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THE MULTIVALUE  TECHNOLOGY MAGAZINE | MAY/JUNE 2008

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**A Snapshot of
International
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INTERNATIONAL Spectrum

THE MULTIVALUE TECHNOLOGY MAGAZINE

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From the Inside

BY NATHAN RECTOR

Well, the 2008 Spectrum Conference is over. The conference and sessions were very well attended. Everyone I talked with went home happy.

We focused on providing more sessions with more educational content. I was able to get experts in the marketplace to create as much non-partisan training as possible. This allowed the conference to include both MultiValue-specific education and general education like Linux and Windows Administration, PHP, ASP, NET, and JAVA QuickStart classes.

The closing conference "Casino night" party on Thursday night was a roaring success, and a lot of fun. During the dinner and game times, we did the drawings for the early bird registration prize and the attendee passport program.

I would like to give a special congratulations to all the prize winners. The first drawing of the evening was for the early bird registration prize — a 40 inch Flat Panel HDTV. Tracy Raines was the lucky winner — and for those of you who are wondering, no, Tracy did not have to check it with baggage when he flew home.

The passport prizes were given away throughout the night. Earlier in the week, each attendee was provided with a passport on which to collect stickers from each exhibitor out on the

Exhibit Floor. A full passport of stickers gave them a chance to win prizes provided by the vendors. Congratulations to the prize winners below.

At the end of the Casino night, everyone cashed in their chips for a chance to win an iPod Touch (first prize), a \$150 gift card for Amazon (second prize), and five pounds of chocolate (third prize). Drew Conboy was the lucky winner of the iPod Touch.

Now it is time to start planning for the 2009 conference, scheduled for March 23rd-26th in Denver, Colorado. You will soon start seeing information on the 2009 conference in the magazine and newsletters. Keep your eyes open for special deals on the 2009 conference throughout the year.

I know some of you were not able to make it to the conference this year, and I would like to get your feedback to help improve the 2009 and future conferences. If you were not able to make the 2008 conference and haven't already done so, please complete the survey at the following URL:

<http://www.intl-spectrum.com/conference/2008/survey/>

-NATHAN RECTOR
President, International Spectrum
nathan@intl-spectrum.com

Congratulations to the Spectrum Raffle Winners!



Nathan Rector (right) congratulates Tracy Raines (left) on winning the Early Bird Registration Prize - a 40 inch flat panel HDTV.

Tom Calligan
Drew Conboy
Eric Daniels
Harry Datisman
Marcela Fink
Bruce Jamilkowski
Jeff Kendrick
George Lawton
Brenda Lewis
Christine Lindstorm

Steve Mattson
Bruce Mcadoo
Kelvin Mclay
Brian McMahon
Dan Olson
Jeff On
Richard Phillips
Tracy Raines
Rick Weiser

And Thank You to the Prize Donors

Ashwood Computer Services
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Pick Programmer's Shop
Raining Data
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INTERNATIONAL Spectrum

MAY/JUNE 2008

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Learn more about the MultiValue Symbol and see what MultiValue Technologies and MultiValue Communities exist to help you support and manage your business and systems. To find out more visit <http://www.intl-spectrum.com>

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International Spectrum is eager to print your submissions of up-to-the-minute news and feature stories complementary to the MultiValue marketplace. Black and white or color photographs and diagrams are welcome. Although there is no guarantee a submitted article will be published, every article will be considered. Please send your press releases, articles, and queries to: editor@intl-spectrum.com. International Spectrum retains all reprint rights.

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A Snapshot Of



*“This year’s event far exceeded my expectations.
The classes I signed up for were great.”*

- Marcela Fink



International Spectrum 2008

BY SHANNON STOLTZ

If you are doing anything MultiValue, the 27th Annual International Spectrum Conference & Exhibition was the place to be for networking, solutions, and education. MultiValue professionals from North America and around the world gathered in Newport Beach, CA, from March 31st – April 4th, 2008, for a week of professional development and networking.

International Spectrum president, Nathan Rector, promised to expand the educational content of the annual conference, and that he did. By the end of the conference, attendees walked away with over 20 hours of professional development education just from the sessions alone.

With over 75 educational sessions over a wide variety of topics, it was obvious that the MultiValue marketplace is keeping up with the times. The new two-hour QuickStart sessions provided an introduction specifically targeted to MultiValue professionals in programming in PHP, Java, and .NET. And more sessions about the business of Information Technology were added this year.

While Spectrum contributors and speakers Mel Soriano and Lee Burstein were missed, seven new speakers were added to the schedule, including Kevin Finley, Dave Taylor, Drew Conboy, Mike Nichols, Richard Thiot, and Nehemiah Spence.

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Monday-Day 1

Continued from page 7

The conference began Monday morning with registration and coffee. (Many thanks to Northgate Information Systems for the lanyards and to InterSystems Corporation for the conference bags.) Friends and colleagues reunited, chatted, and made introductions. A few were heard asking about Spectrum founder, Gus Giobbi, who retired from the MultiValue world two years ago to pursue other endeavors.

International Spectrum president, Nathan Rector, kicked off the conference with his perspective on why the MultiValue marketplace is still here after 30 plus years, and why it remains an excellent business solution going forward. Nathan also announced changes and staff at International Spectrum and more importantly, the location for next year's conference - Denver, Colorado.

On Monday, attendees had the opportunity for five hours of professional development education, choosing from 16 sessions that covered a gamut of topics from object-oriented programming, .NET, Linux and Windows administration, PHP, Java, printing, and IT governance.



"I have already introduced and discussed a few things here at work that were brought out at Spectrum, so the 'ROI' for this expedition has already begun to materialize. Thank you again for putting on a top notch event."

-Barry Rogen, PNY Technologies, Inc.

Tuesday-Day 2

Tuesday was a full day of education and networking. Topics ranged from technology like ODBC, RFID, and SOA to business system topics such as integrating freight management, enhancing specific vertical applications, and business intelligence. Other sessions dealt with the business of IT including project estimation, testing, customer service, and governance.

Oh, of course there was the food. Over breakfast, sponsored by Precision Solutions, Kevin King, in his animated style, conveyed his thoughts on the role of the MultiValue programmer. A round table lunch, sponsored by Raining Data, provided attendees the opportunity to network with others who are using the same database. Between sessions, the break room provided a place to relax and/or get an extra jolt of caffeine, courtesy of Ashwood Computer Company.

Tuesday evening wrapped up with the Sneak Peek Party, the private unveiling of the Exhibit Hall to the full conference attendees. While dining on hors d'oeuvres offered by roaming waiters, attendees were able to kick back and unwind from a full day of training, scope out vendors to talk to later on, and just enjoy the company of fellow MultiValue professionals.

Continues on page 10



“The conference was well-organized, and I came away with tools and resources that I put to work literally the first day back in the office.”

- David Reid

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Wednesday- Day 3

Continued from page 9

Over breakfast on Wednesday morning, Brad Leupen of Entrin-sik, Inc. provided an introduction to Informer. After breakfast, everyone dispersed for another three hours of professional development, with topics covering SQL, .NET, GUI and web/browser interfaces, bar coding, data security, and business intelligence.

Wednesday afternoon brought an opportunity to research tools and solutions in the Exhibit Hall. All of the MultiValue database vendors were represented as well as vendors offering solutions for reporting and business intelligence, rapid application development, integration, terminal emulators, software configuration, programming and consulting, .NET, Web, and the list goes on.

Additional local area MultiValue professionals arrived Wednesday afternoon to enjoy access to the Exhibit Hall and talk one-on-one with vendors and professional colleagues. An ice cream social, courtesy of InterSystems, provided a mid-afternoon break, while the free Internet café gave attendees a connection to the outside world and comfortable place to just sit and talk.

As usual, vendor give-aways (aka swag) were popular. Squish balls, chocolate, tote bags, and USB drives were all seen leaving the Exhibit Hall. A very popular item was the Certified Pick Nerd identification card from Sierra Bravo, complete with photo, a red pocket protector, and thick, black-rimmed glasses.

By the end of the day, one attendee joked, "...my brain is about to explode." But the conference wasn't over yet.

Continues on page 39



The best way to be part of the North American market of MultiValue databases : International Spectrum.

- Cedric Fontaine, Nozumi Solutions Inc





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Spectrum University offers once a week training classes in a variety of topics pertaining to the MultiValue market. Looking for training for yourself or employees? Spectrum University Can help! Check out are latest offerings.

Upcoming Webinar Schedule

TIME AND DATE	TITLE
Thursday June 5, 2008 2:00pm EST, 11:00am PST	UniVerse Indexes This Webinar series will cover how to create and manage UniVerse Indexes. This simple system feature can increase your application performance, but only if used correctly.
Thursday July 3, 2008 2:00pm EST, 11:00am PST	MultiValue Basic Programming For GUI 4 week course for experienced MultiValue programmers who need to write programs and subroutines without any screen I/O for a GUI front end. Key topics include an object oriented overview, business logic only design, COMMON variables, creating reusable objects.
Tuesday July 15, 2008 2:00pm EST, 11:00am PST	UniVerse Administration The MultiValue Administration Series is aimed at those who are involved with day-to-day administration of the MultiValue database environment. Each course will be 4 weeks long and will include the following key topics: file maintenance (creation, sizing and resizing), managing users, managing printers, managing foreground and background processes, backup, locking, working with persistent and non-persistent connections.
Thursday August 7, 2008 2:00pm EST, 11:00am PST	Integrating MultiValue with Excel Microsoft Excel has become an important tool in every day business. It has also become valuable tool in the MultiValue Business applications for data exchange and enhanced reporting. Join us in this series of webinars to see how to interact with Excel from your MultiValue Business applications.
Tuesday August 12, 2008 1:00pm EST, 10:00am PST	MultiValue Programming - Optimization File Design, Programming Techniques, and single-threaded processing can dramatically affect efficiency and processing speed when using your MultiValue database. The webinar provides proven solutions for optimizing your application to take full advantage of your computer's resources.

For more information or to register please visit <http://www.intl-spectrum.com/webinar>

What's Right for You?

BY LARRY CHRISTENSEN

What reporting tool should we be looking at? I work with MultiValue sites across North America and this question is at the foundation of each first meeting. The more fundamental question is, “what type of tool is right to solve the reporting problem?”

The answer isn't always easy. Choosing a type of solution from a technical perspective is usually straight forward. Throw in a few pieces of company politics, and add a dose of IT and the business users not communicating well, and the solutions may be a little tougher to find.

The political piece may end up leading you in multiple directions to solve multiple problems brought about by differing managers. Some business users swamp IT with requests, some build their own reporting infrastructure, and some have essentially given up. In this article, we'll look at how we can support these groups with ad hoc reporting and tactical, analytic, and strategic business intelligence solutions.

Look at Your Current Reporting

First, let's ask, where are your current reports coming from? If none of your reporting is automated, then the answer is easy. Standard reports come with all applications; but, when someone from the organization reads one of these reports and asks a question, it leads the IT staff down the path of creating a custom report. For example, you normally get an accounts receivable aging but don't always get the option to pick “all customers with balance greater than \$500 and greater than 60 days with a name and a phone number.”

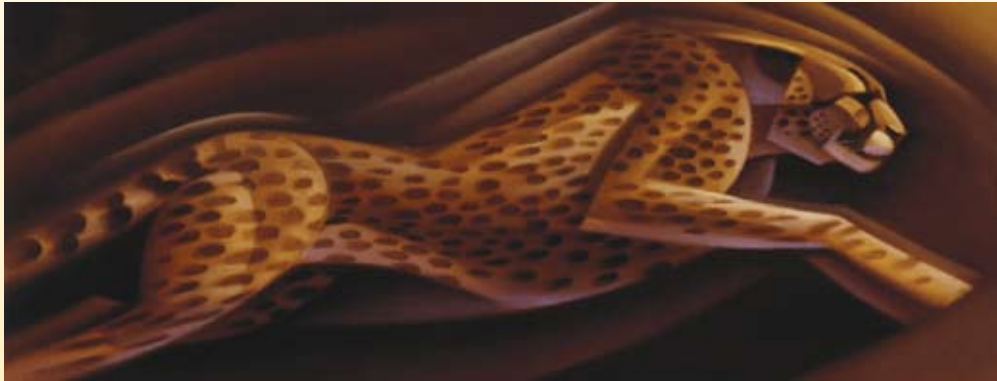
That should be the end of it but a custom report may end up generating more questions than answers. In our simple example, we may also need city, state, and time zone. So another report is created. This process soon moves us into the The Wheel of Reporting (fig. 1), and even simple requests can end up as a continuous loop. One may beget another and then another and another with no end in sight.

Management normally starts budgeting for the automation of the reporting process because adding a new reporting tool is less expensive than the IT salary and time they are paying for

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FIGURE 1 - Wheel of Reporting

Reporting & BI: What's Right for You?

Continued from page 12

to get this information today. So, a need is generated to automate the reporting process.

Get a Handle on Spreadmarts

While all this is going on, your progressive managers are busy creating their own version of the truth. For example, the sales manager will accumulate in-

formation about sales and shipments by territory, salesman, customer, and products from whatever source is easiest. They use what is known as spreadmarts to show their perspective and how they are doing.

A spreadmart is a report created on a PC that accumulates information from multiple sources (some from your application and some from who-knows-where). The user sorts this out using desktop tools like Microsoft Access, Microsoft Excel, etc. Managers in a com-

pany put these together because they have no other way to evaluate and show their view of the information. They want to keep track of what is going on for their own survival and to look good to their bosses.

Wayne Eckerson, a well respected reporting specialist and author, characterizes spreadmarts as the corporate equivalent of terrorism. Just as soon as you eliminate one spreadmart, ten more spreadmarts pop up. We have to find a better way to handle this situation.

Luckily, if you employ the popular reporting solutions currently available to the MultiValue community, they all have mechanisms to get information into Microsoft Excel worksheets and other popular formats. At least you will know where the initial data came from. Make sure the ability to export into multiple formats is on your check sheet when looking at reporting tools. Use the power of the reporting tool to get a handle on out of control spreadmarts.

Ad Hoc Reporting

The first tool everyone looks at is an ad hoc report writer. Ad hoc is Latin and means "for this purpose." Ad hoc generally signifies a solution that has been custom designed for a specific problem or task, non-generalizable, and cannot be adapted to other purposes. This sounds like a good description of a custom report.

The number one requirement when implementing any reporting solution is to know your data. After a number of programmers and enough time goes by, we find ourselves with years of historical data and thousands of dictionaries items on our systems. It is important to identify the authoritative dictionary items we will need to create current and useful views of our data. This will allow us to turn the reporting users loose on the system to create their own reports. The

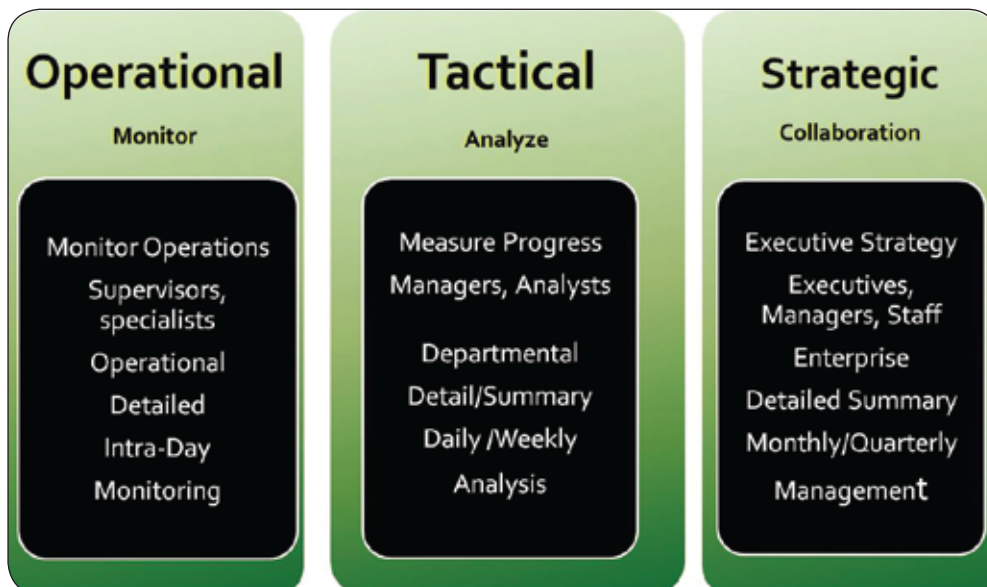


FIGURE 2 - Three Types of BI

user will feel they have ultimate control over what they report on and the IT group will control what data is available to each individual user. Everyone is winning with this balance.

Ad hoc reporting tools are readily available. If your solution involves the creation of large reports with lots of detail, rows, and columns, then this is the solution for you. But, you also have other choices. Several business intelligence tools are available that understand MultiValue. Don't overlook these options.

Business Intelligence Solutions

Many companies find that it is good to see new reports, but it is extraordinary to analyze the data in their system. The ability to see revenue, profits, or trends against last year or the budget, at the click of a mouse, is amazing. Business Intelligence (BI) has become a driving force in the world of reporting. And, the analysis of all that data is big business. BI solutions come under the headings of tactical, operational, and strategic (fig. 2). Let's take a look at these three areas as additional ways to solve a company's reporting concerns.

Tactical

Tactical BI is great at tracking company and departmental processes and projects. It is used more for analysis than monitoring or tracking collaboration within a company. Data is normally updated into a multidimensional cube (think of this as a three dimensional spreadsheet). You may be familiar with the term OLAP (Online Analytical Process). OLAP has become synonymous with Tactical BI. The information in the cube is normally updated during your end-of-day process so the information you look at in the cube is current as of the close of business the prior day.

In this world, analysis of the data is King. Tactical BI gives the user an easy way to see information, such as all sales reps by warehouse, by customer, by product type, by product; and a detailed look at the data associated with

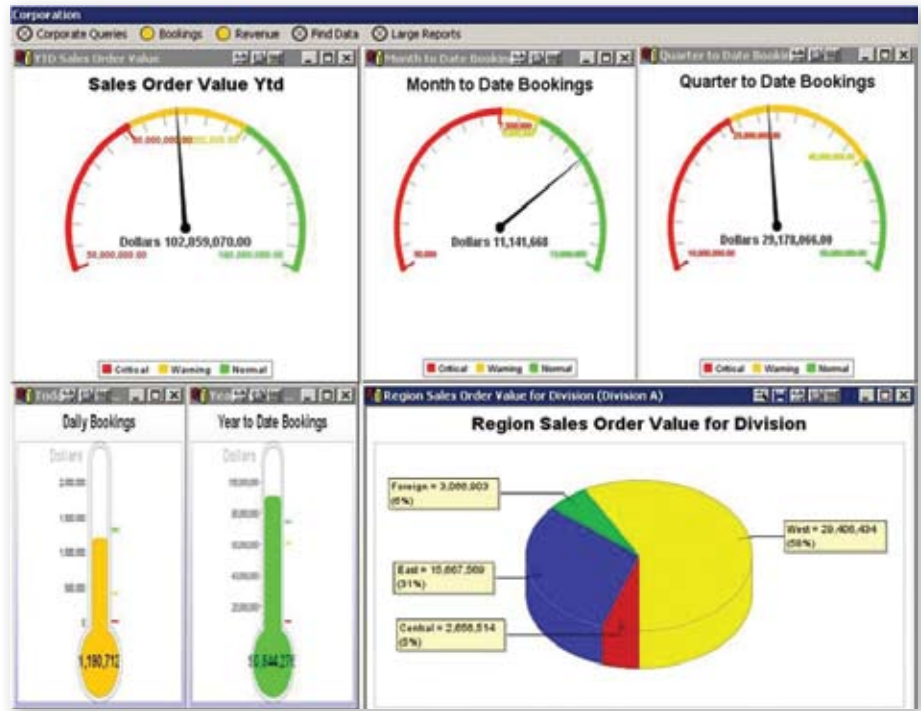


FIGURE 3 - Operational Dashboard

any time frame desired. The detail may include sales, profit, and inventory levels to name a few.

The list of detail available at any level of analysis is only limited by the data available on your system. This is very pow-

erful data analysis capability and gives a company the ability to really gain a leg up on their competition.

Continues on page 44



FIGURE 4 - Who Uses What Type of Reporting

UniData Basic

via CODE PROFILING

BY KEVIN KING

Uh oh. The system is running slower than it did last week. Certainly it couldn't be those small, almost insignificant changes to that daily batch program — could it? And how could we know for certain that those changes were, or were not, responsible?

As each program matures over time, performance can begin to change due to introduction of new features, changes to existing features, and the variety of different programmers who have left their mark throughout the code. Though our customers/users may not specifically state it, everyone wants every program to be running at peak efficiency to get the results they need without extensive delays.

Seriously, who wants to be sitting around at midnight watching a program run? You can bet that such a person probably doesn't have very complimentary things to say about the experience!

In the *Administering UniData* documents (freely available from the IBM web site; see chapter 22 in the Unix document or chapter 18 in Windows), there are brief four pages discussing UniBASIC profiling. While this is a remarkably brief overview of a very powerful feature, the reality is that generating profiling results is really quite effortless. Interpreting those results, however, can get a little complicated depending on the complexity of the program being profiled.

Conceptually, profiling is analogous to watching a program run with a stopwatch and a counter. As the program starts, the timer clicks on and when the program stops the timer clicks off, giving us an elapsed time. If that

were all, profiling would be a nonevent. However, UniData takes this to the next level and gives us the elapsed time and number of times each subroutine in the program is invoked. Furthermore, the profiling report breaks down the dependencies between subroutines so that we can see who is calling who, how often, and what kind of impact those calls are having on the program as a whole.

To profile a program, one must first compile the program with profiling enabled. Figure 1 demonstrates how this is done. Adding `-G` at the end of the BASIC command is all that is needed to tell UniData that you may one day want to generate profiling statistics. Note, however, that just because you compile with the `-G` option does not mean that the statistics will ever be generated. You must actually run the program with the profiling option for the statistics to be generated.

Once a program has been compiled for profiling, one can run the program with the `-G` option to generate the actual statistics, as shown in figure 2. Interestingly enough, you can actually run a program with this option even if the program has not been compiled with profiling enabled. The results, however, are less than adequate unless both the compilation and execution options are used together.

There are two result files generated during the profiling run, both in the account's main direc-

```
BASIC PROGS ZIP.RPT1 -G
```

FIGURE 1 -

```
RUN PROGS ZIP.RPT1 -G
```

FIGURE 2 -

tory (where VOC is found). One is called profile.pid and it contains the profiling statistics based on how much CPU time was used. The other is called profile.elapsed.pid and contains the profiling statistics based on how much clock time was used. Individually each provides useful information. Together, additional useful information can be inferred. (The pid value is the numeric process identifier for that specific Uni-Data session, and it changes every time you log on.)

Even with both the compilation and run-time options used, at times the profiling output may be less than you might expect. Because profiling generates elapsed time statistics for the program and its subroutines, if a program is written using a bunch of GOTOs or a lack of actual GOSUB subroutines, it will be difficult to garner much useful information from the results. Figures 3 and 4 demonstrate this. Figure 3 is a sample zip code report intentionally written to perform badly and give very limited profiling information. Figures 4 and 5 are the actual results of the profiling run.

Looking at figures 4 and 5, we can see that the profiling results are broken into two sections. The top section gives an overview of the program and each of its subroutines, sorted in descending order according to the amount of time each section of code has taken. (In this example, there are no subroutines, so we can see the results are really quite limited.) The second section then shows program and subroutine dependencies, and again is showing very limited information because of the lack of subroutines in our test program. But look at the time differential between the two statistics. In

Continues on page 19

```
* Program Name: ZIP.RPT1
* Written By:   Kevin King
* Date:        19 Mar 2008
* Project:     Connect!
* Description:  This program is a quick ZIP report to
*              illustrate the output of the Unidata
*              Basic profiler. It is intentionally
*              written poorly as a demonstration.
*****
* Open File(s)
*****
NO.OPEN = ''
OPEN 'ZIP' TO F.ZIP ELSE NO.OPEN := 'ZIP '
*
IF (NO.OPEN NE '') THEN
  PRINT NO.OPEN : 'not opened'
  STOP
END
*
*****
* Select the records for the report
*****
CMD = 'SELECT ZIP BY ST BY CNTY BY CITY'
EXECUTE CMD CAPTURING OUTPUT
*
*****
* Process the records for output
*****
OUTPUT.REC = ''
*
EOF = @FALSE
LOOP
  READNEXT ZIP.ID ELSE EOF = @TRUE
UNTIL EOF DO
  READ ITEM.ZIP FROM F.ZIP, ZIP.ID THEN
    OUTPUT.CNT = DCOUNT(OUTPUT.REC<1>, @VM) + 1
    OUTPUT.REC<1, OUTPUT.CNT> = ITEM.ZIP<1> ;* Country
    OUTPUT.REC<2, OUTPUT.CNT> = ITEM.ZIP<2> ;* ZIP Code
    OUTPUT.REC<3, OUTPUT.CNT> = ITEM.ZIP<3> ;* City
    OUTPUT.REC<4, OUTPUT.CNT> = ITEM.ZIP<4> ;* County
    OUTPUT.REC<5, OUTPUT.CNT> = ITEM.ZIP<5> ;* State
  END
REPEAT
*
*****
* Print the results
*****
EXECUTE "SP.ASSIGN HS"
PRINTER ON
OUTPUT.CNT = DCOUNT(OUTPUT.REC<1>, @VM)
FOR OUTPUT.LOOP = 1 TO OUTPUT.CNT
  PL = OUTPUT.REC<1, OUTPUT.LOOP>"L#3" : ' '
  PL := OUTPUT.REC<2, OUTPUT.LOOP>"L#5" : ' '
  PL := OUTPUT.REC<3, OUTPUT.LOOP>"L#25" : ' '
  PL := OUTPUT.REC<4, OUTPUT.LOOP>"L#25" : ' '
  PL := OUTPUT.REC<5, OUTPUT.LOOP>"L#2"
  PRINT PL
NEXT OUTPUT.LOOP
*
PRINTER OFF
PRINTER CLOSE
*
RETURN
END
```

FIGURE 3 - Sample zip code program (poorly written, intentionally)

FIGURE 4 - Profile.pid - Profiling results for a program without subroutines

```

%time cumsecs seconds  calls name
100.0    1.09    1.09          1 TRAINPROGS\_ZIP.RPT1

index  %time      self descendent      called/total      parents      index
      %time      self descendent      called+self      name      children
      called/total
                                <spontaneous>
[1]    100.0    1.09          0.00          1      TRAINPROGS\_ZIP.RPT1 [1]

```

FIGURE 5 - Profile.elapsed.pid - Profiling results for a program without subroutines

```

%time cumsecs seconds  calls name
100.0 1090.00 1090.00          1 TRAINPROGS\_ZIP.RPT1

index  %time      self descendent      called/total      parents      index
      %time      self descendent      called+self      name      children
      called/total
                                <spontaneous>
[1]    100.0 1090.00          0.00          1      TRAINPROGS\_ZIP.RPT1 [1]

```

```

%time cumsecs seconds  calls name
98.0    0.15    0.15          1 TRAINPROGS\_ZIP.RPT4:2000
1.0    0.15    0.00          1 TRAINPROGS\_ZIP.RPT4:1000
0.9    0.15    0.00        44919 TRAINPROGS\_ZIP.RPT4:2100
0.0    0.15    0.00          1 TRAINPROGS\_ZIP.RPT4

index  %time      self descendent      called/total      parents      index
      %time      self descendent      called+self      name      children
      called/total
                                <spontaneous>
[1]    100.0    0.00          0.15          1      TRAINPROGS\_ZIP.RPT4 [1]
      0.15          0.00          1/1      TRAINPROGS\_ZIP.RPT4:2000 [2]
      0.00          0.00          1/1      TRAINPROGS\_ZIP.RPT4:1000 [3]
-----
[2]    99.0    0.15          0.00          1/1      TRAINPROGS\_ZIP.RPT4 [1]
      0.15          0.00          1      TRAINPROGS\_ZIP.RPT4:2000 [2]
      0.00          0.00        44919/44919  TRAINPROGS\_ZIP.RPT4:2100 [4]
-----
[3]    1.0    0.00          0.00          1/1      TRAINPROGS\_ZIP.RPT4 [1]
      0.00          0.00          1      TRAINPROGS\_ZIP.RPT4:1000 [3]
-----
[4]    0.9    0.00          0.00        44919/44919  TRAINPROGS\_ZIP.RPT4:2000 [2]
      0.00          0.00        44919      TRAINPROGS\_ZIP.RPT4:2100 [4]

```

FIGURE 6 - Profile.pid - Profiling results for a program with subroutines

OPTIMIZING UNIDATA BASIC VIA CODE PROFILING

Continued from page 17

figure 4, we see 100% of the time only used 1.09 CPU seconds. But in Figure 5 we see that 1.09 CPU seconds actually translates to 1090 clock seconds — over 18 minutes! For this reason, I tend to start my analysis of the results by looking at the profile.elapsed.pid statistics, and then move into the profile.pid statistics for additional information.

But, as I mentioned earlier, this program was intentionally written to perform badly and generate some nearly useless statistics as a practical demonstration of the evils of unstructured, top-down, no-subroutine code. By contrast, figures 6 and 7 show the profiling results for a program with subroutines.

Without even seeing the source code, by looking at the top of figure 6, we can see that the ZIP.RPT4 program has three subroutines and the main program itself. Subroutine 2000 (shown on the top line with a “:2000” suffix) took 98% of the execution time of the program. Subroutine 1000 took a mere 1% of the execution time. And finally, subroutine 2100 and the main program itself took next to no time at all to run. But look at this: subroutine 2100 was called 44,919 times! The subroutine 2000 was only called once and took 98% of the time, and yet subroutine 2100 was called thousands of times and took virtually no time at all. Based on this, we should probably be thinking about giving some attention to subroutine 2000. It is looking mighty sickly, based solely on these limited numbers.

The second half of figure 6 shows the dependencies in this program. This section can be a little hard to read because there are actually three different lines shown here. We start with the line that includes the index number in brackets. This tells us specifics about a particular part of the program, whether the mainline or subroutine. A line above this line tells us information about the caller of this particular routine. Any lines below — known as descendents — tell us about the routines that were called from this routine. Descendents are sorted in descending order based on the elapsed time for each.

In the figure 6 example, index [1] says that the ZIP.RPT4 program, running from the TRAINPROGS file, took 100% of the time. The main program itself (the self column) took no time at all

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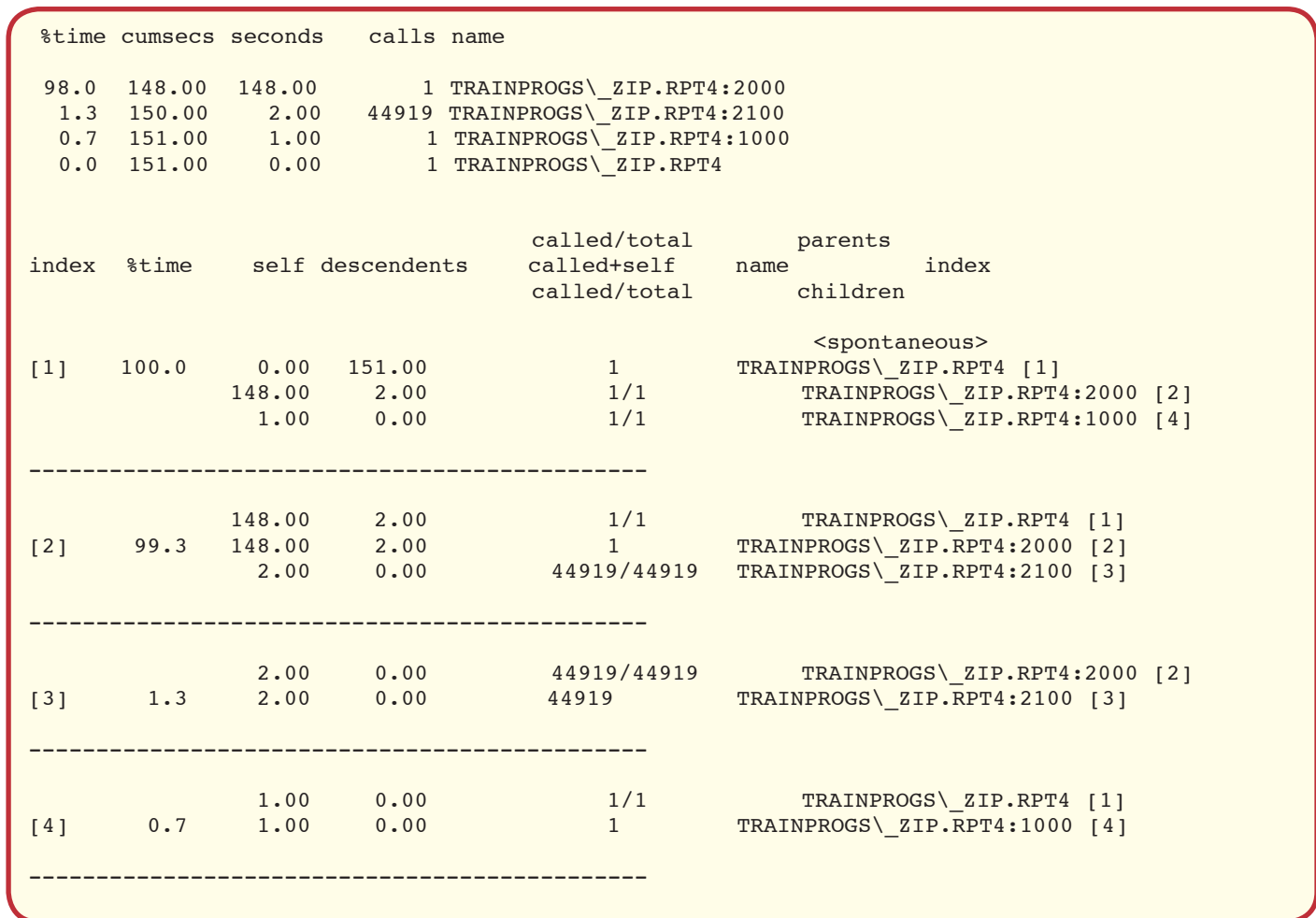


FIGURE 7 - Profile.elapsed.pid - Profiling results for a program with subroutines

NEWSMAKERS



Nebraska Furniture Mart's Database Migration To Reality Goes So Smoothly Staff Fail To Notice The Change

Nebraska Furniture Mart (NFM) successfully migrated NFM's retail applications to Reality, a MultiValue relational data management system provided by Northgate Information Systems. The migration, which took 12 months to complete, went without a hitch. During that period, Northgate assisted NFM in migrating nearly a billion data records together with the suite of sophisticated in-house retail applications used by NFM, the largest furniture retail outlet in the U.S.

"Going live was a non-event," says David Ragan, NFM's Senior Database Administrator. "We came in at 6:00 a.m. the morning of the cutover expecting a flood of panic calls, but the phones never rang. When we asked people how they were getting on with the new system, they replied 'What new system?' They had no clue we'd switched products overnight."

An even tougher test of Reality's resilience came on Black Friday, when sales volumes are ten times greater than on any other day of the year, and peak-time crowds can reach 3,000 in a single store.

As Ragan explains, "We sailed through with only a handful of issues. The fact that senior management had no concerns with doing this upgrade just a few weeks before Black Friday and heading into the busy holi-

day season demonstrates the faith we had in Reality."

In the beginning, however, Reality was not even a contender for NFM's database upgrade. NFM sent an RFI to Northgate "as a courtesy". But the NFM team soon noticed that Reality had a lot to offer and their staff showed a unique readiness to adapt to NFM's requirements. By the end of the first round of evaluations, Northgate was on a short list of two. Feedback from existing users helped with the selection process.

"Everyone we spoke to was thrilled with the performance of their database," says Ragan. "It was only when we delved deeper that differences emerged. Users of other MultiValue products seemed satisfied that crashes were as infrequent as one a month; Reality users couldn't remember the last time their system crashed."

NFM saved time and money on the upgrade process. Ragan believes that it would have taken two years to get where they are now if they had chosen another database provider.

He adds, "We saved on staff resources too. We thought we would have to throw the entire IT team into this project. In the end, a large portion of the work was done by just two people. Other than a couple of

months of intense testing, the majority of the team was able to continue with their normal day-to-day business tasks."

When NFM first chose Northgate, many industry observers thought the retailer was making a mistake. Some were skeptical that Reality could even scale to the size that NFM needed. Ragan himself admits he had some reservations. At every stage in the process, however, Northgate proved their worth. One of their earliest successes was to identify and resolve an NFM system hardware issue. The problem was so well hidden, NFM was not even aware of it themselves.

Northgate engineers also speeded up the data change-over process. They pioneered a new technique that took completed transactions from the live existing system and dropped them into the waiting Reality database. The result was a ready-made, near-real-time copy of the live database. It cut switchover down-time from over 24 hours to less than an hour.

John Seaman, Reality Sales Director, was aware that Northgate was the underdog in the race to secure the NFM contract. "That kind of challenge doesn't worry us," he says. "Over the years, we've upgraded dozens of MultiValue database sites of all flavors and sizes. We never say that the

upgrade path will be painless, but we can say that no customer who has gone down that route has ever regretted their choice."

About Nebraska Furniture Mart

Nebraska Furniture Mart was founded in 1937 in Omaha, Nebraska by Rose Blumkin. She set up in the basement of her husband's jewelry store with a \$500 investment. In 1983, Warren Buffett purchased a majority interest in NFM and made it part of the Berkshire Hathaway family of companies.

For more than 60 years, NFM has sold a wide range of goods including furniture, appliances, electronics, computers, and flooring. NFM continues to maintain its tradition of selling cheap, telling the truth, and providing the greatest selection and service.

About Northgate

Northgate Information Solutions is a major supplier of software applications and outsourcing solutions to the public services, human resources, and corporate markets. Founded in 1969, the company has over 6,000 staff and operates in 46 countries across five continents. By getting to the heart of application-specific processes, Northgate helps organizations increase their business process efficiency.

Northgate also manages customers' key systems, providing a broad range of outsourced solutions available at client sites or hosted at its own secure sites. ■



Rush University Selects Datatel Software Solutions to Bolster Student Services and Aid Enrollment

Rush University has chosen Datatel Colleague and Datatel ActiveApply software solutions to build a comprehensive administrative system and enhance student recruitment efforts. The newly acquired Datatel technology and professional services will replace a legacy administration system used by the institution.

Rush University includes Rush Medical College, the College of Nursing, the College of Health Sciences, and the Graduate College. The university is part of Rush University Medical Center, one of the nation's leading academic medical centers.

Opting not to upgrade to a newer version of its prior vendor's solution, the decision to contract with Datatel was made after a nine-month evaluation by a committee comprised of Rush information technology professionals and end users. Site visits to current Datatel clients, including other

academic medical centers using Colleague, was also part of the vigorous assessment process.

"Our committee chose Datatel because of its great reputation for after-sale support and Colleague's out-of-the-box functionality. Not requiring customization frees up our IT people from writing code, plus Colleague's seamless interface to Business Objects' Crystal Reports will provide us rich, robust reporting functionality," said Paul Jones, M.D., associate provost of Student Services at Rush University. "Datatel has also had much experience with medical universities, which we found compelling."

Rush University, located in Chicago, IL, will deploy the Colleague enterprise resource planning (ERP) solution to support areas such as financial aid, academic records, registration, and student services. A consolidated and user-customizable interface to these critical areas will be provided by the Datatel ActiveCampus Portal, built on Microsoft SharePoint technology. By selecting Datatel, Rush will also benefit from the ability to produce precise, real-time reports for insightful business decision making.

Datatel ActiveApply will allow potential students to apply online to the university. Part of Datatel's e-marketing solution suite, ActiveApply will fully integrate with Rush's Colleague system, allowing for seamless workflows between recruitment offices campus-wide. Higher education institutions have shown an increase in the quantity and quality of applicants with ActiveApply, while streamlining administra-

tive tasks supporting submissions.

"Colleague and ActiveApply will help provide Rush University positive data-driven outcomes so critical to assuring its future sustainability," said John Speer, president and chief executive officer of Datatel. "We are pleased to welcome Rush into our client community, and for allowing us to assist them in providing the best possible technology and user experience to its various constituents across their enterprise."

Datatel Colleague focuses on five key business areas - enrollment and student services, financial management, financial aid, human resources, and institutional advancement. Datatel also offers an array of professional services and consulting exclusively geared toward the higher education market. ■



RATEX Business Solutions Adds MITS Report to its Retail Management System

ATEX Business Solutions, Inc. (RBS), an independent provider of comprehensive inventory management and point-of-sale business solutions to university bookstores has announced the addition of MITS reporting technology to its retail management system, VisualRATEX.

VisualRATEX is an end-to-end solution that handles all major aspects of retail bookstore operations including product ordering, product sales, general ledger, and accounts receivable.

As part of its initiative to provide superior business consulting, software, hardware, training, and support across all aspects of collegiate retailers' information systems, RBS is offering MITS Report as an additional technology to meet their customers' reporting needs. Through MITS Report, RBS clients have additional tools necessary to access the data in their VisualRATEX system and report on that data quickly and easily.

With the VisualRATEX system running on IBM UniVerse, RBS had been relying on the use of basic reporting facilities to complete query statements. Jere Warner, CEO of RBS explains, "We wanted to provide our clients with a more powerful, state-of-the-art way to generate ad hoc reports. In cooperation with MITS, we were able to integrate a successful method of utilizing the data contained in our system. MITS Report makes it possible to create a variety of customized reports where users, on the fly, can manipulate the format of the report while maintaining the data integrity."

MITS President, Fred Owen, adds "We are very pleased to be associated with RBS and welcome them as a MITS partner. Their desire to extend the value of their software offering with the addition of MITS Report fits perfectly with the design of the product and our vision for its use." ■

New Products



IBM Announces wIntegrate 6.1

IBM wIntegrate 6.1 delivers connection resilience, enhanced reporting capabilities, performance and presentation improvements, and increased interoperability. Further customer enhancements provide additional value for solutions providers.

Connection Resilience

wIntegrate 6.1 offers resilient connectivity between its thin clients and the wIntegrate Server. Increasing mobility of clients connecting over the Internet can increase the number of dropped connections. Connection resilience gives thin clients the ability to reconnect to the wIntegrate Server and recover customer access to applications and data without administrator intervention.

Enhancements to the wIntegrate Administrator and Monitor components allow flexible configuration and management of resilient connections. The Administrator's log file includes details of lost and recovered connections.

Enhanced Reporting

QueryBuilder is a powerful forms-based report generation component of wIntegrate. wIntegrate 6.1 provides significant usability enhance-

ments to this key feature. When entering dates in QueryBuilder selection criteria, customers can use the new pre-defined date definitions to easily specify dates such as "today", "lastmonth" and "nextyear". The actual values are resolved at runtime allowing saved queries to be re-used for different dates without having to change the parameters manually.

Customers can modify or create their own field definitions using wIntegrate's powerful scripting language. QueryBuilder dialog boxes have also been enhanced to include arrows to allow you to easily rearrange items, selection criteria, or output fields. Finally, improvements to error handling enhance the user experience with this feature-rich utility.

Performance

The Java Thin Client deployment option was added at version 6 to provide the ability to run wIntegrate as a signed Java applet in a web browser on Windows, Linux, and Mac clients. By caching wIntegrate dialogs and adding a parameter to disable the Nagle algorithm, wIntegrate 6.1 improves performance up to forty percent for the Java Thin Client. This speed increase will improve usability and accelerate user adoption of this user interface enhancement functionality.

Presentation

The ability to improve the presentation layer of your

application with minimal code modifications is a key benefit of wIntegrate. Version 6.1 continues to modernize the look and feel in a number of areas. The Java Thin Client has improved tab controls and rollover buttons to allow developers to provide the most modern look and feel.

Interoperability

In the Web 2.0 world of application mashups, the wIntegrate Java applet provided by the thin client must interoperate and play nicely with HTML pages and other applets in a modern Web application. The ability for wIntegrate to send and receive messages via JavaScript provides two-way links between HTML in the browser and the U2 host, so an enterprise application can both affect and react to events in the browser and other applets. This functionality allows sophisticated application design and functionality.

In addition to interoperating with HTML and other applets, the Java thin client can interoperate with Windows tools such as Microsoft Excel and Microsoft Word by leveraging the OLE interface. This new capability extends compatibility with Windows and lets you leverage QueryBuilder to create custom reports and perform mail merges or populate spreadsheets in this environment.

Customer Enhancements

wIntegrate 6.1 delivers numerous customer enhancements designed to empower business solutions based on the IBM U2 data servers.

In order to extend the language support of the wIntegrate local client, version 6.1 has improved support for Far Eastern languages such as Japanese, Korean, and Traditional Chinese.

wIntegrate thin clients now have extended support for authentication using Windows Active Directory allowing them to login to trusted domains in the same forest. This leverages Active Directory central management of authorization easing system administration workload.

For more information about wIntegrate 6.1, visit:

<http://www-306.ibm.com/software/data/u2/wintegrate/wi61-ann.html> ■

OPTIMIZING UNIDATA BASIC VIA CODE PROFILING

Continued from page 23

(0.00). However, its descendents took .15 CPU seconds. Furthermore, the main program was called once, spontaneously from TCL as evidenced by the caller of "<spontaneous>".

ZIP.RPT4 directly called subroutine 2000, which the profiling statistics note as index [2] (following the subroutine label). ZIP.RPT4 also directly called subroutine 1000, which the statistics note as index [3]. We can then look farther down into the report to get additional information about these subroutines.

Looking at index [2] on the left, we can see that subroutine 2000 took 99% of the CPU time. (Minor differences between the top and bottom sections of the statistics are normal.) We see that subroutine 2000 was called once and took .15 CPU seconds and it then in turn called subroutine 2100 44,919 times for a total CPU time of zero. Here's another confirmation that the 2000 subroutine needs some serious attention.

Turning our focus to the clock statistics in figure 7, we can see that the problem is really quite extraordinary.

Index [2] — our 2000 subroutine — took 99.3% of the clock time, a whopping 148 seconds! And, what about our 2100 subroutine? Again, it was called 44,919 times but an elapsed clock time of only 2 seconds. What in the world is up with this subroutine 2000?

Figure 8 shows the subroutine 2000. Can you spot the inefficiency? If so, e-mail your ideas to me at Kevin@PrecisOnline.com. We'll explore the real problem in the next issue and also look at how we can use the two profiling reports together to support our premise.

Through the next few installments, we'll be looking at a number of different profiling results to learn how we can make small code changes that will produce significant performance benefits. We'll also explore some common MultiValue Basic strategies to see if what we believe to be true is as true as we believe!

This series is based on the Precision Solutions' online Connect! training course number U2-03006: Optimizing UniData BASIC via Code Profiling. Please visit <http://www.PrecisOnline.com> for more information about Precision Solutions and Connect! online training. **IS**

```
*
2000 * Process the records for output
*
EXECUTE "SP.ASSIGN HS"
PRINTER ON
*
OUTPUT.REC = ''
*
EOF = @FALSE
LOOP
  READNEXT ZIP.ID ELSE EOF = @TRUE
UNTIL EOF DO
  READ ITEM.ZIP FROM F.ZIP, ZIP.ID THEN
    GOSUB 2100 ; * Output the information
  END
REPEAT
*
PRINTER OFF
PRINTER CLOSE
*
RETURN
```

FIGURE 8 - Subroutine 2000



KEVIN KING

is the President and Chief Technologist with Precision Solutions, Inc., a leader in technology solutions, support, and training. He is also the author of SB+ Solutions, an enthusiastic private pilot, and Christian guitarist and producer — as time allows.



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Reporting and Business Intelligence Tools:

Viságe.BIT

Next in our series on Reporting and Business Intelligence tools available to the MultiValue market, we explore the capabilities of Viságe.BIT with Ross Ferris, Managing Director of the Australian-based vendor, Stamina Software Pty Ltd.

SPECTRUM: *What is it that Viságe.BIT brings to the table?*

ROSS: Viságe.BIT is essentially a billion answers waiting for a question.

SPECTRUM: *What sort of question?*

ROSS: With your traditional query, you have a specific goal in mind, like “show me the sales for the past week.” So, you write that query, wait, and get a response. If you then want to look at the prior week’s or month’s sales, or break sales up by salesman, customer categories, product categories, you have to re-form your query, wait for an answer, and then move on.

Viságe.BIT operates more as an information exploration tool. It already has all of the “answers” extracted.

SPECTRUM: *How does Visage.BIT know what to extract if I haven’t asked the questions yet?*

ROSS: The things that you would normally include in your report — like “salesman” and “product code & description” — the things that you either include or do a BREAK-ON in an Access statement are what we call a “dimension.” The things that you would normally do a TOTAL

on are “facts” — like a sales quantity, cost, or sale value.

The resulting presentation is similar to Excel on steroids. If a user wanted to see average sale value, he could put a formula in to divide sales amount by sales quantity. Your interaction with the BIT cube is graphical: drag and drop. If you want to drill down to see some more information, you just drop the dimension (how you want to slice and dice your data) into the view, and presto, you have a new answer.

One of the real strengths of Viságe.BIT is that you don’t have to pre-define these drill down paths. Any and all combinations of dimensions are equally valid, and the answer is delivered instantly.

SPECTRUM: *Can you give a concrete example?*

ROSS: If you had a query like:

```
SORT SALES BY DATE BY CUSTOMER BY
PRODUCT WITH DATE >= "1/1/08" AND DATE
<="03/31/08" BREAK-ON CUSTOMER BREAK-
ON PRODUCT.DEPARTMENT TOTAL SALES.QTY
TOTAL SALES.VALUE TOTAL PROFIT DET-SUPP
```

The dimensions for my answer would be the customer and product department. The date plays an active part in WHAT I see - but doesn’t become part of my view, unless I also did a BREAK-ON

DATE, so it is an invisible dimension. SALES.QTY, SALES.VALUE, and PROF.IT are all facts.

SPECTRUM: *So, with Visage.BIT, all that information, across all dates in my data is already in the cube?*

ROSS: Rather than having to create a myriad queries, or front-end programs to prompt users for the variables that need to be included for individual queries, Visage.BIT takes every dimension that anyone has ever used when looking at sales, and every field that has ever been totaled (you can have up to 128 dimensions in a single cube, and 64 facts, so no practical limits here).

Cubes can be defined as a simple drag and drop exercise using a Visage screen, or they can be defined programmatically via an API. Most people end up opting for an API, because the build time is faster, and they can then

include fancy stuff that isn't easy to define with drag and drop, like "when I sell this range of products, also include details of preferred products that could have been substituted." This cube then becomes a powerful tool in the hands of a salesman, as it empowers him to be able to steer customers towards "better" products, and is also fantastic for negotiations with suppliers, as it allows you to very easily quantify an opportunity. Another important feature of Visage.BIT is that as well as being a server-based product, there is also a companion BITSolo product that can be loaded onto a notebook and used stand-alone in the field, which has proven to be a very effective tool for "road warriors"

SPECTRUM: *How long does it take to set all of that up?*

ROSS: Using the API, and the sample programs we provide (which actu-

ally includes an example like this), a few hours.

SPECTRUM: *And in that few hours I get BIT set up and have what I need for BITSolo?*

ROSS: Sure! The actual setup time for Visage.BIT itself is about five minutes, and that includes the base Visage product too. For VARs, this means that they can ship a standard cube build program with their application, and EVERY user can use the same cube. That means you can use it immediately.

SPECTRUM: *Can I get Visage.BIT even if I don't have Visage?*

ROSS: If you were using the drag and drop interface, you would then need to let Visage know which files you wanted people to be able to access — with the API, you can go straight to code and bypass this step.

Continues on page 26

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1	PD48VPC200-68794	\$399.00	1	\$399.00	102
Part Number: 68794 Update Delete					
Description: Ruggedized PicoDot. Convergent Laser.					
2	PD48VPELLP-W/3C	\$345.00	1	\$345.00	50
Part Number: 88528 Update Delete					
Description: Ruggedized PicoDot. Polarized Retro Laser.					
3		\$0.00		\$0.00	YES

REPORTING AND BUSINESS INTELLIGENCE TOOLS

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SPECTRUM: *And this is an actual, shipping product?*

ROSS: Sure! The majority of our Visage.BIT users, ranging in size from billion dollar pharmaceutical companies to small local distributors, still use green screens! Oh, and another great advantage of using the API is that you can then incorporate data from non-MultiValue sources. We have one client that consolidates information from two D3 databases, mvBase, an Oracle database, and a legacy FoxPro application. Also, users can save their own views, which are an amalgam of dimensional arrangements and filters (basically what they are looking at now, if they want to be able to do the same thing again quickly), and these can then be shared with other users of the same cube.

Year	Quarter	Hrs	Prod#	Qty	Sales	Cost	Hrs	Prod#	Qty	Sales
2008	1	2100								
2008	1	2100								
2008	1	2100								

FIGURE 1 - Visage.BIT from Stamina Software Pty LTD.

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SPECTRUM: *So it runs on more than one flavor?*

ROSS: Yes — but also the API makes it “database agnostic.” The main Viságe.BIT engine, which does all of the heavy lifting, runs as a service under Windows — this can be anything later than Windows XP, but typically is a Windows 2003 server. Likewise the Viságe.BIT viewer, either delivered via Web or BIT-Solo, is an ActiveX control, so the client needs to be Windows — though you can access using Mac or Linux desktops via terminal services. We typically take in data from external sources to keep life simple, but you could also write directly from any language. To “make things go,” we just have a simple XML descriptor file, and a collection of flat text files for the data. The API itself is accessed from MultiValue Basic — just a set of subroutines. The drag and drop engine requires a MultiValue back end as well.

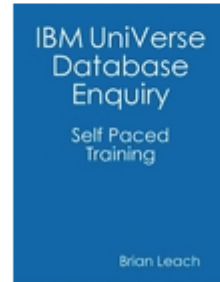
SPECTRUM: *How do we get our own Viságe.BIT?*

ROSS: You can play with a BIT cube online at <http://www.stamina.com.au/Visage/bit.htm>. There are also a number of one hour videos and tutorials available, and a “how to use” manual for download — and, of course, we can also schedule an interactive online demo using RDP connections into our test drive environment. If you need more traditional reporting, we have Viságe.ReportServer — very powerful, allows output to multiple file formats, fax, e-mail, PDF, Excel, HTML — heck, even a real printer, if push comes to shove.

The best bet for buying is to contact us and we can put you in touch with the appropriate people, like MVSolutions in New Zealand and Drexel Management in the USA. And, we are always looking for distributors and to partner with VARs looking to include Viságe.BIT as part of their application solution.

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TECH TIP SENT IN BY DAN WAGNER

Using the W Option to Scroll D3 AQL Reports

YOU CAN SCROLL the output of AQL verbs by adding the W option to your command. Its form is:

```
W{-}{number}
```

This displays the output of a LIST or SORT command in a full screen window, allowing the user to scroll backward, forward, left, and right through the report.

If a minus sign (-) displays after the W option, then a wide virtual display is used to display the output of the AQL sentence. The user can then scroll left and right a screen at a time, as well as up and down a screen at a time.

If a number is entered, that number of lines from the top of the first page are stored as the header, and are displayed on each page. This may cause confusion for reports that display the page number within the header.

The H option (HDR-SUPP) is automatically appended to any reports that do not include a heading sentence.

A short help screen is available while displaying the output to elaborate on the key-strokes.

Examples:

```
SORT VENDOR WITH YTD.PAID > "10,000.00" BY-DSND YTD.PAID  
→ VENDOR.NAME YTD.PAID PRIOR.YRPAID (W-2)
```

```
SORT CASHRECEIPTS WITH CUST.NO = "000221" BY DATE DATE  
→ TOTAL AMT.PAD (W)
```

```
SORT CUSTOMERS WITH YTD_SALES > "50,000.00" BY-DSND  
→ YTD_SALES CUST.NAME SALESMAN TOTAL YTD_SALES (W)
```

Of course, you can also use this option on report commands executed from a Basic program. I think you will find this extremely useful and easy to add to any application software. IS

DAN WAGNER can be reached at 800-466-4713 or dwagner200@yahoo.com. Do you have a Tech Tip to share? E-mail it to editor@intl-spectrum.com

REPORTING AND BUSINESS INTELLIGENCE TOOLS

Continued from page 27

SPECTRUM: *Any success stories to share?*

ROSS: Lots. Here's one: I have a locksmith supply client that within two hours of my arrival determined that: (a) when prompted to identify the top ten clients by profit, the sales manager only scored 50% and (b) the owner knew something didn't add up when overall sales were down, but profit was up. With Viságe.BIT, he found that a chain of locksmiths had started purchasing Lockwood locks from a competitor (low margin), and obviously felt bad, so started to buy other high margin product to make up for it. Result was sales down, profit up. And, they went and got the Lockwood business back that afternoon!

Another one: NILWA (National Independent Liquor Wholesalers Association) — Viságe.BIT is used to collect data from members around the country even though most members use an SQL database. Information is consolidated at Head Office, delivered back to members (individually) to enhance their internal reporting, and then sold back into the market to suppliers, and accessed via a web portal. The consolidated information is then used to track rebates, etc. They also run national promotions and such via cubes, with product point tallies accumulating.

Interesting fact: the liquor merchants typically make more money from selling the information of what was sold to whom, than they do from actually selling the product.

One more: A pharmaceutical company was in danger of losing a number of major client hospitals and health boards because of their inability to provide

useful information that could be easily processed. Viságe.BIT has turned this situation around, and not only have they maintained these clients, but because of the depth and quality of the information they now deliver to their customers (who also access their own private cubes via an Internet portal), they are gaining new business.

For more information about Viságe.BIT and BITSolo, call +61 02 49538050 or visit www.stamina.com.au. **IS**

CHARLES BAROUCH is the CTO for Key Ally, Inc. He is also Past President of the U2UG and a regular Spectrum Magazine contributor.

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Using UniVerse Indexes

PART 3

In the previous two issues, we discussed the need for indexes, the commands to create and build them, and performance considerations of the NO.NULLS option. This issue, let's start by talking about how UniVerse indexes treat multivalued fields.

Indexing on Multivalued Fields

UniVerse comes with two demo accounts, HS.SALES and HS.SERVICE. The HS.SALES account contains a file called CUSTOMER and contains some multivalued data field (fig. 1). In this listing we see a list of companies or, in the case of Fast Copy Center, retail stores. Each customer can have multiple copiers, or none. Notice that Central Hospital (ID 7) has two copies, an M2000 and a S2000. One of the Fast Copy Centers (ID 3) also has an M2000.

I created and built an index on the Product field (PRODID). The results are shown in figures 2 and 3. There are seven unique data values in this index. Using the F-pointer "trick" we talked about in the last issue, we can look at these as if they are regular records. (Again, if you use this trick on a live system and change data

directly in the indexes, you can cause locking problems and potential data loss. You've been warned twice now!)

If we use the editor to look at what has been indexed for models M2000 and S2000 (see figure 4), we see that Central Hospital (ID 7) appears in both indexes. Comparing this to the data listing in figure 1, this is what we would expect.

Indexing on I-types

There may be times when no field contains the exact data that we want to index on. An example might be that our CUSTOMER file has a field, PHONE, that contains the phone number, in this case with parentheses surrounding the area code. If we have a need to quickly select all of the customers within a particular area code, we can write an I-type descriptor to extract just the area code from the full phone number and then index on that I-type descriptor. The results of this is shown in figure 5.

When working in UniVerse, I prefer to use I-types for my derivations, even in a Pick-flavor account. However, there are those who may prefer to stick with the Pick-flavor A and S descriptors using correlatives to form the result. You can create indexes using these kinds of dictionary items as well.

Indexing on a Translate

Since the purpose of an I-descriptor is simply to return a value, you can index

CUSTOMER..	Company Name.....	Product	Serial#
9	Al Used Auto		
1	Better Beer, Inc.	M2000	501278
7	Central Hospital	M2000	501233
		S2000	101212
8	Copies, Inc.	M3000	700514
		S3000	201399
2	Fast Copy Center	C2000	600782
		M3000	700422
		S3000	101456
3	Fast Copy Center	M2000	501310
4	Fast Copy Center	C3000	800311
10	HGT Dental Center	M1000	203510
		M1000	203600
		C2000	600791
6	Lightning Computer Corp.		
5	Ocean State Fish Company	M1000	403485
		M1000	403723
12	Rustic Printers		

FIGURE 1 - Example customer file


```
>LIST.INDEX CUSTOMER ALL
Alternate Key Index Summary for file CUSTOMER
File..... CUSTOMER
Indices..... 1 (0 A-type, 0 C-type, 1 D-type, 0 I-type, 0 SQL, 0 S-type)
Index Updates.. Enabled, No updates pending

Index name      Type  Build  Nulls  In DICT  S/M  Just Unique  Field num/I-type
PRODID          D    Not Req'd  No     Yes     M   L     N     11
```

FIGURE 2 - Index on the Prodcut file

on anything an I-descriptor can produce. That includes calculations, the results of called subroutines, and yes, even the results of TRANS functions (or Pick-flavor T correlatives). There is a classic “gotcha” in doing this, however.

Consider this scenario. Say that you have a ORDER file that has the customer number, CUSTNO, in it. This is also the record ID to the CUSTOMER file. In the CUSTOMER file record there is a field called ZIPCODE that identifies the ZIP Code (postal code) for that customer. Perhaps you want to be able to quickly select all of the orders which were in a particular geographic area, and you chose to do it by ZIP Code. You create a dictionary item that translates from the ORDERS file to the CUSTOMER file and retrieves the ZIPCODE. Then you index on that. Seems to work just fine, doesn't it? Or does it?

Say that order 123 was sold to customer 37. Customer 37's record reports that they are in ZIP Code 92041. Thus, order 123 is indexed under 92041. But then (as actually happened), a new mail office is opened and some of the addresses in 92041 get reassigned to 91942. Someone goes into customer 37's record and changes the ZIP Code. That's fine, but what happens to the indexes on the ORDERS file? Nothing! There is no link between indexes on different files. The ORDERS file has no clue that something was changed in another file, and therefore doesn't update any of its indexes. Order 123 is still indexed as belonging to ZIP Code 92041. Oops!

```
UniVerse 10.2 PE
LIST ONLY CUSTOMER_PRODID_NDX
VOC.....

C2000
C3000
M1000
M2000
M3000
S2000
S3000

7 records listed.
```

FIGURE 3

Third Principle

We now state our third principle of using UniVerse Indexes:

“Do not index on a translate descriptor if the data it returns is subject to change, unless you remember that you will have to periodically rebuild that index.”

```
UniVerse 10.2 PE
>ED CUSTOMER_PRODID_NDX M2000 S2000

SELECTed record name = "M2000".
3 lines long.

-----: P
0001: 1
0002: 3
0003: 7
Bottom at line 3.
-----: N

SELECTed record name = "S2000".
1 lines long.

-----: P
0001: 7
Bottom at line 1.
-----: █
```

FIGURE 4

When good indexes go bad

UniVerse indexes are very stable. I rarely see problems with them. However, let's face it; indexes are data, too. Anything that can cause data loss can

Continues on page 42

```
UniVerse 10.2 PE
>LIST.INDEX CUSTOMER AREA_CODE
Alternate Key Index Summary for file CUSTOMER
File..... CUSTOMER
Indices..... 1 (0 A-type, 0 C-type, 0 D-type, 1 I-type, 0 SQL, 0 S-type)
Index Updates.. Enabled, No updates pending

Index name      Type  Build  Nulls  In DICT  S/M  Just Unique  Field num/I-type
AREA_CODE       I    Not Req'd  No     Yes     S   R     N     FIELD(FIELD(PHON
E, "(" , 2), ")",
1)

>ED DICT CUSTOMER AREA_CODE
This is a Type "I" Descriptor last compiled on 05/05/08 at 18:01.
20 lines long.

-----: P6
0001: I
0002: FIELD(FIELD(PHONE, "(" , 2), ")", 1)
0003:
0004:
0005: 3R
0006: S
-----: █
```

FIGURE 5 - Results of an index on an I-type descriptor extracting area code

Controlling the Development Tools in a Developer Class Copy of OpenInsight

As of OpenInsight release 7.2.1, Revelation Software has offered a development class option for deployments. Where the runtime class did not allow users (either by license or by configuration) to make use of some development tools such as the form designer, compiler, or dictionary builder, the development class engine has no such limitations. Users running development class engines have access to all of these tools. However, there are instances where a system developer will not want those tools available to the users. Luckily, OpenInsight already contains the capabilities to allow the developer to restrict components.

NOT in the SYSPROG Application

First, a very strong warning: the changes that will be discussed in this article should never be applied to the SYSPROG account. As in all MultiValue-based systems, the SYSPROG account or application is a special System Programmer account — the equivalent of Windows Administrator user, or a Linux or UNIX root user.

Changes that are made in this application, whether correctly or incorrectly applied may cause OpenInsight to stop working correctly. Imagine a situation where you may actually disable all the development tools for every user in every application — you could possibly do this by selecting the wrong settings. I'm not trying to scare you, dear reader, but I remind you to be careful.

One note before continuing: in OpenInsight, we refer to a collection of logically related entities and data as an Application; most of the MultiValue world refers to this collection as an Account. For the purposes of this article, we will use the two terms interchangeably.

It's the Repository, again!

As has been discussed before, OpenInsight has an underlying system of tables, indexes, and relationships called the Repository. The Repository maintains information about all items created within an OpenInsight application: the forms, the form executables, pop-ups, stored procedures, stored procedure executables, even dictionary items, if that option is set for a particular application.

The Repository maintains a relationship between these entities, both a uses relationship (as in the BOOKS form uses a BOOKS pop-up) and a used-by relationship (as in the CUSTOMERS dictionary item CUSTOMER_NAME is used by the CUSTOMER monthly report). The Repository also regulates access to entities in an application.

Taking the next logical step, it is possible to use the Repository setting to limit user access to specific entities in an application, including the development tools. First, let's discuss a way to limit access based upon user access levels and then we'll delve into a few solutions using the Repository.

User Access Level

When creating a new user in an application, a user can be set up as a user, an administrator, or a system administrator, as seen in figure 1. When a new user is set up with user-level access, that new user does not get access to the Application Manager. The Application Manager is the default developer's access point to an OpenInsight application, with access to all of the development tools. So, if your application doesn't allow access to the development tools or TCL, the users should be prevented from easy access to the development tools within OpenInsight.

Stop Sharing with Other Applications

Perhaps another more draconian step in restricting use of tools in an OpenInsight application is to stop sharing the development tools between applications. For example, the Table Builder screens (TB_MAIN, TB_CHILD, etc) are written in the SYSPROG account, but can be used by every other application. This is possible because of a setting in the Repository that indicates that a particular entity can be shared with other applications.

By turning this setting on and off from the SYSPROG application (violating the warning made earlier in this article), a development tool can be excluded from an entire application. For example, the entity name for the Table Builder is an OpenInsight form executable named TB_MAIN. Suppose we want to stop sharing that window with any other application. The following steps will accomplish that task.

First, open the SYSPROG application; expand the Repository list to view OpenInsight components, OpenInsight Executables; and finally open the OpenInsight Form Executables (fig. 2). You are presented with a list of all OpenInsight windows. Scroll down the list until the TB_MAIN entity is visible, and click on it. It should become highlighted (fig. 3).

Continues on page 34

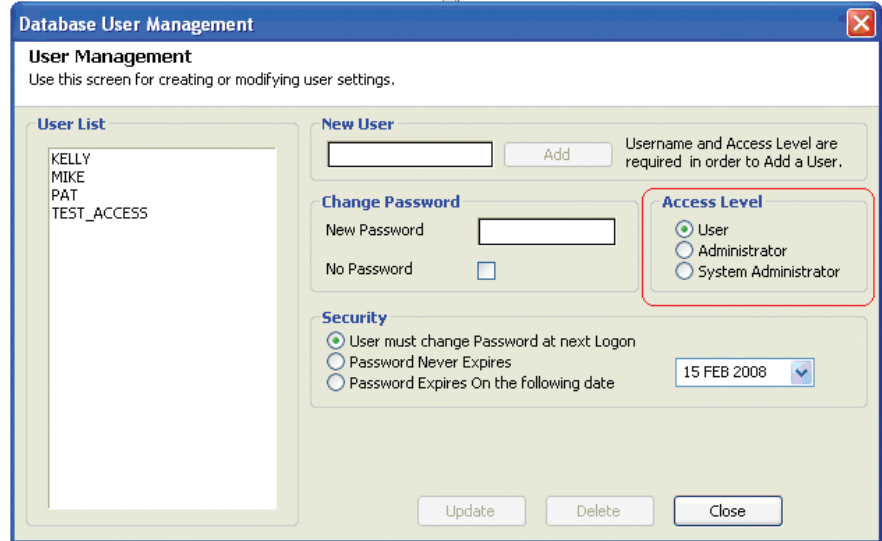


FIGURE 1 - The user access levels, circled in red

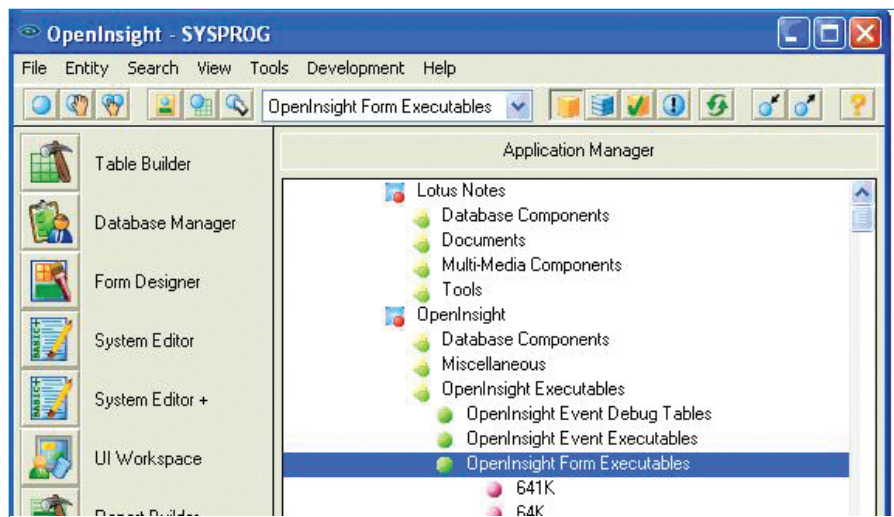


FIGURE 2 - The OpenInsight Form Executables in the Repository Viewer

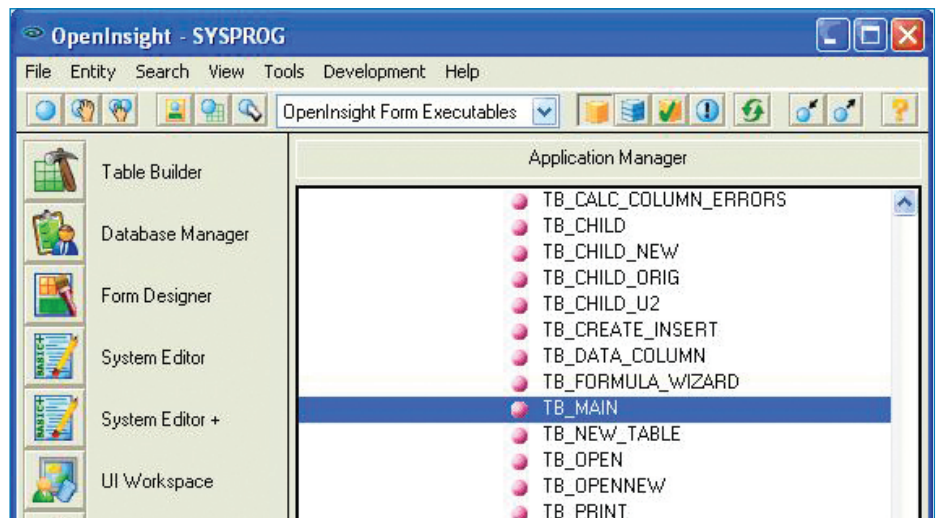


FIGURE 3 - The highlighted TB_MAIN OpenInsight Form Executable

CONTROLLING DEVELOPMENT TOOLS... *Continued from page 33*

Once the entity is highlighted, either press the key combination of Alt-F1 or choose Entity-Properties from the Ap-

plication Manager menu (fig. 4). Once the menu choice has been chosen or the key combination has been pressed, the properties screen will appear (fig. 5).

The properties screen contains a lot of information, most of which is out

of the scope of this article. (Click on the Help button for more information about the capabilities of this screen.) For the purposes of this particular solution, we only care about the Shareable checkbox. When this box is checked, it means that applications that inherit from the SYSPROG application (which means all applications) can make use of this form. When the box is unchecked, only the SYSPROG application can access this form.

Once we've cleared the box and clicked on the OK button, we can still access the TB_MAIN window from the SYSPROG application, but when we try to use the form from any other application we get an error, as seen in figure 6.

Limit User Access

The method described above is a bit extreme as it allows none of the users in an application, including the application author, to use the entity whose sharing was turned off. A more palatable solution is to limit particular Access and Update privileges on a user level.

First, make sure that you are logged into the application in which you want to limit access to the development tools. (For the purposes of this description, we will be using an application named Test_Access.) Next, following the steps described above, highlight the entity whose access you want to limit and get to the Entity Properties screen. However, this time, instead of selecting or clearing the Shareable check box, click on the Update Permit button. A screen similar to the one shown in figure 7 will appear.

The Entity Update Permission screen (fig. 7) contains two lists of users: one, those who are permitted to update and use the Entity and, two, a list of all database users in the application. The Update Permit of \$PUBLIC indicates that all the database users (Mike, Pat, Kelly, and Test_Access) are allowed to use and update the entity in question, which in this case is the TB_MAIN screen.

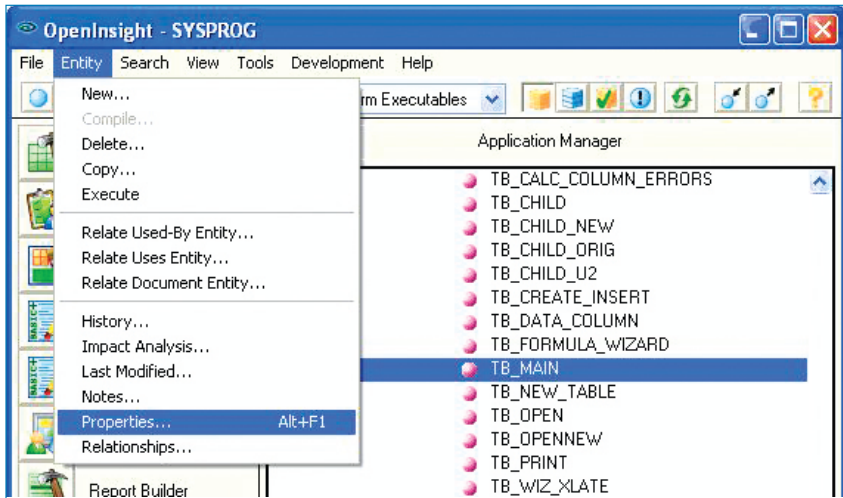


FIGURE 4 - Choosing the Entity-Properties menu choice

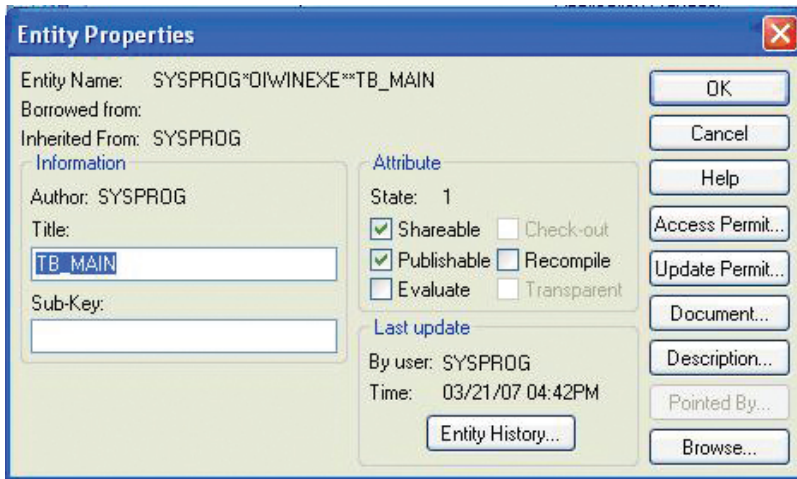



FIGURE 5 - Entity Properties screen for the TB_MAIN Form Executable



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Given that we only want user Mike to have access to the entity, the following steps will accomplish that for us. First, click on the \$PUBLIC to highlight it, and then click on the Remove button. The Update Permit list will then be blank (fig. 8).

Now, we want to add the Mike user to the Update Permit list. Simply click on the database user Mike, and then click on the Add button.

As figure 9 shows, the Mike user now is the only user in the application who can use or update the TB_MAIN screen. In fact, if we log into the TEST_ACCESS application user as anyone other than Mike, we will not see the TB_MAIN screen in the list of application entities as it appears in figure 3. If a user tries to get around the Application Manager and tries instead to execute the window from TCL or from the System Monitor, they'll see an error similar to that in figure 10.

As some sharp-eyed readers have probably noticed, the Entity Property window has a button labeled Access Permit. One would think that this is where the access permissions would be set, but that is not the case. Suffice it to say that the Update Permit is what should be used in non-SYSPROG accounts.

Wrapping it all up

As can be seen by the above, there are multiple ways to limit access of System Tools by users in a development class engine environment. In fact, there are more than those listed above, but these techniques make good use of tools already provided and in place in OpenInsight.

Your mileage will vary, and you can decide which users get access to which tools without having to write your own code. The hardest part you encounter will probably be deciding what should be limited. And if it is, we've done our jobs here at Revelation Software well — letting you concentrate on your business, while we make the system design and implementation as easy as it can be. **IS**

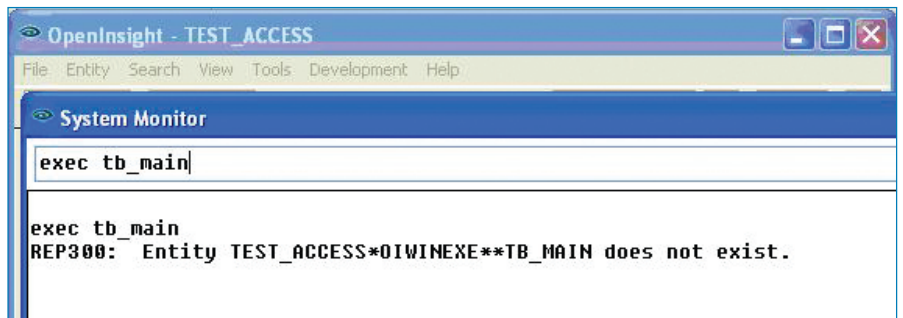


FIGURE 6 - Error received when sharing was turned off

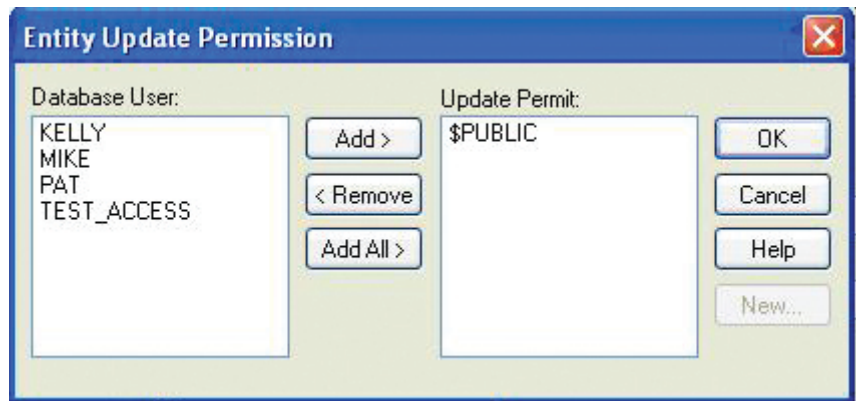


FIGURE 7 - The Entity Update Permission window

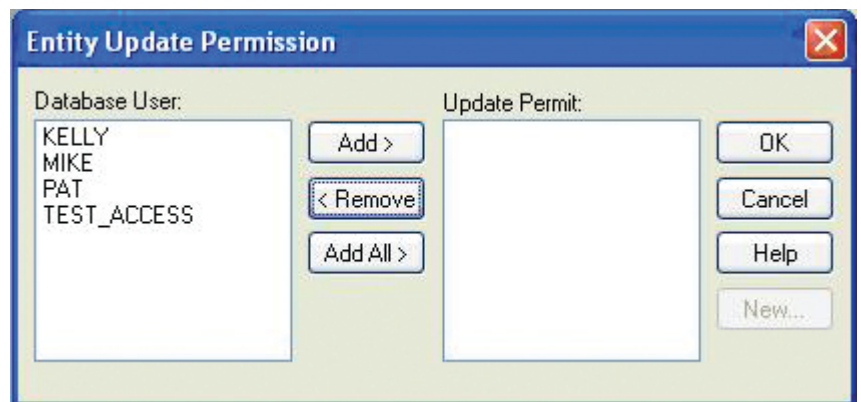


FIGURE 8 - After removing the \$PUBLIC user from the Update Permit list

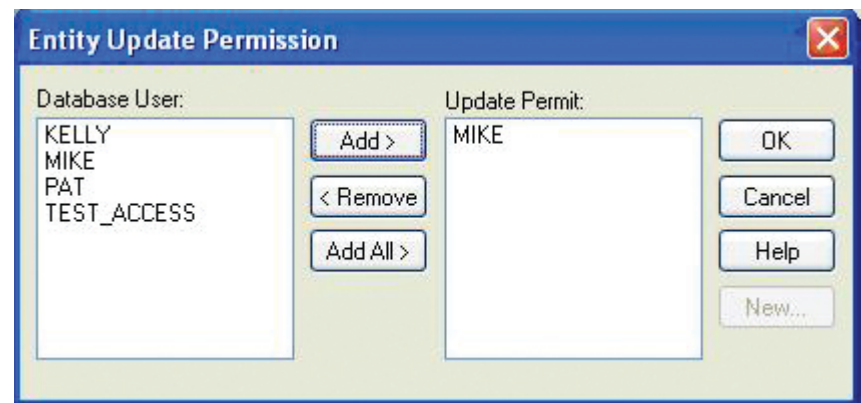


FIGURE 9 - The MIKE user is the only user with Update permissions.

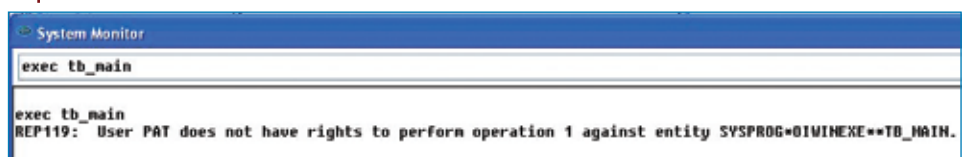


FIGURE 10 - Error message received when access is limited

Why Programmers Should Plan

PART 2

We've already talked about getting others involved in the planning and re-planning of your project. Now we have to look at the steps needed to turn business planning into technical planning.

When you build a house, you consult non-builders on things like the number of stories. Those answers imply technical answers about how solid the foundation has to be, even though you never asked about the foundation. In all technical fields, certain A information implies certain B information. So, while my customer didn't tell me to program in Delphi instead of PHP, I know the strengths of each language I use and I can make a best choice analysis from the facts I have been provided.

```

SUBROUTINE Billing.Correction(Phase, Params, HTML, Status)
* by Walt Aमित
* on 04/01/08
* *****
* This program is designed to allow
* for adjustments up until the bill
* is printed.
* *****
* Initialize
* If Phase=new:
* --Paint Screen (Web Page)
* If Phase=check:
* --Evaluate Params
* --Send back errors in Status
* --Send back errors in HTML
* --If no errors, send user to next page
RETURN ;* Logical End of Program
*
* Start of Subroutines
*
END ;* Physical End of Program

```

FIGURE 1 .

Likewise, in a MultiValue project, I should be able to select the right tools for the job at hand. That might mean introducing a 4GL, a reporting tool, or other existing technologies. It might mean leveraging the tools which the company already owns. It might mean redesigning database files. Moving from the business level specification to the technical specification requires you to have more than one skill, so that the choices are derived from the best course of action instead from the limits of the team.

Let's use a practical example and see where it takes us. Walt has a client with a billing system that was designed for a small medical practice. The client has a small medical practice, but they've elected to start a clinic and they don't want to abandon the system they have; they want to expand on it.

So, following the practices we outlined last issue, Walt meets with all the interested parties, sends out his straw men, and reaches a consensus.

Since the practice uses a 4GL already, he's going to do the project with those tools. Since the 4GL uses the Web as an interface, Walt uses his business plan to convince the client to hire a web designer to make the pages look right and flow smoothly. Now, he has to make

the leap from business plan to technical plan, and layout the project.

Architect-Ive

Walt starts his technical plan by reviewing the existing database architecture. He wants to make the project work smoothly with the existing billing system, so he needs to understand the relationship between the fields and files. This will allow him to selectively add fields and possibly files to the layout without duplication or conflict.

Pseudo-Coder

Next, Walt needs to rough draft the programs and flow. Wisely, he throws out every hint or suggestion that uses a flow chart. What? Yes, Walt knows that flowcharts are useful in explaining technical matters to non-techs. He may actually design the charts — or some of the charts — after the project is complete. He won't use them in the design process because flowcharts have a fatal flaw. They take up more room than almost any other way of describing a process. As a result, you have to either pin them to a wall and walk back and forth, or page through them, or print them so small as to make them barely readable. None of these options make them easy to keep in your head.

A much better alternative, the one Walt chooses, is to pseudo-code. He writes a series of programs that look like figure 1.

This gives him a very compact way of looking at the program flow. Unlike a flowchart, it fits on one page. Unlike a flowchart, he can stick code between the lines, which turns these comments into internal documentation. Unlike a flowchart, if he strays from the design, the comments are right there to remind him that he is changing things, so he can decide to keep to the original plan, or have a clue that he needs to amend the downstream code to reflect that he has chosen to intentionally stray from the design.

As he moves forward, his code moves with him, as you can see in figure 2. He

adds some additional pseudo-code as he goes, but the only real code he adds at this point is branching code (GOSUB, CASE, IF, etc.). He does this because getting the skeleton right is easier before the working code is installed.

Oddly, many non-programmers can read a program that is just comments and branches. So, pseudo-code can be superior to the flowchart in this way as well.

The middle ground between the pseudo-code and the business spec is called the "use case." It is a method for making software more robust by setting up a series of "what if this happens" write ups:

- What if the customer wants to split the bill between two credit cards?
- What if the customer wants to pay in installments?
- What if the check bounces?

When a business person thinks in use cases, reading CASE statements becomes almost natural to them.

Rad Catcher

Since the client is using a 4GL, Walt might have another starting point besides pseudo-code. He could consider RAD (Rapid Application Development). While RAD is possible without a 4GL or an object-oriented language, it is much easier with one of these tools. One of the biggest problems in completing software projects lies in designing interfaces which make sense to the people who will be using the project. The idea behind RAD is that designing the screens rapidly can save huge amounts of time and effort.

Where pseudo-code is primarily about the process, RAD is primarily about the visual elements. So, Walt can start by putting together a quick entry screen

Continues on page 38

```
SUBROUTINE Billing.Correction(Phase, Params, HTML, Status)
* by Walt Aमित
* on 04/01/08
* *****
* This program is designed to allow
* for adjustments up until the bill
* is printed.
* *****
* Initialize
GOSUB INIT
*
BEGIN CASE
  CASE Phase = "N"
    * If Phase=new:
    * --Paint Screen (Web Page)
  CASE Phase = "C"
    * If Phase=check:
    * --Evaluate Params
    * --Send back errors in Status
    * --Send back errors in HTML
    * --If no errors, send user to next page
  CASE 1
    * Error in Phase, only "N"ew and "C"heck
    * Are supported
END CASE
RETURN ;* Logical End of Program
*
* Start of Subroutines
*
INIT:
* TBD - Add Initialization Code
RETURN
*
END ;* Physical End of Program
```

FIGURE 2

Why Programmers Should Plan

Continued from page 38

and treat it just like he treated his other straw men.

“Sally, have a look at this page for the billing entry. Let me know what options you need that I’ve left out.”

This allows us to get the comments, complaints, and compliments before the code is finished. Personally, I’d be willing to jump through a lot of hoops to avoid having to do fundamental redesign on projects that are already having birthdays. RAD doesn’t require a lot of hoops, but it does dramatically reduce the amount of late-phase redesign.

RAD extends the amount of time during which the business professionals can actively contribute to the design and implementation of the project. Most 4GLs allow you to create working screens (with little or no validation) in a few minutes. Walt elects to do both

RAD and pseudo-code, so that he develops the engine at the same time as he builds up the screens. Since both techniques allow you to make mistakes and redesign quickly, he isn’t trapped by any of the decisions he makes early on and can learn from his peers on the non-technical side.

- When Walt is done building a usable version of the software, he has achieved several important goals:
- Walt’s client knows why he has made the choices he has.
- The client has an emotional stake in the success of the project.
- The project has a high chance of meeting the real needs.
- The skills he has applied make him more valuable on future projects.
- Walt now has friends and allies at the client. People trust that he can listen and deliver.

- Because he has included them in the design cycle, the perceived time between the end of the spec and the release of working code is shorter.

If the next project uses a different 4GL, a different database, or serves a different business need, Walt is still a strong candidate because he can do the analytics even in a situation where he can’t do the coding. It seems that project planning not only increases the chance of success but it also improves your reputation. **IS**



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Thursday- Day 4

Continued from page 10

Thursday morning started with breakfast in the Exhibit Hall and additional time for attendees to connect with the vendors. The Exhibit Hall was more relaxed and gave attendees time to talk in-depth with vendors and to work in a few more demos or discussions.

The afternoon brought another four hours of education, with session topics ranging from .NET, refactoring, interfacing e-mail with your database, SOA, optimizing legacy systems, and browser enabling applications.

The conference wrapped up on Thursday evening with a buffet style gourmet dinner on the patio and a rousing casino night party. While some attendees opted for a game of poker over dinner, others enjoyed the beautiful Southern California evening out on the patio with dinner, drinks, and colleagues, before coming in to play at the tables. Throughout the evening, raffle prize winners were announced, and at the end, the players with chips left over were entered into a drawing for more prizes.

Now that this year's Conference is over, plans are in the works for the 2009 Conference, scheduled for March 23rd — March 26th in Denver, Colorado. Rumor has it a few of this year's attendees are already planning ski trips to coincide with next year's conference. Now that's mixing business with pleasure. See you next year! **IS**

SHANNON STOLTZ is an IT communication consultant, trainer, and freelance writer. With over 15 years in the IT industry, Shannon has cultivated a customer-centric focus through a variety of roles including training, project management, software installations, technical writing, governance, business analysis, public relations, and copywriting. She resides in Texas with her husband (a programmer) and four kids. Shannon can be contacted at shannon@shannonstoltz.com.



Understanding the Real Benefits of *Ajax Technology*

Sometimes I get things wrong and assume that people understand the benefits of certain technologies. Almost thirteen years ago, I started writing and talking about the Web at Spectrum, and I might as well have been describing theories of interest rates, bond prices, and arbitrage regulations. It took a few talks and articles to get folks to understand that there was a place for the technology at the MultiValue business table.

Likewise, in past issues, I gave some technical information regarding Ajax, but I think some folks have since forgotten, misunderstood, or decided to act coy about it all. I thought it best, therefore, to make sure we all understand what Ajax is all about.

After all, there's a never ending stream of hype about Ajax web applications; you may be assuming that Ajax is some incredible new plug-in or programming language. I got an e-mail that suggested that the reader was under the impression that Ajax was not possible because the browser wasn't able to download the Ajax plug-in.

So, as a reminder, you don't need to do anything particularly special. You can use Ajax right now. Of course, I'm assuming you have a web browser released in the past five years: Internet Explorer, Firefox, Safari, Netscape, or Opera. If you've used Google Maps or Gmail, then you've used Ajax applications.

These applications vastly improve the richness of web applications. A well written Ajax application changes in real time; you won't be forced to wait for a page to reload anytime you

click on something. You can actually drag boxes around; the pages can refresh themselves with new data or images; pages can be re-formatted without re-downloading. And again, no special browser or browser plug-in is required. Ajax is merely a programming technique that milks all the features of today's browsers to generate something that feels less webby and more Windowsy.

What Can Ajax Do?

- **No Waiting for the Edit Checks:** Traditional web pages ask you to submit a form, wait a few seconds, grab a cup of coffee, watch the browser draw the page component by component, and then add whatever information was needed. Were you on a shopping cart page but forgot to enter the area code in a phone number? You'll have to start all over again. It's an electronic version of lather, rinse, and repeat.
- **I can't even imagine how many e-commerce sales have been lost because the shopper encountered one too many error messages and gave up.** Ajax removes the wait. The page does not reload; the browser responds with its edit checks as you go about your business.
- **Pages Update in Real Time:** Ajax-enabled pages update themselves in real time. Many news pages, including Yahoo for example, redraw the entire page at certain time intervals, such as every 10 minutes. In contrast, a browser using Ajax techniques will poll the web server every few seconds in the background, so it's able to update any — and only — information that needs changing. The rest of the page does not change, flicker, or move.
- **Interactive Graphics:** The Web is laden with Flash, but the interaction itself is basically mainframe-like data entry systems. Ajax techniques transition us into the world of GUI controls. You might see animations like dissolving text that tell you something's being saved. You can drag items around the page. You can see static text become editable fields when you move your mouse over it.

What Ajax Isn't

- A plug-in: Ajax applications do not use special browser plug-ins or other types of additional software.
- Browser-specific: Just use a browser from this millennium and your Ajax web page should work.
- Proprietary: "Ajax" might be a common name in the pantheon of household marvels, but when it comes to the web, Ajax is not a company, a product, or a mythological figure. It's not even the name of a standard or international Internet committee. It's a programming technique that blends the benefits of several technologies.

Why Does Ajax Seem So New?

The term Ajax was coined only in 2005. The approach has been there for a long time. But until it was given a name, it was tough to encourage the use of some nameless programming technique. Ajax is pretty much just geek lingo. It stands for Asynchronous JavaScript and XMLHttpRequest (with blue dots of DHTML and DOM, I suppose). So, we're talking about stuff that's been around: Javascript and DHTML, to let applications respond to mouse clicks and other events; DOM, so that web applications manipulate the graphics and display; and XMLHttpRequest, so that the browser and the web server can communicate without having to refresh the page.

Why We Need Ajax

- Web not Windows: The Web isn't just static pages anymore. People are using web pages instead of Windows programs to do most of their work. Ajax can be thought of as WWW 3.0.
- Frustration: The point-and-click-and-wait web page stinks. People expect better.
- Multiple Desktops: People use more than one computer, so any applications that license and limit to only one location simply won't succeed. Ajax helps deliver powerful features without having to install software over and over.
- G & M technology: Google and Microsoft are using it, so we might as well accept that Ajax will be around a while.

The Drawbacks of Ajax

- Limitations: Ajax is a blend of several technologies, but not all technologies. It doesn't do much of anything for multimedia, data storage, printing, printers, speakers, or webcams.
- Fast but not instantaneous: The data and edit checks still need to be processed by the web server, a possible back-

end server and the broadband connection. You'll find a vast improvement in interactive timeliness, but Ajax is no magical solution to a lousy web connection or database server.

- Internet is needed: If you're trying to use a PC without the Internet, you won't be able to use Ajax.
- JavaScript reborn: Serious Ajax applications require strong proficiency in JavaScript, in addition to the other languages that are needed on the back-end.
- Spaghetti Code: You think it's easy to get into spaghetti code with BASIC? Imagine the potential when you blend multiple technologies such as Ajax. Coder beware!
- Hacker possibilities: In past articles I've described some of the inherent risks of poorly constructed JavaScript and Ajax code. Recent articles in the popular press have shown that hackers are hijacking Ajax at some sites and creating havoc. Preparedness is always needed.

What's Actually Happening

Ajax processing seems more akin to traditional GUI programs than traditional web pages. The JavaScript monitors events and manipulates objects when defined events occur. The manipulation may head back to the web server and perhaps a database server. Interestingly, the interaction is asynchronous, as the event-listening is handled separately from the event-processing.

Here's a typical Ajax transaction flow within the browser:

- Page Hit: Page gets requested in a link or URL.

Continues on page 45

**Ajax is merely
a programming technique
that milks all the features
of today's browsers
to generate something
that feels less webby
and more Windowsy.**

Using UniVerse Indexes, Part 2

Continued from page 31

cause inaccurate indexes. Take a look at figure 6. The first report shows only two customers have copier model M2000. But one of your users is insist-

ing that Central Hospital also has one. The selection criteria is simple enough, but since PRODID has an index, the index is used automatically. You can

override this by adding the option NO.INDEX to your statement, which in the second report demonstrates that, in fact, the index is not in step with the data. (Somebody may have ignored our warnings about monkeying with indexes directly <ahem>.)

Summary

I think you can see the value in using indexes on UniVerse files. But as with any powerful tool, care must be taken not to inadvertently misuse it, thereby hurting overall system performance rather than increasing performance of key parts of the application.

For those of you who would like to explore

```
UniVerse 10.2 PE
>SORT CUSTOMER WITH PRODID = "M2000" EXAMPLE
SORT CUSTOMER WITH PRODID = "M2000" EXAMPLE 07:08:21pm 06 May 2008 PAGE 1
CUSTOMER.. Company Name..... Product Serial#
1 Better Beer, Inc. M2000 501278
3 Fast Copy Center M2000 501310
2 records listed.
>
>SORT CUSTOMER WITH PRODID = "M2000" EXAMPLE NO.INDEX
SORT CUSTOMER WITH PRODID = "M2000" EXAMPLE NO.INDEX 07:08:52pm 06 May 2008 P
AGE 1
CUSTOMER.. Company Name..... Product Serial#
1 Better Beer, Inc. M2000 501278
7 Central Hospital M2000 501233
3 Fast Copy Center S2000 101212
M2000 501310
3 records listed.
>
```

FIGURE 6 - Using the NO.INDEX option

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using the b-trees of indexes directly from Basic, check out the BCAN statement in the UniVerse Basic Reference manual. IS

CLIFTON OLIVER brings over three decades of in-depth experience to his work in the information industry. His expertise includes project management and facilitation, technology management, application development, data warehousing, and strategic planning for information services. In addition to being a Certified Computer Professional, he is also well known as an instructor, speaker, and author for both technical and managerial audiences. As a result of his experience, he is well suited to help his clients identify, evaluate, and implement effective solutions for a variety of problems and opportunities.

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Reporting & BI: What's Right for You?

Continued from page 15

Operational BI

Operational BI has literally become the new face of BI. Management is becoming increasingly obsessed with quickly gaining information about what is going on. Operational BI often tracks mission critical operational processes. And the information you have is automatically displayed and refreshed every day, hour, or minute. The emphasis is on monitoring more than analysis or collaboration.

Operational BI normally uses thermometers, speedometers, charts, and graphs to visualize a company's key performance indicators (KPIs) and displays the information on a dashboard (fig. 3). Visualization of the summarized data has become popular since the user can see at a glance the current status of any and all areas of the company at the same time.

Operational BI has taken on a new face as well, giving the user an easy way to drill down and through the data underlying the visualization. Here, we are starting to see a real blurring of the lines between tactical and operational BI.

Strategic BI

Strategic BI may adapt versions of the tools we talked about earlier, but uses them from a different perspective. Strategic BI is more concerned with looking at the company from a collaborative perspective vs. an analysis or monitor-

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ing viewpoint. The users normally have data that is updated every week, month, or quarter, and are interested in whether a new policy or direction is implemented effectively by the different departments within the organization.

For example, if a new pricing model is applied to a particular product type, are marketing, sales, and manufacturing talking and what is the holistic effect on the company? Did the decision lead to more sales with lower expenses as predicted or did it lead to chaos in the company and with the customers? Strategic BI looks at the health of the total organization.

Making a Decision

We have talked about different types of reporting: spreadmarts, ad hoc reporting, and the three different types of business intelligence solutions. They all have a place in your organization (fig. 4).

You may find there are times you need to quickly create a custom detailed report and have an ongoing need to analyze the data and trends of your customers, salespeople, and products. You may have requirements for all of the above. Whatever your decision, I would recommend you look at all your options before committing your precious budget dollars. **IS**



LARRY CHRISTENSEN is the President of C-7 Reporting Solutions, LLC and has been involved in the MultiValue community since 1982 with emphasis in reporting and business intelligence for the past six years. Any questions or comments may be directed to Larry at larryc@c-7reporting.com or (909) 349-1736.

Webonomics

Continued from page 41

- Initialization: The page loads. Objects are initialized and possible event loops are started.
- Event Loop:
 - An event occurs on the browser, such as a key press or mouse movement
 - The event is sent to one of the browser's objects, that in turn sends a request to the web server
 - The web server processes the event (with a possible run to a database server)
 - The web server replies to the calling object
 - The object takes the reply and updates variables and calls functions, based on the initial request.

So that's it. Ajax isn't anything more than a combination of different tools with solid programming techniques. It's slick and clever, but more importantly it's vastly usable in many of our MultiValue forms. In future articles, I'll return to the technical aspects of Ajax and see how it makes your forms that much more user-friendly. **IS**



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Clif Notes

Continued from page 46

The names, addresses, phone numbers, and other personal data of six million Chilean citizens were posted on the Internet by a hacker who gleaned the information from sites of the government-owned telephone company.

In what appears to be a violation of its own privacy laws, the Italian government posted the tax details of every one of their citizens on a web site and made the information available to everyone.

A couple of years ago, I was one of thousands of people who received a letter from the US Veterans Affairs department informing us a laptop computer containing our confidential information had been stolen. So sorry. Don't forget to monitor your credit reports. Have a nice day. So it's an Internet Jungle out there. And it recapitulates a lot of the Real World.

Al Gore tried to claim he helped invent the Internet Superhighway. We geeks laughed at him, not just for his claim, but for terminology. Senator Ted Stevens claimed the Internet was a bunch of tubes. We laughed at him, too.

It is more like a mass transit system. You get on it, and you are already in danger. But if you know how to act, you know what stops are in areas you absolutely must not get off the train, and if you are very, very careful, you can get to the nice places you want to visit. But you take your chances. The more aware you are, the better your chance of getting from point A to point B. But watch out for the pickpocket, the sex pervert, or the undercover cop sitting next to you.

It turns out that the Internet is not a bunch of tubes; it is more like a bunch of rat-infested, dangerous subway tunnels.

It gives me the Willards just logging on somedays. **IS**

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NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____ FAX _____

E-MAIL _____ WEB SITE _____

SIGNATURE _____ DATE _____

(All questions must be answered. Incomplete forms will not be processed. Complimentary subscriptions are limited to U.S. addresses.)

1. What is your job function/title?

- | | |
|---|---|
| <input type="checkbox"/> Principal/Owner | <input type="checkbox"/> Sales/Marketing |
| <input type="checkbox"/> President/GM/CEO | <input type="checkbox"/> Programmer/Analyst |
| <input type="checkbox"/> MIS/DP Manager | <input type="checkbox"/> Purchasing |
| <input type="checkbox"/> Controller/Financial | <input type="checkbox"/> Consultant |
| <input type="checkbox"/> VP/Department Head | <input type="checkbox"/> Other _____ |

2. Is your company a (check one):

- | | | |
|---|---|---|
| <input type="checkbox"/> Computer System Supplier | <input type="checkbox"/> Dealer/OEM/VAR | <input type="checkbox"/> Software House |
| <input type="checkbox"/> Consultant | <input type="checkbox"/> End User | <input type="checkbox"/> Other _____ |

3. What MultiValue Databases does your company use? (check all that apply)

- | | | | |
|--------------------------------|--|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> D3 | <input type="checkbox"/> Native MultiValue | <input type="checkbox"/> Reality | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> jBASE | <input type="checkbox"/> uniData | <input type="checkbox"/> UniVerse | <input type="checkbox"/> uniVision |

5. What major business/industry most clearly describes your company?

- | | | | |
|--|------------------------------------|---|---------------------------------|
| <input type="checkbox"/> Accounting | <input type="checkbox"/> Medical | <input type="checkbox"/> Direct Marketing | <input type="checkbox"/> Legal |
| <input type="checkbox"/> Banking/Finance | <input type="checkbox"/> Dental | <input type="checkbox"/> Construction | <input type="checkbox"/> Retail |
| <input type="checkbox"/> Education | <input type="checkbox"/> Insurance | <input type="checkbox"/> Other _____ | |

6. What are your firm's approximate gross annual sales?

- | | |
|---|--|
| <input type="checkbox"/> Under \$500,000 | <input type="checkbox"/> \$500,000 - \$1 million |
| <input type="checkbox"/> Over \$1 million - \$5 million | <input type="checkbox"/> Over \$5 million - \$10 million |
| <input type="checkbox"/> Over \$10 million - \$25 million | <input type="checkbox"/> Over \$25 million - \$100 million |
| <input type="checkbox"/> Over \$100 million - \$500 million | <input type="checkbox"/> Over \$500 million |

Clif Notes Continued from page 47

walking by; the hawker doesn't grab you and shove your head in the door. But a lot of these sites squat on misspellings of legitimate domains and then redirect your query. You want to go to mypoodlepops.com, accidentally type my.poodlepoops.com, and Bam! You have 64 porno pop-up windows open on your screen. This teaches you several things: 1) you really need to take a refresher course in touch-typing; 2) don't EVER let your kids surf the Net unsupervised—forget the filter programs, they are always behind the curve; and 3) there seem to be a lot of ugly people who want to take their clothes off.

Now, the big thing is phishing. For those of you reading this from your cave, phishing (fishing) is a spam technique that uses a form of social engineering to trick you into giving up private information by making you think you are talking to someone, some company, you actually have a trusted relationship with. You get an e-mail from Bank of America (or Commonwealth Bank of Australia, whatever) saying there has been suspicious activity on your account. It provides you with a link to "validate" your account information. Said link takes to you a page that looks exactly like your bank's home page, logos, links, and all. Unfortunately, had you or other victims had a browser that allows previewing a URL before clicking, you would have seen that you are not going to BankAmerica.com. You are flying off to bankuhmurika.com. You are about to give up private information to a con artist, just like the con artists that used to rip off your 90 year old grandma—but you've been had, and you are only 32, I mean, 29.

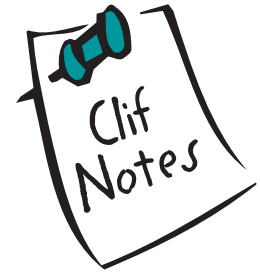
And, just like in every major city (and now, many of the smaller towns), even if you avoid all of these dangers, you still might be the victim of a drive-by attack. You don't even need to use the Internet to be affected by it. Sometimes it is even the people we trust with our defense who pop us.

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IS 03/08

The Internet Is Not Your Friend

BY CLIFTON OLIVER



The Internet used to be such a nice place.

You would come home after 10 to 14 hours of flogging old PROC code into submission, kick off your shoes, log into your provider on your 2400 baud modem, and download and read all six of your e-mails. Or, after a long week of getting ready to install a new set of hardware, you would browse some of your favorite Usenet groups dealing with your ham radio or Hummel collection hobbies, typing gingerly because of the blisters on your fingertips from having spent most of that week soldering pins 2, 3, and 7 into RS-232 connectors on the new patch panel. Occasionally, you might meet up with some friends on IRC to chitchat about whether or not the Pick system was going to slay ERP, the Evil Relational Pundits.

The whole thing was kind of like a laid-back coffee house. You would gather with a few like-minded friends, sit for a while, swap stories, wax philosophic, and in general, enjoy the company. Sure, every so often someone would get hot under the collar and start a flame war, not unlike the new coffee house singer screeching out Joan Baez songs with the amp turned up too loud, until the moderator/owner informed them this was more of a laid-back, Joni Mitchell type of place. And they would either settle down, calm down, and fit in, or pack their sound gear and move on.

Then, not unlike a small college town that suddenly finds itself the target of new development of low-cost, mass-market, rabbit warren apartment complexes, things went to hell, A-O-Hell in a lot of people's opinions. Suddenly, the great unwashed masses stormed the castle. The fairly sedate coffee houses gave way to dimly lit loser bars. Worse even, said rotgut ranches were usually situated in new strip malls. But the strip malls were not as bad as the influx of neighborhood strip clubs. As you

would expect from the history of human depravity, the criminal element—always on the lookout for a way to make a buck off of the naïve, desperate, or feeble-minded—soon followed.

It did not take long after Robert Morris's infamous worm for worms, trojans, viruses, and other assorted malware to become Big Business. Canter and Siegal sent the first commercial e-mail spam, setting the stage for what has now become a way of connected life. Internet spam is not only a disruptive, frequently offensive, unwanted consumer of the resources we pay for (effectively being theft), it has a negative effect on the economy due to the cost of fighting back the e-mail flood and the lost productivity. It is much worse than junk mail ever was. I used to partially heat my house by saving and burning junk mail; wish I could do that with spam mail. I could retire and live off of the proceeds of running a generator and selling power back to the public grid.

And then there are the porn sites. It's worse than a hawker trying to lure you off the sidewalk for a "free look." At least you have the option of just

Continues on page 46

“To get that information just type –

```
SORT CUSTOMER.MASTER BY CUST.NAME WITH SALESMAN = "JKL" '  
CUST.NBR CUST.NAME CREDIT.LIMIT OPEN.BAL ID.SUPP  
LPTR HEADING "CUSTOMER CREDIT LIMIT REPORT 'D' 'L' "
```

or I could just build it for you.”



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