage Butler sees in Revelation is its seamless integration to the Web. OpenInsight and Revelation's Web Deployment Pack allow developers to Web-enable their applications without making any changes to the underlying code, which simplifies things considerably.

"Our very first experience with using OpenInsight to Web-enable a client was done for an airline in Seattle," Butler explained. "By the end of the second week, the Web site was fully deployed. The client spent a total of $20,000, including the Revelation licenses. To webify an airline reservation system for $20,000 in two weeks — that's unheard of.

Continues on page 22

Getting to 100% with REVELATION SOFTWARE

Continued from page 21

"What's cool is that with OpenInsight, you can work a few different ways. You can use something like the Macromedia MX suite to design the client/user interface. That allows us to create a sophisticated GUI with rich graphical content that integrates seamlessly with the data back-end. You can also use OpenInsight to dynamically deliver HTML pages entirely from the server, so it runs on any browser – you don't need anything on the client side. Or you can use Revelation's JOI tool (Java for OpenInsight) to deliver data-driven Java clients to any Java enabled device. I don't know of any other tool that's as robust on the back-end and gives you that kind of GUI flexibility. Maybe Oracle does – but that's going to be too expensive."

Bob Carten, Revelation's Senior Developer, explained that Revelation's approach is perfectly suited for the job. "The idea that the dictionary is separate from the data; that you can modify the dictionary without affecting the data; that our tables have what you can think of as properties and methods, and that we can dynamically change those without ever breaking what exists so far – all that means that I can iterate the database's back-end as quickly, frequently and safely as I can iterate that event-driven front-end. That's what makes us such an ideal database to sit behind a GUI tool."

Butler agrees. "In an environment where time-to-market is critical, good Web and GUI tools emphasize flexibility. Revelation makes good Web tools because they cut and weave as deftly as the Web pages they support." Or as Bob Carten likes to say, "Revelation hugs the road to success."

Coming Full Circle with XML

With the advent of XML, Revelation's approach seems to be right on the money. "When we look at XML, we feel like our time has come," says Carten. "The core idea in a Revelation database is that if you take delimited data and hand it to an interpreter, magic happens! And the core idea behind the web – and now behind XML – is that if you take delimited data and you hand it to an interpreter, magic happens!

"We feel like the whole infrastructure has caught up to where Revelation's been all along. The machines have gotten good enough to support it. The web is there. The XML interface language is there. Everybody is saying, 'If you can be a good delimited database, you are the tool of the moment.' Well, we are." **is**

ABOUT THE AUTHOR:

ROBIN WOODLAND is a writer and communications consultant in the San Francisco Bay Area who knows it's GUI with a U-I. Contact him at rwoodland@earthlink.net.

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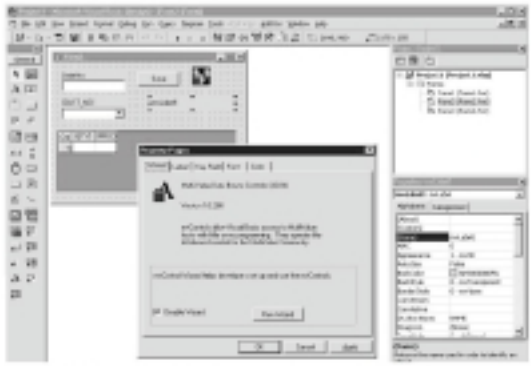

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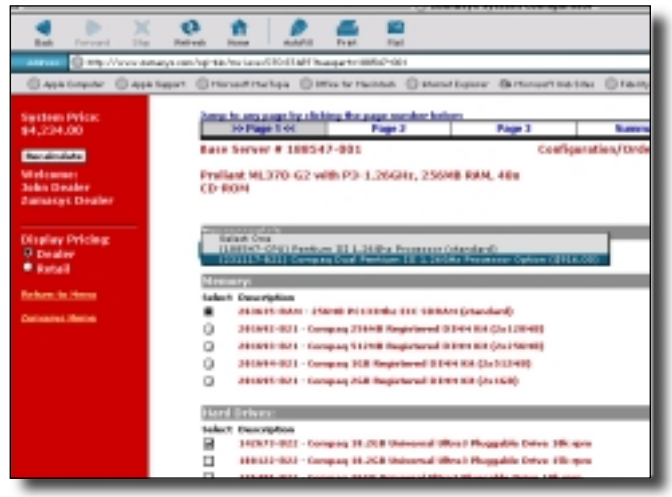

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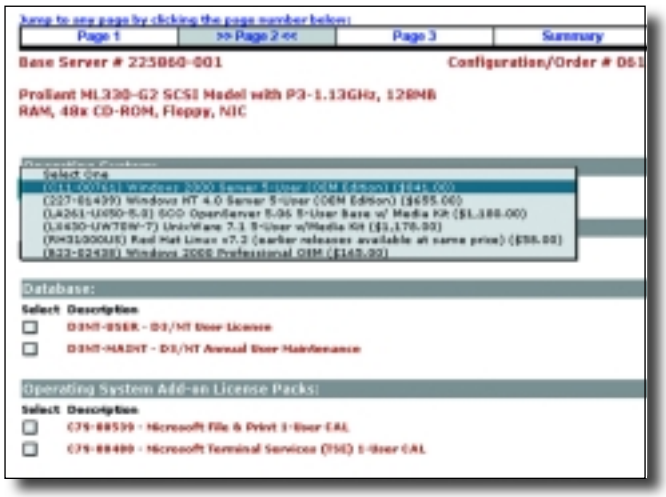

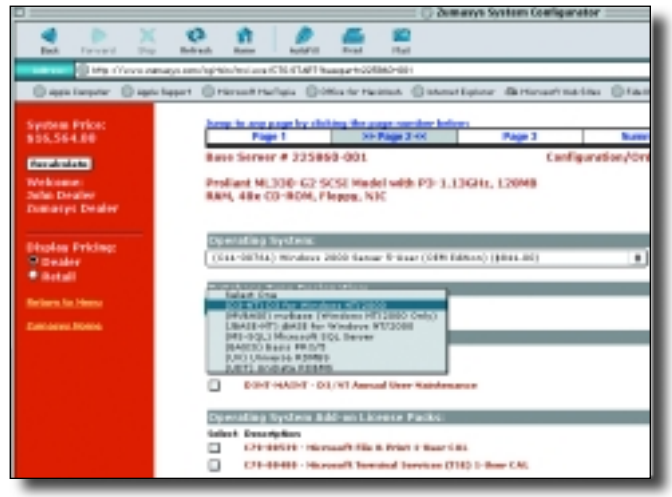

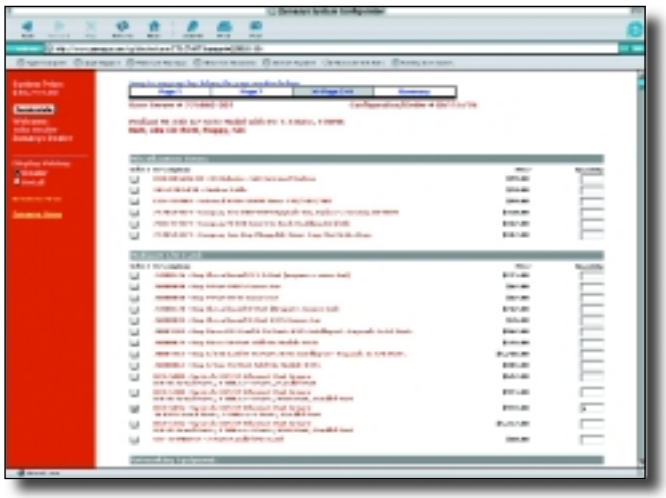

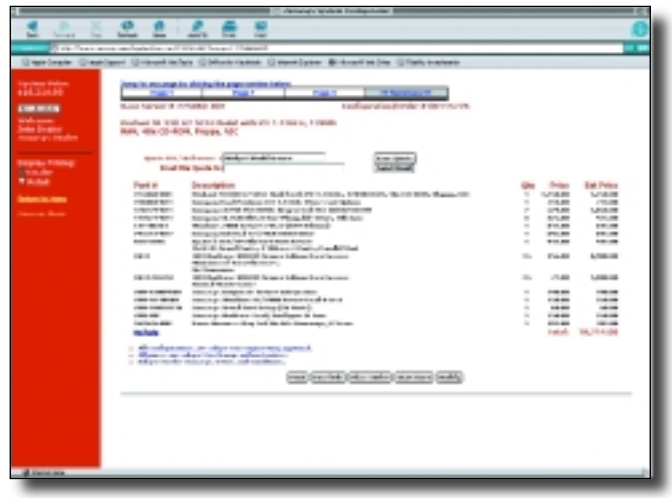

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A Data/Basic Programmer's Story:

"I Didn't Need to Know HTML to Enable Web Integration"

A step-by-step case study in setting up WebWizard with a UniVerse database

BY ALBERT QUAN

I'm writing this article to demonstrate a real-life working example of a remarkable MultiValue tool for Web integration, WebWizard. The Web Wizard API, from Via Systems, allows Data/Basic programmers like me to build sophisticated web applications—with no HTML or Javascript knowledge.

I work for Modular Information Systems, an IT professional services consulting firm. We provide a variety of services which include network design and architecture, IT strategic planning, project management, system integration, software design and development, conversions, and winery software. With such a diversity of services and clients, our Help Desk plays a key role in managing customer services.

Our Help Desk Call Tracking System, which uses UniVerse on Windows 2000, not only allows customers to e-mail, fax, or call in their technology problems and requests, but also enables them to display their own help desk calls through the Internet. This is possible through WebWizard, as it connects Web technologies with our UniVerse customer database.

We began this Help Desk Web integration project in October 2001. Via Systems came to Modular's offices to present a two-day training course on using WebWizard 5.0. Although I have nine years of Data/Basic programming experience, I have not done any web work. I was expecting to be told that it was a requir ement to learn some HTML before I could use WebWizard. I was wrong. We were all excited and amazed at how quickly and easy it was to set up WebWizard to interface with our Help Desk Call Tracking System on UniVerse—without knowing any HTML.

Building the WebWizard Interface

About eight months after attending the training course, I faced the task of building the WebWizard interface for our Help Desk Call Tracking System. There are two interfaces that can be used with WebWizard: the WWAPI interface or the HTML interface. I preferred to use the WWAPI interface since I did not know HTML.

I was a little worried that I would not remember all that Via Systems had shown us regarding WebWizard's "WWAPI" subroutines—but with the help of the training class examples, the WebWizard manual, and a little trial and error, I was able to create my own WebWizard interface.

The first step to setting up WebWizard was to load WebWizard on the Web server. This included installing the PC programs on the Web server, configuring the PC programs, and installing the host programs on the host system. Our Web server runs on Windows 2000, and ASP (Active Server Pages) must be installed for WebWizard. (WebWizard also works with Apache Web servers).

After running the setup program from the CD to install the PC programs, I needed to set up the connection to the host system. Once the connection was established via the "Connection Wizard," the host programs were loaded and a script was created to allow WebWizard to communicate with the host system. After WebWizard was configured and I was able to connect to my UniVerse account successfully, I could start working on the WebWizard Interface.

I required five Web pages for my Help Desk application:

1. **LOGIN SCREEN (user login and password) –** HDLOGIN SUBROUTINE
2. **INQUIRY –** Validates user login and password and displays help desk calls for the user which allows user to select a help desk call or enter a new help desk call – HDINQUIRY SUBROUTINE
3. **INQUIRY DETAIL (Detail of an open help desk call) –** HDINQDETAIL SUBROUTINE
4. **NEW CALL (Entry of a new help desk call) –** HDNEWCALL SUBROUTINE
5. **Confirmation and Validation of New Call –** HDCONFIRM SUBROUTINE

All of the Data/Basic subroutines required that the following be in the first few lines of the program:

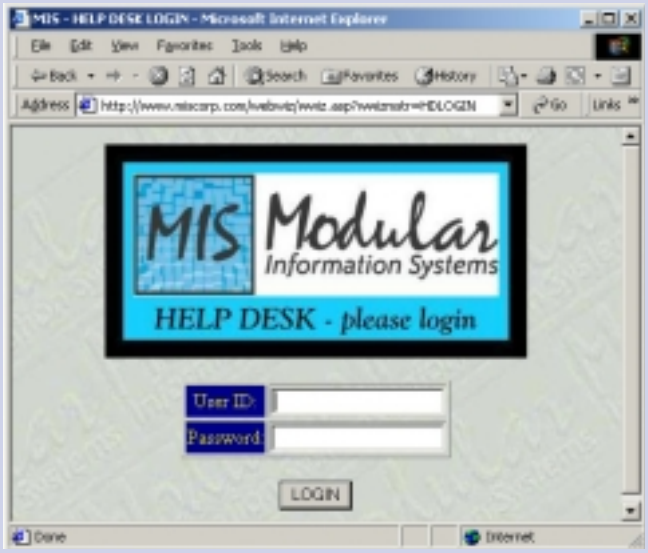
```
01  SUBROUTINE MYPROGRAM
02  INCLUDE WWIZ.INCLUDE WIZCOMMON
03  CALL WWAPI.INIT("NEXT SUBROUTINE","TEMPLATE")
```

SAMPLE CODE FROM HDLOGIN SUBROUTINE:

```
0001:      SUBROUTINE HDLOGIN
0002: $INCLUDE WWIZ.INCLUDE WIZCOMMON
0003:      CALL WWAPI.INIT("HDINQUIRY","")
0004:      CALL WWAPI.BOOKMARK("MIS - HELP DESK LOGIN")
0005: * CALL WWAPI.BACKGROUND("","LIGHTBLUE")
0006:      CALL WWAPI.BACKGROUND("http://www.miscorp.com/webwizpics/modularbg2
 .jpg","")
0007:      CALL WWAPI.ALIGN(WWIZ.ALIGN.CENTER)
0008: CALL WWAPI.PICTURE("http://www.miscorp.com/webwizpics/hdlogin.jpg","MISLO
 GO",WWIZ.NORMAL,"")
0009:      CALL WWAPI.NEWLINE
0010:      CALL WWAPI.NEWLINE
0011:      CALL WWAPI.START.TABLE(1)
0012:      CALL WWAPI.COLHDR("DARKBLUE",WWIZ.ALIGN.CENTER,"YELLOW","User ID:")
0013:      CALL WWAPI.NEWCELL("","","")
0014:      CALL WWAPI.TEXTBOX("USERID","","","")
0015:      CALL WWAPI.NEWLINE
0016:      CALL WWAPI.COLHDR("DARKBLUE",WWIZ.ALIGN.CENTER,"YELLOW","Password:"
 )
0017:      CALL WWAPI.NEWCELL("","","")
0018:      CALL WWAPI.PASSWORD("PWD","","","")
0019:      CALL WWAPI.END.TABLE
0020:      CALL WWAPI.NEWLINE
0021:      CALL WWAPI.BUTTON("LOGIN","LOGIN")
0022:      RETURN
```

The WIZCOMMON variables are used to interact with the Web browser. The WWAPI.INIT routine initializes the WWAPI interface. The first parameter of the WWAPI.INIT subroutine is used to call another subroutine and the second parameter is used for special "templates" to display results. In order to activate the program for WebWizard, I needed to compile and locally catalog my program and then run the WWIZ.PUBLISH tool to "publish" the Web page.

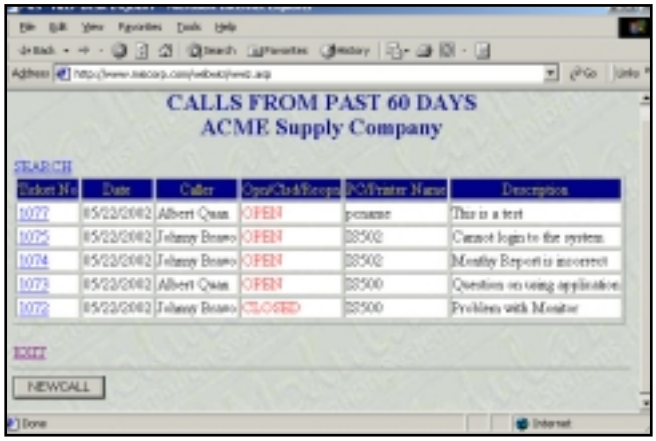
WebWizard also provides a testing utility, RUN.WEB, which can be run on the host system without using a Web browser. By default, RUN.WEB will "execute" the returned HTML, simulating a text-type browser at the command line. Text boxes will become input statements, and check boxes and radio buttons become "Y/N" inputs. By responding to the prompts from RUN.WEB, you can execute multiple Web pages in succession (by electing to execute a "link," or by pressing a "button"). If you need to "debug" a WebWizard Data/Basic program that generates multiple pages of output, you can begin with the first Web page, and "walk" through each successive page until you reach the error page. I found this utility to be very useful when creating my programs. If I did not use the right syntax for a WWAPI function, the Web page would not display. Via Systems recommended it was good practice to always use RUN.WEB in our training session.



Login Screen – HDLOGIN

The user's entry of User Id and Password from the HDLOGIN login screen are automatically passed to the HDINQUIRY program through the WWAPI.INIT subroutine once the "LOGIN" button has been pressed. The HDINQUIRY program validates the User Id and Password fields and then displays a list of calls for the user. Backgrounds and pictures can also be added with the WWAPI.BACKGROUND and WWAPI.PICTURE subroutines. Be sure to store pictures and backgrounds in a directory available to the Web server. Originally, I stored my pictures in a directory where I could see the pictures through the local intranet—but they would not appear when I accessed the Web page through the World Wide Web. Once I discussed this with our network administrator, he moved the pictures to the Web server directory where our Web page existed, and the pictures appeared. *Continues on page 28*

mvToolChest



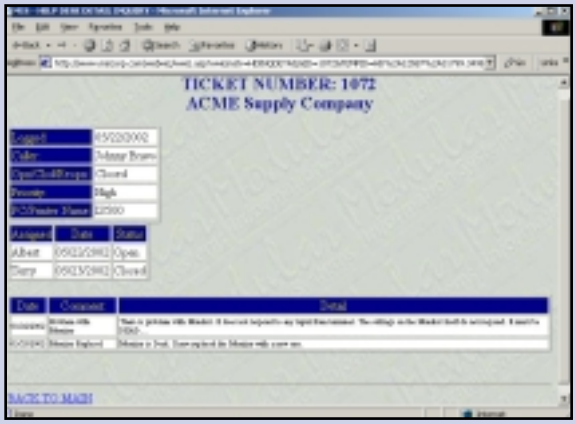
Inquiry Screen – HDINQUIRY

The list of calls was set up in a table using the WWAPI.START.TABLE and WWAPI.END.TABLE subroutines. Moving to another cell within the table is accomplished with the WWAPI.NEWCELL subroutine. Creating a new row is accomplished with the WWAPI.NEWLINE subroutine. The column header descriptions and colors were set using the WWAPI.COLHDR subroutine. The Ticket No is a link to the HDINQDETAIL subroutine, which displays the call detail. The "EXIT" link brings the user back to the login screen and the "NEWCALL" button calls the HDNEWCALL subroutine to allow the user to enter a new call.

TABLE ENTRY FROM HDINQUIRY SUBROUTINE WITH COLUMN HEADERS:

```
0143:        CALL WWAPI.START.TABLE(1)
0144:        CALL WWAPI.DEFINE.TABLE("white":VM:"white":VM:"white":VM:"white"
 :VM:"white":VM:"white","","")
0145:        CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Ticket No")
0146:        CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Date")
0147:        CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Caller")
0148: *      CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Status")
0149:        CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Opn/Clsd/Reopn")
0150:        CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","PC/Printer Name")
0151:        CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Description")
0152:        CALL WWAPI.NEWLINE
0153:        DONE = 0
0154:        LOOP
0155:          READNEXT ID ELSE DONE=1
0156:        UNTIL DONE DO
0157:          READ CALL.REC FROM CALL.TRACK, ID THEN
0158:            CALL WWAPI.LINK(ID,WWIZ.PROGRAM,"HDINQDETAIL&ID=":ID:"&TEM
 PID=":TEMPID:"&CUSTNO1=":CUSTNO1)
0159:            CALL WWAPI.NEWCELL("","","")
0160:            CALL.DATE = OCONV(CALL.REC<1>,'D4/')
0161:            CALL WWAPI.TEXT(CALL.DATE)
0162:            CALL WWAPI.NEWCELL("","","")
0163:            CALL WWAPI.TEXT(CALL.REC<5>)
0164:            CALL WWAPI.NEWCELL("","","")
0165:            BEGIN CASE
0166:              CASE CALL.REC<39> = "O"
0167:                CALL.STATUS = "OPEN"
0168:              CASE CALL.REC<39> = "C"
0169:                CALL.STATUS = "CLOSED"
0170:              CASE CALL.REC<39> = "R"
0171:                CALL.STATUS = "REOPEN"
0172:              CASE 1
0173:                CALL.STATUS = "UNKNOWN"
0174:            END CASE
0175:            CALL WWAPI.START.FONT("RED","","TIMES NEW ROMAN")
0176:            CALL WWAPI.TEXT(CALL.STATUS)
0177:            CALL WWAPI.END.FONT
0178:            CALL WWAPI.NEWCELL("","","")
0179: CALL WWAPI.TEXT(CALL.REC<36>)
0180: CALL WWAPI.NEWCELL("","","")
0181:            CALL WWAPI.TEXT(CALL.REC<19,1>)
0182:            CALL WWAPI.NEWLINE
0183:          END
0184:        REPEAT
0185:        CALL WWAPI.END.TABLE
```

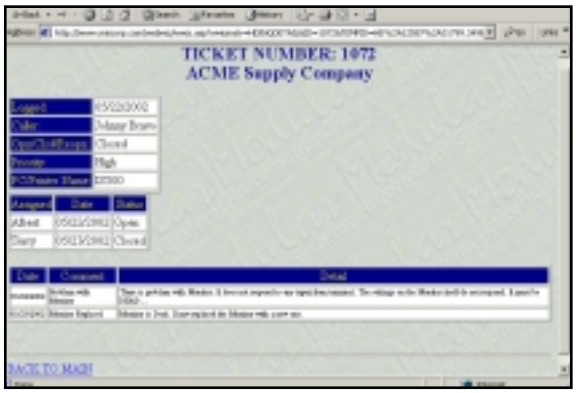
▼ *Continues Next Column*



INQUIRY DETAIL SCREEN – HDINQDETAIL

TABLE ENTRY FROM HDINQDETAIL SUBROUTINE WITH ROW HEADERS:

```
0054:     CALL WWAPI.COLHDR("DARKBLUE","3","YELLOW","Logged:")
0055:     CALL WWAPI.NEWCELL("WHITE","","")
0056:     CALL WWAPI.TEXT(OCONV(TRACK.INFO<1>,"D4/"))
0057:     CALL WWAPI.NEWLINE
0058:     CALL WWAPI.COLHDR("DARKBLUE","3","YELLOW","Caller:")
0059:     CALL WWAPI.NEWCELL("WHITE","","")
0060:     CALL WWAPI.TEXT(TRACK.INFO<5>)
0061:     CALL WWAPI.NEWLINE
0062: *   CALL WWAPI.COLHDR("DARKBLUE","3","YELLOW","Status:")
0063:     CALL WWAPI.COLHDR("DARKBLUE","3","YELLOW","Opn/Clsd/Reopn:")
0064:     CALL WWAPI.NEWCELL("WHITE","","")
0065:     BEGIN CASE
0066:       CASE TRACK.INFO<39> = "O"
0067:         STATUS = "Open"
0068:       CASE TRACK.INFO<39> = "C"
0069:         STATUS = "Closed"
0070:       CASE TRACK.INFO<39> = "R"
0071:         STATUS = "Reopen"
0072:       CASE 1
0073:         STATUS = "Unknown"
0074:     END CASE
0075:     CALL WWAPI.TEXT(STATUS)
0076:     CALL WWAPI.NEWLINE
0077:     CALL WWAPI.COLHDR("DARKBLUE","3","YELLOW","Priority:")
0078:     CALL WWAPI.NEWCELL("WHITE","","")
0079:     BEGIN CASE
0080:       CASE TRACK.INFO<22> = "1"
0081:         URG = "Critical"
0082:       CASE TRACK.INFO<22> = "2"
0083:         URG = "High"
0084:       CASE TRACK.INFO<22> = "3"
0085:         URG = "Medium"
0086:       CASE TRACK.INFO<22> = "4"
0087:         URG = "Low"
0088:       CASE 1
0089:         URG = "Unknown"
0090:     END CASE
0091:     CALL WWAPI.TEXT(URG)
0092:     CALL WWAPI.NEWLINE
0093:     CALL WWAPI.COLHDR("DARKBLUE","3","YELLOW","PC/Printer Name:")
0094:     CALL WWAPI.NEWCELL("WHITE","","")
0095:     PCNAME = TRACK.INFO<36>
0096:     CONVERT VM TO " " IN PCNAME
0097:     CALL WWAPI.TEXT(PCNAME)
0098:     CALL WWAPI.NEWLINE
0099:     CALL WWAPI.NEWLINE
0100:     CALL WWAPI.END.TABLE
```



OPEN NEW CALL SCREEN – HDNEWCALL SUBROUTINE

WebWizard provides several WWAPI subroutines for data entry. Some of the options that are available include: combo boxes, list boxes, check boxes, multi-line text boxes and single text boxes, along with radio boxes. The Open New Call screen uses a radio box for the Priority field and a multi-line text box for the Problem field. These entry subroutines are easy to use and the WebWizard manual does provide good information on the parameters required for the subroutines.

TABLE ENTRY FROM HDNEWCALL SUBROUTINE FOR INPUT ENTRY:

```
0056: * START TABLE INPUT
0057:     CALL WWAPI.START.TABLE(1)
0058:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Ticket No:")
0059:     CALL WWAPI.NEWCELL("WHITE","","")
0060:     CALL WWAPI.TEXT(TRACKNO)
0061:     CALL WWAPI.NEWLINE
0062:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Caller:")
0063:     CALL WWAPI.NEWCELL("WHITE","","")
0064:     CALL WWAPI.TEXT(CALLER)
0065:     CALL WWAPI.NEWLINE
0066:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Date*:")
0067:     CALL WWAPI.NEWCELL("","","")
0068: * default entry date
0069: IF ENTDATE = "" THEN
0070: ENTDATE = OCONV(DATE(),'D2/')
0071: END
0072:     CALL WWAPI.TEXTBOX("ENTDATE",ENTDATE,"15","12")
0073: *   CALL WWAPI.VALIDATE.DATE(ENTDATE,0,"Please enter a valid date")
0074:     CALL WWAPI.NEWLINE
0075:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Phone*:")
0076:     CALL WWAPI.NEWCELL("","","")
0077:     CALL WWAPI.TEXTBOX("PHONE",PHONE,"15","12")
0078:     CALL WWAPI.VALIDATE.PHONE("PHONE",0,"Enter a valid phone number")
0079:     CALL WWAPI.NEWLINE
0080:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","E-mail*:")
```

▼ *Continues page 30*

▲ *Continued from page 29*

```
0081:     CALL WWAPI.NEWCELL("","","")
0082:     CALL WWAPI.TEXTBOX("EMAIL",EMAIL,"30","25")
0083:     CALL WWAPI.NEWLINE
0084:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Summary*:")
0085:     CALL WWAPI.NEWCELL("","","")
0086:     CALL WWAPI.TEXTBOX("SDESC",SDESC,"55","45")
0087:     CALL WWAPI.NEWLINE
0088:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","PC/Printer Name*:")
0089:     CALL WWAPI.NEWCELL("","","")
0090:     CALL WWAPI.TEXTBOX("PCNAME",PCNAME,"20","15")
0091:     CALL WWAPI.NEWLINE
0092:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Problem*:")
0093:     CALL WWAPI.NEWCELL("","","")
0094:     CALL WWAPI.MULTILINE.TEXTBOX("PROB",PROB,60,12)
0095:     CALL WWAPI.NEWLINE
0096:     CALL WWAPI.COLHDR("DARKBLUE","1","YELLOW","Priority*:")
0097:     CALL WWAPI.NEWCELL("WHITE","","")
0098:     CALL WWAPI.RADIO("URG","Critical":VM:"High":VM:"Medium":VM:"Low","1
 ":VM:"2":VM:"3":VM:"4",URG,0)
0099:     CALL WWAPI.END.TABLE
```

WebWizard also provides several validation subroutines. Some of these are Alpha, Alphanumeric, Date, Numeric, Phone, Social Security Number, Time, and Zip Code. When the validation occurs, it can be controlled through the WWAPI.CONFIGURE subroutine (at each field or when a submit button is pressed).

Variables can be passed between the programs using the WWAPI.STORE subroutine, which allows a variable to be "remembered." These variables can be accessed through the requesting program, through the WWAPI.GET.VAR subroutine. WebWizard also allows the use of the WWIZTEMP file where variables can be written to the temp file and then be accessed by its special record key. I did not want to pass the user id and password through the links since they showed in the parameters for the URL when the screen displayed. To avoid this, I wrote the user id and password to the WWIZTEMP file and passed the TEMP ID instead. The WWIZ.GENID subroutine automatically generates a unique id and the first parameter is a prefix which is concatenated with the Internal date and time in

Continues on page 32

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mvToolChest

Continued from page 30

format "HD*DATE*TIME," which becomes the key. The second parameter is the variable for the Result. The WWIZ.GENID subroutine also deletes any temporary ids that were created previously and are older than two days, to prevent the temporary file from becoming too large.

WRITING TO WWIZTEMP FILE IN HDINQUIRY SUBROUTINE:

```
0095:     CALL WWIZ.GENID("HD",TEMPID)
0096: *
0097:     TEMPREC = ""
0098:     TEMPREC<1> = USERID
0099:     TEMPREC<2> = PASSWD
0100: *
0101: *   WRITE USERID ON TEMP.FL,TEMPID
0102:     WRITE TEMPREC ON TEMP.FL,TEMPID
```

STORING THE TRACKNO, TEMPID VARIABLES TO BE PASSED TO RECEIVING SUBROUTINE HDNEWCALL IN HDINQUIRY SUBROUTINE:

```
0191:     CALL WWAPI.STORE("TRACKNO",TRACKNO)
0192:     CALL WWAPI.STORE("TEMPID",TEMPID)
```

RECEIVING THE TRACKNO, TEMPID VARIABLES IN SUBROUTINE HDNEWCALL:

```
0017: * coming from HDINQUIRY program
0018:     CALL WWAPI.GET.VAR(NOTFOUND,"TEMPID",TEMPID)
0019:     CALL WWAPI.GET.VAR(NOTFOUND,"TRACKNO",TRACKNO)
```

Variables are being passed back to the HDNEWCALL subroutine if any of the required fields are blank. See the WWAPI.LINK shown below. This defaults back to the information the user already entered, so they don't need to re-enter all the fields again:

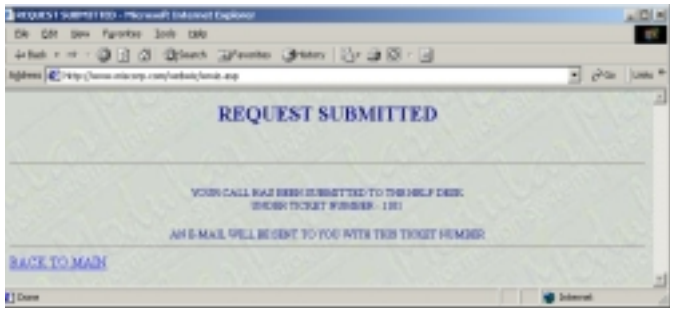
ERROR VALIDATION IN HDCONFIRM SUBROUTINE:

```
0037:     IF SDESC = "" OR PROB = "" OR URG = "" OR PHONE = "" OR EMAIL =
 "" OR ENTDATE = "" OR PCNAME = "" THEN
0038:       CALL WWAPI.START.FONT("DARKBLUE","","TIMES NEW ROMAN")
0039:       CALL WWAPI.TITLE(2,"ENTRY ERROR")
0040:       CALL WWAPI.END.FONT
0041:       CALL WWAPI.NEWLINE
0042:       CALL WWAPI.NEWLINE
0043:       CALL WWAPI.DRAWLINE
0044:       CALL WWAPI.ALIGN(WWIZ.ALIGN.CENTER)
0045:       CALL WWAPI.TEXT("The following fields are required:")
0046:       CALL WWAPI.NEWLINE
0047:       CALL WWAPI.TEXT("    DATE")
0048:       CALL WWAPI.NEWLINE
0049:       CALL WWAPI.TEXT("    PHONE")
0050:       CALL WWAPI.NEWLINE
0051:       CALL WWAPI.TEXT("    EMAIL")
0052:       CALL WWAPI.NEWLINE
0053:       CALL WWAPI.TEXT("    SUMMARY")
0054:       CALL WWAPI.NEWLINE
0055:       CALL WWAPI.TEXT("    PC/PRINTER NAME")
0056:       CALL WWAPI.NEWLINE
0057:       CALL WWAPI.TEXT("    PROBLEM")
0058:       CALL WWAPI.NEWLINE
0059:       CALL WWAPI.TEXT("    PRIORITY")
0060:       CALL WWAPI.NEWLINE
0061:       CALL WWAPI.NEWLINE
0062:       CALL WWAPI.TEXT("Please be sure that the fields are completed
 ")
0063:       CALL WWAPI.NEWLINE
0064:       CALL WWAPI.LINK("RETURN",WWIZ.PROGRAM,"HDNEWCALL&TEMPID=":TEM
 PID:"&TRACKNO=":TRACKNO:"&PHONE=":PHONE:"&EMAIL=":EMAIL:"&SDESC=":SDESC:"
 &PCNAME=":PCNAME:"&PROB=":PROB:"&URG=":URG:"&ENTDATE=":ENTDATE)
0065:       CALL WWAPI.NEWLINE
0066:       CALL WWAPI.NEWLINE
0067:       CALL WWAPI.DRAWLINE
0068:       RETURN
0069:     END
```

Continues Next Column

E-MAIL

```
0152: * SEND
0153:
0154:
0155:
0156:
0157:
0158:
0159:
 "
0160:
0161:
0162:
0163:
0164:
0165:
```



CONFIRMATION SCREEN – HDCONFIRM SUBROUTINE

Once the user has entered their new call and passed all of the validation routines, the call is submitted into our Help Desk application and an e-mail is automatically generated to the user through the WWAPI.EMAIL subroutine.

ENERATION IN HDCONFIRM SUBROUTINE:

```
EMAIL
USERTO=EMAIL
USERFROM="HELPDESK@MISCORP.COM"
SUBJECT = "TICKET NUMBER ":TRACKNO:" SUBMITTED"
TEXT = ""
TEXT<1,1,1> = "Thank you for your submission."
TEXT<1,1,2> = " "
TEXT<1,1,3> = "The Ticket Number should be used to reference

TEXT<1,1,4> = "the call you have submitted regarding:"
TEXT<1,1,5> = " "
TEXT<1,1,6> = "    ":SDESC
TEXT<1,1,7> = " "
TEXT<1,1,8> = "We will be contacting you shortly."
CALL WWAPI.EMAIL(USERTO,"","",USERFROM,"",SUBJECT,TEXT)
```

I normally use Microsoft's Internet Explorer as my browser but wanted to try Netscape to see how WebWizard would respond. I loaded the latest version of Netscape (6.2) and received an XML error when I tried to access my Web page. I sent the error to Via Systems and they noted that Netscape's newest version had a change in the latest Navigator—it identifies itself first as XML-compatible, and only after that, as HTML-compatible. They indicated that this problem has been fixed on the latest WebWizard Version 5.1, but also sent me a quick fix for the program.

Users using Viaduct to access their host system can automatically highlight a WebWizard subroutine in their program and automatically get help on the function. The WebWizard manual can also be downloaded from www.via.com.

Using WebWizard provided us with a tool to generate Web pages quickly and easily and I did not need to have any experience with HTML. The WebWizard manual does provide good information and they do try to provide several examples of programs and Web pages for referral. Via Systems was always quick to respond to my e-mail requests for information and provided detailed informative answers to my WebWizard questions. **is**

A L B E R T Q U A N is a senior consultant with Modular Information Systems (www.miscorp.com) where he excels at software design and analysis and is kind to all who require his help. Albert has been a MultiValue systems analyst and programmer for nine years.

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Wireless Networking

BY MELVIN SORIANO

I'm still giggling over wireless network. Admittedly, I've been known to giggle over lots of things, but this wireless stuff can bring a smile to the most hardened face. It's so easy! I'm just amazed that I can and do walk around the house, office, airport lounge, and patio with my laptop, continually connected to the Internet.

And throughout these remote locations, I'm not lacking in speed. My laptop's 802.11b (Wi-Fi, or 'Wireless') card has a network speed capable of 11Mb. For most of my needs, that's plenty enough. On the contrary, the limits come more from my cable modem than the wireless card. And most people can get a PCMCIA card or a USB-connected gadget for less than US$100, gaining the same bandwidth.

So, I have this wonderful ability to do pretty much as I please from throughout my house. It's not without scary moments, though. For example, now I have to worry if I'm sitting too close to the bird fountain while I'm working; I wouldn't want a feathered friend to splash the laptop, or indeed do a far worse insult.

Easy and simple. But, as goes airline check-in, so goes simple networking. There are just too many opportunities for unauthorized access. The intrusion does not affect merely your data, but also every packet, bit, byte, keystroke that gets transmitted over the wireless network. Just as we've had to adjust to new airport security procedures, we need to be similarly vigilant in our networking environment.

Wireless has some reasonably good security measures. Overall, wireless implementations are fairly sound. First, let's look at the three security schemes: SSID, MAC and WEP.

The Service Set Identifier (SSID) gives a password to your system. It says that to use the wireless service floating in the air, you need to have this password. Think of it as a generic network password. You load it onto your device (usually a laptop or PC), and then it is used by the wireless devices while negotiating access. It's akin to having your boarding pass in order to get into the airline terminals or to enter a commercial airliner. As long as nobody touches your PC and sees what the password is, then you should be comfortable that the SSID will block out the first tier of hackers.

The Media Access Control (MAC) filtering is brute force blocking. Your network device has a unique MAC address. Your conventional Ethernet card will have a different MAC address than your wireless Ethernet card. You program your wireless router or access point (hub) to only communicate with specific MAC devices. This hardcode security is awfully inconvenient but at least it helps ensure that you are who you say you are. I compare this to the driver's license (or other form of government-issued identification) now required to board commercial airliners.

The Wired Equivalent Privacy (WEP) protocols are encryption standards. You make up a bizarre ugly random password (BURP). If you don't want to have to make up a BURP, you can use your device's BURP generator. The password generator usually prompts you for a phrase and then converts that phrase into the BURP. One thing to keep in mind, though, is that although one vendor will have the same password generator in its various products, different vendors will generate BURPS differently.

This encryption method creates a communication pathway that is about as secure as the typical SSL approach used with "https" web addresses. Although it's not infallible against determined researchers and hackers, it creates a strong problem for those who might get past the first two lines of defense and sniffs out your packets.

The combination of these three options makes most wireless uses reasonably secure. The performance, despite the encryption, is quite robust and, when dealing with home-based cable modems, more than powerful enough for most purposes.

Of course, not using any of these options means that your wireless network is free to be used by all. Recently, I was at my sister's home in a quiet area of New York State. I cracked open my laptop late the first evening, fully expecting to connect to the Internet using their phone line as I have in previous visits. Imagine my surprise when I not only found a wireless service available, but a completely unsecured one. I easily checked my email using by brother-in-law's DSL line—without any logging in mechanisms.

Generally, this would be a disconcerting issue, but my sister lives a hundred yards to the nearest neighbor. My brother-in-law reasonably decided that any person willing to loiter on their snow-covered land just to get free wireless access to the Internet should be permitted to do so, given their willingness to also accept frostbite.

Many people, therefore, seem uninterested in who uses the excess bandwidth. Now, if all you are doing is surfing the net, then the slightly limited bandwidth might be imperceptible. Moreover, the information on your specific PCs might not be readily accessible, so the unauthorized use might not be an issue. This is not a normal business situation, but home use seems to vary considerably.

For example, there are actually areas known as "hot spots" where you can find free wireless access. Some people post information on public websites, offering the location of their wireless access points. You can actually see folks loitering in cars with their laptops in front of these offices, apartments, and homes, gratefully downloading email at remarkable speeds and with no dial-up costs.

Most companies, though, are not this generous. Some businesses have begun offering

their wireless bandwidth for use on a time-share basis. For example, if you walk into an airline lounge at a major airport or into one of many Starbucks around the country, you might find wireless signals available. These locations will offer you temporary access to the bandwidth. You can buy just 20 minutes of time up to a month of access. In many instances, your access is portable from one location to another, so that you truly have an exciting high-bandwidth mobility. Any attempt to use the network will fail until you "Log in" to the wireless access point.

Most people or businesses, however, will unlikely offer their bandwidth to strangers, for a fee or not. If so, then additional security is probably in order. Many people are finding safety in the skies by using Virtual Private Networks (VPN).

VPN allows users on an open network to connect to a business or private network securely. Most businesses, therefore, should consider VPN for their wireless access. It's usable with the other security options, but is easier to manage; more secure, and has been used for some time.

A special protocol (known as Internet Protocol Security, or IPSec) is used for encryption rather than WEP. This encryption approach uses many algorithms for scrambling the data. The flexibility of VPN technology is intended to ease use in highly varied network environments.

The encryption usually involves three security approaches.

The Authentication Header tacks on special authorization codes with the IP packets. These extra codes are such that the packets cannot be interpreted individually, nor can they be altered as they traverse the Internet without being noticed. The recipient of these packets will know how to deal with these headers.

In addition to the Authentication Header, there is also the Encapsulation Security Payload. When using this technique, part of the header itself and all of the data is encrypted. The connectivity modes can vary but many think that the "tunnel" mode is more secure. The actual encryption technique used is based on the Data Encryption Standard, with different length keys depending on the manufacturer.

Lastly, here's what you need to know about the Internet Key Exchange protocols. These standards help figure out the algorithms to be employed by the previously mentioned encryption techniques. The combination of these three approaches delivers a rather scalable solution. You will find that the keys are managed, exchanged, and authenticated without your active and exhaustive participation.

So, when you look at these three VPN protocols and compare them with typical wireless techniques, the wireless security is fairly acceptable to most home and small business implementations. A hacker would have to deliberately and diligently whack at the network to break in.

The VPN options, though, should be fairly attractive to medium through large businesses. The administration is centrally controlled, which makes life much easier when dealing with a large number of users. The deployment is easier, the control is straightforward, and the approach is proven and already widespread. For these reasons, VPN is probably the best choice for wireless security in bigger implementations.

Does it mean it's now safe to return to the air? With proper caution and consideration, most will find it a fast and easy way to get onto the Internet superflyway. **is**

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BY STEVE BACKMAN AND JIM BUTLER

.NET for Real

Hey there, frustrated developer. Looking for something really new, powerful, with quick results but quite safe? Well, I have a new drug, er, software package for you.

Microsoft .NET ("dot net") went through a year or more of well-publicized beta releases, so it's hard for the ordinary mortal to know whether it's really out or not, real or not. Elements like Web Services got released as downloadable add-ins to existing Web technology. Beta copies of the main products circulated for months. Magazine publishers rushed to switch all their content to the actually unreleased software.

Thinking positively, one could say that Microsoft sought wide experimentation to give it more of a chance to reduce bugs and missteps. But with the official release, the marketing blitz has been unbelievably intense and broad scale for a developer product, so there's no mistaking that it's out now.

At one level, .NET simply recasts and repackages the same grandiose and self-centered vision of a Microsoft Windows-centered Internet. Having come a bit late to the Internet table in the first place, Microsoft has sought for years now to make up for it with one all-encompassing vision after another.

At the heart of the .NET version lies the use of Web Services for disparate computer systems to exchange information and integrate their functioning with each other. From the Microsoft point of view, Web Services amount to the next incremental step in its object technology.

With its Component Object Model (COM), software applications running on the same computer, whether desktop or server, could manipulate each other's internal workings. That is, Word, Excel and other familiar products came with published specifications of how to work the internal features (format a table, build a mail merge letter) from without (another Office program, a Visual Basic or C++ program, a Web site). The controlling programs didn't have to come from Microsoft, i.e., AccuTerm's Visual Basic for Applications scripts can work this magic. In time, Microsoft extended the model (Distributed COM or DCOM as well as other technologies) so that the integrated function extended over a network and not just inside a single computer.

COM/DCOM provided the system-level architecture for the different software elements to have this integrated functioning. Other competing standards existed, and Microsoft's COM, while open to third-party developers, only worked on Windows for all practical purposes. You may have come across software that, for example, enabled an Apache Web server running on Linux to use ODBC (Open Database Connectivity) to reach Microsoft—or other NT/2000-hosted databases—including MultiValue databases. Whether practical or not, these tools provided direct database linkages, not object-based integration.

Exchanging Data between Web Sites

Along comes Web Services. Web Services provides a framework and support for creating software that contains objects usable by any other Web Services-oriented software, regardless of the machine or operating system of either side. For example, right now, many Web sites offer some dynamic mapping functions, such as "get directions to the vacation resort" variety. Up until now, these generally required the use of a patchwork of connection options between the resort Web site and Mapquest or other map generator Web sites. With Web Services, a map provider site can simply publish a series of methods (available programming functions) that a client site can call to get geo-spatial-related services. Then, the hotel's Web software can directly create an instance of the map provider's site mapping object, pass in the required location parameters, and generate the maps—all from within the resort site.

Web Services operates using SOAP, the Simple Object Access Protocol. SOAP, in turn, utilizes XML, the Extensible Mark-Up Language (HTML for data). Like HTML and unlike the older COM-based data exchanges, XML travels over Internet-friendly pathways and uses plain text. This feature allows any computer software vendor to work with Web Services. IBM, Sun and others have joined with Microsoft to embrace the technology. Of course, this could turn out yet another instance of a possible universal standard hijacked by corporate competition and branding. And what else is new? Meanwhile, at the very least, Web Services without a doubt provides a more open interface between different kinds of software systems.

Web Services within a Site

Equally important, even within one site, Web Services provides a much simpler mechanism for a Web server that may sit outside the organizational firewall to reach its own internal data sources. Again, the use of plain old text-based XML at its core allows easier passage of communication through essential security barriers.

As many Microsoft-oriented developers have discovered, you can use Web Services without .NET. For the last year and more, developers could download the free tool kit and use it with Active Server Pages and other elements of Microsoft Web technologies. ASP.NET, however, fully integrates Web Services into its data access strategies.

ASP.NET and associated .NET technologies are offered as a standard option for the data services layer of the software (that is, the set of objects that connects to, searches, reads, writes the database). The software running on the Web server can pass requests through the organizational firewall to another server, which gets the data and then passes it back as a packet. The two servers then cut their connection until they need to communicate again, such as recording an edited change in the data. This means that the data set comes not only in an XML text-based packet, but is disconnected from the database. If you have programmed for or sat in on the design of Web sites with dynamic data, then you know these communication issues are crucial to resolve.

ASP.NET makes it equally straightforward for the data services software to provide data within the single site or to business partner sites—such as our vacation resort example—elsewhere on the Internet. MultiValue vendors can, and presumably are, building Web Services and XML readiness into their core offerings.

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Struggling with Active Server Pages

While much of the discussion—and the hype—about .NET have focused on Web Services, the new tools offer many other advances over ASP.

Microsoft's Active Server Pages succeeded because it was simple. It gave developers a way to see what comes in to the website and control what goes out to the browser. It was very easy to get started, and if things weren't working well, you could understand why (though the debugging tools were pretty skimpy, there wasn't much hidden from the developer).

But ASP also provided a pretty raw set of tools, and the various schemes Microsoft promoted to facilitate building actual Web sites had tremendous shortcomings. If you followed the lead and tried to build sites using such things as Visual Basic Web Classes, Microsoft Access' Data Access Pages, Microsoft's client-side scripting, or Visual Studio's Visual Interdev, you will now find these tools all gone from the new .NET framework. They didn't work well or only really worked with Internet Explorer browsers. Technologies like Design Time controls (buggy prewritten ASP scripts) and VB Web classes could be considered the first few attempts to build an infrastructure for Web applications. But Design Time controls came as clunky add-ons to ASP, patched into Microsoft's Visual Interdev environment. When they didn't work correctly, you'd find yourself 150 lines into Microsoft Visual Basic Script code.

While many developers just starting out could do simple sites with it easily, complex tasks demanded more functionality that developers had to build on their own, and coding environments had serious deficiencies.

Scripting Headaches

Active Server Pages required that all roads to data and interactivity begin with Web page scripts running on the Web server, notably VB (Visual Basic) script. If you wanted to use a component based on a compiled language, the script could reference the component, but still the Web page relied on the script to initiate the process. Typically, this meant that Web pages with dynamic data had a conglomeration of HTML page description tags interspersed with scripting calls, to carry out this or that operation to insert dynamic data elements into the page. VB Script resembled Visual Basic, but doesn't have its programmability. It used memory inefficiently, could only use simple (untyped) variables or refer to components or objects in a general ("late bound") way, and had cumbersome options for debugging and testing code.

In addition, where developers did integrate compiled language components, we found the standard headaches with Microsoft development even worse than on networked systems. What developers call "DLL Hell" refers to the difficulties ensuring the right version of compiled libraries get loaded into—or removed from—the Windows registry when you want them to. In Web-based environments, dealing with these issues frequently required shutting down the IIS Web software or completing restarting the server itself. These steps always slowed down progress, and for patching or updating running sites, made things downright disruptive.

What do you need all the code for? Everything you did on an ASP page required work. To show a grid or table of data, you typically read in the records, and then programmatically built up an HTML table on the fly. Carrying forward information about the user session from page to page ("saving state") required lots of code. Validating data entered took more code.

ASP.NET Usability

ASP.NET represents Microsoft's third attempt to address developers' needs for a programming environment for the Web, and to ensure it's on par with that of their database tools or with other Web development environments such as Cold Fusion. For the first time, Microsoft has provided a serious Web application framework. It's object-oriented, relies on the .NET framework, and adds its own Web class libraries. It's also event-driven, with controls on the client Web page able to generate server events. Microsoft has built in some good controls such as the data table for present grids, which takes care of a lot of the underlying plumbing code for sorting, paging, binding data to the Web pages for editing, and other everyday tasks.

With the data table, for example, you can now place a table grid control on a page, and indicate where it gets its data from and various other display features (properties). The browser will then display the page with data, handle paging, and so on. The data will still appear in the browser as an HTML table, but the developer didn't have to build it.

.NET in your Future

Many developers found that you had to work your way into your own groove among three hard choices with Active Server Pages. You could use proprietary and clunky Microsoft-recommended approaches, stick with VB Script and simple sites, or come up with your own compiled tools and live with adversity in the development process.

> "Having come a bit late to the Internet table in the first place, Microsoft has sought for years now to make up for it with one all-encompassing vision after another."

For those who took the latter approach, .NET offers something of a breath of fresh air. It incorporates many of the professional programming requirements for which many independent developers had already developed their own tools. It uses full-blown compiled programming languages, which directly manage the Web pages. It also provides a graphical developer environment for building the pages and the site, and incorporates various server-based elements into the typical Web site development tasks.

Will Microsoft developers immediately migrate to .NET? Not by a long shot. For one thing, those developer shops that did work through their own techniques for overcoming ASP's limitations, now have reasonable tools they have confidence in. The new ASP.NET controls make it easier, but they don't necessarily do more or work faster or more efficiently than the now tried and trusted, home-brewed work-arounds.

For its part, even without these controls, ASP.NET provides a much more robust and flexible framework for building Web apps and creating your Web libraries and controls. But once you get past using the provided controls and capabilities, it is more complex than ASP. To use the full power of ASP.NET, you need to really understand (rather than just use) the object-oriented technologies that underlie it. Most people will probably just use the tools provided and do quite well with those. While you can download and use ASP.NET and the .NET Framework for free with existing Internet Information Server, to really work with it, you will need to upgrade Visual Studio.

Microsoft did ensure that you really could have Visual Studio 6 and Visual Studio .NET coexist on the same machine. And the same IIS-based Web site can handle both existing ASP pages and ASP.NET pages. You can take the transition as gradually as you want. But installing the new Visual Studio takes about 2 Gigabytes. Yup. (The run time for deployment is much smaller, but still larger than before.)

Microsoft's war with Sun over Java and other factors caused it to revamp the programming languages. It has now rebuilt its main offerings for the Web (Visual Basic, C++ and Java) around a Common Language Runtime (CLR). This has some pluses in the form of a single set of system libraries for all programming, but it also means that the new languages for Visual Studio .NET (notably VB.NET, C#) and J# look different and require some relearning.

Developers have taken on initial .NET sites for production cautiously—smaller, limited-use sites first. It will take experience throughout the year ahead to determine how well the new software framework performs, and how stable and secure it is. While tons of books, magazine articles, and Web sites salute the new programming goodies, developers no doubt feel like they're the front line infantry in seeing how robust the new platform really is.

Actually, the drug analogy from this piece's open paragraph probably works better. For independent software developers, Microsoft technology has been something like a drug experience (at least from what people tell me about such things). Since Visual Basic 3, Microsoft Office 4 and related mid '90s versions of all things Microsoft, the company has made it attractive and easy for independent developers to get started. It offers attractive pricing, little immediate side effects, a cheery community of fellow users to join, lots of comeons, and a relatively quick path to feelings of power and equal standing with one's bottomless budget. As you get deeper, however, you find you have entered a difficult and strange world, with endless disturbances and complexities to explain to those around you.

This has made other pathways attractive—if the costs come higher, you know them in advance. If development—such as with open source—requires a rockier road, at least you can see it all from the start. And at least you're not feeding the Microsoft profit machine.

But the fact is that all commercial grade Web development remains complex today because of the complexity of the Internet and the desires of users for rich, easy experiences on it. Web Services certainly seems like the right idea, and it does appear that its broad scale embrace will catch on in the coming phase of the growth of the Internet. Did Microsoft get it right this time? Stay tuned, but the Redmond colossus now has a stronger story to tell against competing mainstream products. And it certainly makes it harder to justify putting a lot of time into proprietary MultiValue development environments: .NET will make it easier to program with industry-standard technologies against MulitValue and other legacy systems using standard middleware techniques. If you have worked with ASP these past few years, you'll probably agree that it's hard not to like what we have seen so far. **is**

Steve Backman (sbackman@dbdes.com) and Jim Butler (jambutler@attbi.com) are part of the Database Designs Associates team, providing Web development consulting, training and development on Microsoft and MultiValue platforms. Jim will finish his first two .NET sites as this issue goes to press. We'll keep you posted.

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MARK MUELLER,

President and CEO, founded Monolith in 1986

Expertise. Reliability. Strategic Partnerships. Every company makes the same promises. And so does Monolith Corporation. But it's also offering something that's in short supply ... maturity and a mindset for growth and change. Not one to sit around with the same 'ole offering, 16-year-old Monolith has been observant to trends, obedient to its customers, and dynamic in its technical offerings and marketing channels. Clearly, Monolith has been working overtime on its mission to master the MultiValue market.

For the MultiValue File

Company: Monolith Corporation

Founder: President and CEO, Mark Mueller, 1986

Focus: Monolith provides professional services, including: Discovery and Design, Integration Services, Installation and Start-up Services, Conversion and Migration Services, Remote System Administration, Virtual Private Networking and Data Warehousing. Monolith also provides software (operating system, database, office productivity) and hardware including a complete line of Intel-based, Compaq and HP servers and workstations.

Headquarters: Raleigh, NC

E-Mail: info@monolith.com

Taking control of your destiny has its advantages. Rather than waiting for things to happen, you make them happen. Instead of being stagnant, you're dynamic. Rather than follow, you lead the way. Many have tried, and many have failed. But Monolith Corporation has been the one to succeed, taking control of its business plans for 16 years, maturing into a wise and experienced supplier, and surpassing its competition in terms of market penetration and revenue growth.

What's its secret? The driving force behind Monolith's stronger and far-reaching business plan is its commitment to a thriving reseller channel and a leading-edge "total solutions" tactic.

"Our turnkey solutions approach to business means our customers consistently have a positive experience without the finger-pointing that sometimes occurs with increasingly complex multi-vendor

product and service deployments," said Mark Mueller, president and CEO.

Monolith's success started early on with Mueller's desire to capitalize on the expanding PICK marketplace with a new line of microcomputer technology products and services. "From the beginning, my goal was to provide VARs with fully integrated turnkey solutions, based on innovating products that were backed by first-class customer care," he said.

Always a creative company, Monolith's birth was no different. Its initial seed money to start the company came from a community development block grant. "The company was awarded this grant based upon creating 13 jobs in exchange for a low interest loan that our bank used as collateral on another SBA loan," Mueller remembered.

From creating 13 jobs in 1986 to employing 125 in 2002, Monolith has grown in more ways than human bodies. As a leading microcomputer product and service provider from the start, Monolith has expanded into infrastructure and computing architecture solutions, as well as business intelligence and data warehousing solutions.

"The company's core business is rapidly evolving towards software and services, with the new IBM partnership as a cornerstone in the foundation," Mueller said, referring to its new status as an IBM Master VAR, announced in February of this year.

As an IBM Master VAR, Monolith supports a sales channel of 300 resellers and is the leading distributor of IBM Informix U2 products in North America.

The company offers a variety of servers, workstations, networking devices and peripherals from Intel, Compaq, and Hewlett-Packard, among others. Single and multi-processor systems with hot-swappable hard drives and RAID configurations ensure maximum system uptime as well as system reliability and expandability. Each server is tested with Windows NT

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BTW

BY STEVE VANARSDALE, MV INDUSTRY ANALYST

BY THE WAY: The featured vendor in this issue's Spectrum Spotlight is Monolith, the quiet OEM company that switched from Pick Systems D3 to IBM U2 about five years ago. Since then, Mark Mueller and Ray Methvin have made Monolith the sole distributor of U2 products in the United States. Typically, that's a good position to use and abuse the VARs.

You know the routine. In the distribution game, the leverage is simple. Either the VAR (or the orphaned end-user) buys from you, or they have to go directly to the supplier. That is always more expensive, and sometimes nasty and difficult. Suppliers like IBM have endless credit requirements, stiff terms, and imperial support contracts. Plus the attitude.

I decided to check out the Monolith approach. To nobody's surprise but mine, Monolith prefers to work at the desktop and server level. No big-ticket RS6000, no large-scale enterprise computers—yet. According to the head guy, CEO Mark Mueller, "At the moment, a big system sale can be a lot of work with a slim profit margin, while 20 small VARs and end-users can be a million dollars of business." Interesting. Getting to be the big shark by feeding off the small fish? Seems like it. According to Ray Methvin, director of Sales: "The Monolith market is targeted at smaller VARs and all the more traditional MV guys." And sure enough, some of them say Monolith is pricey. I decided to look into the facts.

Big surprise. MV is only one part of the Monolith story; more than half their business is in Microsoft networks and products. So their guys know the MV and MS talk. Their VARs say Monolith will stand between the MV VAR and the anti-MV forces, walking the talk to both. Monolith makes stuff like VPN (virtual private networks) actually work with legacy MultiValue applications. That's what the extra cost is all about.

Monolith made a hard decision years ago, according to Methvin: "Instead of lowering the price, Monolith chose to exceed the customer's expectations. We'll get you product quicker, and we'll call you back the same day that you call with a problem."

Apparently, Monolith takes up for the smaller VARs and end-users, just as Hewlett-Packard was the champion of the "small" and became the weapon-of-choice against the "bigs." It's a state-of-the-art technological knowledge without the attitude; it's personalized service approach for the small VAR and customer that doesn't have the volume and the credit necessary to get on-site service from Raining Data and IBM. For the little that service is worth. According to Methvin, the typical on-site installer unpacks the server, plugs it in, attaches one workstation, and leaves. Often the MultiValue end-user is left standing in a pile of workstations with their mouth open, too surprised to speak. "Those guys drop the ball on the very first day. So Monolith quietly picks it up and gives the VAR and end-user a touchdown."

Especially in an anti-MV environment. That's where a quiet support company can be a good thing. Harvey Ward of WUFT in Florida has a Monolith UniVerse system running alongside a giant SQL Server network, but had forgotten Monolith's name… no problems, no calls.

Kate Campion of CPR in Dallas also likes these guys. "They set the system up, link it with the old system, and migrate the data. They know NT, 2000, and UniVerse, and took the time to know our application as well." Campion is a savvy MultiValue VAR, experienced in both D3 and UniVerse, and is developing a version of her credit management application in Visual Basic on SQL Server. She says that CPR will still use Monolith for her customers in places where this new version is rolled out, especially during the transition, "because they know both sides".

BTW: It's not likely that the ritual of finger pointing is going away. But a good defense is a distributor that takes the responsibility for the hardware, operating system, and the database. It's hard not to like these guys. They're putting the cutting edge on MV, and servicing VARs as if they were customers. And Mueller likes to stand up for the VAR in the face of anti-MV hacks. One of the better marks to have in one's corner. ***=/srv***

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☐ Over $10 million - $25 million ☐ Over $25 million - $100 million
☐ Over $100 million - $500 million ☐ Over $500 million

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Monolith Corporation

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and MultiValue RDBMS to ensure system compatibility, and servers arrive at the customer's site with the operating system and RDBMS loaded and configured.

Within the past few years, a new Monolith division was created to focus on business intelligence, data warehousing, data quality, and data/text mining. This division is partnered with various leading-edge technology companies, including Ascential Software, DataFlux Corporation, Cognos Corporation, ProClarity Corporation, and SAS Institute.

"All of our operating systems and database products, relational database management systems, business intelligence tools, Web development and terminal emulation products are fully tested with Monolith servers for compatibility and reliability, and they are loaded and configured as part of Monolith's Total System Solution," Mueller said.

Monolith also offers a complete line of networking and peripheral products to compliment its systems and solutions. Through its partnerships with Intel, Cisco, and Digi International, Monolith is able to provide terminal servers, hubs, Ethernet adapters, and UPS products, which are also fully tested and configured by Monolith prior to shipment.

At the core of Monolith's "Total System Solution" are its service capabilities. It offers a host of capabilities from certified consultants, including Discovery and Design, Integration Services, Installation and Start-up Services, Conversion and Migration Services, and Remote System Administration.

"The company will continue to introduce new products and services to effect transition over the coming years," Mueller concluded, "but service will continue as the key differentiator at Monolith … forever and ever." **is**

BY NATHAN RECTOR

Palm VS. Pocket PC ... *Revisited*

I've been giving PDA presentations at the International Spectrum conference for the past few years. One of the questions that keep getting asked during these lectures is, "What kind of devices do I use? Do I prefer Palm devices or Pocket PC devices?"

This question is kind of loaded. The answer is, use what works best for you and for your applications. There are several things to consider, however, when you choose which one to use, and some of this can be found in my article, "Diary of a PDA Project", *International Spectrum* Sep/Oct 2001). In this article, though, I'll cover the major differences you should be aware of between Palm OS and Pocket PC OS.

Versions

Both Palm and Pocket PC have gone through several versions. The key difference is that Palm's user interface has not changed very much since its first release. Pocket PC has had a user interface change in every version since its initial release.

See more information about this under "Backward Compatibility."

POCKET PC	PALM
Windows CE 1.0 H/PC	Palm OS 2.0
Windows CE 2.0	Palm OS 3.0
Window CE 2.1	Palm OS 3.5
Pocket PC	Palm OS 4.0
Pocket PC 2002 (Windows CE 3.0)	Palm OS 5.0

Hardware

Pocket PC started with a modular design to be able to handle as many different types of devices as possible. Microsoft's original approach was to provide a slimmed down version of Windows. This created versatility in the types of hardware and devices it could work on.

Palm stayed with the PDA-style devices as much as possible. A few years ago, Symbol licensed the Palm OS to put on its data collection devices, but primarily kept the PDA-style input screens and added a bar code scanner.

POCKET PC	PALM
Handheld PC	Palm-sized PDA
Palm-sized PC	Portable Data Collections Device
Tablet Devices	
Portable Data Collection	
Portable Data Collection w/keyboards	
Thin Client Hardware	
Laptop-style Devices	

Backward Compatibility

The compatibility story for Pocket PC devices is very confusing. As a basic rule, any older application will have to be rewritten for each version of the Pocket PC OS. This causes major development efforts if you have to support more than one version of Pocket PC or major hardware upgrades.

Palm devices have a common user interface, so an application written for the older versions of the OS will work fine on newer versions. This allows you to support existing Palm devices with one code set, as well as use the new devices.

POCKET PC	PALM
Any applications written for non-ARM Pocket PC systems were instantly made obsolete by Pocket PC 2002.	All older Palm applications will work on newer Palm OS devices.
Applications written on earlier version of WinCE had different user interfaces, so applications written for one version did not work on new versions.	Common User Interface between all versions.
Emulation software is provided to help run older applications running on a Palm-size device, but does not support applications running on Handheld PCs or Tables.	

Palm VS. Pocket PC ... *Revisited*

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Software Development

Pocket PC is Microsoft, so you have to use Microsoft's software for development. If you are developing applications for the Pocket PC 2002, then you can use AppForge's software which allows you develop both Palm and Pocket PC programs from one code set.

Palm applications have many different development languages. The basic rule is, if you develop in it, you can write Palm applications. If you need to develop for both platforms, then I would recommend using AppForge's software. AppForge allows you to create applications that will work on both Pocket PC and Palm from one set of code.

POCKET PC	PALM
Microsoft's Visual Studio – C++ and Visual Basic	C++
AppFore Visual Basic Plug-in	NS-Basic
MobleVB – also an AppFore product	Java
	Satellite Forms
	AppFore Visual Basic Plug-in
	MobleVB – Also an AppFore product
	Pascal
	Many more not listed here…

Existing Software

The true test of an OS's dominance is how many existing commercial and shareware applications are on the market.

POCKET PC	PALM
About 1,600 *software programs*	*Well over* 13,200 *software programs*

Battery Life

Typical device usage is for Address Book, Date Book, and other simple database applications that don't require major resource usage. "Heavy usage" is when you have constantly running programs or large resource programs—such as MP3, video players, GPS, or wireless connectivity. Devices with barcode scanners vary between typical and heavy use depending on how often the bar code scanner is used.

POCKET PC	PALM
Typical Usage: 3 Days	Typical Usage: 2 Weeks
Heavy Usage: 8 to 10 Hours	Heavy Usage: 3 Days

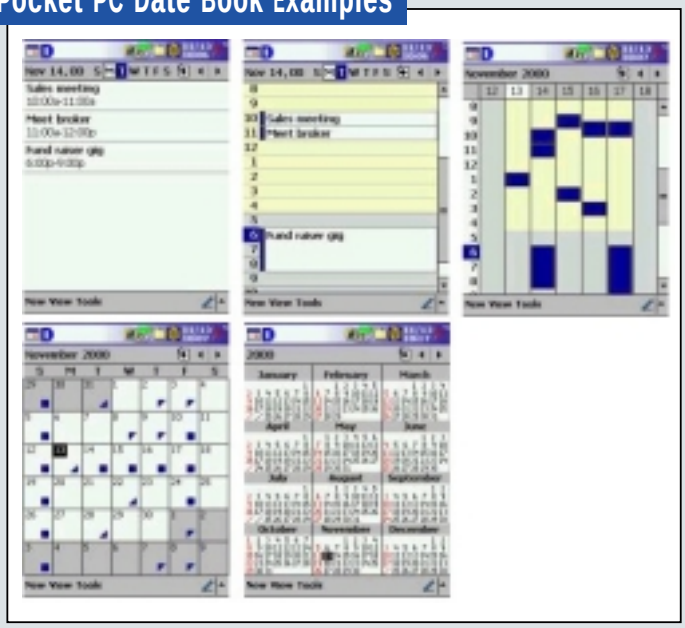
Size/Weight

POCKET PC	PALM
Average Weight: 6 to 10 oz	Weight: 5 to 5.4 oz
IPAQ with Wireless	Weight: 13 oz

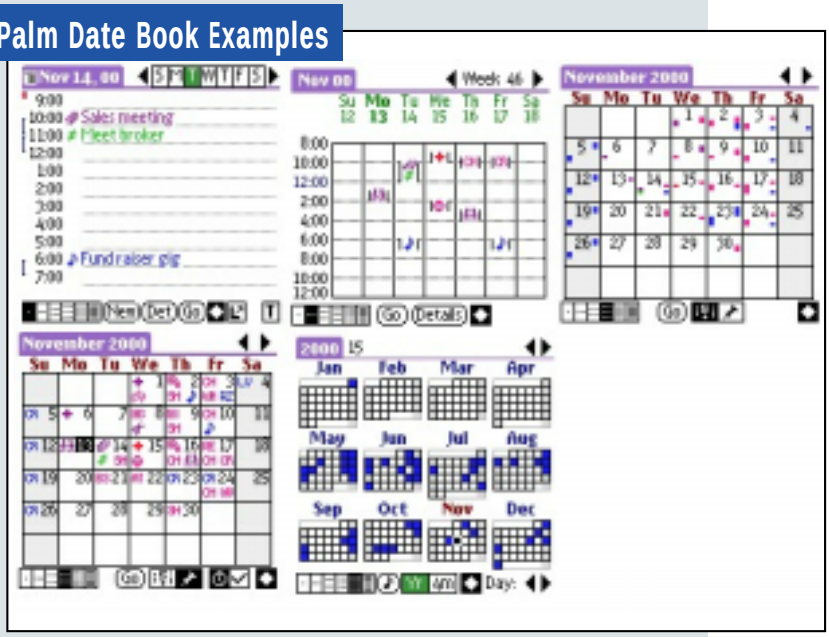
User Interface

The Pocket PC user interface is much more pleasant to the eye than the Palm OS version. But the Palm OS version is clean and simplistic. It also supports a monochrome screen, where all newer versions of Pocket PC must be color.

Pocket PC Date Book Examples



Palm Date Book Examples



Price

The prices included in this chart are average, or list prices. You can always shop around and find better deals. I'm providing two sets of prices: PDA and Symbol Data Collections. PDAs are the normal PDA devices you can buy off the shelf at any computer store.

Symbol Data Collection devices are designed to be used in warehouse environments and are much more rugged. Symbol devices are the most commonly used portable data collection devices. The PPT 2800 and SPT 1700 use identical hardware.

POCKET PC	PALM
Starting Price (PDA):	*Starting Price (PDA):*
Pocket PC 2002 – $499.00	Palm v5.0 - $150.00
Older Versions – $299.00	Older Versions - $99.00

Starting Price *(Symbol Data Collection):*	Starting Price *(Symbol Data Collection):*
PPT 2800 - $1995.00	SPT 1700 - $1255.00

Smart Phones

Both Pocket PC and Palm are trying for the smart phone market. Palm has been the first of the two to release a PDA/Phone combo, but the reception has been only "so-so". It is basically a PDA with a hands-free headset plugin, so it is somewhat bulky if you are used to just a cell phone. If you carry both a PDA and cell phone, then it is a nice device since you now only have to carry one instead of two.

I do not know of anyone who has created a cell phone using the Pocket PC OS (as of this writing). Microsoft has added the functionality, but has not yet tested it in a production device.

There is a newcomer to the market—the Nokia 9200. This device has been popular in Europe for several years now, but is just now making its way into the U.S. Go to www.nokiausa.com for more information. (By the way, AppForge's MobleVB also allows you to create applications for the Nokia 9200 as well as the Palm and Pocket PC devices.)

POCKET PC	PALM
No Production Version	Handspring Treo

Conclusion

My choice is still the Palm devices, but it is very much a personal choice. This last year, the Pocket PC was gaining ground because of the iPAQ and the accessories that come with it, such as a digital camera and an MP3 player/recorder. With the release of Palm OS 5.0 in June 2002, the Palm has caught up with the Pocket PC in the multimedia functionality. **is**

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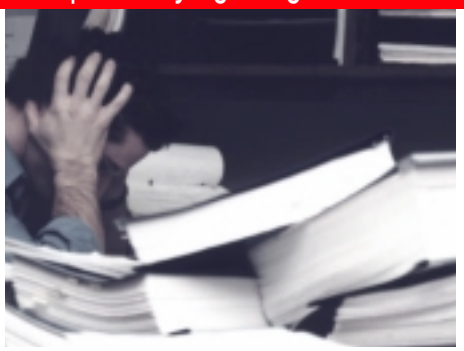

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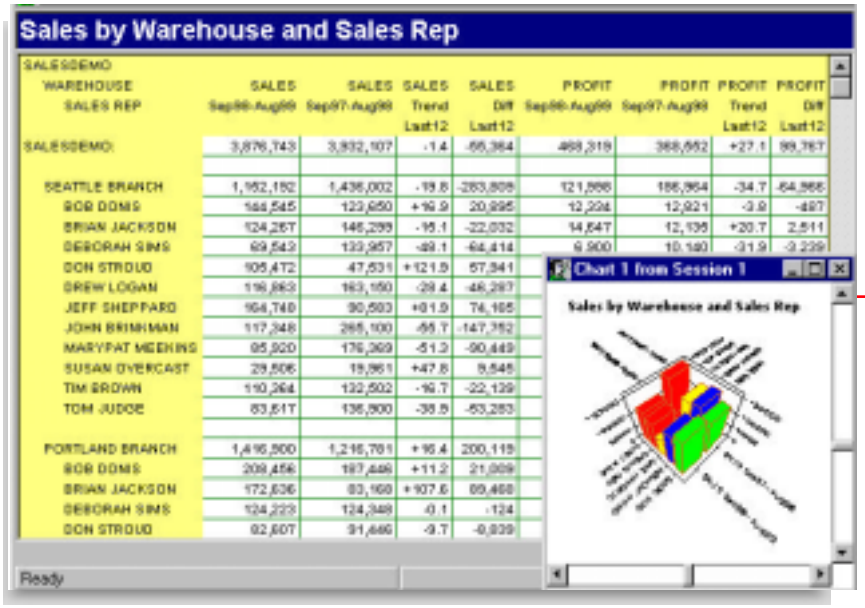

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