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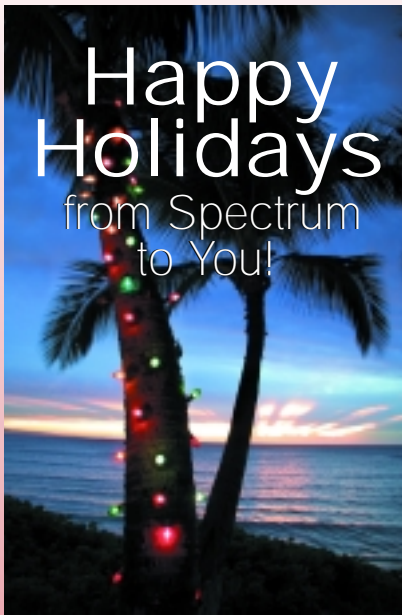
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*By Lawrence R. O'Connor*

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CORRECTION

In the "Where Are They Now? The Original Microdata Dealer Network" article (May/June 2004), an error was made when Bob and Randy Jordan were named as partners in Tideland Data Products Inc. (TDP). It has been brought to our attention by a reader that Marty Martin and Len Krisman (both deceased) were the original and only partners in TDP.

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# All-New Format For 24th Annual Spectrum Show



## Targeted Workshops; Compatible Technologies; New Software Offerings

To keep things fresh and interesting there will be a whole new set of topics presented at the USA Spectrum Show this year.

Continuing under the theme of "Bringing the International MultiValue Market Together," show attendees will be able to choose from a broad array of presentations featuring useful workshops, new technologies compatible with MultiValue applications and new MultiValue software systems that have surfaced in the past 12 months.

To support users and potential users of some of the more widely installed MultiValue utilities such as MITS and ViaDuct, there will be a series of new half-day training workshops conducted by the software authors.

The emphasis this year in the "tools" path will be on previously un-presented MultiValue software tools that we discovered at Spectrum regional shows in the past year, many from overseas.

Much has also been accomplished in the Web-based "Rapid Application Development" for MultiValue world, and several new offerings in that area will be on display.

Last, but not least, conference attendees will learn about major new MultiValue compatible technologies such as IBM's WebSphere and Raining Data's PDP for .NET.

Naturally, key executives from IBM, jBASE International, ONgroup, Revelation Software, Raining Data, VIA Systems, and Northgate will be presenting their latest product plans and progress for the delegation.

In the category of "Bring on the Fun," we'll be hosting International Spectrum's First Annual Database Challenge contest at the show.

So mark your calendar for **February 22-25, 2005** and plan to attend the MultiValue event of the year. Early-bird registration discounts are now available on [www.intl-spectrum.com](http://www.intl-spectrum.com). We look forward to seeing you there!

— GUS GIOBBI, CHAIRMAN, IDBMA, INC. —  
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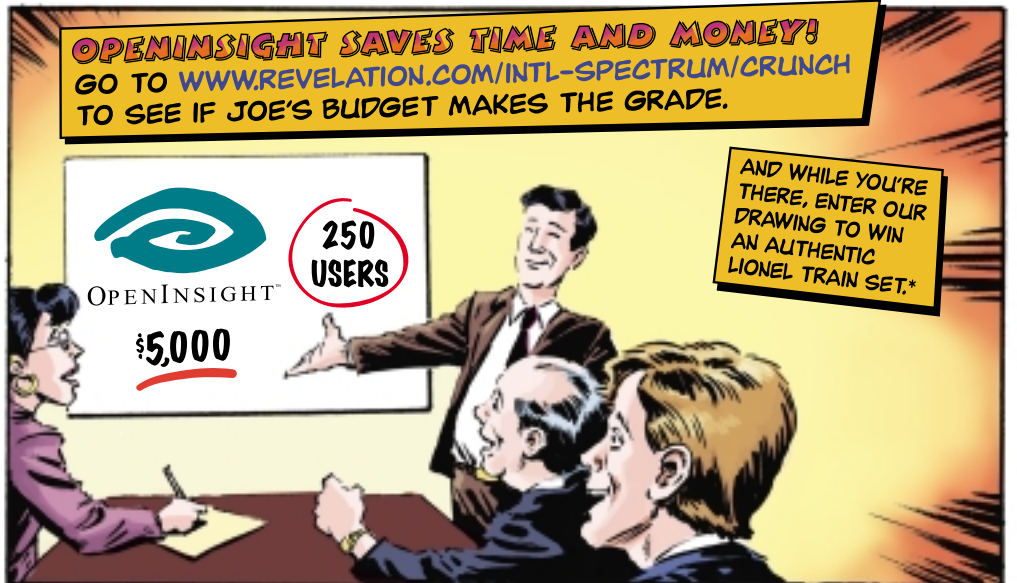
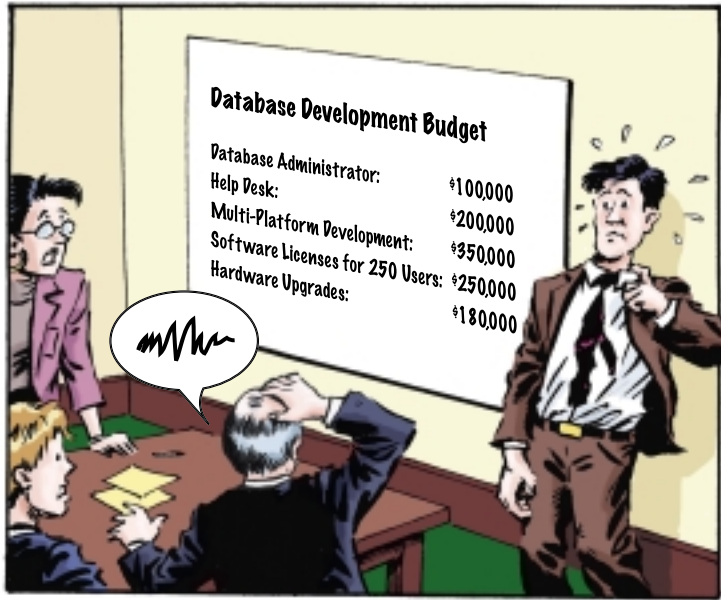
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# REV GUY IN... THE BUDGET CRUNCH



# Legacy Applications

## Get New Life With Service Oriented Architecture

It's time for another set of new IT acronyms, describing what we already know, to enter our lives. Just when we got used to Visual Basic or Delphi programming with objects, and finally learned how to spell XML (and XSLT and XSL-FO). Perhaps you've dabbled in Java or "WEBified" your application.

Acceptance of the "latest and greatest" IT solution is frequently driven by sources other than those that are responsible for the legacy application. These legacy applications have been running the business for decades and there really is nothing wrong with them. However, today's business is not done in a vacuum and often requires communication with other applications. Many times, you know little about these applications other than you need information from them or need to provide information to them.

So, what is this new IT acronym? SOA — Service Oriented Architecture. SOA is a collection of services that communicate with each other. This communication can be as simple as passing data or as involved as coordinating other services to return a result. A service is a function that is well-defined and self-contained. You make a request and get a response. While many, if not all, of your legacy application can be thought of as a collection of services (entry, reporting, inquiry, etc.), there is an additional consideration. Services do not depend on the context or state of other services. Your legacy application typically depends on interactive operator input. A service would not care how the request was made (operator input, over the Web, from a GUI front end, batch entry, etc.) or if the connection was persistent or not.

At some point in time you probably received a request to provide data from your application to a spreadsheet, EDI, auditing agency, report generator, etc. You most likely wrote a program that prepared a flat file export of the requested data. After doing this several times you devise a way to automate the

BY LEE H. BURSTEIN, PRESIDENT

Dynamic Systems, Inc., Executive Vice President, Guided Intelligence, LLC.

process so it happens as a menu option or on a scheduled basis. Sound familiar? You are well on your way to building services for discrete portions of your application.

Is it possible that other, non-MultiValue, systems have made their way into your computing environment? If so, this new system may be dependent on information from your legacy system. This new system may not even be within the same facility, time zone or even country.

At the same time, your legacy application may now get some of its required information from a new source. Existing business logic will be used to manipulate the data and possibly send it on to a reporting product.

Regardless, what you need in terms of a request is very well-defined, as is the request required by another system.

Putting this into a SOA (Service Oriented Architecture) context requires the discrete parts of your application to be accessible via Web Services. There are a variety of products in the MultiValue arena that can present your legacy application services as a Web Service, i.e., .Net data providers from various database vendors, third party tools and XML integration servers. The main advantage these products offer is that you have little, if any, changes to the business logic of your stable legacy application. These products can take the result of your application/service and provide XML as the response.

XML is important because it is the language of SOA. It is the standard markup language for Web Services communicating with each other. You are also seeing XML replacing, or at least supplementing EDI. New XML standards are periodically being introduced that are industry specific. For example, XBRL (eXtensible Business Reporting Language) is a relatively new standard for financial reporting. The government is adopting XBRL for filings.

Edgar OnLine, which makes public regulatory financial reporting easy, is championing XBRL. It is clear that XML is quickly becoming a standard to be reckoned with.

By now you must be asking how this gives new life to your existing legacy application. It is really quite simple. Turn key functions of your legacy application into discrete services, make them accessible via Web Services through .Net, Java, XML Integration Server, etc., and let your business affiliations know how to use them. What you have just done is open your computing environment to those who know how to request information (of course you tell them), plus access to your data is under the control of your business logic (the same logic that has been running the business all these years). Controlled access to your application, little or no change to application functionality, adherence to accepted standards, controlled access to allied applications, no need to continually redevelop the same utilities, etc. This sounds like a winning opportunity since no one cares what is behind the Web Service, only what it delivered in the response to a request in a standard format.

One final note for those of you who follow Gartner. They have added to the acronym confusion with SOBA (Service Oriented Business Application). This is nothing more than applications written specifically for SOA. Adopting these standards can extend the life of your legacy applications. *is*

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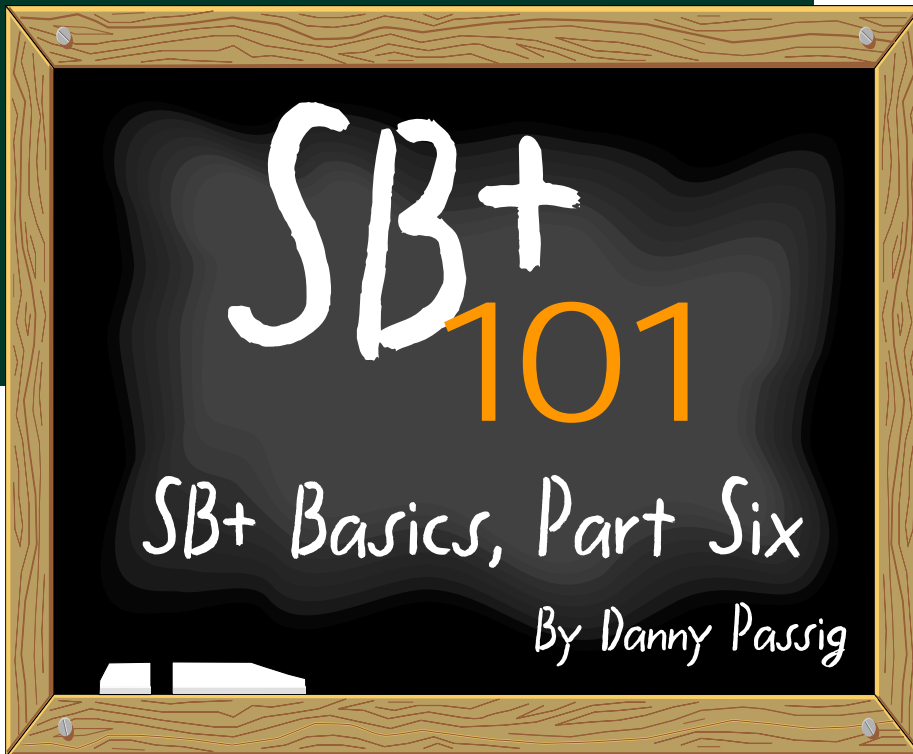
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**M**y last article concluded with a discussion of general processes in System Builder Plus. I will start this article with a discussion of expressions.

Expressions are an important concept and feature of SB+ and are one of its most powerful aspects. They are found everywhere in SB+ and are used to derive a value for your application.

They may be used to:

- derive a value for a field not stored in a record
- define what value a field is to be assigned or updated with
- perform a calculation
- perform conditional logic
- build keys
- derive variable information for use in a process, such as a file name to be used

There is a very rich set of built-in functions and operators and you have complete access to everything stored in memory and externally on disks, CD, etc.

The SB+ expression language has many benefits over traditional BASIC expressions. An expression can be simple or as complex as your imagination can dream up.

They may be used to construct correlatives, conversions, default values, calculated values and they are a basic part of the SB+ paragraph language. Before you do any serious SB+ development you should acquaint yourself with all the possible elements and operators of expressions. Intuitive help is always available wherever an expression is allowed and will help you build your expression from a template.

The following example will show you the power of expressions:

```
(F("ADDRESSES",NAME:"*":ID)<5>)
```

This is a correlative which reads attribute 5 from a record from the ADDRESSES file, using a name code and address ID from a record stored in SB+ common. Traditional BASIC would require the following:



```
NAME = RECORD<1>
ID = RECORD<2>
OPEN 'ADDRESSES' TO ADDRESSES THEN
    READV VAL FROM ADDRESSES,NAME:"*":ID,5 ELSE
        VAL = ''
    END
END
```

As you can see the SB+ expression is brief and would be easier to type.

#### Transaction Definitions

This is where you define transactions that update multiple files. The updates may be in real time or batch mode.

#### Periodic Update Definitions

You specify update information for files that are regularly updated in the batch mode, in these definitions. This is the perfect place to set up an update on a selected group of records in a file.

#### Documentation

This tool will generate application documentation, technical listings and user manuals. Using this tool will allow you to produce up-to-date documentation.

#### Generate Source Code

If you have a need to generate and compile BASIC code for applicable process types, this is the tool you would use. Generating source code for a process allows it to run faster and gives you the ability to modify the BASIC code for the process.

#### Graph Definitions

Use this tool to display simple bar graphs for information in your database, even on non-graphic terminals.

#### Tutorial Definitions

SB+ will track each step as you run an application and will give you the opportunity to document each step with pop up windows. These online tutorials will teach your users how to use your application.

#### Job Schedule Definitions

A job or series of jobs to be run at a later time may be set up using this tool. A perfect job for this tool could be your daily backup.



#### Revision Control

This tool allows you to keep track of all the modifications you have done since your last version. A media dump of all your modifications may be created and restored on your live account. SB+ revision control is not as comprehensive as third-party tools which are available, but it has always done what I needed it to do, without requiring the purchase of additional software.

#### Dialog Box Definitions

Definition of Dialog Boxes which may be called to display error messages or other text, while giving user options for alternative action, may be created with this tool.

#### Code Table Definitions

If you need to specify tables of codes and associated descriptions which allow the entry of a code and echo the related description, this is the tool you would use.

#### Function Key/Action Bar Definitions

This tool would be used to define sets of Function Keys and Action Bars, which may be linked to any screen or menu.

#### Help/Letter Text

When you need to define screens of help text or compose form letters which can be merged with data from any file, this is the tool which you would use.

#### Housekeeping

You would use this tool for maintenance of various control parameters to tailor SB+ to your precise requirements.

#### Language Translation

If you need to translate your application to another language, for example, German, you could use this tool. All that is required is a dictionary with the words in English and the language you are translating to, and SB+ will do all the hard work for you.

#### DOS/UNIX Link

If you use SBClient as your terminal emulator, you will have seamless integration between DOS and SB+. This will allow you to transfer data back and forth between your MultiValue database and DOS. There are other third-party terminal emulators which contain the

same functionality as SBClient, but if you wish to stay under the IBM umbrella this is the way to achieve that.

Using a terminal emulator will offer you the same seamless integration with UNIX.

That's all for this installment. Feel free to contact me if you have any questions (passigdanny@qwest.net). is

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## An Introduction to Dynamically

# Hashed FILES

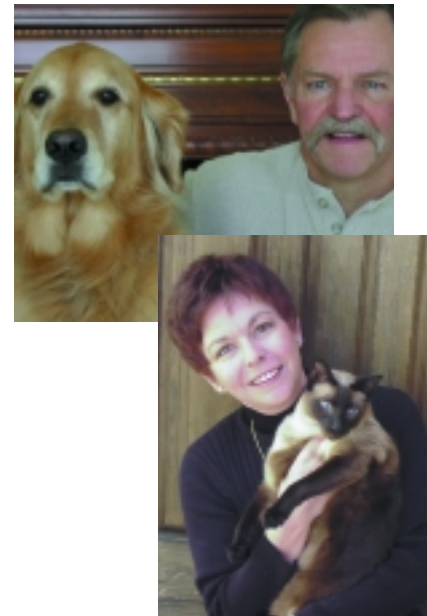
BY JEFF FITZGERALD AND PEGGY LONG

We have talked at great length about the design and efficiency of hashed files. The biggest performance factor in hashed files is overflow — overflow occurs naturally when more data records hash to a particular group than can be held in the primary group buffer. The additional data is held in overflow buffers that are more costly to read and write. As the overflow becomes extreme, performance suffers dramatically. We've argued that regular, systematic file maintenance is required to keep hashed files performing optimally.

The hashed files in use by UniVerse and UniData have two variants — “statically” hashed and “dynamically” hashed. The two are commonly called “static files” and “dynamic files.” We've used static files almost exclusively in our examples up to now; we wished to avoid complicating matters until we had defined and discussed the basic file structures. Now it's time for a discussion of dynamic files.

As far as we know, the earliest theoretical model for dynamic files was presented by computer scientist Witold Litwin at the Sixth International Conference on Very Large Data Bases, held in Montreal in October 1980. Litwin's paper was entitled “Linear Hashing: A New Tool for File and Table Addressing” and lays the foundation for dynamically hashed files. (If you would like a .pdf copy of this paper, please email us at [jeff@fitzlong.com](mailto:jeff@fitzlong.com) or [peggy@fitzlong.com](mailto:peggy@fitzlong.com); be warned that the math is not trivial!)

Litwin's theoretical work was the basis for Prime Computer's implementation of dynamic files in the 1980s. UniVerse and UniData both use similar strategies in their dynamic files. The dynamic file mechanism is quite elegant and worth a close look. We will first describe dynamic files in general and will later talk about the specific implementations in UniVerse and UniData.



## HASHED FILE BASICS — *A Quick Review*

Overflow occurs in static files when more data hashes to a group than can be held in the group's primary buffer. As our previous articles have pointed out, this can happen for a variety of reasons. The most common (and most easily resolved) cause of overflow is that the modulo of the file is too small. Suppose that a file is created with a modulo of 3 and a separation of 4 — the file will have three groups (the number of groups is equal to the modulo) and each group will have a primary buffer of 2,048 bytes (buffer size is equal to the separation multiplied by 512). Now suppose that we populate the file with 24 data records, each of which is 500 bytes in length. Assuming that we have perfect distribution of the records among the groups, each group will contain 8 records and 4,000 bytes of data. Since the primary buffer of each group can only contain 2,048 bytes of data, each group will have to add one overflow buffer to hold the data.

The overflow buffers exact a performance penalty, as it will require two I/Os to access data records in the overflow buffers. The maintenance solution is to resize the file, increasing the modulo from 3 to 7 (remember that the modulo should be a prime number but not 2 or 5). Again assuming a perfect distribution of data records, no group will require overflow buffers and we can once more access any record with a single I/O operation.

*Continues on page 12*

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Joke	Writer Full Name	Joke Text	Rating
+ Writer Full Name : Aaron Westendorp (5 items) Total Rating: 0			
+ Writer Full Name : George Burro (4 items) Total Rating: 5			
- Writer Full Name : Hannah Hendriksen (4 items) Total Rating: 13			
MEMBAR	Hannah Hendriksen	Two men walk into a bar. The third one ducks.	4
INSCHEMAC	Hannah Hendriksen	My agnostic, dyslexic, insouciant neighbor told me he lies awake at night wondering if there is a dog.	4
EYES	Hannah Hendriksen	What did the right eye say to the left eye? Between you and me, something smells.	3
PIZZAG	Hannah Hendriksen	Pizza shop: Do you want your pizza cut into 6 or 8 pieces? Customer: Oh 6 please -- I couldn't possibly eat 8.	2
Totals			13
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# An Introduction to Dynamically Hashed FILES

## DYNAMIC FILE BASICS

The basic idea behind dynamic files is that the file will recognize that it needs to be restructured because of overflow and will take care of itself automatically! Sounds like magic, doesn't it? Be careful not to equate dynamic files with "automatic resizing," which is NOT how they work. For static files with large modulus, a resize may require hours — it would be disastrous to trigger an automatic resize on a live file! There is no magic!

First let's review the basic theoretical model; in our next article we will explore the UniVerse and UniData variations on this model. Dynamic files use a clever "splitting" mechanism to perform a sort of "partial" resize on individual groups of the file. Splitting takes place based upon the "load" of the file; the "load" is simply the ratio of data to available space. As an example, suppose we have a file with a current modulo of 4 (we will soon tell you why 4, a non-prime number, is okay). If the separation is 4 each group can contain 2,048 bytes and the capacity of the whole file is  $2,048 \times 4 = 8,192$  bytes. Suppose that there are a total of 4,096 bytes of data in the file. The "load" of the file is then  $4096 / 8192$  or 50%.

A parameter known as the Split Load determines when splits occur — this parameter is specific to the file and is stored in the file header. A common default value for Split Load is 80%, causing splits to occur when the total load of the file exceeds 80%.

It is also important that we know which group will split and that all groups, over time, have a chance to split. Dynamic files have a pointer that we will call the Split Pointer, which references the next group to be split. In our example file, we will start

with the Split Pointer referencing the first group of the file.

Imagine the users of the file are busy adding new data records and updating existing records so that the load of the file is increasing. When the load of the file exceeds the Split Load of 80%, the group referenced by the Split Pointer will split. In our example the load will exceed 80% when 6,554 bytes of data have been written to the file ( $8,192 \times .8 = 6,554$ ). When this happens, a new group buffer will be appended to the file and the modulo will increase from 4 to 5. Approximately half the data records from group 1 (the group referenced by the Split Pointer) will be moved from group 1 to group 5. Then the Split Pointer will be incremented so that it references group 2.

Now, after the splitting of group 1, the capacity of the file has increased from 8,192 to 10,240 ( $5 \times 2,048$ ) with the increase in modulo from 4 to 5. Since there were 6,554 bytes of data in the file the load has decreased to 64% ( $6,554 / 10,240$ ). As more data are added to the file, the load will increase until it again exceeds the Split Load of the file. When this happens, group 2 (the group now referenced by the Split Pointer) will split, with half of its data being moved to group 6, which is added to the file. The Split Pointer will then be incremented to reference group 3, which will be the next group to split. Each split causes the file's modulo to increase by one.

Splitting will continue to occur in this manner until the modulo of the file has doubled to the next power of 2. In our example, we started with a modulo of 4; when the modulo has increased to 8, the Split Pointer will be reset to reference group 1. As further splits occur, the modu-

lo will increase from 8 to 16 with the Split Pointer marching progressively through groups 1 to 8 and then resetting to reference group 1.

## MORE DETAILS

At this point you should have a LOT of questions! We certainly did the first time we studied the mechanism of splitting. We will try to provide answers without violating our non-disclosure agreements with the companies involved.

*How does it know which records to move when a group splits? The modulo is an important part of the hashing algorithm; won't the records get lost if you just change the modulo whenever you feel like it?*

Good questions! Remember the goal is to move approximately half the records in the group during a split. If either all or none of the records are moved to the new group it hasn't accomplished the goal of reducing overflow. And we must be able to retrieve the records whether they were moved during the split or not. Dynamic files handle this in a very clever way.

As we pointed out in our earlier articles the record keys are transformed into "hash keys" as the first step in the hashing process. The hash key is a number that is represented in binary form by the computer. For static files, the hash key is divided by the modulo of the file, and the remainder plus one indicates the group to which the record hashes.

For dynamic files the first hashing is done using a "base modulo." The "base modulo" is the greatest power of two less than or equal to the current modulo. Remember that each cycle of splitting increases the modulo to the next power of two and then the Split Pointer is reset and the splitting cycle starts over. Suppose that we have a dynamic file with a current modulo of 6. The base modulo will be 4, the greatest power of two less than or equal to 6. We also know that the Split Pointer now points to group 3 — we know this because for the file to have grown from modulo 4 to modulo 6, groups 1 and 2 will both have had to split, leaving the Split Pointer referencing group 3.

Suppose that more data are written to the file, triggering a split of group 3. Say that there are four records in group 3 and that the hash keys for the records are 26, 6, 42, and 38. Notice that when the hash keys are divided by the base modulo of 4 the

remainders are all 2 — 2 plus 1 equals 3, the number of the group the records hash to. To determine what records to move during the split, the records are hashed using the base modulo multiplied by 2, in our example this would be 8. Dividing the hash keys by 8 yields remainders of 2 (for hash key 26), 6 (for hash key 6), 2 (for hash key 42) and 6 (for hash key 38). It can be shown that any number which has a remainder of 2 when divided by 4 will have a remainder of either 2 or 6 when divided by 8. If we add 1 to the remainders we have two records hashing to group 3 and two hashing to group 7. Group 7 is the new group being created by the split, so the records hashing to group 7 are the ones to be moved.

Retrieval of data records works in a similar fashion. To demonstrate this, let's use a slightly larger file with a current modulo of 73. The base modulo will be 64, the highest power of 2 less than or equal to 73. The Split Pointer is referencing group 10, since the first 9 groups must have split to increase the modulo from 64 to 73. We wish to retrieve a data record so the record key is turned into a hash key — suppose the hash key is 475954. Dividing the hash key by the base modulo of 64 we get a quotient of 7436 and a remainder of 50. Adding 1 to the remainder yields group 51. Since group 51 is above the Split Pointer, we know that this group hasn't yet split in the current splitting cycle. Therefore, the record to be retrieved is in group 51. We simply read the group and get the data record.

Suppose, though, that the hash key is 232262. Dividing by the base modulo of 64 we get a quotient of 3629 and a remainder of 6. Adding 1 to the remainder yields group 7. But group 7 is below the Split Pointer (which references group 10), so group 7 has split already during this splitting cycle and the data record could be either in group 7 or the group which was formed when group 7 split, which would be group 71 (the base modulo, 64, plus the group number, 7, equals 71). To determine which of the two groups contains the record, we divide the hash key, 232262, by twice the base modulo, 128, getting a quotient of 1814 and a remainder of 70. Adding 1 to the remainder yields group 71, so the record was moved to group 71 when group 7 split. Now we can simply read group 71 and get the data.

*For static files it's important to use a prime number modulo; in dynamic files the current modulo usually won't be a prime number and the powers of two used in the hashing*

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*algorithm sure aren't prime. Won't that cause bad distribution?*

Well, you might think so, but that is taken into account by the hashing algorithm. For static files the hash key is calculated by a formula that involves multiplication by a constant that is not a prime number. The hash key is then divided by the file's modulo and the remainder determines the group. If the modulo is non-prime it can cancel with the non-prime constant and reduce the possible range of remainders. For dynamic files the hash key is calculated by a formula that multiplies by a large prime number instead of a non-prime constant. This ensures that the non-prime modulo will have no common factors with the prime number multiplier. For more detail about this approach to hashing, refer to Donald Knuth's "The Art of Computer Programming."

*In static files the overflow buffers are appended to the end of the file. With dynamic files it sounds like the new groups created by splitting are appended to the end of the file, too. Won't the new groups and the overflow get mixed up?*

They sure would! In order to calculate the address of a group's primary buffer, the group buffers have to be contiguous within the file. To handle this, dynamic files are implemented as a directory containing two files. One file contains only the primary data buffers for the groups — as splitting occurs the new groups are appended to the file. The other group contains only overflow buffers — as overflow buffers are needed they are appended to the overflow file.

*What happens if you delete a lot of data?*

There is an operation called a "merge" which is the opposite of a "split." A parameter known as the Merge Load is set for each file. A default value of 50% is often used. When the total load of the file decreases to less than the Merge Load, the last group of the file is combined with the group from which it split. The Split Pointer is then decremented by one. Typically the space used by the groups which are merged is not returned to the disk, but is held in the file and used if subsequent splits occur.

#### THE COMPROMISES

The design of dynamic files makes a number of assumptions which are not always met. As with most designs there are some compromises which lead to sometimes interesting results. We'd like you to be aware of some particular characteristics of dynamic files.

*Splitting and merging is only triggered by a write to the file.*

Unless a record is written to the file no splitting or merging will occur. And each write operation will result in at most one split or merge. This is good as it reduces the amount of overhead required by the splitting and merging. But suppose that you change the Split Load of a file from 80% to 60% — you'd like the file to split until the actual load is reduced to 60%. This won't happen until there are enough writes to the file to cause the desired splitting to take place. A way to force the splits to occur is to copy the file to itself with this sort of command: COPY FROM filename TO filename ALL OVERWRITING (this is ideal or Information syntax, HELP COPY should give you syntax for other flavors).

*Continues on page 42*

# Let the Good Times Roll Out

## Frequencies Caught Unlicensed

BY MELVIN SORIANO

When last we chatted, high speed Internet wasn't everywhere yet. That's because wiring up rural areas or older buildings can be cumbersome, expensive, or unprofitable. The huge rise of wireless sites has altered the landscape though. On top of that, the options for wireless networks have matured and are now ready for prime time. Great strides have been made in expanding practical wireless options. We spoke about three technologies: WiMax, UltraWideband, and Mobile-Fi.

A major factor in the rapid innovation at the moment is the existence and extent of unlicensed radio wave spectrum. In the past, big telecommunication companies paid billions of dollars to license exclusively from the federal government a section of the radio spectrum. The upside of this approach is that these companies can deliver cellular phone services without any interference from each other. The downside is that it intentionally deters others from using the same radio frequencies.

Today, however, most of the newest wireless technologies use unlicensed radio frequencies. Any company, heck, any individual, can try out neat ideas on these unchartered frequencies. It's like learning to drive in a huge parking lot. In my part of Pasadena, most teenagers learn to drive in the usually empty Rose Bowl parking lot.

Wi-Fi started this gold rush mentality. It wildly succeeded in exploiting the unclaimed radio lands. Essentially, several companies agreed (imagine the difficulty of a group of technology companies agreeing to anything) to establish a standard. Once they all agreed, it was easy to market the technology. The commitments allowed large manufacturing volumes to bring down the cost of Wi-Fi hardware. These low costs permitted demand to grow, and the strong demand created even more incentives for larger manufacturing volumes.

This year, over 50 million laptops, handhelds, PDAs, and other such Wi-Fi gadgets should be pushed off the shelves. That's a quadrupling of the number just two years ago.

Despite the possibilities, the new technologies do have considerable adoption challenges. The biggest manufacturers have begun to bicker over the exact standards for Ultrawideband and Mobile-Fi. At this point, we may not see final standard agreements in those wireless solutions for another year. Don't expect equipment makers to start mass production, then, of these two technologies. It might take a couple years, therefore, before the manufacturing costs are lowered by economies of scale. In a twist, Mobile-Fi is getting ready for release on licensed radio frequencies. But given the benefits we talked about last time, Mobile-Fi may easily be replaced by WiMax once it becomes extensively adopted and mobile.

On top of that, these developments aren't going unnoticed by existing companies. Cellular telecoms now are deploying solutions that will let their customers get faster Internet connections on their cell phones and laptops. This technology is called 3G (third-generation) and is to compete with WiMax and Mobile-Fi directly. Verizon has installed a 3G network in a couple U.S. cities, and should have 100 cities installed by the end of next year.

Other telecoms are providing similar services across the world. Now, 3G is slower than WiMax. However, it is not only more reliable, it's already available. Companies such as IPWireless have been making 3G equipment for a couple years and its utility has already been shown.

A more fearsome bogieman exists for these new technologies, though. Whether 3G can be edged aside does not eliminate a fundamental problem: we're running out of room on the radio spectrum. Since these many new devices are blabbing on top of each other over the same radio frequencies, they are starting to bump up against each other. The megacompanies are thus lobbying the U.S. government to release more radio frequencies for these new technologies. Where are the frequencies supposed to come from?

Broadcast television. The major network TV broadcasters sit on enormous tracts of spectrum. Back in the good old days of black and white TV, there didn't seem to be any need to reduce the size of this huge area. Although the government and the FCC have encouraged the use of unlicensed spectrum, this conflict between new technologies and traditional media is certainly no cakewalk. Broadcasters are thoroughly intent on preserving their monopoly of this landscape. Economic and technological pressures should eventually force them to cede the radio waves, but it may take some time for the politics to work its way through.

I'm optimistic that such changes will occur. After all, these new technologies offer benefits that should benefit the entire economy. Wireless Internet should spur productivity, in ways I described previously, by economically collecting data from remote and dispersed locations, and to do so on an as-needed basis. It should increase remote computing beyond what the already successful RF-technologies can deliver. In effect, demand for remote computing is moving away from just humans being more productive, but also making our tools more effective from remote locations as well. Some estimate that in the next couple years we should see U.S. sales soar to upwards of \$10 to 20 billion in sales.

Already, industries such as construction, health care, and emergency services are moving quickly to deploy these new gadgets. Some construction companies are expecting that the new technologies can help them reduce energy consumption. Service companies such as hotels are thinking of using those ZigBee sensors to closely monitor hotel room activity and temperatures to reduce heating and cooling costs in each hotel and meeting room.

The U.S. Energy department is encouraging the use of these sensors in manufacturing. They might be able to reduce energy costs by up to 15%, as complex piping systems in the manufacturing plant can be better tracked.

Processes that are used to produce plastics use enormous amounts of heat, and the sensors should be able to monitor all sorts of information and report data immediately. Waste and leaks should be vastly reduced, saving by some estimates hundreds of trillions BTU in energy annually. Heck, that's the amount of energy used by a small state.

Moreover, as use expands and research moves forward, the sensors continue to shrink in size and become more versatile. Some believe that they can be reduced to the size of a piece of dust. We're not talking, then, of just dozens of sensors. We're talking THOUSANDS of these dust bunnies. "Smart dust" could even be sent into the air to monitor weather, chemicals, and other environmental activities.

The various new guys aren't going to stand apart either. They're going to start integrating amongst themselves. Sooner or later, mobile phones, PDAs and laptops will switch seamlessly not just from one network node to another, but also from one type of network to another. They'll quietly switch from Wi-Fi to WiMax to ancient phone networks. The biggest cell phone manufacturers are already adding Wi-Fi to their products.

Of course, many businesses have been sending phone calls over the Internet (VOIP). But on top of that, some colleges and businesses are now trying to send phone calls over Wi-Fi. For example, some colleges have delivered Internet phone service over Wi-Fi networks already. Students make free domestic calls from all over these campuses with their PCs and laptops. Telephone infrastructure is thus one expense that is eliminated. These colleges are now even testing delivery of cable TV using Wi-Fi. Intel, in trying to go for gold twice, is trying to make WiMax the next Wi-Fi. The first WiMax modems will probably cost over \$400 next year. That's a heck of a lot more than the typical broadband modems or even 3G phone cards. But since WiMax is even faster than most landlocked broadband, that might be a worthwhile price. Many companies won't let Intel take over the WiMax marketplace,

so you can bet that those modem prices will plummet quickly. And within a year, we should see WiMax built into laptops, just like three years ago when Wi-Fi became an option on laptops.

Again, colleges are starting to push the envelope. Both Portland State University and Oregon Health & Science University began deploying a combo network of WiMax and Wi-Fi. They are testing rooftop devices to manage these networks, along with the city fire department. The goal is to grow the network from the campus to the entire city.

Cities covered by these smart networks? Wow. But with good solutions and good planning, these technologies will roll out during the next couple years. And what will be the only surprise? I doubt I know, but I'm sure it'll be due to some new gadget testing the limits of unlicensed radio frequencies. is

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# The Ins and Outs of Software Maintenance When You Have No Access to Source Code

BY ROBERT R. COLTUN

**A**s the IT manager, director of MIS/IS/IT or senior analyst of your organization, you are the professional placed in charge of maintaining the software that your company relies on. If your software has been purchased from a third-party vendor and your company hasn't purchased rights to the source code, the task of maintaining it becomes even harder.

Hopefully the vendor who wrote the software is still in business and still supporting the product. Having a support contract with the vendor does not necessarily mean that the vendor will be making modifications to the application. Most modifications covered under contracts involve only error correcting or changes needed with regard to new rules and regulations required by government. Other modifications will have to be handled in-house or contracted back out to the vendor, sometimes with exorbitant costs or untimely delays involved.

As long as you have a good rapport with your existing vendor, you may be able to persuade the vendor to add a subroutine call into an existing program or application for a relatively small fee. This way your in-house IT staff can actually write the software necessary to modify and enhance the application. This is not an unusual request to make of a vendor, and doing so can save your company thousands of dollars. Doing the work in-house can also save your company time if the

vendor can not meet the deadlines required to complete the project.

Remember that even if the vendor that developed the software application is still in business, you cannot expect it to freely distribute all of the proprietary information. If you have a good working relationship with your vendor, most likely you will be able to get the information you require for a fee.

## If Your Vendor Is Out of Business

If the vendor is out of business and the source code was held in escrow, you're home free with future application development issues. If not, continue reading. The IT manager who has no access to the source code has a tremendous challenge to overcome.

Begin the process by compiling lists of hardware vendors, software vendors, operating systems, databases, scripting languages, application languages, reporting tools, communications software, etc., that can help you with this process. It doesn't matter what database/application environment you are working with, whether it be PICK, UniVerse, UniData, Revelation, DB2, Informix, Oracle, SyBase, etc. The more you know about your environment, the more you will be able to tackle and integrate the different pieces to solve whatever problems arise.

Your next step is generating a new map for the existing application. Mapping out your application can begin by reviewing and cataloging all the screens and particular jobs/functions that each item on a menu may control. Depending on the operating system,

you need to determine what file systems the application(s) may be using. Reviewing and mapping the file systems as well as their contents may be tedious, but this process is a necessary evil.

If you're lucky enough to be able to find associations between the filenames that exist within the partitions and the dictionaries, indexes, tables and schemas, etc., you're one step closer to being able to maintain your software. On the other hand, let's say that you don't have these associations available. If this is the case, you will have to set up some data entry tests to trace the way data is distributed and written to the files within your software application.

Start by working with the different departments in your organization to generate some specific tests where all the data entered into the system can be controlled. One at a time, run through each test and review the data written to the files. Check for date & time stamps as to when the files were last processed. Keep track of which files have date & time stamp modifications, as well as the size of any of the files which have been changed between tests. Reviewing this information will play a key role in documenting your system's application for future maintenance, new program development, etc.

Another way to extract crucial information about your system is from the scripting, query and reporting languages that are available to you at the application and/or operating system level. Many scripting, query and reporting languages and tools are not compiled, making it easier to make changes to



the software. Others, which are compiled, may still have file tables or schema tables that may be accessible to the user even if the scripts are not.

### One of the Tricks I Use

One of the tricks I use when modifying existing applications when I have no access to the source code is by using the system indexes. Indexes were designed to identify a field and to store data needed to quickly access information within your application.

Let's think outside of the box and expand the way an index may be used. Instead of using an index to identify a field and to store data, why not use that index to trigger a script, report or program to add new functionality to your application? Using the index technique, you can actually execute another program once the initial program files the current record it's working on. The index will execute the new program, reopen the record you were just working with, and allow you to continue processing with the code that was developed by the vendor.

Whether your vendor is around or not, one thing to remember is that you're working in a live environment and that this procedure is ongoing. All systems are different, and what may work for one may not for another. The more you can learn about your applications, tools and operating system, the more effective you will be at overcoming obstacles and managing your system effectively. Source code issues do not signify the end of the line, just a new direction needed in handling them. The challenge is to embrace the process and conquer the obstacle in front of you. The personal rewards of accomplishing this task are many. is

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ROBERT R. COLTUN is one of the founders and the CEO of Mount Olympus Systems Inc., the developer of Zeus Data Integration software. He has been working in the IT industry for over 25 years and specializes in ETL tools. He can be reached at MrOlympus@mtolympus.us.

# Question

**Suppose you were assigned the task of increasing the maximum length of an attribute in a file. It is a frequently used field, so you know that it will affect many programs. There are definite possibilities of over printing and screen wrapping.**

**Your system has over 2500 programs spread out over 12 libraries. You know that the code has been modified by multiple programmers over the years and that each one had their own naming conventions.**

**Your job is to identify, check and modify every program that is affected by this change! How long would it take you to do it?**

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# SALES TAX SOFTWARE

## *in the MultiValue World*



Because some states are planning to partially subsidize the costs of using approved sales tax software, Spectrum sat down with Stan Zegel, president of AdValorem — provider of EasyTax, the first product that allows MultiValue sites to use any of the standard sales tax calculating and reporting software packages that have long been available outside the MultiValue community.

**SPECTRUM:** Stan, what's your background in the MultiValue environment?

**Zegel:** I started with the Microdata Reality system back in 1975, when an Iowa firm I then owned became a subdealer for SMI in Chicago. I already had a dozen years of computer experience by then, going back to the paper tape and punch card era, and was so impressed with the flexibility of the Pick system and the ad hoc reporting capability, that I knew that MultiValue systems had a great future. I introduced MultiValue into one of the conglomerates, and they ended up effectively buying us out, and using various MV systems in their operations. Since then I've worked several places implementing sales tax systems, but was disappointed to find only obsolete legacy sales tax systems have

been available to the MV world until now, so I decided it was time to bridge the gap.

**SPECTRUM:** So that's when you founded AdValorem?

**Zegel:** Yes. Sales tax is one of the ad valorem taxes, that is, the amount of the tax depends upon the value of the item taxed. We named the firm AdValorem to emphasize our expertise in this specialty. We've spent the past two years developing a MultiValue-compatible universal interface that any accounting system can easily use as a gateway to talk to any of the popular sales tax engines.

**SPECTRUM:** What's so special about a sales tax engine? After all, to calculate sales tax you just look up the tax rate in a table of 50 state rates and multiply it by the subtotal, don't you?

**Zegel:** A lot of folks assume it's that simple — until a state sales tax auditor does an audit of their firm's books. After their company's comptroller writes a large check for back taxes, penalties, and interest, they realize their assumptions were wrong, and that their home-brew sales tax routine has innocently done a lot of things wrong.

**SPECTRUM:** Such as?

**Zegel:** Using outdated rates, following the wrong rules, overexempting a customer, or trying to charge tax based on the invoice total instead of doing it line-by-line. The sales tax laws, rates and rules differ from state to state. Every month many of the 52,000 states, counties, cities

and special districts that can charge sales taxes change their rates. You have to assign the correct combination of jurisdictions for each sale — and the combined tax rate is not always the sum of the parts — and then keep separate track of how much each state, county, city or district gets from each

With discounts on taxes coming for those who properly use approved canned sales tax software, it just makes sense to use it.

### AUDITOR BAIT

This does *not* meet the legal requirements:

```
SalesTaxAmount = Subtotal * TaxRates(StateNumber)
IF CustRec(CRSTaxExemptFlag) EQ CodeExempt THEN
    SalesTaxAmount = ZERO
END
```

line item of each invoice. Some cities are in more than one county, so you have to get your jurisdiction combinations right to get the taxes right. But as cities sprawl into adjacent counties, those combinations keep changing too.

**SPECTRUM:** How does one keep up with all those constant changes?

**Zegel:** It's a full time job needing several people, so the tax engine firms do that and then send their subscribers monthly updates to their rates and rules files.

**SPECTRUM:** What kinds of rules are there?

**Zegel:** Some state laws charge the tax rate of the place the goods were shipped *from*, instead of shipped *to*, and others do an intricate combination of both. In some places the tax rate is different on a quarter-pound hamburger than on a quarter-pound *of* hamburger. On select items there may be a maximum amount of tax, regardless of how much a single item costs, or they may be not

taxable at all at certain times of the year. Software, farm machinery or other specific classes of items may or may not be taxable in different places. There are over a dozen combinations of factors involving freight, and different states levy taxes on different groups of those freight combinations. And of course, most companies forget all about charging taxes on their own purchases.

**SPECTRUM:** Tax on their own purchases? I know you have to charge on your sales, but why your purchases?

**Zegel:** In case the vendor didn't charge you tax. Every state requires you to voluntarily report and pay the missing tax on your purchases. They call it "Use Tax" and it's a very fertile field for the sales tax auditors because they know most firms ignore it. It's related to the myth that purchases over the Internet are not taxable. A few days ago I talked to Dan Hall, the Audit Bureau manager at the Illinois Dept. of Revenue, and he told me that wrong rates, Use Tax, and poor tax exemption docu-

mentation are the three most common errors they find in an audit. He said most firms audited end up paying an average of \$50,000 in back taxes, penalties and interest. That's typical in other states too.

**SPECTRUM:** That's an expensive lesson.

**Zegel:** I often say it's like we are in the burglar alarm business: our phone rings the morning after.

The bad news is that you are subject to audit by every state you do business in, so you can end up paying several states large amounts because of the same software deficiency.


The good news is that many of the states are going to start giving a tax discount to firms that install and properly use approved tax engines. But until now, those were very unwieldy to integrate, install and implement in a MultiValue environment, so most firms have been stuck with in-house-written sales tax routines that won't qualify for the discount.

*Continues on page 20*

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**SPECTRUM:** Is that where your EasyTax product comes in?

**Zegel:** Indeed. EasyTax is MultiValue-compatible middleware, sitting between any MultiValue accounting system and the other-language tax engine.

The MultiValue application exchanges standardized text strings with EasyTax, and EasyTax then translates back and forth with the most popular tax engines: CertiTax, TaxGen, Taxware, Vertex Q-series, WorldTax or Sabrix. We're always adding to the list.

EasyTax also does all the error handling and lots of automatic corrections and administrative simplification. Best of all, when your company needs to graduate to another tax engine, you don't need to do any reprogramming; we just send you the plug-in that works with your new tax engine.

If you're in the business of selling your software to others, then having the EasyTax interface in your base code gives you a competitive advantage, because you now have fully featured sales tax built in without needing to learn anything about it. Plus, your customers always have a selection of tax engines instead of just whatever simplistic substitute that your competitor may offer.

**SPECTRUM:** How much do those tax engines cost?

**Zegel:** It varies — some of them charge per transaction, others charge an annual fee based upon your company's size — and some of the bigger suppliers don't even want to do business with small and medium-sized businesses so they price their product to step over the SMB market. Not all of them do that.

**SPECTRUM:** How then does a small-er MultiValue user get to use one of those?

**Zegel:** We work with you and counsel you toward the tax engine that best fits your current needs and budget. Because you interface to EasyTax, instead of directly to, say, Taxware or Vertex, we end up fielding all the support calls anyway. That in itself often removes some objections the big boys have to selling to a smaller business. The smaller suppliers never have a problem dealing with other SMBs. Some bigger packages are overkill for most SMBs anyway, but for those firms who really need that extra power or special features, we are working with some of the more exclusive suppliers to handle for them what they consider to be the "nuisance" tasks of dealing with SMB customers.

**SPECTRUM:** But some firms, like manufacturers, don't need sales tax engines, though, because they sell to wholesalers.

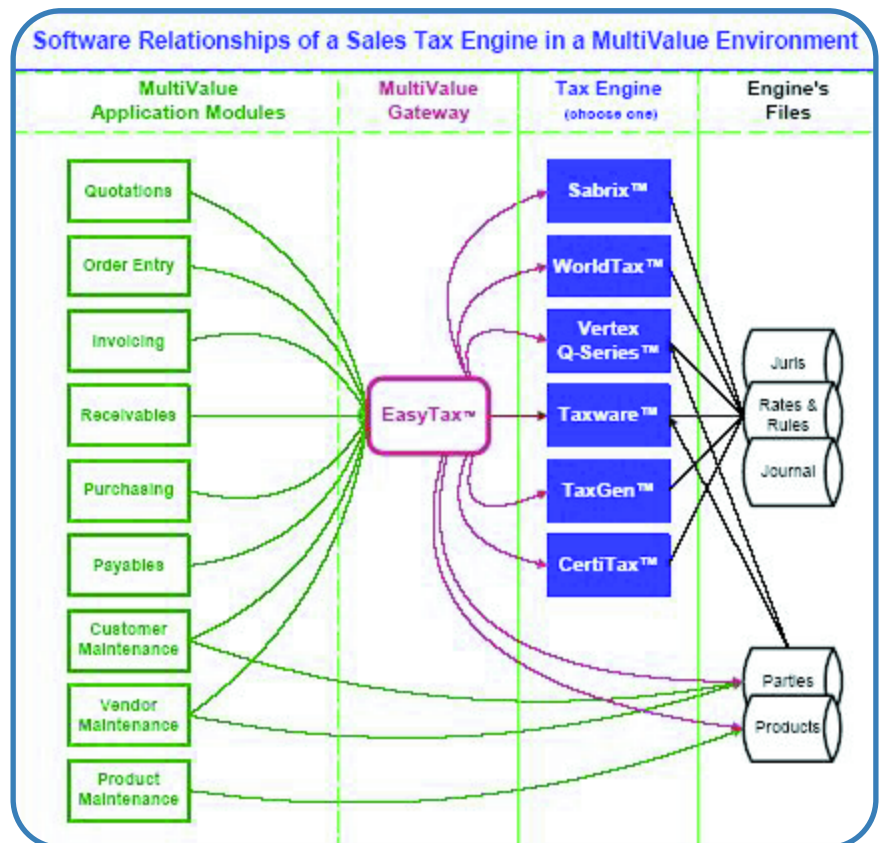
**Zegel:** Actually they have the same problems at audit time because they still need to prove that each customer has paperwork on file supporting a reseller exemption. And they still have the Use Tax exposure. Because they may collect little sales tax, they often are not as diligent about current documentation as other firms, and end up being even more vulnerable.

**SPECTRUM:** How likely is it that a firm is going to get audited?

**Zegel:** No one can say for sure, because the selection criteria are secret and change. But sales taxes are a big part of most states' revenues, and money has been tight for them recently.

**SPECTRUM:** Any advice about being audited?

**Zegel:** An auditor usually spends 60 hours at a company, and someone on your



staff has to find and supply him with specific records he requests as he goes along. The more automated lookup systems you can provide an auditor, then the faster and more accurately he finishes, and your accounting staff can get back to their normal work. Being able to drill down online from an entry on the sales tax return to browse the invoices that were part of it really helps. There are also exemption certificate imaging systems available that tie in to a tax engine, and using them cuts out a lot of time and cost.

**SPECTRUM:** I didn't realize sales tax was that involved, or how much liability a firm could incur by using in-house sales tax software.

**Zegel:** It's not just in-house. Many purchased accounting packages make the common erroneous assumptions too, so unless you are subscribing to an add-on like CertiTax or Taxware, your comptroller and company have financial risk. Nowadays, it is rare for anyone to mess around doing payroll in house because of the complexities and changes, and sales tax software is in that same category. And with the subsidy coming for those who properly use approved canned sales tax software, it just makes sense to do so.

**SPECTRUM:** How about Canada and other foreign countries. Do tax engines handle them too?

**Zegel:** Most of them handle the USA and Canada automatically, but nowhere else. You can add on WorldTax or Sabrix, which handle almost all the rest of the world.

**SPECTRUM:** What else does AdValorem do?

**Zegel:** We also provide address standardization and correction software, and we have an option that can even tell you as the order is entered whether the address is just a vacant lot (even if the address is otherwise within a valid range), so you don't end up sending goods to a wrong place, or the bill to a fraudulent address.

We also distribute the Net Integrator network security appliance that can be administered by non-technical staff. It provides — all in one box — firewall, central virus scanning, e-mail, Web Services, and central data warehousing with incremental backups as often as every 15 minutes to hot-swappable disk.

**SPECTRUM:** What does the future look like?

**Zegel:** In 1789 Ben Franklin wrote: "In this world nothing can be said to be certain except death and taxes," and we are in the tax service business.

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# History of MultiValue Where Are They Now?

## Remembering Each 'Person of the Year' from *Spectrum* Magazine

Our fourth installment of *Spectrum's* 20th anniversary commemorative "Where Are They Now?" series takes a look at seven unique men and women. This small group of MultiValue "celebrities" was honored as "Man of the Year" or "Person of the Year" (we didn't become politically correct until later!) and joined an elite and select group to be featured in International Spectrum magazine from 1989 to 1997.

### International Spectrum Person of the Year

1989

Len MacKenzie, General Automation

1990

Jim Capeless, VMark Software

1991

Judd Van Dervort, Keystone Information Systems

1992

Russ Monbleau, DEC

1993

Richard Lauer, Sequoia Systems

1994

Honor Guiney, Stauffer Information Systems

1997

Jane Christie, General Automation

To be distinguished out of so many in the MultiValue marketplace as "Person of the Year" was truly a well-deserved honor. At the time of the award, some were running their own companies or taking their company public, while others were executives in sales, service or R&D. Some had been working to expand the PICK technology since Microdata officially introduced it in 1968, while others were considered new blood, trying to transcend the atypical nature of the PICK marketplace. In the end, *Spectrum* chose each "Person of the Year" because they were clearly successful businessmen and women in their era who were respected among many in the industry. The final vote that got their names in light, however, came from their conspicuous, well-timed, and ground-breaking approaches to doing business in the world of PICK.

So, big questions remain. Who are these seven illustrious individuals? Are they still persevering in PICK? If not, how long did their capricious PICK careers last? Did their fame prove fleeting, or catapult them into continuing notoriety? We look forward to sharing their stories with you now.

*Continues on page 27*

## The complete application development environment for the web

DesignBais News aims to provide the multi-value market with an overview of recent developments in the DesignBais product and news from our growing customer base. It also includes a section on technical tips to help ensure that you are getting the most out of your DesignBais development.

### News Flash

DesignBais Release 1.20 (15<sup>th</sup> November 2004) introduces **cross-browser** compatibility for public web access. This means that you can build web applications for public consumption utilizing the DesignBais forms designer and know that they will work on all well-known browser types. Some of DesignBais' standard features are not supported by all browser types, but the restricted feature set provides more than enough functionality to design and build public-access web sites. This exciting new development provides you a 'one-stop' development platform for your browser-based business applications and your public web-access requirements. You still only need to know multi-value to take advantage of DesignBais' complete web-development environment.

*"I like DesignBais because it satisfies the requirements that I hear expressed often in the MV industry: It's inexpensive, simple to use and deploy, and doesn't require the Pick developer to learn a new language or technology."*

**Tony Gravagno – Nebula Research and Development**

### DesignBais Release 1.16

We are very excited with the quality and performance of release 1.16. We have introduced a number of new features to the product. As always, our development is influenced by our install base. A number of the latest features are as a result of requests from developers utilizing DesignBais.

- **Graph support for forms**  
This facility enables the designer to add Graphs to forms that are generated from basic code on the server. The Graph controls utilise the browser's standard functionality, so there is no need to install any software on the client to utilize this feature.
- **Hyperlink Buttons**  
We have introduced a new style of button that provides the designer with a Hyperlink style button. This is a great feature that helps make your DesignBais applications behave the way that Internet users expect.
- **Date format controlled by browser**  
We have changed DesignBais to extract the preferred date format from the browser. This will particularly help ASP type operations where users may access the DesignBais applications with different date formats.
- **Case based form sections**  
We have modified the DesignBais form section construct to allow functionality similar to a Case statement. This provides a very powerful way to control the enabling, disabling and even hiding of fields (or entire sections) on a DesignBais form.
- **Optional side-menu construct**  
The designer now has the ability to completely hide the side menu on a DesignBais form. This feature has been developed as a result of a number of requests from DesignBais developers. There is now a menu type on the menu definition named 'Hidden Side Menu' that governs this function.
- **Multiple language support**  
DesignBais now has multi-language support, via its simple to use Glossary construct. Terms used on forms can be replaced by language equivalents to help give your application a truly international flavour. The glossary is linked to a user or user group, so you can have one user on English and another in Chinese on the same system.
- **Tab Index Navigation**  
DesignBais now enables the Designer to create a Tab or Entry index for every input field on a form. Again this is in response to a number of requests from DesignBais developers. You can now customise the tab/cursor movement to help make Data Entry easier. This feature helps make DesignBais a useful data entry tool for the 'Heads-down' user.

### Spectrum Conferences – London, Sydney and Melbourne

DesignBais was again very well received at the Spectrum conferences in London, Sydney and Melbourne. In Sydney, the DesignBais technical session was full to overflowing and the two extended technical sessions were also very well attended.

We believe that DesignBais fits exactly with what the multi-value developer requires. A simple, elegant and yet very powerful way to migrate existing complete business applications to the Browser/Internet. The requirement to only know multi-value basic is quickly gaining credence as more and more developers become frustrated with the .NET complexity.

A number of developers that we spoke with in both London and Sydney indicated that development in the .NET environment is very slow and very expensive and added complexity to their development organisation that they were not equipped to deal with. We have a number of clients that are now using DesignBais that have been through the .NET experience. They are discovering that they are significantly more productive and producing higher quality output with DesignBais.

# Special Advertising Section

## Peartree Software Redesigns Applications in the Browser Environment

Peartree Software has a lengthy history of developing and supporting applications in the Multi-Valued environment. This history dates back to 1978. The following quote is from **David Moser**, President of Peartree:

"The main applications that we are supporting were badly in need of a total redevelopment utilizing the browser environment.

Our company embarked on a research and development project early in 2002. We investigated a number of development tools and attempted to go with a leading edge and mainstream environment. We chose Microsoft .Net! I was expecting to encounter a number of learning curve issues and relatively slow development at the start. I never imagined that we would encounter the roadblocks and total lack of productivity that we did.

It was like a breath of fresh air when I was introduced to DesignBais at the Spectrum conference in New Jersey in November 2003 and then again in Vegas in March 2004. Since we received the first and subsequent releases of DesignBais, we have made significant progress. DesignBais is quick and intuitive for both Multi-Valued and non Multi-Valued programmers. In fact, non-programmers readily pick up most aspects of development in this environment.

We expect to be able to bring our RV Dealership application to market very soon as a result of going with DesignBais. **Well done!**"

## DesignBais breaks the performance barrier

We have recently completed a number of scalability and performance tests with DesignBais. The results we are getting are outstanding. The following details structure and the results of one of these tests.

Hardware	Dual Pentium 4 512 MB Memory SCSI Disk array (No hardware raid or hardware caching)
Operating System	Windows 2000 Server IIS Server
Test Details	Multiple browser sessions from multiple PCs simulating screen loads from a menu selection over a 24 hour period.
Database	Universe Release 10.1 Database residing on the same physical server and the IIS server.
Results	3.51 million screens refreshes in a 24-hour period. Server maintained a CPU utilization of approximately 80% during the course of the test.

As you can see from the above results, the architecture of DesignBais will provide outstanding performance on Hardware that may be viewed as minimal for the task.

## DesignBais Technical Tips

This section of the news is devoted to providing technical tips for the DesignBais Developer. If you wish to see particular topics covered in future DesignBais News articles, please email your requests to [dhs@peartree.com.au](mailto:dhs@peartree.com.au).

### Technical Tip 1 – The benefits of Sections.

Sections are a powerful way to improve the intuitiveness of the user interface of your DesignBais application. They allow the designer to hide or disable parts of the form in response to user action.

The following is an excerpt of a form without sections enabled. A section of the complete form has been cropped to make it fit on the page.

The screenshot shows a web form titled "Client Maintenance" with a "DesignBais" logo in the top right. The form contains several input fields: "Client Code", "Client Name" (with a search hyperlink), "Street Address", "Town/City", "Zip/Post Code", and "Country" (set to "Canada"). Below these fields is a table with three columns: "Client", "Client Phone", and "Client Email". The table has two rows, with the first row containing some data and the second row being empty. At the bottom of the form are "Submit" and "Clear" buttons.

All of the fields on the above form were added to the form with a section name of **Main**. This is the default. What I want to do in this example is to hide most of the details on the form until the end-user enters a Client code, or uses the search Hyperlink Client Name to invoke a search form to select the client.



# Special Advertising Section

To do this we must firstly change the section name of the first four components to something other than **Main**.

The four fields to change are

Select the field – **Client Code**. Then select the **Properties** side menu option to view the properties for this field.

You can see that the current section name is **Main**. I will change this to **Startup**. The naming convention is up to the designer. I will repeat this for the three required fields.

I now have four fields at the top of the form that have a section name of **Startup** and the rest of the fields on the form have a section name of **Main**.

I will now select the Sections option from the side menu of the Designer.

Sections	Initial State	Condition by Variable	Condition Operand	Value for Condition	Section State
Startup	Enabled (Display)	No Condition	No Operand		
Main	Hidden	DBC.CLIENT.CODE	# (Not Equal)		Enabled (Display)

From the above form example you can see that we now have two sections on the form, being **Startup** and **Main**

Simply by using the intuitive controls available on this form I have identified how to display the two sections that are on this form.

**Startup Section**

Always enable and always display all fields within this section. (These are the fields identified earlier)

**Main Section**

Hide all fields in this section until the input field named DBC.CLIENT.CODE (the client code) is not equal to Null. Leaving the Value for Condition column blank indicates a null. When this condition is true all fields belonging to that section will be enabled and displayed.

The result

You can now see that only the fields identified with the **Startup** section are now displayed.

Contact	Contact Phone	Contact Email	Contact
Rebecca Derry	333 333 333	rderry@nilessamedaycouries.com	13181
Kimberly Howard	444 444 444	khoward@nilessamedaycouries.com	13210
Mary Lewis	555 555 555	mlewis@nilessamedaycouries.com	13241
Benjamin Gray	666 666 666	bgray@nilessamedaycouries.com	13210

When the user enters a client code or uses the search function to select a client, the section defined as **Main** is enabled and displayed

This is only a very simple use of the sections function.

# Special Advertising Section

## Technical Tip 2 – Basic Subroutine Control – Validation

DesignBais requires developers to know only how to program using Multi-value basic. The following is a simple example of a subroutine that checks if the value entered in a Client Name field is correct. It's not a real-world example, but it does show how easy it is to control and verify the input from the user interface.

BEGIN CASE

CASE **PROCESS.EVENTSOURCE** = "DBC.CLIENTNAME"

**PROCESS.EVENTSOURCE** identifies the field that caused the event and subsequent call to the basic subroutine

IF **DBVALUE** = "GOOGLE" THEN

**DBVALUE** is the common variable containing the data entered by the user

**DBCALLURL**="http://www.google.com/newWindow"

**DBCALLURL** is a common variable that instructs DesignBais to load a URL.

END

IF **DBVALUE** = "FRED" THEN

**IERR.TEXT** = "No Fred's allowed"

**IERR.TEXT** is a common variable that informs the DesignBais server that an error has occurred. The error will be displayed. The value entered by the user will not update the record.

CALL **DBLG.GLOSSARY**(**IERR.TEXT**)

This standard DesignBais subroutine will check the Glossary for the error message contained in **IERR.TEXT** and replace it if the user is using another language glossary. This allows your program error messages to be multi-lingual

END

IF **DBVALUE** = "GEORGE" THEN

**DBVALUE** = "HARRY"

Changing **DBVALUE** will update the user interface with the change and also update the record

END

IF **DBVALUE** = "DIALOG" THEN

CALL **DBLG.DIALOG**(4,"Are you sure you want to do this",**DB.IDBCCLIENT**, **DBRESP1**)

**DBLG.DIALOG** is a standard DesignBais subroutine that instructs DesignBais to display a dialog box and call a basic subroutine when the user makes a selection.

END

IF **DBVALUE** = "MOVE" THEN

**DBRETURN.FIELD** = "DBC.SUBURB"

**DBRETURN.FIELD** instructs DesignBais to position the cursor at the required input field. In this case **DBC.SUBURB**

END

END CASE

As you can see from the above example, it is very easy to control user input, validate entry and control the actions of the browser interface

## The New DesignBais Forum

The new DesignBais forum is now operational. This site is designed to allow DesignBais developers and future DesignBais developers to communicate with the DesignBais support and development team, and communicate with each other.

To access the forum go to the following link.

<http://designbais.bais.com.au/forum>

# History of MultiValue Where Are They Now?

Remembering Each 'Person of the Year' from *Spectrum* Magazine



## 1989 Man of the Year: Len MacKenzie

Regarding the "Man of the Year" Award: "I was sincerely flattered because I always felt that the award belonged to the founding members of Spectrum, including Gus and his organization. I was very pleased to get the award, and it has always been of high value to me." -*Len MacKenzie, October 2004*

Len MacKenzie was the first to be honored as *Spectrum's* "Man of the Year" when it was instituted 17 years ago. His reputation at the helm of General Automation (GA) set him apart as one of the industry's most influential personalities in PICK during the 1980s and early 1990s.

MacKenzie joined GA in 1980 as president, chairman and CEO—a position he held until the early 1990s. (MacKenzie led the GA team that identified the potential for the PICK product that transformed GA from a minicomputer company into a systems firm with hardware and software.) He has not been involved with the MultiValue market since resigning from GA in the mid-1990s, although he did remain on GA's board for a few years after that.

When he left the industry in the mid-1990s, MacKenzie joined his wife, Nanci, in the natural gas industry. After buying

out Nanci's partners in USGT, he helped develop it from a company with \$12 million in revenue to one with over \$500 million. Four years ago, the MacKenzies sold USGT to one of the largest energy companies in the U.S. (at which time the firm was doing approximately \$2 billion per year in sales). They stayed on for a few years, then officially retired in 2002. MacKenzie's "retirement" in Dallas, Texas, equates to consulting with two startup firms — one in the energy sphere and the other in the construction industry.

### QUOTABLE QUOTE: A Colorful Memory from My PICK Career

"I was asked to make the 'Really Big Speech' at one of the early association meetings. Although I had prepared a long and detailed speech on what I thought we ought to do, I looked around the room and realized everyone was spending their time talking about 'the PICK product' and doing their damndest to not use the word. I dropped my script and talked about the importance of all of us working together and developing a broader base for our products. I challenged the audience to join me in creating a 'PICK organization.' (It became Spectrum, thanks to Gus giving the group a name and offering to manage it.) This got a standing ovation and I remember my friend Ted Sabarese yelling from the back of the room, 'Great idea! Count me in!' and off we went.

"When we decided to create this Spectrum association for the PICK world to unite behind, I went and told Dick Pick

about it. With all respect to the deceased Mr. Pick (whom I considered a friend — most of the time), he said, 'You can go to #%&@ and I won't have it!' Well, it did happen and Pick's company finally joined in. I still remember the look on his face when he had to admit to me that it had worked. It was quite humorous. He was frequently harassing me for 'screwing up' his plan!"



## 1990 Man of the Year: Jim Capeless

"The primary reason I left the MultiValue market was because I noticed at a Spectrum show that Gus Giobbi had a better 'comb-over' than I. So I knew that it was time to retire." -*Jim Capeless, October 2004*

Jim Capeless was named "Man of the Year" in 1990 at a time when his company, VMark Software, was at the top of the charts, redefining the marketplace through its innovative introduction of the first UNIX and NT-based PICK-like environment, UniVerse. Capeless served as the president and CEO of VMark until 1996, shortly after the company merged with Unidata under the name Ardent Software, which was then purchased by Informix and later, IBM.

Although he retired from the MultiValue industry in 1996, Capeless spent many years doing part-time, pro bono work for an international management company where he coached CEOs from start-up companies, assisting them with their business plans and financing. He has also served as a board member for four companies. Now retired, Capeless spends most of his time in Naples, Fla., but still maintains

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# History of MultiValue Where Are They Now?

Remembering Each 'Person of the Year' from *Spectrum* Magazine

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a home in New England. He admitted to "finally taking up golf," and said, "The only technology research I do these days involves the composition of titanium and graphite utilized in golf clubs."

## QUOTABLE QUOTE: My Most Interesting Experience in the PICK Market

"The most interesting experience [of my career] was at VMark, building and growing a small, private start-up company, losing money to a much larger and publicly traded company, and all of the concomitant growth issues, while at the same time bringing a once proprietary technology and its business applications into the general 'open' marketplace. The most personally satisfying accomplishment was to achieve profit and growth in each of the seven plus years that I was CEO and to have the company named as one of the 'Top 100 Software Companies' by *Software Magazine* in its annual survey the last three years I was there. (A little company by the name of Microsoft was number one.)"



## 1991 Man of the Year: Judd Van Dervort

Regarding the "Man of the Year" Award: "I was very pleased to be named 'Man of the Year,' although I felt at the time that others were more deserving. Dick Pick created an exceptional database; John Keogh, a master marketer, created a very successful distribution channel; Tom Davidson created what has become the most successful dealership, and on and on. So I was flattered, but not fooled."

*-Judd Van Dervort, October 2004*

Judd Van Dervort, *Spectrum*'s third "Man of the Year," apparently thought himself not as deserving as some of his peers (see his quote above). The truth is, however, that Keystone Information Systems was one of the strongest and most innovative software houses and VARs in the MultiValue industry at the time of his nomination for the award. And it still is, 15 years after he was named "Man of the Year." (Van Dervort must have done something right in his career. He was also highlighted in the May/June 2004 issue of *Spectrum* as one of the original Microdata dealers in the first installment of this series, "Where Are They Now?" He was then featured a

second time in the July/August 2004 article, "The 25 Most Influential People in PICK," which was the second installment of the series.)

Van Dervort began his technical career as a junior programmer at RCA in New Jersey in its Missile and Surface Radar Division in 1963. This was before the time of the assembler and long before the age of the compiler, so the systems were coded in octal (a numbering system with only the digits 0 through 7, and when you add 1 and 7 in octal, you get 10). With a sense of humor, Van Dervort remembers: "I sat all day writing code in octal and adding and subtracting in octal. For a few months, I couldn't get my checkbook balanced until I discovered that I was keeping the register in octal. The bank, of course, was using decimal."

Next, he spent over five years at Philco in Pennsylvania, in the systems programming department. A few of the managers at Philco left and formed a professional services company called Keystone Computer Associates (KCA) and asked Judd to join them. KCA became Microdata's sixth dealer in 1974. University Computing Company (UCC) eventually bought KCA, but discontinued this "fledgling" dealership department after a few years.

In 1975, Van Dervort received start-up capital from a KCA customer, and opened the doors to Keystone Information Systems. In 1980 Van Dervort sold his Reality territory back to Microdata and bought out his venture capital partner. Keystone signed up as Prime Computer's first reseller, and then as ADDS' first reseller. Van Dervort was one of six resellers that started VMark Software and became its first reseller as well.

Van Dervort remains the president of Keystone Information Systems today, still committed to developing leading business systems based on MultiValue (Keystone's platform is based on the U2 product line from IBM). Van Dervort's thoughts on the MultiValue market: "One future avenue for MultiValue technology to grow is the possibility that IBM will take it mainstream, either by pushing it as they do DB2 or integrating the MultiValue features into DB2 and creating a simple migration path for MultiValue vendors. I don't believe that it will ever become mainstream unless a big player in the database market makes it happen."

**QUOTABLE QUOTE: My Biggest Accomplishment in the Market**

"The biggest accomplishment we have had in the MultiValue market was last year when I got a letter from the sheriff of Ontario County, N.Y., which uses our public safety software. It told me of a cell phone call that came in to the dispatch center from a man who had just had a serious snowmobile accident somewhere in the woods. He couldn't move and didn't know where he was. We had just installed a feature to locate the position of cellular callers. The dispatcher, using our status-mapping software, was able to see the location of the caller and direct the responding officer, who she could see on her map monitor because his vehicle had an automatic vehicle locator, to the injured caller. The Medivac helicopter was quickly on the scene and the caller survived. The sheriff felt our software saved

his life. I've been involved in a lot of automation projects, but life-saving software was a first for me."



**1992** Man of the Year:  
**Russ Monbleau**

Regarding the "Man of the Year" Award: "To quote Garth and Wayne, 'I am unworthy.' First of all, putting me in a group with the likes of the previous winners actually embarrassed me. These were captains of

the industry and I was a lowly Digital marketing grunt. It was a huge honor."  
**-Russ Monbleau, October 2004**

Russ Monbleau's career in the PICK market may have been short-lived, but it was definitely colorful and creative. When he was named "Man of the Year" in 1992, Monbleau had been with Digital Equipment Corporation for about two years, managing VAR recruitment for one of Digital's reseller organizations. At that time, Digital was trying to develop opportunities by converting competitive software platforms to run on Digital hardware. This eventually brought Monbleau to the doors of VMark and Unidata, as two companies that could accomplish the software conversions and thus provide access to a solid group of industry-focused VARs in the PICK marketplace.

Quite the consummate salesperson, the 1992 "Man of the Year's" claim to fame was basic: shifting Digital into a new market, recruiting over 100 new VARs, and generating over \$200 million in new business. Curiously, Digital didn't respect these accomplishments as much as *Spectrum* did, because at the same time of the *Spectrum* award, Digital was in the act of de-

*Continues on page 30*

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# History of MultiValue Where Are They Now?

## Remembering Each 'Person of the Year' from *Spectrum* Magazine

Continued from page 29

funding its PICK efforts. According to Monbleau, he was engaged in a "one-man quixotic effort to retain the PICK focus."

"When Gus and Monica [Giobbi] called with the ["Man of the Year"] news, I blurted out something really dumb, because they didn't know what was happening inside of Digital and I was in a real high state of stress at that time," Monbleau remembers. "The irony of it was that the timing was so perfect that it actually helped me win the case for further program funding and kept the project alive for another two years."

Monbleau said he has a framed copy of the *Spectrum* magazine cover hanging in his office today and when people ask him about it, he explains his short but enjoyable history of working in the PICK market. "When they ask how Digital rewarded me for all the new business, I respond with a very short poem: 'A Pen, A Plaque, And a Heart Attack.' (There was also a dinner but it didn't rhyme with anything.)"

All joking aside (which is difficult for Monbleau), the heart attack in 1995 was the impetus to leave Digital in 1996 and begin his new career selling life insurance.

"I suffered the heart attack on the third day of my vacation of all things," Monbleau said. "It was 100% stress related, and in recovery I cogitated on my recent past behavior and realized the attack most likely stalled off a nervous breakdown. So, after one more very dissatisfying year with Digital, I voluntarily took the 'Downsize Walk' and got the heck out of that meat-grinder."

Monbleau became an independent insurance broker and began studying various products and carriers and licensing with good companies to develop a comprehensive product portfolio. "So, now I have had five jobs in five different industries, and as

in the past, what I learned from one job has had some viable application to the next one," Monbleau concluded. "As it turns out, my insurance specialty now is helping small businesses define their benefits packages and showing them how to get the best value for the least amount of expense. My background gives me copious amounts of empathy for their situation and I believe has prepared me to do a better job for them."

### QUOTABLE QUOTE: A Memorable Anecdote from My PICK Career

"Digital would not provide free loaner systems for software development. This created a real problem with VMark who practically had to add a loading dock for all the stuff they were given gratis by every other competitor in the universe. (Catch clever use of words here.) So, I was called into the office by my boss's boss and his boss and ordered to convince VMark that they had the wrong business model and should be paying for all that stuff. It was a position of such incredulous stupidity and arrogance that I almost burst out laughing. Which just might explain one reason why I never made VP."



### 1993 Man of the Year: Rich Lauer

Regarding "Man of the Year" Award: "It was a great honor. I've spent the majority of my career in PICK/MultiValue and had the privilege of working with a number of wonderful people, [all with] a strong sense of commitment and extreme loyalty to the technology and the people. To be recognized by *Spectrum* as a leader in our industry was both humbling and enormously gratifying." -*Rich Lauer, October 2004*

Lauer entered the PICK industry in 1973 as the first employee at Southern California Data (John Keogh's company and one of the first Microdata Reality dealerships — see the May/June issue of *Spectrum* magazine). After serving as SCD's executive vice president and general manager, Lauer left in 1980 to start his own VAR business, Government Systems Group. GSG sold an application designed for a specialized group of government agencies, which ran on Prime INFORMATION. When a change in federal legislation eliminated this niche market, Lauer joined Pick Systems in 1983 as vice president of Sales and Marketing.

In late 1986 Lauer and his co-worker, Tim Holland, left Pick Systems to join Sequoia Systems, a manufacturer of high-end, fault-tolerant computers. While there, Lauer served again as vice president of Sales and Marketing, and eventually became responsible for all of the company's worldwide sales. It was towards the end of his seven-year tenure with Sequoia that *Spectrum* recognized Lauer as the industry's "Man of the Year" — acknowledging his part in helping Sequoia grow from zero to \$75 million in sales in a few short years, including a successful IPO.

"Thanks to the amazing Sequoia hardware architecture, and the equally amazing Tim Holland, we were able to deploy viable

configurations of several thousand simultaneous users in a fault tolerant, UNIX environment," Lauer said. (Prior to Sequoia, native PICK had never been ported to UNIX, and the largest PICK configurations were just several hundred simultaneous users.)

Lauer left Sequoia and the PICK market altogether in 1993 (at which time he co-founded a firm which developed a Windows-based decision support tool), but returned to PICK with a bang in 1999. He and two business partners, Gil Figueroa and Tim Holland, backed by an adventurous venture capital group, bought Pick Systems from Dick Pick's estate. Within a year, Pick Systems merged with a non-MultiValue, smaller (but public) software development tools company, Omnis Technology. The newly combined public venture was renamed Raining Data Corporation (as it remains today). Lauer served as the president of Raining Data until 2001.

Lauer has not returned to the MultiValue market since he left Raining Data. He spent several years as CEO of dBASE Inc., the firm that acquired rights to the dBASE database technology from Borland. Most recently, he has become involved with a

group of offshore (Indian) engineering companies with a strong focus on .NET and the latest BPM (Business Process Management) methodology.

**QUOTABLE QUOTE: The Most Interesting Job in My PICK Career**

"The most interesting job I had was with Raining Data—without question. It started with a bizarre process where Dick Pick's widow, along with the caretaker management and the entrenched lawyers, wanted to ignore our 'all cash, higher price' offer. It seems they wanted to sell the company to another, lower priced bidder. Fortunately, the probate judge was as confused by this as we were and, following a short trial, directed the estate to sell to us. I had always wanted to run Pick Systems. It turned out to be a considerably tougher job than I thought. But I'm pleased to say we accomplished some significant things (acquisitions, mergers, public listing, etc.). I really enjoyed this adventure and would do it all again in a heartbeat."

Before Dick Pick passed away in 1994, Lauer worked for him directly at Pick Systems as vice president of Sales and Marketing. He recalls: "Dick Pick, being the eccentric, iconoclastic, mad scientist-engineer that he was, had a tendency to consider anybody working for him that wasn't a programmer to be inferior. He liked to use the term 'brain dead.' As his sales and marketing guy, I was, of course, consequently brain dead by definition. Despite this flaw, I managed to work for Dick for almost three years — which at the time, was a record for that position. When I joined the company, the guy who preceded me in the VP of Sales and Marketing position had lasted only six weeks! As a result, once I reached the critical six-week milestone, the wild-and-crazy Mr. Pick orchestrated a ceremony where he presented me with my 'six-week watch.' Not too fancy, it was a very stylish Mickey Mouse watch. But I was grateful for the sentiment. And to this day, I proudly display this treasure on a plaque in my office."

*Continues on page 46*

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## WADE and WAVE Expand Scope to Include D3 and jBASE

OHM Systems, headquartered in Cincinnati, Ohio, announced at the Spectrum Shows in Sydney and Melbourne, Australia, the release of the Web-centric Application Development Environment (WADE) and Web-centric Virtual Environment, the report writer, for jBASE and D3.

The popular OHM products have been available to new developers and end users on IBM's U2 platforms since 2002. "It has taken some work with the engineering departments of the various databases to move the WADE and WAVE environments to the new platforms," said Catherine Anbil, vice president of OHM. "The product release will be in beta the fourth quarter of 2004 with release to new installations in 2005."

All of the features, functionality and flexibility of the existing U2 database versions of WADE and WAVE will be available in the jBASE and D3 environments. WADE is the only known tool that has mastered the ability to give the user field level validation without page submission in the Intranet processes. WADE is rules and code based, allowing for quick development and deployment of screens, forms, reports and more.

OHM developers are able to carefully protect and maintain all the powerful and exciting features of MultiValue environments while updating to a completely browser-based deployment of the product.

To make appointments for in-depth reviews of the products, email OHM at [sales@ohmworld.com](mailto:sales@ohmworld.com) or visit the Web site at [www.ohmworld.com](http://www.ohmworld.com).

## ONware Certified on Windows Server, XP, and SQL Server Technology

Microsoft Corp. has reviewed and certified ONware, the database-independent MultiValue environment, on SQL Server. MultiValue developers are using ONware to move their applications to

SQL Server. Once on SQL Server, they can continue developing and maintaining applications with MultiValue tools, use relational tools, or combine the two. Sites, such as CitiGroup, that have gone live rehosting their MultiValue applications with ONware report improved performance as well as other benefits, according to ONgroup, developer of ONware.

ONgroup, with its software ONware, has passed Microsoft's rigorous testing procedures and is certified as a Microsoft Partner. According to Microsoft, the Microsoft Certified Partner brand signifies that ONware and ONgroup are reliable, experienced, leading-edge and endorsed by Microsoft.

"Partner status improves our access to Microsoft resources so that we can keep ONware at peak performance with SQL Server," said Denise Buttrey of ONgroup.

Tim Spells, president of ONgroup, added: "VARs with MultiValue application packages are able to compete successfully in a vast marketplace now that their applications are SQL-enabled. Providing a MultiValue-enabled relational database breathes new life into MultiValue applications and creates opportunities in the general IS marketplace."

ONgroup specializes in helping organizations with MultiValue technology, such as U2 and D3, migrate to or integrate with standard relational technology, such as Microsoft SQL Server, Oracle and DB2.

ONgroup, headquartered in Atlanta, has offices in Los Angeles, New Orleans, London and Sydney.

## What's New in mvQuery 5

mvQuery Version 5 introduces a range of new features designed to complete the query processing model and to invigorate the reporting and exporting facilities of the product.

The primary focus of this release is on extending and completing support for more complex multivalued queries and on support for managing higher data volumes.

### Query Processing

The Query Processor has been given a complete overhaul to support a number of key facilities and to improve overall query performance. Administrators can now select a number of different "routes" for query processing, to provide the best performance dependent on the capabilities of their particular servers.

## VP Supply Installs 1image's Document Imaging Solution

1image has announced its newest installation at VP Supply, a national supplier of plumbing and HVAC parts in Rochester, New York. 1image performed a server-level integration with VP's line of business software, UniVerse-based SHIMS, so that employees can access images directly from the SHIMS application.

This has helped reduce the time it takes to answer customer service queries and improve the efficiency of VP's accounts receivable processes. 1image has also enabled VP's U2-based application software to automatically print supporting documentation for invoices, along with the customer invoice.

In the future, VP plans to grow its 1image system to manage material safety data sheets, streamline the payables processes, and allow customers and traveling employees access to documents via the Internet, the company said.

By accessing images through the SHIMS application, VP Supply will ultimately reduce its day sales outstanding and improve operational efficiency. To learn more about 1image's document imaging solutions, visit [www.1image.com](http://www.1image.com), or call 1-800-844-1468.



**Multivalue Associations** - mvQuery versions 4 and below provided limited support for multivalued associations. Most of this support was limited to managing a single multivalued defined within the database. This restricted the ability to create complex form reports and to organize multivalues effectively for export purposes from general queries, although of course, individual custom queries could be created that allowed exporting using only a single association. mvQuery 5 includes full support for multiple associations throughout the product.

**Extended MultiValue Selection Processing** - The inclusion of full association control completes the query facilities, with support for value level filtering (WHEN clause processing) that can operate across multiple columns and associations, freely mixed with non-filtered (WITH) selections.

The mvQuery query processor has been extended to provide facilities not available in the native database enquiries, including the ability to specify WHEN filtering across more than one association, and the ability to post-select exploded multivalues to provide more consistent results than standard Access reporting. Where specific selection operators are not natively supported on some databases, many of these are now supported through emulation.

**SubValues** - mvQuery version 5 introduces direct support for sub-value data for the first time. Subvalues can be processed through exploded queries using a choice of formats, including multivalue raising, delimiting or text formatting.

## RESULTS PROCESSING

**Large Result Sets** - A significant enhancement to Version 5 is support for larger result sets, through the introduction of result caching on the client. This can be configured on a per-client basis for larger data selections, allowing more resource-limited clients to handle larger data volumes.

**Formulae** - Formulae now include a JOIN() function to allow extraction and management of individual multivalues.

**Formatting** - A new formatting library has been provided to present a consistent series of named formats across results, formulae and report objects. Previously two different report formats were used for reporting and for results, which caused confusion.

## REPORTING

The reporting facilities also benefit from the new association handling. More complex result sets provide the groundwork for an improved reporting model that includes the ability to freely intermix multiple value and record level sections, to specify multivalue section controllers and improve support for multiple page forms.

**New Section Types** - The existing record header, record footer and value sections have been replaced with a single record and a single value section type. These can be freely mixed to allow multiple associations to be combined more effectively in the same form without the need to use multiline text fields in record sections.

Value sections can be linked such that they iterate together (important for conditional sections) or can iterate separately.

A new Multivalue Controller has been added to each section that determines the iteration depth and row summary operations, providing more accurate summarizing where the fields displayed may be missing trailing multivalues.

**Summary Actions** - The summary actions have been extended, and now support: running totals, counts, minimums, maximums and averages, and for the first time, there is support for percentages.

**Report Formulae** - A new Formula report object now supports a subset of the functionality available to a formula column. In addition, these provide summarizing operations using the report banding, allowing the creation

of formulae that make use of summarized values (e.g., AVG(field) - AVG(field)) similar to CALC expressions in database queries.

Report formulae can also be included in embedded fields.

**Charting** - The report also supports a new chart object, allowing charts to be directly embedded into the reports for the first time.

This supports a range of chart styles and summarizing operations across columns and across rows.

**Barcodes** - The barcode object has been rewritten to provide improved support for barcode types and for the inclusion or omission of check digits.

**Report Designer** - The report designer gets a facelift, with new buttons for setting all style and color information, font faces, and access to properties. The property pages have been restyled and the style information is now carried through from the Wizards to be automatically applied to new report objects.

**Report Production** - A new, leaner preview has been added to provide faster rendering with lower overheads. Production of Adobe PDF reports now operates correctly on Windows 98, and the documents support improved levels of compression, making them easier to email or distribute.

Printer Selection has been improved and specification of an invalid printer name no longer routes to the default printer for security.

## EXPORTS

The Export Library has been extended with a new range of exports to extend the library capabilities, improve export performance for larger result sets, and to support the new association model.

**Export to Microsoft Excel** - Two new exports have been added to Microsoft Excel. The Export to Microsoft Excel Macro allows exporting of selected columns to a Microsoft

Excel worksheet, while specifying a macro to run before and after export that may be resident in the same or a separate workbook. This allows sites to create libraries of macros that can be used for reformatting and post processing export data.

The Export to Microsoft Excel Pivot takes a wizard approach to building a Pivot Table from a result set.

**Export to Database** - A new Export to database replaces the existing exports to Microsoft Access and to OleDb. This provides improved response times, and has the ability to update multiple tables concurrently with full control over the normalization of data. The existing database exports are still supported for backward compatibility, and see some performance improvements, including support for currency fields in Access 2003.

**Export to HTML Drill Down** - mvQuery does not offer a native drill down facility in the client; this would make the client too complex and bulky for many sites. In place of a client; drill down, mvQuery 5 includes an Export to HTML Drill Down that converts a result set into a series of HTML pages with drill down capability that can be easily deployed to allow departmental viewing.

**Export to File** - A new Export to Large File provides better performance when exporting large result sets.

**Export to XML** - The Export to XML has been enhanced to support the new association model and now escapes all meta-characters.

**Export Templates** - Export control is made much easier through the addition of Export Templates that can store the details of a given export, available for user selection, scripting and the Print Server. This removes the need to create arduous lists of export parameter name pairs, particularly for the database exports.

There are numerous other enhancements in mvQuery Version 5 with

*Continues on page 35*

## jBASE Introduces the New OSMOSiS 4GL and mv.NET

Hot News for System Builder and SB+ users on D3, mvBASE and U2

jBASE International heralds the arrival of the latest addition to its rapidly growing family of world-class development tools: OSMOSiS.

The OSMOSiS product set offers advanced development tools for the MultiValue user and allows MultiValue applications to be integrated into the current mainstream of the computing world, away from proprietary environments and into Windows and the Internet.

The OSMOSiS approach allows developers who have invested their training in an existing 4GL to retain much of that investment. An existing application is moved completely to OSMOSiS, with little redevelopment required. Retraining of staff is limited to the use of new OSMOSiS functionality not available in the user's current environment. The developer does not lose anything, but gains the flexibility of Visual Basic forms.

In addition to the GUI tools, there is a complete set of character-based tools enabling both GUI and character applications on one system. Character-based routines can also be used in the GUI environment.

"With OSMOSiS and a MultiValue environment, the longevity of an existing product is enhanced, and new avenues of business open up," states Pete Loveless, CEO of jBASE International. "It is possible to take an existing product into the mainstream of Windows applications, whilst retaining all its character-based options and functions."

One part of the OSMOSiS product suite is the OSMOSiS-SB Converter, which creates a migration path from other 4GL products. Existing applications, created with proprietary 4GL systems such as System Builder, SB+ or Magician, can be imported and converted into OSMOSiS formats and conventions, in a simple process, with minimal post-conversion

work. OSMOSiS-SB Converter is a full and comprehensive conversion suite taking all of the original 4GL parameters and creating both character and Windows-based OSMOSiS applications.

The design principle of the OSMOSiS-SB Converter is to create a toolset that is capable of taking other MultiValue RAD applications and translating them into the OSMOSiS product's parameters and conventions. System Builder, SB+ and Magician applications are the first target systems. The aim is to be as closely compatible as possible, and to allow existing developers of these products to continue using a familiar syntax, which will then be converted to OSMOSiS format.

"None of the currently available rapid application development tools allow creation of Visual Basic forms, with total Windows application integration, and none provide the openness of an OSMOSiS and MultiValue system. OSMOSiS removes the isolated environment, which has limited MultiValue database developers for a long time," continues Loveless. "With OSMOSiS, they now have the tools to achieve this transformation quickly and effectively."

jBASE International is now promoting, selling and supporting the OSMOSiS product set. For pricing or additional information, please email [sales@jBASE.com](mailto:sales@jBASE.com) or visit the new OSMOSiS section on the jBASE Web site: [www.jbase.com/products/osmosis.html](http://www.jbase.com/products/osmosis.html).

### Introducing mv.NET

jBASE International also announced a major new strategic technology alliance allowing the next generation of Microsoft .NET developer tools to be brought to the MultiValue community. This technology comes in the form of a new .NET Data Provider and developer toolset product called mv.NET. mv.NET incorporates advanced technology — based on many years of real world knowledge and experience — that allows optimized, sophisticated access to all MV-resident data and programs. It goes beyond the proprietary data access solutions supplied by MultiValue system vendors to provide a richer, more advanced, more open solution for the MultiValue developer.

mv.NET is the solution of choice for developers wishing to access any flavor of MultiValue database from within Microsoft's .NET environment, particularly Visual Studio .NET.

mv.NET is not simply a product designed to allow access to MultiValue systems from within .NET; it is designed to allow powerful and rapid application development that incorporates today's advanced technological and architectural concepts, particularly:

- Automated application tiering
- Remote site Internet connected client workstations
- Optimized fetch-on-demand and background populated database access
- Database platform independence

mv.NET provides essential features to allow developers to access MultiValue systems from within Microsoft's .NET environment (including Visual Studio .NET - VS.NET). These features include:

- Connection to and support for all MultiValue system flavors
- .NET compliant (data-bindable) data objects
- Multi-dimensional data structure aware data objects
- VS.NET resident add-in supporting MV-based development activities

Both aspects of mv.NET -- the MultiValue system access and the .NET integration -- stand as world-class technologies in their own right, but combined together, they provide a potent solution to the MultiValue developer, allowing him/her to progress their software application interfaces through this decade and into the next.

More information can be found at <http://www.jbase.com/products/mvnet.html>.

Continued from page 33

improvements to mvQuery Print Server and the administration routine, including revised documentation, making clear the more complex capabilities of the product.

## Zumasys Signs Reseller Agreement With LightPointe for Wireless Optical Solutions

Zumasys Inc. announced that it has signed a reseller relationship with LightPointe, the leader in optical wireless solutions. Based in San Diego, LightPointe designs and manufactures high-speed optical wireless products for use where copper and RF solutions are unavailable or limited. Optical wireless solutions are based on free-space optics (FSO) technology, which transmits voice, video and data on beams of light.

LightPointe's products link campus/enterprise networks to fiber backbones or bridge two or more buildings in classic LAN-to-LAN connections historically addressed by T1/E1 or 802.11 bridges. With bandwidths ranging from single T1/E1 up to 2.5 Gbps at distances up to 4 km, LightPointe products transmit voice, data, and video over any protocol without the need for fiber-optic cable or RF spectrum licenses.

"Optical wireless provides more bandwidth for less money than traditional wireless bridges and we are excited to add the LightPointe products to our portfolio of wireless solutions," said Paul Giobbi, president of Zumasys. "With the new LightPointe FlightLite 100 we are able to offer our customers 100Mb full-duplex connections between buildings for as little as \$7,500, which is fantastic."

According to Bob Preston, senior vice president and chief marketing officer at

LightPointe, the FlightLite 100 is ideal for a variety of applications, including building-to-building connectivity, especially where IT managers are seeking to replace 802.11b products and looking toward 802.11a/g as the next logical step. "With FlightLite 100, remote buildings can be connected to the campus LAN for about the same price of competing 802.11 solutions but with about four times the bandwidth," he said. "Zumasys has a strong history providing Wireless LAN/WAN solutions to the SMB market and we are excited to partner with them."

## OHM Teams With Winnix

OHM will be aggressively working with Winnix Software in France. Winnix is a large supplier of jBASE products and was very impressed with OHM's Web-centric Application Development Environment (WADE) and report writer product WAVE at the London Spectrum Show. OHM will be participating in Winnix's December conference where OHM will showcase its products. Winnix and OHM will make the OHM products available in a French version as

the companies continue to build the relationship.

Winnix, with its database experience and technology resources, will embrace the WADE product for its current clientele as well as future prospects. OHM and Winnix will also be working on development products to meet the French market requirements.

For information about the conference in France or about OHM's products and offerings throughout the international market, contact OHM's headquarters in the U.S. at (513) 771-0008 or visit its Web site at [www.ohmworld.com](http://www.ohmworld.com).




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# Getting the Code to the People

## Deployment Tools in OpenInsight

**Y**ou're finally finished with the software. You've debugged it, checked the spelling, made sure it worked in both user and development mode. Now you need to get it out to your customers. How did you keep track of your changes? A list on a yellow pad? Are you sure you remembered everything? And how will your customers install these changes? Do you have to walk them through the process on the phone, or is it much easier than that?

OpenInsight, Revelation Software's MultiValue database product, has quite an array of deployment tools. This article will cover the use of OpenInsight's Runtime Deployment Kit (RDK) tools, as well as its collaborative development capabilities, and some ideas on homemade software tracking tools.

### The Runtime Deployment Kit

Although one may infer from the name of this module that it is used only for deploying to runtime systems, the RDK can be used to update development systems at client sites, as well as creating runtime versions of an application. OpenInsight's licensing allows developers to create as many single-user runtime versions of applications as they like. And by runtime, Revelation means no deployment of development tools, such as form designers or compilers.

### Different Kinds of Updates

The RDK supports three different types of deployment models: Full System, Application, and Upgrade/Module.

A Full System deployment is a full system image that includes all defined application components, as well as all necessary supporting system code and modules. This full system image provides an independent environment from which your application can be run and in which you have limited development capabilities. This may be referred to as a standalone, turnkey, run-

BY MIKE RUANE, REVELATION SOFTWARE

time application, runtime deployment, or runtime environment. It includes the OS-level components needed to run a copy of OpenInsight, as well as all internal database components and programs needed by OpenInsight to run.

An Application deployment is a full application image that includes all components defined in the application, but no system components. This type of deployment does not provide an independent environment from which your application can be run. An application deployment (which is similar to a check-out, a topic covered in an earlier article) needs to be installed into an OpenInsight runtime application or a full OpenInsight development environment.

An Upgrade/Module deployment is a type of application deployment except that it provides partial application images that contain only components that the developer selects from a given application. An Upgrade/Module deployment must also be installed into an OpenInsight runtime application or a full development environ-

ment in which the application was previously defined.

In practice, developers usually use either a Full System deployment, or an Upgrade Module deployment. If a developer wanted to get an application out to a site that already had a copy of OpenInsight, they'd probably use a tool called Appbackup. An Appbackup, as the name suggests, is used to either back up or restore an application into an already installed copy of OpenInsight. The screen shot in Figure 1 shows the options available to the developer; the fields are self-explanatory.

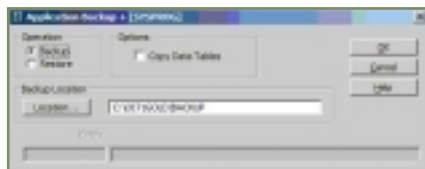


FIGURE 1: The Appbackup Window

When a developer opens up OpenInsight's RDK, they are able to make one of two new pieces needed for a deployment,

either a Repository View or a Deployment Definition, as seen in Figure 2.

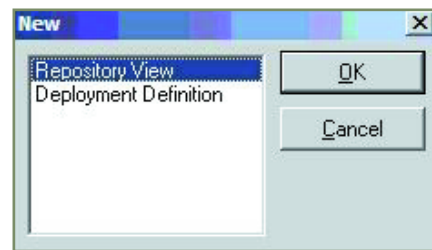


FIGURE 2: The two pieces needed to create a deployment.

### STEP 1: Creating a Repository View

The first step in creating an RDK deployment is to decide what pieces should be rolled out to a client. Now, if you're a developer and creating a brand new install, you'll probably just pick up all the pieces in the system and go with that. However, suppose you're working on a series of changes for a client for a specific accounting module. Changes could be made to dictionaries, programs, screens, reports, and other assorted parts and pieces. You

*continues on page 38*

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## DEPLOYMENT TOOLS

Continued from page 37

may even end up deleting some components that are no longer needed. How are you going to track what you've changed? In OpenInsight, this is not a chore at all. As has been mentioned in previous articles, OpenInsight is a repository-based development system. As different components are added and changed, the repository tracks the time and date that the changes were made and who changed them.

As seen in Figure 3, a developer has a number of choices on how to pick what entities (OpenInsight's term for any component in an application—window, program, popup, report, etc.) should appear in a deployment. The developer can pick and choose from all entities in the application, all entities changed since a certain date and time, entities found in a select list, entities using a different entity, or entities changed by a certain developer within a date range. For the purposes of brevity (and a lack of column space<g>), we won't go into every combination and permutation of the above choices, but will choose the most common option of entities changed since a certain date and time.

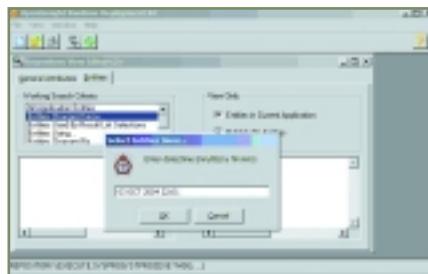


FIGURE 3: Choosing all entities changed since a certain date and time.

Once the developer has clicked on the OK button, the system will select all the entities that fit the select criteria and display them in the working list box on the left, and they can be moved into the deploy list box, which is the list box on the right. The result of this action can be seen in figure 4.

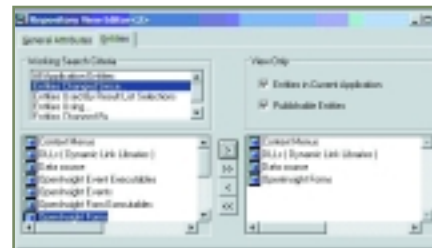


FIGURE 4: Entities selected and moved to the deploy list box.

All that is left is for the developer to save the Repository View.

## STEP 2: Creating a Deployment Definition

Once the Repository View has been created, the developer then needs to create a Deployment Definition. A Deployment Definition contains information such as the directory that the update should be written to, what type of deployment should be made, and additional tables or dictionary items that should be included, whether they should be deployed with or without data, a version number, and other sundry information.

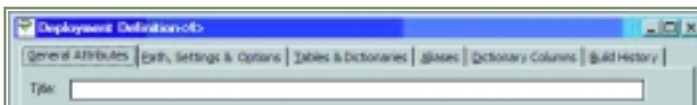


FIGURE 5: The six screens for a Deployment Definition.

The deployment definition is created by choosing New — Deployment Definition from the RDK. The user is then presented with a screen with six different tabs, as seen in Figure 5 above.

The General Attributes tab is where the developer will enter a title and description of the Deployment Definition.

The Path, Settings & Options tab is where the developer sets the directory that the deployment should be written to, the type of deployment definition, version and date information, and other sundry information. In Figure 6, the developer has chosen a type of Upgrade/Module, and has clicked on the list of Repository Views.

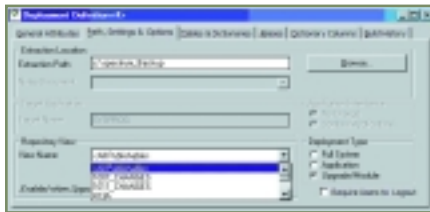


FIGURE 6: The Path, Settings and Options tab of the Deployment Definition.

The Tables and Dictionaries tab is used to indicate which tables and dictionaries should be rolled out in the deployment and whether they should be sent out with data or empty.

The Aliases tab allows the developer to send out a table in a deployment, but as an alias or Q-Pointer.

The Dictionary Columns tab allows the developer to choose specific dictionary fields to be deployed.

Finally, the Build History tab shows a history of the building of the deployment.

Once the Deployment Definition has been saved, the developer can then initiate the deployment by clicking on the Extract button, or by choosing the menu option File-Extract Application. As the extraction is taking place, a screen appears indicating progress in the extraction. Figure 7 shows the screen.

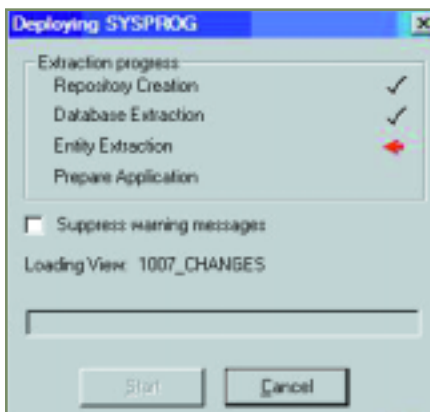


FIGURE 7: The Extraction Progress screen.

Once the extraction has completed, the developer can then either further massage the deployment, or send it to the client as is.

## Massaging the Deployment Definition

Suppose after doing all of the above, you still have a few different tweaks you want to make to the system. For example, say you wanted to delete a report or dictionary field from the target system, but the RDK tool does not have a facility for that. The developer would simply attach (set a Q-Pointer to, for you old-time MV types<g>) the directory that the deployment definition was extracted to. In a table named SYSUPGRADE, there is a record named %PROCESS%, as seen in Figure 8. By looking at this record we see that it contains different sections, each enclosed in square brackets. For example, the section labeled [DELETE ROWS] is where a developer would put a list of filename/record IDs that they would like deleted from an already existing application at a client site.

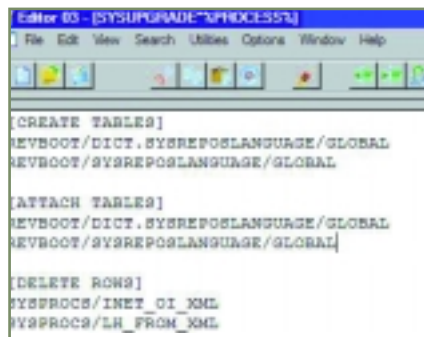


FIGURE 8: The %PROCESS% record in the SYSUPGRADE file.

## A Note about Licensing

As might be expected when deploying applications, there are some licensing issues that need to be observed. Since this tool is called the Runtime Deployment Kit, when a developer is making a full application deployment they cannot roll out the development version of OpenInsight; they must roll out a runtime version of the engine. Luckily, this is supplied with every copy of OpenInsight. Also, they cannot roll out other development tools, such as the Form Designer. And, if an application is using some third party OCX or OLE controls, there may be additional runtime licensing from the control's owner to keep in mind.

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## Installing the Deployed Code

Once the update has been created, how do you get it installed at the client's site? This is perhaps the easiest answer of them all. OpenInsight has built into it a routine named RDKINSTALL. As the name implies, it is used for installing RDK updates. It takes one parameter, the directory where the Deployment Definition is waiting to be installed from. So, all a user would have to do is go to a command line and type in Run RDKInstall 'C:\my data' and the install would begin. However, most developers simply create a menu choice in their application that runs an RDKInstall process; this routine also prompts for the Directory location.

One note — the RDK Extract process does not create a Setup.EXE or MSI image for installation; third party tools are required for that, from companies such as InstallShield. Further information on integrating an RDK Extract with these tools is available from Revelation Software.

## Conclusion

As you can see from the descriptions of the procedures above, it is easy to make, deploy, and install changes to OpenInsight systems. In point of fact, Revelation uses these very same procedures to create upgrades for OpenInsight, so you know it has to work.

OpenInsight's RDK is just another example of how Revelation Software tries to make the mundane tasks in application development easy, letting developers do the more important work of fulfilling their customers' needs. is

# The Multiple Values of Upgrading

## *Maximizing performance and minimizing costs by upgrading office computers*

**L**ike anyone else, users of MultiValue software solutions are interested in saving money. And in an industry driven by high-performance computing, the need for up-to-date equipment may even be greater than in some other fields. However, you've probably noticed that computer systems don't stay current for long, which makes saving money difficult at times.

If you're like many others trying to make their way in business, you probably outfitted your office with top-of-the-line computers only a couple of years ago, and now you are bombarded with reports, ads and competitors telling you what was recently the "fastest, biggest and best" system you could buy is now obsolete.

Most don't have the deep pockets needed to constantly purchase the latest and greatest computer equipment. On a limited budget it can be hard to justify buying new office computers even when it becomes apparent that the

old ones don't hold a candle to today's technology. This presents a dilemma. Sure the older systems still work, but deep down you know that they just aren't doing what they need to be doing. This makes staying competitive an even greater challenge than usual.

Fortunately, more options exist than relegating the older systems as plus-size paperweights and sacrificing mounds of hard-earned cash to the technology gods in order to put brand new machines on employees' desks. In fact, the best option to improve your office computers may be to take the upgrade path.

Upgrading can be as simple as installing additional memory or making much smaller investments in external storage devices and faster processors. Many businesses and individuals would rather prolong the lives of their computers than get rid of them, and upgrading piece by piece can also eliminate the learning curve needed

to adjust to a new machine. The difficulty of seamlessly migrating crucial data and programs to a new system is also eliminated, or at least postponed substantially, by upgrading.

If upgrading is the way you need to go, here are some of the quickest, most effective and least expensive items that can bring your older computers back up to speed and keep your business at the top of the game.

### Hard Drives

One of the most important features of any computer is its ability to store large amounts of data. Many computer systems today come standard with 20 to 40 Gigabytes (Gb) of storage, but that was not the case even one or two years ago. What was once enough storage to support the bulkiest of files may not even satisfy the minimum system requirements of some new software.

The market has responded in order to accommodate these hefty new programs, however. External hard drives, such as FireWire and FireWire/USB (Universal Serial Bus) combo solutions, offer anywhere from an extra 20Gb to the neighborhood of 400Gb of storage capacity and more.

Such external drives allow for quick transfer rates between systems and other drives. Most come with accessories and are easy

BY LAWRENCE R. O'CONNOR  
President, Other World Computing



to install, making the upgrade process quick and painless. And what is more, the relatively new FireWire 800 standard is a speedy communications protocol that isn't going to disappear anytime soon, so when you do become ready to invest in new computers for the office you will always have the extra digital storage space on hand should you need it.

## CD-ROM/R/RW and DVD-ROM/R/RW Drives

If you regularly use your computers' original CD drives to install/run software, listen to music and so on, you've probably noticed that quad- or 16X-speed isn't as fast as it used to be. Upgrading to a faster CD-ROM drive may be just what you're looking for to give your system a valuable boost in performance.

In order to "write" a new CD or DVD on your desktop, you'll find that CD-R/RW and DVD-R/RW drives present another set of viable options. These drives are becoming faster and less expensive, and their "burning" capability provides an ideal storage solution for large amounts of data. Many industry experts agree the future is in writeable drives.

## Processor Upgrades and Accelerators

Perhaps you're simply looking for a little more "zoom." Processor upgrades and accelerators allow you to increase the overall performance of a computer by allowing it to process information faster. Accelerators do this by shifting operational functionality and providing additional cache memory, thereby freeing up the computer's main processor so it can do its real job, which is running software applications. And with recently released processor upgrades available at great values that enable older computers to perform at faster clock speeds, anyone planning to replace office computers simply because "new ones are faster" should seriously reconsider.

## Memory

While everything that has already been mentioned can help increase the usability of your current computers, one of the most tried and true ways to improve performance

is by simply installing more random access memory, otherwise known as RAM.

If your company is running applications that require large portions of system resources, upgrading the amount and/or type of memory can speed up those applications and allow you to run more programs with less strain on your hardware. And with memory prices near bargain-basement levels, upgrading a computer's RAM is one of the most affordable options to prolong its life.

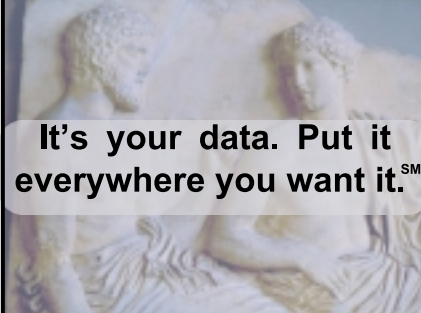
As a user of MultiValue software, you already understand the critical need to maximize all aspects of your business to achieve continued success. The same is true of your computer equipment. However, even with computer prices dropping, the more you can upgrade your existing machines to keep them doing what you need, the more money you are going to save until you are once again ready to grab the latest and greatest computer equipment. In the long run, upgrading one piece at a time can allow you to further extend the effective lives of your computers and make a significant contribution to your bottom line. is

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*LAWRENCE R. O'CONNOR is a serial entrepreneur and computer upgrade expert who got his start in business at age 14 when he founded Other World Computing ([www.owcomputing.com](http://www.owcomputing.com)), which provides quality hardware products and support to the Macintosh universe, in 1988. Other World Computing (OWC) operates the popular [Macsales.com](http://Macsales.com) Web site, which features one of the largest online catalogs of enhancement products, including OWC's own Mercury acceleration and FireWire product lines. OWC also owns and operates [FasterMac.net](http://FasterMac.net), a national Internet Service Provider designed specifically for Macintosh users, as well as [OWC.Net](http://OWC.Net), an ISP that provides Internet access, design and hosting solutions in the greater Chicago area. Lawrence can be reached via email at [larry@macsales.com](mailto:larry@macsales.com).*

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## AN INTRODUCTION TO DYNAMICALLY HASHED FILES

*Continued from page 13*

*The group to split may not really need to split.*

Since the group to split is the one referenced by the Split Pointer it might not be the one that really needs to split. Say, for instance, that a file was a current modulo of 129 — the Split Pointer would reference group 2 and the current splitting cycle would take the file up to a modulo of 256 before the Split Pointer resets to group 1. Suppose, for some bizarre reason, all of the data records added to the file were to hash to group 1 and that groups 2 through 129 were fairly full but had no overflow. If the load of the file exceeds the Split Load it will cause splitting to occur in group 2, then group 3, group 4, and so on. But since those groups have no overflow, the splitting doesn't reduce overflow — it simply makes the file larger. Meanwhile, since the data added hashes to group 1, that group will add sufficient overflow to contain the data which might be extreme. It will take 128 splits before the Split Pointer resets and group 1 can be split. Then it may split once — for a second split to occur in group 1 will require 256 more splits.

So, dynamic files can be severely affected by bad record distribution. There is an assumption that the data will be evenly enough distributed that over time all groups will split and the amount of overflow will be moderate.

*When a split occurs, the data may not hash evenly between the original group and the new group.*

It is quite possible that when a group splits one of these scenarios will occur: (1) None of the records moves to the new group; (2) All of the records move to the new group; (3) A disproportionate number of records either moves to the new group or stays in the original group; or (4) The records are of different sizes and only the smaller records either move or stay. Any of these situations can lead to the disappointing result that the split doesn't successfully reduce overflow.

*The data may not hash evenly among the groups of the file.*

As is the case with static files, bad hashing can cause overflow and create a performance problem. Dynamic files are in no way immune from the effects of poor hashing. Dynamic files have only two file types ("Sequential/Numeric" and "General" on UniVerse and "0" and "1" on UniData). It

is quite possible to design files that hash poorly using both of the file types. This can be further aggravated by great variances in record sizes. And, as we will see when we talk about specific UniVerse and UniData dynamic files, it isn't always straightforward to pick the best of the two file types.

*There is a bit more overhead and complexity with dynamic files.*

To access dynamic files, the system must open a directory and two subfiles. In addition, there is the current load, the Split Load, the Merge Load, the base modulo and the Split Pointer to keep track of (as well as other things about the file). In addition, splitting and merging are somewhat expensive operations. This additional overhead costs something — in general, a well-tuned static file may be faster than a dynamic file. Of course, a badly tuned static file will usually be much slower than a dynamic file!

If a system halt or other problem occurs while files are being written to, the files involved can be corrupted. Because dynamic files are more complex than static files it may be a bigger job to fix them when damage occurs.

## CONCLUSION

Dynamic files are an implementation of a very clever, sophisticated and elegant design theory. They offer a step toward reducing the maintenance overhead of static files. However, they are not magic and don't offer the ultimate solution — a database file which needs no maintenance. is

Twenty years ago Peggy Long and Jeff Fitzgerald were running a critical benchmark on a top-of-the-line Prime INFORMATION system. The benchmark aborted. After several hours of detective work they identified a damaged file. That started a discussion concerning performance, broken files and how to check the internal structure of files after a system crash.

After several weeks of work using Peggy's FORTRAN skills and Jeff's INFO BASIC knowledge they were confident that they understood the file internals. This led to a utility that would quickly scan a file, report errors and recommend the optimum MODULE and TYPE parameters needed to RESIZE the file. A year later they began marketing FAST, which evolved from this utility.

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# QuickBooks Limitations

*I have received a lot of interest from my last article on QuickBooks and decided that I should answer a few questions that keep cropping up.*

## Practical Limitations

The typical QuickBooks user is a small business with 20 or fewer employees and annual revenue of less than \$2 million (per the Intuit Web site). The ideal use of QuickBooks is to keep at least two to three years of detail before compressing. This allows you to run reports and do comparisons between the years. Two to three years of detail can equate to a 30 to 100Mb file.

When you compress information, make sure you read “Condensing data to reduce file size” in your manual or help. This will explain how condensing data affects the data file and what should be done before a data file is condensed.

The last practical limitation is the time it takes to load and run QuickBooks. Out of the box, QuickBooks can take up to 30 seconds just to load the starter database. As your database becomes larger, you will

start to see load time take longer, as well as the time it takes for a transaction to be recorded in QuickBooks.

## Max Number of Records

The first limitation is that there is a limit to the number of transactions QuickBooks Database can hold. For starters, QuickBooks can handle a maximum of 2 billion transactions. Now this doesn't seem like a problem, and disk space will likely run out before you run into this limitation, but there is a limit.

When it refers to transactions, it is referring to Invoice, PO, Journal Entries, and other things like that.

The next limitation, and it's a major limitation as far as we are concerned, is that the support files have a limit to the number of records. The following is a chart of support files and the max number of records in them.

Pro and Premier Editions  
Each list in QuickBooks has a maximum number of items it can contain, as shown in the following table:

List	Maximum number of items
Chart of accounts	10,000
Items, including inventory items (Group items can contain only 20 individual items.)	14,500
Price levels	20
Job types	10,000
Vendor types	10,000
Customer types	10,000
Payroll items	10,000
Classes	10,000
A/R terms and A/P terms total	10,000
Payment methods	10,000
Shipping methods	10,000
Customer messages	10,000
Memorized reports	14,500
Memorized transactions	14,500
To Do notes	10,000
Total names: employees, customers, vendors, and other names combined	14,500

**Note:** Any one name list can contain up to 10,000 names, but the name lists combined cannot exceed 14,500 names.

List	Maximum number of items
Chart of accounts	10,000
Items, including inventory items (Group items can contain only 20 individual items.)	29,000
Price levels	20
Job types	10,000
Vendor types	10,000
Customer types	10,000
Payroll items	10,000
Classes	10,000
A/R terms and A/P terms total	10,000
Sales reps	29,000
Sales tax codes	10,000
States	10,000
Payment methods	10,000
Shipping methods	10,000
Customer messages	10,000
Memorized reports	29,000
Memorized transactions	29,000
To Do notes	10,000
Total names: employees, customers, vendors, and other names combined	29,000

Customer/Vendor/Employee Database Limitations  
Please make a special note of the max number of "Total Names" each version of QuickBooks can handle. QuickBooks stores all the Vendor, Customer, Employees and "Other Names" in a common file. This means that all your Vendors and Customers, added together with the number of employees you have, can't be over the max.

Since QuickBooks keeps all these records in basically one file, this will also cause another limitation. You can not have a Vendor and Customer with the same value in the QuickBooks "Name" field, which they use much like you use a record number.

Some of us have Vendors that are sometimes our Customers, which can cause problems. The only way around this is to use two different values in the "Name" field. QuickBooks documentation recommends adding a "\_v" to your vendor name. Not the best solution, but it works.

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	Description: Ruggedized PicoDot Convergent Laser				
2	FD4HVP4LPW90	\$345.00		\$345.00	0.00
	Part Number: 68526				
	Description: Ruggedized PicoDot Polarized Reticule Laser				
3		\$0.00		\$0.00	YES

Chart of Accounts

This is not really a limitation, just something you might want to know about. By default, QuickBooks does not have "Use Account Numbers" turned on. When this option is not turned on, you are unable to see or update the Account number information associated with the GL Account.

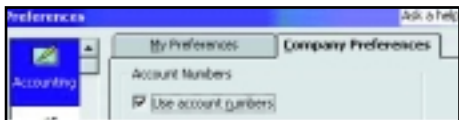
Without Account Numbers



With Account Numbers



To turn this feature on, go to :Edit | Preferences," then the company information under "Accounting."



Although, be aware that the "Chart of Accounts" order will be resorted based on Account Number instead of by the Name of the Account.

Inventory

QuickBooks Inventory is a very simple inventory system. The inventory structure is designed more for a small home business with single items. It doesn't have really good controls for inventory handling or process flows.

The best way I've found to use the Inventory feature in QuickBooks is purely for high-level accounting for the GL or invoice. Let your MultiValue system handle your inventory and processes flows since that was what you designed your system to do.

Create only very high-level inventory categories for invoicing and PO creation if you need to use these features. is

NATHAN RECTOR , a regular contributor to *Spectrum*, is owner of Natec Systems, a consulting firm specializing in D3, AP and R83 environments and custom programming. He can be reached at nrector@natecsystems.com or www.natecsystems.com.

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# History of MultiValue Where Are They Now?

Remembering Each 'Person of the Year' from *Spectrum* Magazine

Continued from page 31



## 1994 Person of the Year: Honor Guiney

Regarding "Person of the Year" Award: "My first reaction was surprise, but I was very flattered to have been considered and happy to be the first woman selected. During that period of my life I was traveling heavily and leaving young children behind at home. It was particularly difficult to manage a career. Over the years I have been contacted by a few women who have seen or read the article that were happy to hear about another woman juggling the same issues." *-Honor Guiney, October 2004*

Honor Guiney was the first "woman" to be recognized by *Spectrum* in this annual feature, therefore, "Man of the Year" appropriately became "Person of the Year" in 1994. It was ten years earlier when Guiney was introduced to the MultiValue industry when she worked as a programmer/analyst for Ameron Inc., implementing MRP applications on a Prime Computer. In 1987 she moved to a MultiValue consulting company, Lorien Systems, with the responsibility of program director.

It was during her time at Lorien that Guiney began to emerge as a notable leader in the industry, when she served as the president of the Prime Users Group. In 1990 she became vice president of Professional Services for Stauffer Information Systems, the company that developed the Blacksmith application development tool. Guiney was selected as *Spectrum's* 1994 "Person of the Year" while still at Stauffer, where she was helping to grow the company by developing a new business unit to deliver consulting and training services.

About the same time the "Person of the Year" article hit the street, Unidata Inc. was recruiting Guiney away from Stauffer. As the vice president of Global Services, she



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successfully launched a new professional services division for Unidata, where she brought in profit margins up to 30% and grew the staff to 120 people globally. “When I first arrived at the company, there was just me and my trash can,” Guiney remembered. “It was a very challenging job. The sales force generally felt that there was not an opportunity to sell services because the predominant sales channel was through our VAR network. This meant that I had to bootstrap the business with very little assistance. [But], we had a great team that accomplished amazing things. Our revenue growth was fantastic and surprised us all.” Eventually, Unidata merged with VMark and became Ardent Software. Guiney left the company about six months after the merger closing in 1998.

When leaving Ardent, Guiney was asked by one of the board members to work with another company he was involved with. This quickly became the start of her current company, Polestar Group Inc. “At Polestar we are focused on driving impactful bottom line results through inter- and intra-company process redesign. We are typically engaged by the top levels of companies to play a key role in driving strategies through process and technology,” Guiney said.

**QUOTABLE QUOTE: My Thoughts on the MultiValue Market**

“I remember when the argument was if PICK or UNIX would dominate operating systems and eliminate IBM. This doesn't appear to have been the right discussion. Perhaps we should have been debating Oracle, Microsoft, SAP and Linux. The marketplace and all of these technology providers have changed radically over the last 20 years. Each of these technology sets and providers found some level of success in wide deployment. Certainly MultiValue systems have not dominated operating systems or even databases. Nevertheless, there has been and is a market for the right products and services. There is no reason why solutions built on MultiValue technologies cannot compete given the right value in the targeted market. Perhaps a better discussion

is, “What is the right solution set and targeted markets?” The likely fit is when the MultiValue technologies are embedded in solutions. Therefore, the MultiValue market in itself is likely dead while the utilization of the technology inside solutions could still have a significant life.”



**1997 Person of the Year: Jane Christie**

Regarding “Person of the Year” Award: “I was humbled by the experience. There had been so many folks before me who had been the initial risk takers and inventors in this marketplace. In fact, I had asked that several of the key developers of MultiValue products be included on that *Spectrum* cover with me. With their skills and vision, they were the ‘men of the year’ every year.”  
-Jane Christie, October 2004

Coincidentally, the first “Man of the Year” was Len Mackenzie in 1989 and the last “Person of the Year” was Jane Christie in 1997. As the bookends of this annual award, both served in the role of president and CEO of General Automation (later renamed to GA eXpress — a company that no longer exists).

Although General Automation is no longer operating in the MultiValue market, Jane Christie is.

She was first exposed to PICK in 1984 when she worked for First Data Resources as the director of Operations for their Southern California Third Party Services Group. “I needed to find a services and logistics software package that could be fully implemented in 90 days. After much research, we chose a package that ran on

Microdata. We had a successful implementation and I remember our corporate IT folks being impressed with how ‘open and portable’ our product was.”

Christie then began her notable career in the MultiValue market when she joined General Automation in the late 1980s, first as vice president of Customer Services, then vice president of Sales and Services, and lastly CEO of GA and the re-invented company in 1998, GA eXpress. It was at the height of General Automation's technical reign in 1997 that *Spectrum* recognized Christie's leadership and her company's dominance in database development. (In 1997, GA employed some of the leading PICK gurus of all time, such as Tim Holland, Ian Sandler and Henry Eggers, to name a few.)

Today Christie holds the position of director of Sales and Support for FusionWare Corporation, a company that acquired the technology assets of GA eXpress in December 2003. Although FusionWare continues to support data access, connectivity, and Web services products for the MultiValue industry, it also offers an integration server for any type of database, application or line-of-business connectivity.

**QUOTABLE QUOTE: Fond Memories from My Career in the MultiValue Market:**

“The day that the photograph was taken for the cover of *Spectrum* magazine, the key developers within the marketplace were all in San Diego with me for the photo shoot. Afterwards, we had lunch and a meeting. It was fantastic to see Dave Holly, Tim Holland, Ian Sandler, Henry Eggers, and Antoon Houben all sitting around a table discussing the MultiValue market. I wish we had taped that event. In some cases these folks had not sat down with each other in years ... it was a spirited conversation at times. On a humorous note, they all had suggested that I wear a beard for the photo as they were all with beards that day.”

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