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THE MULTIVALUE TECHNOLOGY MAGAZINE | JUL/AUG 2008

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# KPIs

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## FEATURES | JULY/AUGUST 2008

### 6 IMPROVING THE VISIBILITY OF KPIS

Take a look at how one company made small programming changes to serve up the KPI data management needed. This article gives step-by-step tips on how small programming changes and triggers can help you do the same. **BY CANDI HART**

8 **Optimizing UniData Basic via Code Profiling: Part 2** Looking for tips on how to speed up your UniData programs? Check out this next installment for specifics on what could be dragging your programs down. **BY KEVIN KING**

12 **Documentation: Simplified** Hate writing documentation? Learn quick and effective ways to provide users with the info they need without sweating ink. **BY CHARLES BAROUCH**

14 **Extending UniObjects.NET** Missing the Basic functions like DCount and Locate that are not available in VB and C#? Learn how to use Extensions to emulate these missing and useful functions. **BY BRIAN LEACH**

30 **Using Google Features in an OpenInsight Application: Browser-Based Fun** Learn how to integrate free Google maps, charts, and other fun tools to your browser-based application, even if you aren't using OpenInsight. **BY MIKE RUANE, REVELATION SOFTWARE**

34 **Reporting and Business Intelligence Tools: C-7 Reporting** Find out about the reporting tools and expertise available through C-7 Reporting in this interview with Larry Christensen. **BY CHARLES BAROUCH**

## DEPARTMENTS

**From the Inside** page 4

**Newsmakers** page 24

**New Products** page 28

**Tech Tip** page 38

**Webonomics** page 40

**Clif Notes** page 47

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# From the Inside

BY NATHAN RECTOR

I need authors for articles. Are you interested?

I've asked many people to write articles from over the past few years, and have been rewarded with some very good and interesting articles. Most of these authors are techies like yourself or have had company restrictions that they have worked around regarding proprietary code and work.

If you would like to see yourself published, and these are some of difficulties you are running up against, then we can help you. The most common problems that new authors have are:

- Don't know what to write about,
- Company restrictions on propriety code, and
- Not a writer and don't know how to create a finished article.

Let's start with the "don't know what to write about" difficulty. That one is easy to solve, as I have a list of general topics that might spark your interest:

- Moving from a mainframe (i.e., RS6000) to a small server — issues and pitfalls
- Purchasing a \$500 personal computer to run your business versus purchasing a \$1,500+ server system
- Virtualization and your MultiValue system
- Sending e-mail — how to handle attachments
- Receiving e-mail and processing it in your business systems
- Exchanging information with a relational database and your MultiValue system
- Using web services from within your MultiValue application

I can go on and on. There are so many topics out there that I probably could fill a few pages with ideas. Since there are so many article ideas, I'm going to post some of them at ([intl-spectrum.com/ideas](http://intl-spectrum.com/ideas)).

If you would like to post a request for an article, please contact me and I'll add it to the web site.

The next difficulty that I've heard from potential authors is, "I'm not a writer. I don't know how to write a finished article." My suggestion is — don't.

International Spectrum has staff writers that can take a rough article and clean it up for you. This way you can just take an hour or two and pound out an article without having to worry too much about how bad your spelling or grammar is.

So, if you are worried about your writing — please don't be. Let us polish your articles for you. Trust me; the International Spectrum staff is very good at doing this. As proof, when I submit my own articles, the original articles are sometimes very rough, especially when I'm in a hurry, but by the time you read them, the articles have been polished — by our staff.

The last difficulty, "company restrictions on proprietary code," can be problematic until you look at it from a different angle. This is a major hang up for a lot of people, but you don't have to provide your company's code in the article. You just have to provide enough code to show examples.

Sometimes the article is about a concept or suggested way of doing something, and you can strip the code examples down to a line or ten to show concepts without giving away anything your company owns.

One of the authors here at International Spectrum has this same problem. He worked with his management and found a way to write the article to cover the topic without using any of the company code. Most of the code he supplied was information provided on public domain web sites, and a line or two of code on how to access or use the code. No company process or code was given away.

The last complaint I have heard is, "Everyone knows how to do that already."

*Continues on page 17*

# INTERNATIONAL Spectrum

JULY/AUGUST 2008

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*International Spectrum* is published six (6) times per year at the subscription price of \$40.00 U.S. in the U.S.A.; \$45.00 U.S. in Canada and Mexico; \$50.00 U.S. for other countries. Single copy rates are \$7.00 U.S. in the U.S.A. and Canada, and \$9.00 U.S. in all other countries. International Spectrum is published by International Spectrum, Inc., 80 Garden Center, Suite 6, Broomfield, CO 80020; Tel: 720/259-1356; Fax: 603/250-0664 E-Mail: [request@intl-spectrum.com](mailto:request@intl-spectrum.com). Copyright 2008 International Spectrum, Inc. All rights reserved. Reproduction in whole or in part, without written permission, is prohibited.

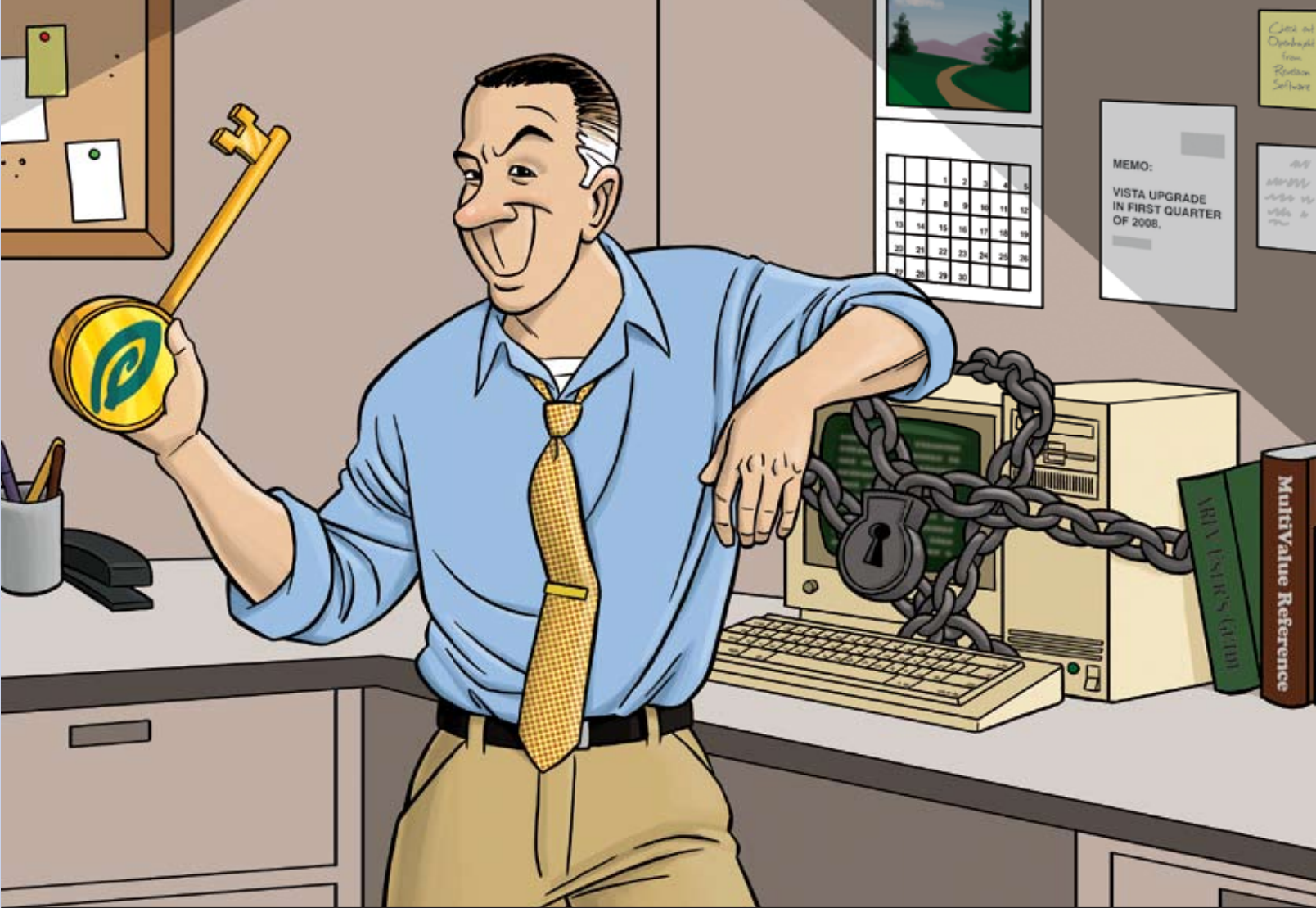
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# Improving the Visibility of KPIs

B Y C A N D I H A R T

**K**ey Performance Indicators (KPIs) have long been available to MultiValue users. Many an application was sold when the demo made it clear to management that *they* could sit down at any time and request the number of open orders or the total dollars invoiced so far this month. Some KPIs may be nothing more than those totals that management has always defined and wanted easy access to. And now we have dashboards which take advantage of the newest graphical tools to display those KPIs in a more intuitive, visual manner.

I wish to discuss here a little of the programming, design, and development history of MultiValue business intelligence as it relates to KPIs, and how we are able to enhance our applications with small programming changes. Finally, because triggers are relatively new, I will discuss the possible use of triggers to generate the data.

*“The strength of our database has always been that we can easily make little changes as we go without a complete rewrite.”*

Let's use, for example, management's request to check the value of orders received daily. They would type the command `SUM ORDER ORDER.VALUE WITH ORD.DATE = "today's date"` whenever they wished throughout the day. Eventually they got tired of typing that command and would request that a stored procedure be written that would allow them to choose the date. If they missed a few days, however, they might not be able to go back and get orders as of a week ago or compare this month with last month.

Let's look at programming examples of how a specific company, GBF Enterprises, created a module they called the executive interface, and what they are doing today to continue to improve the visibility of their KPIs.

### Stage 1 - Define

Allow management to set up and store their own KPIs and view the results whenever they want.

First they created a file (fig. 1) and screen to enter data into that file. They called the file EXEC.DATA. The input screen allowed TODAY or YESTERDAY as keywords that could be used in the selection criteria.

A subroutine EXEC.COMMAND was written that was passed the EXEC.DATA record (fig. 2). It would construct

the command (using the keywords), run the command, and store the new result, date, and time in the EXEC.DATA record.

The EXEC.COMMAND subroutine was called from a procedure/program that would select and list all EXEC.DATA items for that user, allow him/her to select a specific KPI, pass the record to the subroutine which would execute the command and store the result, and then display the result.

### Stage 2 - Automate

Have the commands execute automatically and display all their KPIs when they log on in the morning.

A field was added to the EXEC.DATA file to store multi-valued times to execute the command. Management was able to enter the scheduled times in the EXEC.DATA entry screen. Then another calling program was written that was run as a phantom (fig. 3). It would wake up every 10 minutes and select all EXEC.DATA items. If the current time was greater than the next scheduled time for that item the EXEC.COMMAND subroutine was called.

By having scheduled times, KPIs for information that was only needed as of yesterday's close of business could be run once at night, but information that should be watched

*Continues on page 20*

Sequential ID	<u>Sample Data</u>
1>The title of the KPI	123
2>The file name	'Daily total order value'
3>The English command that generated the totals	ORDER
4>Attributes to select	SUM ORDER ORDER.VALUE
5> Connective	ORD.DATE
6> Value of attribute in quotes or keyword	=
7>The last date this command was run	TODAY (keyword)
8>The last time this command was run	14676
9>The result	59678
10>The users that desired this information	153788
Added later:	TOM CANDI TONY
11>Times that this info should be generated	32400]43200]54000]59400
9:00AM]12:00PM]3:00PM]4:30PM	

Fig. 1 The file



# UniData Basic

via **CODE PROFILING**

PART 2

BY KEVIN KING

In our last installment we looked at how easy it is to leverage UniData's built-in Basic profiling features to improve our understanding of program performance. In short, compile with `-G`, run with `-G`, and UniData rewards you with a bounty of useful optimization information.

Picking up where we left off, we had just started investigating the performance problems of a small internal subroutine (fig. 1) as reported by UniData's profiler (fig. 2). Looking at these profiling statistics it's clear to see that most of the runtime for this program is in the 2000 subroutine. 98% of the runtime is in this one subroutine, and yet it's only being called once! Also interesting is that the 2100 subroutine (not pictured) is consuming 1.3% of the runtime despite being called 44,919 times. Something definitely seems upside down, as one would

expect the routine being called thousands of times to take longer than the routine being called only once.

So let's dissect this code. Skipping past the comment lines and label, our first executable line executes the `SP.ASSIGN HS` command to setup the printer to output to the `_HOLD_` file and suppress output to the printer. Could this be our problem? It's not likely, but it's worth checking because some clever programmer might have replaced this verb with their own version and that version may be, shall we say, "less than optimal." Nonetheless, leaving no stone unturned, I logged in, went to TCL, and issued this command and it returned instantly. Knowing this routine is only being called once, and therefore this command is only being executed once, we can rest confidently that this is not our problem.

Next, the program enables output to the printer. Again, it's only happening once so it's highly unlikely that this would cause any sort of delay. Still, it's no big deal to write a quick sample program to turn the printer on and off and get a timing (fig. 3) so we can easily prove this isn't our problem.

Next, the variable `OUTPUT.REC` is initialized. Note that this variable doesn't appear anywhere else in this subroutine, but it *might* appear somewhere else in the program. Truth is I've included this line intentionally as a red herring to show how easily it can be to get distracted when profiling. While `OUTPUT.REC` may in fact be somewhere else in this program, there's absolutely no need to give it another thought at this time because

```

*
*****
**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

```

Fig. 1 Subroutine 2000



%time	cumsecs	seconds	calls	name
98.0	148.00	148.00	1	TRAINPROGS\_ZIP.RPT4:2000
1.3	150.00	2.00	44919	TRAINPROGS\_ZIP.RPT4:2100
0.7	151.00	1.00	1	TRAINPROGS\_ZIP.RPT4:1000
0.0	151.00	0.00	1	TRAINPROGS\_ZIP.RPT4

index	%time	self	descendents	called/total called+self called/total	parents name children	index
[1]	100.0	0.00 148.00 1.00	151.00 2.00 0.00	1 1/1 1/1	<spontaneous> TRAINPROGS\_ZIP.RPT4 [1] TRAINPROGS\_ZIP.RPT4:2000 [2] TRAINPROGS\_ZIP.RPT4:1000 [4]	
[2]	99.3	148.00 148.00 2.00	2.00 2.00 0.00	1/1 1 44919/44919	TRAINPROGS\_ZIP.RPT4 [1] TRAINPROGS\_ZIP.RPT4:2000 [2] TRAINPROGS\_ZIP.RPT4:2100 [3]	
[3]	1.3	2.00 2.00	0.00 0.00	44919/44919 44919	TRAINPROGS\_ZIP.RPT4:2000 [2] TRAINPROGS\_ZIP.RPT4:2100 [3]	
[4]	0.7	1.00 1.00	0.00 0.00	1/1 1	TRAINPROGS\_ZIP.RPT4 [1] TRAINPROGS\_ZIP.RPT4:1000 [4]	

Fig. 2 Profiling results

the profiling stats show that the performance bottleneck in this program is in this 2000 subroutine. So whatever happens outside of this routine can't possibly be a contributing factor. In this case, all we're doing is initializing the variable, and only once. So barring some kind of horrific system failure, there's no practical way that this could be taking all of 148 seconds.

Next, we move into a READNEXT loop. Ah, now things are getting interesting. Anytime there's a performance issue, loops are great places to begin the search. Looking a little deeper into the loop, we see where the 2100 routine is being called on each iteration (if the record is found); so with this informa-

tion and our profiling statistics, we can see that this loop is happening at least 44,919 times.

Notice I said "at least." The way this program is structured the loop could actually be iterating several billion times or

“  
*Anytime there's a performance issue, loops are great places to begin the search.*  
 ”

more. We know that the 2100 routine is being called for each record that is found, but what if the active select list contains a couple billion IDs for records that don't exist? Certainly this is an option worth exploring. So if we look up earlier in the program to where the records are selected (fig. 4), we can easily discount that as a possibility, as we're

selecting the same file that we're iterating over. If there were a couple billion records in this file at the time of the SELECT that weren't there as we looped through them, well, something bad would have happened and this performance evaluation would be the least of our ongoing concerns. Besides, looking at our profiling statistics, we can see that the 1000 subroutine that does this selection is quite fast, doing its work in a single second. It's highly unlikely that it's picking up a billion or so record keys — in sorted order no less — in that short of a window.

So, at this point we're ruled out just about everything in this subroutine except for the READNEXT and READ. Could READNEXT be the problem? Once again it doesn't take much code to prove its innocence.

That leaves us but one possibility, the READ. By process of elimination this absolutely has to be the source of the

*Continues on page 10*

```
PRINT TIMEDATE()
PRINTER ON
PRINTER OFF
PRINTER CLOSE
PRINT TIMEDATE()
```

Fig. 3 Sample program to turn the printer on and off

## OPTIMIZING UNIDATA BASIC VIA CODE PROFILING, PART 2

Continued from page 9

slowdown, but why? Does each READ really require all that much to do its job? Would a MATREAD perform any better?

Before we jump into that READ/MATREAD debate — an issue we will be discussing shortly enough — let's look at some other possibilities. Anytime there's an READ or WRITE bottleneck, it's a good idea to first evaluate the size and configuration of the file to ensure that there's no sizing issues. Using Uni-

Data's file.stat command (the lower case version) for this file (fig. 5) one potential problem becomes instantly obvious — the file is dramatically undersized and therefore it's taking a lot more effort to retrieve any information from the disk.

Notice in our first profiling statistics that the 1000 subroutine that selects records from the file (fig. 4) does not show any performance degradation due to the file size problem (fig. 2). This can be misleading unless you consider that the UniData file structure is organized such that selecting keys and reading records are two completely different operations.

Don't be fooled into thinking that if the SELECT is fast the records will be able to be read just as quickly.

Using RESIZE, I've taken the recommendation of the file.stat command and resized this file to 2,677 groups. If this were a file that were growing regularly I'd probably want a few more groups than what UniData recommends, but for this demonstration the recommended value is acceptable. Once the file is a more reasonable size, we can then proceed with another profiling run.

Note that once the program has been compiled with the -G option, there's no need to recompile it again to run profiling again. We can simply run the program (either catalogued or not) with the -G option to get updated statistics (fig. 6). Now that the file is a more reasonable size we see that the selecting and processing of the records both take 50% of the runtime, which is considerably more balanced than the earlier run.

Continues on page 45

```
*****
* Open File(s)
*****
*
NO.OPEN = ''
OPEN 'ZIPSMALL' TO F.ZIP ELSE NO.OPEN := 'ZIPSMALL '

STOP
*
*****
1000 * Select the records for the report
*****
*
CMD = 'SELECT ZIPSMALL USING DICT ZIP BY ST BY CNTY BY CITY'
EXECUTE CMD CAPTURING OUTPUT
*
RETURN
```

Fig. 4 Records selection earlier in the program

```
File name = ZIPSMALL
Number of groups in file (modulo) = 1
Static hashing, hash type = 0
Block size = 1024
File has 831 groups in level two overflow. Please resize.
Number of records = 44919
Total number of bytes = 1836922

Average number of records per group = 44919.0
Standard deviation from average = 0.0
Average number of bytes per group = 1836922.0
Standard deviation from average = 0.0

Average number of bytes in a record = 40.9
Average number of bytes in record ID = 10.0
Standard deviation from average = 4.3
Minimum number of bytes in a record = 28
Maximum number of bytes in a record = 65

Minimum number of fields in a record = 5
Maximum number of fields in a record = 10
Average number of fields per record = 5.0
Standard deviation from average = 0.5
The actual file size in bytes = 2556928
Suggested resize modulo = 2677
```

Fig. 5 UniData's file.stat command

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# Business Tech: Documentation Simplified

BY CHARLES BAROUCH

**M**any of the installments in this series have hinted at the importance of documentation.

This time out we are going to pull this idea fully into the spotlight.

Of course, most of us know the conventional wisdom on creating documentation. It falls in the priority list between volunteering for multiple pay cuts and getting that lobotomy. The reason we tend to view documentation in such a dim light comes from bitter experience.

## Writer's Cramp

The rationale is simple. When I deliver a six hundred page report that makes sense of the company's earnings, I get thanked. When I deliver a fifty page training manual, I get groaned at by people who don't have time to read. When I deliver an entry screen, I might get some complaints. When I deliver the documentation, I always get told that any process which needs this many instructional pages is too complicated. When I deliver a new file, the company gets to retain important data. When I release the technical documentation, no one ever looks at it except the Auditors. And they never seem happy.

Strangely enough, once we realize that we tend to get punished for delivering documentation, we eventually learn to stop. After all, if we are going to take pain over something, it should be something we value. As we all know, programmers don't tend to put much value in documentation. We tend to hate it as much as the users hate it. See where the mere discussion of documentation takes us?

## Write as Rain

So, if the act of making documentation is horrible, and the act of reading it is worse, why am I advocating that you write doc-

umentation? The answer lies with Humpty Dumpty. "When I use a word," Humpty Dumpty said, in a rather scornful tone, "it means just what I choose it to mean, neither more nor less." (from *Through the Looking Glass* by Lewis Carroll)

“  
*When I use a word,'Humpty Dumpty said, in a rather scornful tone, 'it means just what I choose it to mean, neither more nor less.'*  
”

Following the egg's lead, I don't advocate standard documentation. Instead, by redefining the word documentation to mean "any mechanism which effectively transfers the necessary knowledge when it is needed," I disqualify nearly every document you hate and open the door to useful, practical, applaud-able documentation.

## Flip Out

When you were a kid, you probably spent some time doodling in the corners of a school book, ultimately producing a flip book — a short bit of animation which moves as you thumb through the pages. This was fun to do and fun to show off.

I like to document by doing a screen capture at each step, then adding one — or at most two — paragraphs, and put the whole mess up as a mini-website which can be flipped through by embedding a next arrow on each page. That way no one ever has to go looking for the manual. With a quick HTML index to let them skip around to just the part they need to know, no one ever reads my documentation, but everyone reads the pieces they need to read.



The result is high retention amongst visual learners. If I feel ambitious, I might drag the images into Page Plus, or some other software, which will allow me to draw a circle or two and maybe point a couple of arrows. The process isn't very taxing and the results get used productively.

### F1 for All

Some people aren't visual learners. For these folks, the F1 key is the way to go. Context sensitive help is just like documentation, only diced down to a size that promotes easier digestion. When Data Entry Edna gets up to the field called date, in an application where there are nine kinds of dates, her F1 key gives her all the words which the programmer couldn't cram into the actual screen. One press of that magic button and Edna knows that 'Date' is 'End Delivery Date' and not 'Sale Date' or 'Estimated Date' or 'Promised Date', or any of the other kinds of dates.

The result is that the documentation stays tucked out of the way until it is needed. When it appears, it even turns to the exact right one of our diced bits.

### For Dummies

The reason the For Dummies books and their ilk sell well is that they don't read like typical documentation. They are light and funny, and you should abandon all hope of writing this way for your projects. Let's be very clear — that sort of thing takes months to write and edit. Anything in this style which is pushed out quickly runs the risk of sounding sarcastic and arrogant. If you really do want to write this way, get a book contract and do it as a real book, where you will have the time and resources to get it... er... write.

### From the Top

Another successful documentation technique is to write your text as a se-

ries of lessons. In this case, the expectation is that it will be read end-to-end, like traditional documentation, but it has the benefit of producing specific rewards. Making lessons instead of chapters keeps us away from lecturing on the brilliance of our design or the struggle to balance the parts of our task in writing the software. Lessons focus on what the reader needs to know, in the order they need to attempt it.

Writing as a teacher also forces you to think through the process as a whole. I once had a boss who frequently said, "If you did any of these jobs for a day, you'd see a dozen ways to make it easier." Writing lessons forces us to see the project from a more user-centric perspective. Often the exercise of developing documentation helps us discover problems, create efficiencies, and build sympathy for the folks who have to live with our creations.

*Continues on page 22*

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# Extending UniObjects.NET

BY BRIAN LEACH

**W**hen VMARK first created UniVerse Objects, it heralded not only a new middleware that positioned UniVerse firmly in the client/server world, but also introduced a new paradigm for representing a MultiValue database. UniObjects took familiar elements of the MultiValue world — files, commands, select lists, subroutines, dynamic arrays — and encapsulated these into a small number of classes with simple properties and methods. At the same time extending the model into the modern world and making the whole platform more approachable to mainstream developers.

But in simplifying the model some features were lost, including many useful constructs in the Basic language that have no direct equivalents in client languages like VB and C#.

So it was left to developers to build libraries of functions to emulate familiar facilities such as DCount, Field, Matches, and Locate. But a question raised on the U2-Users list (u2ug.org) prompted me to think about how some of these might be turned into extension methods.

Extension is a new feature introduced in .NET 3.5, one of many additions brought in to support LINQ. Its purpose is to allow third-party developers to add new methods to existing classes, including those classes that are built into the .NET framework. Using extension, I figure to add some new methods to some of the fundamental data types and to the UniObjects classes to make up for some of these missing features.

And so in this article I shall be creating an extension method that will add Locate functionality to the Uni-DynArray class that handles dynamic array operations in UniObjects.NET.

## Creating Extension Methods

Extension methods enable a developer to add new public methods to an existing class, without the need to subclass or to have access to the source code. Let's start with a simple but useful example.

In the .NET framework, dates are handled through the DateTime class. This stores dates in the .NET internal format and offers methods for adding, subtracting, parsing, and formatting dates. A useful extension to this for U2 developers might allow a DateTime to convert to and from the

Pick internal date used by all MultiValue platforms.

The DateTime class exposes two methods for converting to and from the date/time form used in OLE Automation (ToOADate and FromOADate). The automation date/time is actually a double precision number, in which the integer portion holds the date and the fractional portion holds the time. Fortunately for us the date portion is held as the number of days since 01 Jan 1900, which makes it easy to derive the Pick date by simply subtracting the difference between this and the Pick start date, as shown in figure 1.

Adding this to the DateTime as an extension method is fairly straightforward. You will need to create a

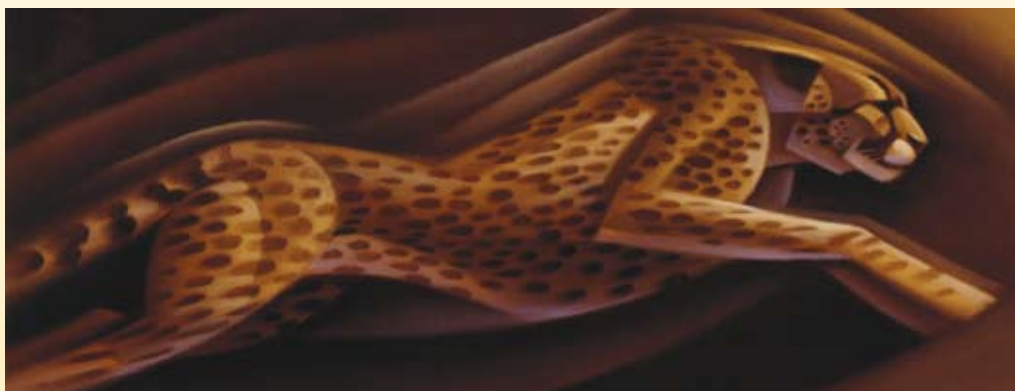
*Continues on page 16*

```
return (Int32)(myDate.ToOADate() - 24837);
```

**Fig. 1**

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## EXTENDING UNIOBJECTS.NET

*Continued from page 14*

class library project that will hold the extension methods in a new class. You then reference the namespace of that library anywhere you want to make use of the new methods. I'll be using C# but you could do the same using VB.NET if you prefer.

Using the calculation above, I can create a new U2Extension project with an Extension class holding the two methods to convert a DateTime to and from a Pick date respectively (fig. 2).

There are two essential things to notice about this class. First, the class and the methods are defined as public static, which means that the methods can be called without creating an instance of the class — just what you need for a function library. Second, each method signature has an initial argument marked with the keyword `this`, which performs the sleight of hand that marks this out as an extension method. The initial argument specifies the type being extended (DateTime in this case) and provides a reference (dt) to the current instance.

To see this in action, add a second project and include a reference to your class library. Now you can import the extension class into a form or module by adding a `using` (C#) or `Import` (VB) statement. Here is the exciting bit — as soon as you do this, Visual Studio becomes aware of the extensions, so it can offer these new methods through its IntelliSense (fig. 3).

Now the `ToPickDate()` and `FromPickDate()` can be used like any other DateTime method (fig. 4 and fig. 5).

### Coding Up Locate

Back to the `Locate` statement. I'm going to take the following Basic statement in figure 6 and turn this into an equivalent extension method (fig. 7).

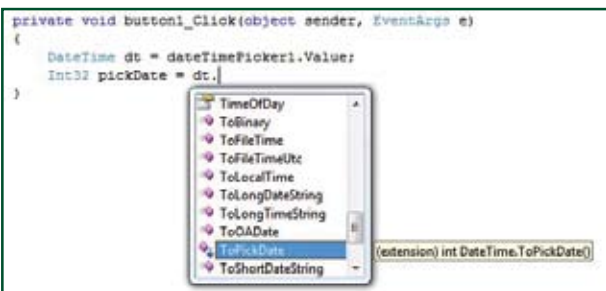
What happened to the field and value specifiers? `UniDynArray` provides a `Extract()` method that returns the

*Continues on page 18*

```
namespace U2Extensions
{
    public static class Extensions
    {
        public static void FromPickdate(this DateTime dt, _
            Int32 pickDate)
        {
            dt = DateTime.FromOADate(pickDate + 24837);
        }

        public static int ToPickDate(this DateTime dt)
        {
            return (Int32)(dt.ToOADate() - 24837);
        }
    }
}
```

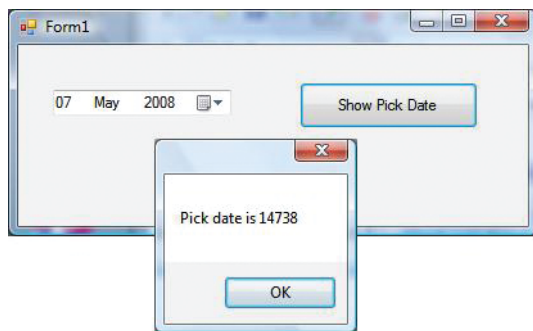
**Fig. 2** An Extension class showing two methods to convert DateTime



**Fig. 3**

```
private void button1_Click(object sender, EventArgs e)
{
    DateTime dt = dateTimePicker1.Value;
    Int32 pickDate = dt.ToPickDate();
    MessageBox.Show("Pick date is " + pickDate.ToString());
}
```

**Fig. 4**



**Fig. 5**

```
Locate Value In DynArray<Fno, Vno> By Mask
→ Setting Pos Then|Else
```

**Fig. 6**

```
Boolean Locate(UniDynArray da, String value, String mask,
→ ref Int32 pos)
```

**Fig. 7**



## FROM THE INSIDE

Continued from page 4

Now this isn't a difficulty per se. It is more of a mind-set that needs to be changed. Here is an example: Can you write an article on "how to print your MultiValue data to a PDF document?" Response: "Well everyone knows how to do that."

I don't know about you, but I've worked with about 50 different customers that had that same need and didn't know how to do it. Just because it seems like common knowledge, doesn't mean that there aren't people who don't know how to do it.

So, please, I need authors. I want to hear how you solved your business or technical problems. Send me an e-mail at nathan@intl-spectrum.com if you have additional ideas or want more information on writing articles. **IS**

**-NATHAN RECTOR**

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```
DynArray.Extract(Fno, Vno).Locate(Value, Mask, ref Pos)
```

Fig. 8

```
String t = da.StringValue;
List<String> s = new List<String>();

char delim = (char) 0xFC ;
if (t.IndexOf((char)0xFD) > 0) delim = (char)0xFD;
if (t.IndexOf((char)0xFE) > 0) delim = (char)0xFE;

s.AddRange(t.Split(delim));

if (mask == "") {
    pos = s.IndexOf(value) + 1;
    return (pos > 0);
}
```

Fig. 9

```
Int32 i;
Boolean desc = false;
Boolean num = false;
double d1 = 0, d2;
num = (mask.ToUpper().IndexOf("R") >= 0);
desc = (mask.ToUpper().IndexOf("D") >= 0);
if (num) d1 = double.Parse(value);

for (i = 0, pos = 1; i < s.Count; i++, pos++) {
    if (s[i] == value) {
        return true;
    }
    if (num) {
        d2 = double.Parse(s[i]);
        if (desc && (d2 < d1)) return false;
        if (!desc && (d2 > d1)) return false;
    } else {
        if (desc && String.Compare(s[i], value) < 0 ) return false;
        if (!desc && (String.Compare(s[i], value) > 0)) return false;
    }
}
return false;
```

Fig. 10

```
public static Boolean Locate(this UniDynArray da,
    → String value, String mask, ref Int32 pos)
```

Fig. 11

```
private void button1_Click(object sender, EventArgs e){
    Int32 pos = 0, fno = 0;
    String value;
    Boolean found;
    String mask = "";
    UniSession sess = UniObjects.OpenSession("host", "demo", "demo", "uv", "uvcs");
    UniDynArray da = sess.CreateUniDynArray(textBox1.Text.Replace('^', fm).Replace(']', vm));

    value = textBox2.Text;
    mask = textBox3.Text;
    fno = Int32.Parse(textBox4.Text);
    found = da.Extract(fno).Locate(value, mask, ref pos);
    MessageBox.Show("Found = " + found.ToString() + " Pos = " + pos.ToString());
}
```

Fig. 12

## EXTENDING UNIOBJECTS.NET

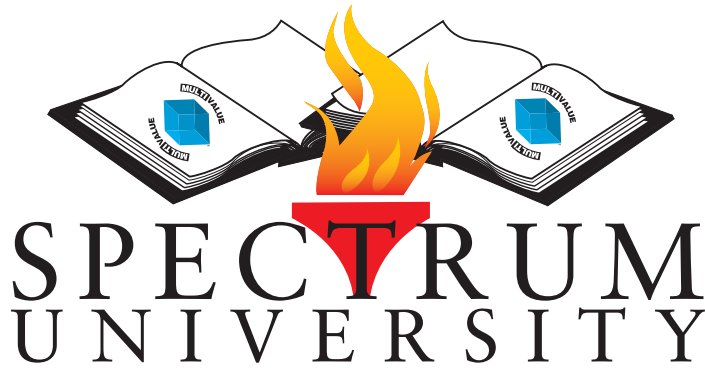
*Continued from page 16*

extracted field or value as a new UniDynArray, so that part has already been done for me (fig 8).

Following the PICK flavor, all I need is to find the highest remaining delimiter that might be left following an Extract. This delimiter can be used to split the underlying content into a list of strings so any locate that does not use a mask can simply search that list (fig. 9).

That was easy, but a Locate with a mask needs a little more work. I'm going to

*Continues on page 42*



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# Upcoming Webinar Schedule

TIME AND DATE	TITLE
<b>Thursday</b> <b>August 7, 2008</b> <b>2:00pm EST, 11:00am PST</b>	<b>Integrating MultiValue with Excel</b> 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.
<b>Tuesday</b> <b>August 12, 2008</b> <b>1:00pm EST, 10:00am PST</b>	<b>MultiValue Programming - Optimization</b> 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.
<b>Tuesday</b> <b>August 26, 2008</b> <b>2:00pm EST, 11:00am PST</b>	<b>MultiValue Retrieval Syntax</b> MultiValue Retrieval is a fact of life in all MultiValue applications whether you are an end user or developer. This 4 week course will cover all aspects of writing your own retrieval statements. The major topics are Verbs, Sorting, Selection Criteria and Output Specifications.  This webinar is a good refresher course for the professional, or an introductory course for your new IT staff or power users.
<b>Thursday</b> <b>September 11, 2008 2:00pm</b> <b>2:00pm EST, 11:00am PST</b>	<b>Optimizing UniData BASIC with Code Profiling</b> As code "matures" its performance can begin to suffer under the weight of new code and changes to existing code. The boss wants every program running at peak efficiency - and why not? But how can we know where the bottlenecks might be? In this course we'll explore Unidata BASIC profiling and how this feature can help you maximize the performance of your programs without wasting a lot of time with experiments or guesswork.
<b>Tuesday</b> <b>September 23, 2008</b> <b>2:00pm EST, 11:00am PST</b>	<b>MultiValue BASIC Debugging</b> Debugging can turn from a science to an art really quick in today's business systems. With the demands on new development, debugging and maintaining existing programs require you to spend time understanding the best way to debug problems.  This class will teach you effective debugging solutions using both realtime and passive debugging techniques.

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

## IMPROVING THE VISIBILITY OF KPIS

*Continued from page 7*

```
SUBROUTINE EXEC.COMMAND(EXEC.DATA.ID,EXEC.REC,EXEC.DATA.F)
INCLUDE EQUATES EXEC.DATA
*
GOSUB BUILD.COMD
GOSUB EXECUTE.COMD
GOSUB UPDATE.FILE
RETURN
* =====
BUILD.COMD:
VERB=FIELD(EXEC.REC<EXEC.DATA.COMMAND>," ",1)
CRITERIA=EXEC.REC<EXEC.DATA.CRITERIA>
* Selection criteria could be a literal.
  → eg: STATUS = "0"
IF CRITERIA[1,1]#"'" AND CRITERIA[1,1]#"'" THEN
* Convert keywords into current internal dates
  → eg: TODAY = DATE()
CALL GET.CALC.DATE(CRITERIA,CALC.DATE)
IF CALC.DATE = "" THEN CRITERIA = "" ELSE
  CRITERIA="\":OCONV(CALC.DATE,"D2/"):\"
END
END
COMD=EXEC.REC<EXEC.DATA.COMMAND>
IF EXEC.REC<EXEC.DATA.ATTR> # "" THEN
  COMD=COMD:" WITH ":EXEC.REC<EXEC.DATA.ATTR>
  IF CRITERIA # '' THEN
    COMD=COMD:" ":EXEC.REC<EXEC.DATA.CONNECTIVE>
    COMD=COMD:" ":CRITERIA
  END
END
RETURN
*
EXECUTE.COMD:
PERFORM COMD CAPTURING OUTPUT RETURNING RESULT
ERR.NO=RESULT<1,1>
BEGIN CASE
  CASE ERR.NO = 401 ;* No items present
    RESULT = 0
  CASE VERB = "COUNT"
    RESULT=RESULT<1,2>
  CASE ERR.NO = 423
    RESULT = RESULT<1,3>
  CASE 1
    RESULT=0
END CASE
RETURN
*
UPDATE.FILE:
LOOP
  TRYAGAIN=0
  READU EXEC.REC FROM EXEC.DATA.F,EXEC.DATA.ID
  → LOCKED TRYAGAIN=1 ELSE EXEC.REC=''
UNTIL TRYAGAIN=0 DO REPEAT
EXEC.REC<EXEC.DATA.LAST.DATE>=DATE()
EXEC.REC<EXEC.DATA.LAST.TIME>=TIME()
EXEC.REC<EXEC.DATA.RESULT>=RESULT
WRITE EXEC.REC ON EXEC.DATA.F,EXEC.DATA.ID
RETURN
*
END
```

**Fig. 2** The command subroutine

throughout the day could be scheduled, for example, every 2 hours.

Since they had a screen generator with a window painter, they created a screen that displayed when the user logged on that listed all that user's KPIS and the results as of the last scheduled run. Throughout the day they had the capability to redisplay that screen.

### Stage 3 - History

Save the history and display a graph.

The executive interface window was modified to allow the user to select an item and generate a graph (remember AccuPlot?). To accomplish this, a secondary file was created: EXEC.DATA,HIST which would store the previous days EXEC.DATA record with the SEQ#\*DATE ID. And a simple change was made to the subroutine to check to see if the current date was greater than the last date run and if so, write the current record to the history file before executing the command again. So now the phantom would automatically store the history.

### Stage 4 - Dashboards

Most recently, Keith Garrison, the owner of GBF, after seeing some of the dashboard tools, requested that some of the KPIS be automatically regenerated whenever there was an update, with the plan to show those totals on a large screen that would change as results were reported rather than have anyone have to remember to request it.

### Using a Trigger

At this point you may be thinking — ah, it's time for a trigger. But wait. As Cliff Oliver has said in previous articles, just because you can do something, doesn't mean you should. Though it would be a simple matter to make a trigger call the



subroutine that is already there generating the totals, remember, *that* subroutine does an execute of an access command. To do an access command automatically every time an order is updated would seriously degrade the system.

It's time to rethink the design. To keep the best of what's there, here's my approach:

1. Add the filenames and attributes being totaled to the control record (fig 4). It would be updated by the screen that enters the EXEC.DATA items.
2. Make a new subroutine:
  - Confirm that this record meets the selection criteria else return
  - Check to see if this is a new date. If so, write the current record to history and set the result to zero in the new record.
  - Add the new value to the result in the EXEC.DATA record, being sure to lock the record first.
3. Then, yes, add the trigger (fig. 5). It should read the control item to see if the EXEC.DATA fields for that file have changed and, only if needed, call the new subroutine.

Keeping in mind that not all of the KPIs need to be watched on a daily basis, keep the existing programs in place and just remove the scheduled times for the info that is going to be maintained throughout the day.

This is a typical development process in MultiValue applications. The strength of our database has always been that

*Continues on page 23*

```

* EXEC.COMMAND.CALL
* This program is always running as a phantom
* It wakes up every 10 minutes and runs scheduled
  → EXEC.DATA records
OPEN 'EXEC.DATA,CONTROL' TO CONTROL.F ELSE STOP
OPEN 'EXEC.DATA' TO EXEC.DATA.F ELSE STOP
INCLUDE EQUATES EXEC.DATA
*
LOOP
  READ CONTROL.REC FROM CONTROL.F,"%CONTROL%" ELSE
    → CONTROL.REC="STOP"
  STATUS = CONTROL.REC<1>
UNTIL STATUS = "STOP" DO
  GOSUB RECORD.LOOP
  SLEEP 600
REPEAT
*
STOP
*=====
RECORD.LOOP:
SELECT EXEC.DATA.F
MORE=1
LOOP
  READNEXT EXEC.DATA.ID ELSE MORE=0
WHILE MORE DO
  READ EXEC.REC FROM EXEC.DATA.F,EXEC.DATA.ID THEN
  GOSUB CHECK.SCHEDULE
  IF DOIT THEN
    CALL EXEC.COMMAND(EXEC.DATA.ID,EXEC.REC,EXEC.DATA.F)
  END
END
REPEAT
RETURN
*
CHECK.SCHEDULE:
DOIT=0
IF EXEC.REC<EXEC.DATA.SCHEDULE> = '' THEN RETURN
* If this has never been run the date will be null
  → and < today
IF EXEC.REC<EXEC.DATA.LAST.DATE> < DATE() THEN DOIT=1 ELSE
  LAST.TIME=EXEC.REC<EXEC.DATA.LAST.TIME>
  DDD=1 ; NOMORE=0
  LOOP
    SCHED.TIME=EXEC.REC<EXEC.DATA.SCHEDULE,DDD>
    UNTIL (SCHED.TIME > LAST.TIME) OR (SCHED.TIME='') DO
      DDD=DDD+1
  REPEAT
    IF TIME() GE SCHED.TIME THEN DOIT=1
  END
RETURN
*
END

```

**Fig. 3 The phantom calling program**

This was originally created to flag the phantom to stop

Phantom status – set to 'STOP' to end process	<u>Sample data</u>
multivalued list of files	RUNNING
Exec Data ID's for the files – subvalued per file	SOH]
The Attribute that is totaled – subvalued per file	74\75
	34\8 (Order Amt)

**Fig. 4 Sample control item**

*Continued from page 13*

**REMarkable**

Don't forget the importance of comments as internal documentation. If BASIC is your programming language, your programs are at some level literature meant to be read by other programmers. That would make comments the built-in Cliffs Notes. When properly used, comments are sure to help the person writing the external documentation. Since that person may well be you or someone who reports to you, helping them should be high on the agenda.

**Auto Docs**

Generally speaking, automatically generated documentation is pretty poor. However, don't discard it as an option. Some packages, usually ones bound to specific 4GLs, are not bad. Even a relatively bad auto doc can be used to build a rough draft of the real documentation. I don't know about you, but any tool that gets 50% of the job done for me is worth a second look. I worked with one brilliant auto doc in the mid-eighties that still has many of the newer contenders beat. Unfortunately, the 4GL it was associated with has not been kept current.

**Undocked**

I've worked in places where all education is based on conversation. This sort of shop lives and dies by developing subject experts. You don't read documentation in that kind of shop, you go to the subject experts. If government regulators have their way, these people will be doing a lot more reading. Between U.S. efforts like SOX and HIPPA, and world wide efforts like ISO 9001, the written word is becoming a legal necessity.

Obviously, there are even more options than I've listed here. It seems that when it comes to documentation we have many possible directions, and all of them are improved by working with the users. We have to match the technique to the audience if we want a good chance at success.

Next installment we'll talk about approaches to training. **IS**



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Part Number: 68528		Update X Delete X			
Description: Ruggedized PicoDot. Polarized Retro Laser					

```

SUBROUTINE SOH.TRIGGER(SOH.REC)
* Trigger called from SOH file
* If key fields are changed this will update
  → the EXEC.DATA file
* This is a PRE-WRITE & PRE-DELETE trigger
*
OPEN 'EXEC.DATA,CONTROL' TO EXEC.DATA.CONTROL.F ELSE RETURN
OPEN 'EXEC.DATA,HIST' TO EXEC.DATA.HIST.F ELSE RETURN
OPEN 'EXEC.DATA' TO EXEC.DATA.F ELSE RETURN
EQU SVM TO CHAR(252)
*
GOSUB ASGN.VALS
GOSUB EXEC.DATA.UPDATE
*
RETURN
*
=====
ASGN.VALS:
FILEVAR=ACCESS(1) ;* SOH
ITEM.ID=ACCESS(10) ;* Sales Order #
FILENAME=ACCESS(11)
DELETE.FLAG=ACCESS(12)
NEW.ITEM=ACCESS(16)
BEGIN CASE
CASE DELETE.FLAG
EVENT = "DELETE"
CASE NEW.ITEM
EVENT = "NEW"
CASE 1
EVENT = "CHANGE"
END CASE
RETURN
*
EXEC.DATA.UPDATE:
READ CONTROL.REC FROM EXEC.DATA.CONTROL.F,"%CONTROL%"
→ ELSE CONTROL.REC=""
LOCATE FILENAME IN CONTROL.REC<2> SETTING FILEPOS
→ ELSE FILEPOS=''
NUM.ATRS=DCOUNT(CONTROL.REC<4,FILEPOS>,SVM)
READ ORIG.REC FROM FILEVAR,ITEM.ID ELSE ORIG.REC=''
FOR AAA = 1 TO NUM.ATRS
EXEC.DATA.ID = CONTROL.REC<3,FILEPOS,AAA>
ATR.NO = CONTROL.REC<4,FILEPOS,AAA>
IF EVENT = "DELETE" THEN
ATR.VALUE=-ORIG.REC<ATR.NO>
CALL EXEC.UPDATE(EXEC.DATA.ID,EXEC.REC,EXEC.DATA.F,
→ ATR.VALUE)
END ELSE
ATR.VALUE=SOH.REC<ATR.NO>
IF ORIG.REC<ATR.NO> # ATR.VALUE THEN
ADJ.VALUE=(ORIG.REC<ATR.NO>-ATR.VALUE)* -1
CALL EXEC.UPDATE(EXEC.DATA.ID,EXEC.REC,EXEC.DATA.F,
→ ADJ.VALUE)
END
END
NEXT AAA
RETURN
*
END

```

Fig. 5 The trigger

## IMPROVING THE VISIBILITY OF KPIS

*Continued from page 21*

we can easily make little changes as we go without a complete rewrite. As the providers add features (like triggers and dashboards) we can enhance our applications. But I refer you back to Charles Barouch's article on IT Planning — every time we get a request for an enhancement, we should always take the opportunity to rethink our design and redefine our objective. We can use the new buzz words and keep the original power of our applications. **IS**



CANDI HART has been an independent consultant in Southern CA since 1980. She was known as Candi Piech

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## SHORT-LINKS

### What are those short links in the text of some articles?

As our authors share their knowledge and experience, they also point you to the Web for more info. Some of these URLs are long and cumbersome to use.

To make the URL easier to read and use, we are now using Short-Links to redirect you to the web page the author recommends.

The format ([intl-spectrum.com/s9999](http://intl-spectrum.com/s9999)) drops the "http://www." from the front.

Most modern browsers fill that in for you, or you can add it back in.

Comments or additional suggestions? Please drop us a note at [editor@intl-spectrum.com](mailto:editor@intl-spectrum.com)

# NEWSMAKERS



## Campana Systems and Entrinsik Partner to Offer Real-time Reporting to AAA/CAA Auto Club Customers

Campana Systems Inc., an international leader in integrated information solutions for the AAA/CAA auto club industry, and Entrinsik, Inc. have announced a partnership to provide Campana's AXIS customers with Informer, an easy-to-use, feature-rich reporting tool for extracting data and generating reports in real time via the Web.

For over 20 years Campana Systems Inc. has been providing integrated business and information management solutions to AAA/CAA auto clubs through its AXIS Division. The AXIS product suite, which includes member relationship management, emergency road service, membership, travel, point-of-sale and financial toolkits, are used by auto clubs to deliver exceptional and timely service, build stronger member relationships, and increase member retention.

Founded in 1984, Entrinsik provides leading-edge data-

base reporting solutions and unsurpassed customer service. With their flagship product, Informer, thousands of users enjoy the ability to leverage the Web to share real-time information impacting key business processes across the organization. With Informer, business users enjoy the freedom and flexibility to analyze and share information anytime, anywhere for immediate and optimal decision-making.

"At Campana, we leverage strategic technology relationships that enable us to provide added insight and cost efficiencies to our customers. By partnering with Entrinsik, our AXIS customers will benefit from enhanced reporting capabilities, including the ability to quickly and securely retrieve real-time data using Informer's easy-to-use and intuitive platform, and view the information in familiar desktop formats like PDF, Microsoft Excel, and HTML," says Pierre Lapalme, director of sales and marketing.

"Campana has an excellent reputation as a one-stop shop, dedicated to a full-service approach to providing integrated information solutions. We are delighted to have Campana as a Partner," says Doug Leupen, president of Entrinsik. "We look forward to collaborating with them to offer Informer, adding value to their overall solution by enabling their customers to instantly translate critical data into valuable information where and when they need it."

## About Campana Systems

Campana Systems Inc. is an international leader in information solutions for the auto club and health care industries. Since 1988, we have helped our clients achieve their ongoing business objectives using our in-depth industry knowledge and trusted business solutions. Our employees are dedicated to continually meeting the evolving needs of our clients. This dedication has helped build a global reputation based on solid support, trust, and unsurpassed customer relationships. For more information about AXIS, visit [www.AXISforAutoClubs.com](http://www.AXISforAutoClubs.com).

## About Entrinsik, Inc.

Founded in 1984 and in the MultiValue market since, Entrinsik, Inc. has become an industry leader in delivering reporting systems for the IBM U2 family of database products. With Informer, thousands of end-users using MultiValue databases leverage the Web to securely share information anytime, anywhere. With its intuitive, easy-to-use interface, Informer provides end users, IT staff, and executives an operational business intelligence environment by delivering up-to-the-minute information impacting key business processes. Entrinsik provides leading edge technology and unsurpassed service to their customers. For more information, visit Entrinsik at [www.entrinsik.com](http://www.entrinsik.com). ■



## University of Maryland Honors Datatel with 2008 Smith Digital Economy Award

Datatel, Inc. has received the University of Maryland's Robert H. Smith School of Business 2008 *Smith Digital Economy Award* for "successfully demonstrating the transformational abilities of new technologies in the digital economy." The award was presented to Jayne Edge, Datatel vice president of strategic planning and marketing, at the University's Undergraduate Awards Banquet in College Park, MD.

The *Smith Digital Economy Award* is part of the Smith Leadership and Excellence Awards program, a volunteer-driven effort aimed at recognizing individuals and organizations that reflect the core values of the Robert H. Smith School of Business. Past recipients include Nextel Communications and XM Satellite Radio.

Nominated organizations were evaluated on a variety of attributes, including an innovative business model, corporate citizenship, advancement and/or profit potential, digital transformation, and advancement of knowledge. "Even in the midst



of a highly competitive pool. Datatel stood out as a clear leader," said Howard Frank, dean of the Robert H. Smith School of Business.

"Datatel truly appreciates receiving this wonderful recognition from one of the nation's finest higher education institutions," said Edge. "At Datatel, we strongly subscribe to the notion of continuous quality improvement, innovation, and transformation. The *Smith Digital Economy Award* is a welcome confirmation of our strategic direction and successful results."

### About Datatel, Inc.

Datatel provides colleges and universities fully-integrated administrative software systems and professional services that help them manage business processes and enhance the technology end-user experience across campus. Serving five million students at more than 750 institutions throughout North America and overseas, Datatel has exclusively focused on higher education for 29 years. Datatel is headquartered in Fairfax, VA. For more information, visit <http://www.datatel.com>. ■



## Revelation Software 2008 User's Conference a Huge Success

The 2008 Revelation Software User's Conference took place on May 13-16, 2008 at the Rio All-Suite Hotel and Casino in Las Vegas, Nevada. Over 130 developers, users, and

consultants attended the conference and made it a huge success.

In his keynote address, Mike Ruane, president of Revelation Software highlighted the many features of OpenInsight 9.0. "Our next release of OpenInsight has exceeded our expectations with the inclusion of WebOI, new Application Manager, Editor and Form Designer."

Various members of the Revelation Development team gave presentations on the new features included in OpenInsight release 9.0. Other distinguished members of the Revelation community from all corners of the globe enlightened the crowd with topics ranging from Ajax to Google widgets.

The conference also included a Vendor Fair and Exhibition which featured twelve companies who have products and services that are essential to the Revelation community. A dinner and bowling event at the Lucky Strike Lanes, located within the Rio Hotel, provided attendees with a chance to wind down after a three days of sessions.

All in all, attendees were very happy and excited with the conference. Some of the comments received included, "I got a lot out of the sessions – each had something new to learn. It's a pity I couldn't attend them all" and "The mix of people has changed slightly with several new faces including youngsters! It was good to see all of our old friends again and once again the entertainment provided on the penultimate evening was a real crowd pleaser." The general consensus was that we should have another conference in 2009, and we're looking across the United States for the next venue.

For a complete conference wrap-up, go to [www.revelation.com](http://www.revelation.com) or call 800-262-4747.

### About Revelation Software

Founded in 1982, Revelation Software delivers a suite of application development tools and companion services that take full advantage of leading network computing architectures and client/server platforms. The company's flagship product, OpenInsight, is the only database development and application environment that provides Windows, Linux, and Java-based GUI tools to develop and deploy web-based and client/server applications that support native and relational XML, SQL, and the leading legacy MultiValue data sources such as ARev, Pick, and IBM UniVerse. There are more than 1.6 million licensed users of Revelation products across 80,000 deployed sites worldwide. The company has offices in Westwood, New Jersey, as well as a European distributor in the United Kingdom, and an Asia Pacific subsidiary in Australia. ■



## Zumasys Relocates And Debuts New Logo & State-of-the-Art Solution Center

Zumasys has relocated its corporate headquarters to a brand new 11,000 sq. ft. facility within the Irvine Spectrum. The new facility, at 9245 Research Blvd., is centrally located at the intersection of the 405 and 5 free-

way (off the Bake Parkway exit) and will feature a state-of-the-art Solution Center showcasing the latest technologies in virtualization, storage, VoIP, and more.

Named one of Orange County's 100 Fastest Growing Businesses in 2007 and a member of *Inc.* magazine's Inc. 5,000 list, Zumasys provides enterprise-class IT solutions to small and medium businesses across North America. The company provides outsourced IT services, disaster recovery planning, hosting services, VoIP, and remote access solutions that allow mobile users to connect wirelessly to applications via a browser from anywhere using 3G wireless technologies from Qualcomm.

"Many things have changed in our first eight years including, not the least of which is how we share ideas with customers – the environment has become much more hands on," said Paul Giobbi, president of Zumasys, Inc. "Informed businesspeople want to see, touch, and feel the solutions they are considering before making an important technology purchase. We are investing in a Solution Center that will be open to our customers/prospects and will be equipped with the latest solutions from our core vendors including HP, NetApp, ShoreTel, Motorola, Citrix, VMware, and SonicWALL."

Named after the Aztec emperor Montezuma who was forced to confront the "new world," Zumasys helps companies preserve their historical IT investments as they move to embrace new technologies. The company's new logo and tagline – We've Got IT Cov-

*Continues on page 26*

## NEWSMAKERS

Continued from page 25

ered — were designed to boldly declare the comprehensive role that Zumasys plays in managing its customer's technology infrastructure.

"Quite simply, we want to be your single source for advice on all technologies," continued Giobbi. "This new facility is a giant step in fulfilling that vision and we are excited about the possibilities it offers our customers."

Zumasys has grown consistently and profitably since October of 2000 when it spun-off from JBS, a \$68M software distributor based in Houston, Texas. Today, nearly 2,000 companies across North America including Bebe Stores, American Express, Rio Tinto, Ganahl Lumber, and The Irvine Company rely on Zumasys for world-class professional services and ongoing support.

Zumasys will debut its new Solution Center on September 12, 2008 when it hosts its Open House & Vendor Expo. The event will feature two days of training on the latest infrastructure technologies, live hands-on demonstrations, and a free vendor expo. Visit [www.zumasys.com/events](http://www.zumasys.com/events) for more information.

### About Zumasys, Inc.

Zumasys specializes in architecting and implementing multi-vendor technology solutions that solve IT challenges for small and medium businesses. The company focuses on preserving and evolving legacy systems, business continuity & disaster recovery, and allowing remote branches and mobile users to connect to applications wire-

lessly using 3G wireless. Zumasys has attracted wide-spread attention and accolades from customers, vendors, and press alike. Its deployments have been featured in publications including Computerworld, eWEEK, Network World, Business Solutions Magazine, and Computer Reseller News. An Inc. 5000 company, Zumasys was also named one of the fastest growing solution providers by CRN Magazine three years in a row and is the only company to have winners or finalists appear on all five years of Qualcomm's prestigious A-List Awards for Wireless Innovation. Zumasys is a Microsoft Gold Certified Partner and holds reseller agreements with Citrix Systems, DoubleTake Software, HP, IBM, NetApp, Panasonic, Sierra Wireless, SonicWALL, and VMware. ■



## IBM 2008 U2 University Now Open For Registration

Join one of four IBM 2008 U2 University (U2U) events. U2U is the premier U2 technical event for IT executives, managers, professionals, DBAs, developers, and business partners. This event brings you speakers from across the IBM U2 team including leading developers, architects, and specialists dedicated to providing quality technical training, information, and resources to help maximize your U2 investment. You won't want to miss our two and one-half

days of information-packed technical training. Talk with product experts and network with your peers.

### Conference Highlights:

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- August 5-7, Sydney, Australia (Chargeable tutorials begin on August 4) Save \$100 AU with Early Bird registration through July 15, 2008
- September 16-18, San Diego, CA (Chargeable tutorials begin on September 15) Save \$100 US with Early Bird registration through August 16, 2008, 9 PM EDT

- October 7-9, Atlanta, GA (Chargeable tutorials begin on October 6) Save \$100 US with Early Bird registration through September 7, 2008, 9 PM EDT
- October 28-30, Telford, UK (Chargeable tutorials begin on October 27) Mark your calendar for this event. Registration will be available shortly.

Register today! You can't afford to miss U2U! ■



## BlueFinity Roadshow: Integrating MultiValue and Microsoft .NET

The merging of MultiValue databases with open system technologies has blossomed over the past decade, yet much of the MultiValue marketplace has not fully investigated the ease with which Microsoft .NET can enhance their application software. mv.NET from BlueFinity International closes the loop for .NET integration with MultiValue applications and allows Rapid Application Development using the latest Microsoft technologies such as Visual Studio to create and enhance MultiValue applications.

Using BlueFinity's mv.NET, Value Added Resellers can modernize their applications both visually and functionally using native Windows technology. "VARs can emphasize

to their prospects the use of standard Windows components in the application's interface and middle-tiers, thereby minimizing objections to the back-end database," explains David Cooper, lead developer at BlueFinity.

"They can even seamlessly integrate their application with other open system technologies. The heavy investment in the MultiValue application is preserved and enhanced by using the business logic while changing the presentation layer and creating new applications with the existing MultiValue back end."

In-house IT departments can modernize their applications in the same way, preserving

the investment in back-end database-resident routines while realizing the benefits of Windows/browser-based interfaces. This approach also allows MultiValue programming resources to be tightly focused on supplying database-resident functionality, while more readily available .NET programming talent can be engaged for the production of interface related aspects.

"Whether you are looking to build a new e-commerce website, create web services, enhance legacy applications, or create new rich applications using MultiValue business logic, mv.NET from BlueFinity International can get you

there fast with less development cost."

BlueFinity is currently considering planning a series of one day technical seminars to take place the first week of October 2008 in various USA locations. These seminars will provide an introduction to the various aspects of mv.NET, from a technical perspective, for those already familiar with a version of a MultiValue database. Some working knowledge of Microsoft .NET is recommended. Topics will include an in-depth technical overview of mv.NET architecture and functionality, installation/configuration, licensing and pricing, product roadmap, live demonstrations of application development,

and a Q&A session with the BlueFinity team.

Help choose locations for the seminars by filling in the brief survey here: [http://www.bluefinity.com/roadshow\\_survey.html](http://www.bluefinity.com/roadshow_survey.html). Further plans for seminars in Australia, France, and the UK are also underway. Visit [www.bluefinity.com](http://www.bluefinity.com) for more information. ■

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# New Products



## New Release of MITS Discover Improves Usability, Flexibility, and Performance

MITS, provider of Online Analytical Processing (OLAP) business intelligence and operational reporting solutions, announced a major new release of its flagship business intelligence solution, MITS Discover.

MITS Discover 7.0 delivers significant enhancements to the end user experience, improved tools for creating and adjusting analysis focused data collections known as hypercubes, and numerous enhancements to performance and reliability. Existing customers, partners, and prospective users will find improvements of interest in the solution.

The release has been in beta use by select customers, who have been impressed with the improved performance of complex queries and the overall stability of the solution despite numerous enhancements.

### Powerful New Dashboard Tools

"We have done major expansion and enhancement in our dashboarding capabilities, which we believe will please current users and attract new interest in Discover," says MITS Vice President of Engineering and Product Development, Gary Owen.

The release includes a new, browser-based Dashboard Object Creator, which allows business users to rapidly create dashboard components in familiar grid, gauge, chart, and other formats, each of which can be incorporated into any number of dashboards. The enhancement, along with new dashboard library tools, will simplify the creation and use of dashboards while reducing the need to involve scarce IT resources in the process.

"Many of the enhancements included in this release are a direct response to input from our customers and our professional services unit," says Owen. "So, not only do we feel the new features are strong ... we're also certain they're precisely what our user community wants most."

### One Report, Many Sources

With the new release, end users will be able to create reports from multiple data sources, not just from a single hypercube. This will speed and simplify the process for many queries that

previously required more complicated effort.

"It's a powerful new feature," cites Owen. "For those organizations that build their own cubes and like to really push the solution to its limits, it will open a number of new doors—with a lot less pushing."

### Extensive Usability Improvements

Enhancing queries and reports will get easier as well, notes Owen. "We've added drag-and-drop capabilities for relocating columns within a query or report grid. And now users can add or omit multiple columns simultaneously, instead of one at a time." Performing "what if" and other more involved analysis will also be easier. Furthermore, the ability to selectively drill down within a displayed query or report by limiting results to specified values of a key data column has been substantially re-engineered.

One enhancement in particular that will deliver significant time savings is the ability to add new drill-down paths to a hypercube without the need to rebuild the cube. End users who realize they need to explore data in a new way will now be able to do so without delay.

Reports and queries will be easier to navigate and view. Sorting on multiple columns is now easier, and new icons indicate the current sort order in effect, column by column. Users can hide "zero value"

report rows, and navigate instantly to the beginning or end of the results.

Finally, a small but important enhancement adds a dynamic, visible status bar to queries in progress. For analyses needing several minutes to process, end users will know when results will be available.

### Under the Hood: Shared Technology Breeds Flexibility, Reliability

Some of the improvements with the new version—particularly those focused on improved performance and wider application in the future—leverage the work MITS has done on its companion MITS Report product. Now, says Owen "both solutions will more fully leverage state-of-the-industry constructs and technologies—Java gateways, Ajax calls, and tiered application design."

"Though it will make us more flexible moving forward, the prime motivator is the end user," explains Owen. "These newer technologies let us incorporate familiar user interface models—the kind people are accustomed to using on Google, Facebook and Flickr—so it will work in a way that people will expect it to work."

Existing users are encouraged to contact their MITS provider to arrange upgrades, which involve a simple licensing formality. For more details, contact a MITS representative at [info@mits.com](mailto:info@mits.com) or visit the



MITS web site at [www.mits.com](http://www.mits.com).

### About MITS

MITS is the leading developer of Advanced Reporting and Business Intelligence for the MultiValue database market and beyond. The MITS product line contains both the MITS Discover OLAP Business Intelligence suite as well as the ad hoc operational reporting solution, MITS Report. Founded in 1996 and headquartered in Seattle, Washington, the company's technologies are used by thousands of organizations, resellers, and systems integrators worldwide. MITS products are firmly entrenched in a wide range of business areas, including manufacturing, distribution, retail sales and services, education, government, health-

care, and insurance as well as in many other industries. ■



### OpenQM for the Intel Mac

Ladybridge Systems recently announced the availability of the OpenQM MultiValue database product for the Intel version of the Apple Mac.

OpenQM has been available on the PowerPC-based Mac since March 2007. This announcement brings the product forward onto the latest Mac systems.

Providing what is probably the lowest total cost of ownership of any MultiValue database product together with advanced functionality and outstanding support services, OpenQM is now available for Windows, Linux, FreeBSD, PowerPC- and Intel-based Mac, and Windows-based PDAs.

OpenQM takes the industry standard MultiValue data model and extends it to include object-oriented programming alongside many new features in dictionaries, the command language, the query processor, and application programming.

A license for OpenQM includes the powerful AccuTerm termi-

nal emulator and Coyote web server at no additional cost.

For more information about OpenQM, visit [www.openqm.com](http://www.openqm.com). ■

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# Using Google Features in an OpenInsight Application: Browser-Based Fun

**E**verybody seems to know about Google. It is the most popular search engine on the planet, at least according to Nielsen Online. Nearly every web user has used either the Google search page or the Google search bar in the browser. Heck, the term ‘google’ (originally based on a misspelling of the term googol – ten to the 100th power) was defined in the *Oxford English Dictionary* in 2006, meaning “to use the Google search engine to obtain information on the Internet.”

However, Google is much more than a simple search engine. For example, try this simple true and false quiz:

1. The Google search bar is a calculator. (T/F)
2. Google has indexed entire printed books. (T/F)
3. Google offers a free office suite of tools, including a word processor, spreadsheet, calendar, and e-mail. (T/F)
4. Google wants to rule the world. (T/F)

With the possible exception of question four, the answer to all the above is true.

In this article, we’ll explore using just a few of the many capabilities and features that Google provides. While our orientation is biased towards OpenInsight (as the author is a developer for and employee of Revelation Software), the techniques can easily be applied to any development tool that can display a browser interface and send a request through the Internet.

## How to Talk to Google

Most internet users communicate with the various Google services by typing in a command to

an address bar in a browser. They are communicating with Google via HTTP and URL commands. Other options include using XML or other text strings to the various Google Application Programming Interfaces (APIs).

Depending upon the tool within Google that a developer wants to use, a different way of communicating may be available. For a developer, the first stop should be [code.google.com](http://code.google.com). From that page there is a link to the various APIs available. Some, such as Google Spreadsheets or Google Calendar, use the Google Data API. This API defines and provides the protocols for reading and writing data on the web. These APIs use either Atom or RSS for communications. RSS is more established, but Atom is newer and has more features. More information about Atom can be found at [AtomEnabled.com](http://AtomEnabled.com).

Other APIs, such as Google Maps or Google Charts, can be manipulated entirely via HTTP commands. If your product supports the ability to send a string of HTTP text to a browser, it can handle this interface. For the purposes of this article, we’ll limit our discussions to this type of interface. In general, it is simpler to create these strings and pass them through

“  
*The techniques can easily be applied to any development tool that can display a browser interface and send a request through the Internet.*  
 ”

the browser than it is to interpret and use a new API. Also, it's much easier to debug as you can use a regular browser to test your strings.

### General Requirements

OpenInsight is a graphical, multivalued, database application development tool. It has its own programming language, editors, form designer, and much more. Within the form designer, and so within OpenInsight forms, developers have the ability to embed 'Browser' controls. This lets developers create forms that effectively have the Internet available for these forms.

In order for the examples in this article to work correctly for your copy of OpenInsight, you will need the following to use Google with an embedded HTML control in an OpenInsight Screen:

1. Have a live connection to the Internet;
2. Have an OLE control in your OpenInsight screen, with a control class/text value of "about:blank";
3. Have the ability to assemble a web address or URL; and
4. Perform a 'SEND\_MESSAGE' of 'Navigate2' of that web address to that OLE control.

Figure 1 shows an example of an OpenInsight form in the Form Designer with the above.

So, the general flow of operation in an OpenInsight screen is to gather the data, assemble a valid string of HTTP text for the particular Google API being used, and then tell the embedded browser control to 'Navigate To' or execute that string of HTTP text.

### Show Me the Way: Google Maps

Our first example will show how OpenInsight can control Google Maps. This will allow developers to embed Google Maps within their OpenInsight screens. It allows for different levels of zoom, the ability to show for maps, satellite view or a hybrid of both, and perhaps best of all it's free.

When using Google Maps, all the user has to do is send address information to the Google servers. If a latitude and longitude are passed, the user will see a faster response time than if they pass just address information. However, address information only, such as "99 Kinderkamack Road, Westwood, NJ", usually works fine.

When an address is passed to Google in that format, it is passed to an internal Geocoder that tries to figure out the latitude and longitude based upon what was passed in. And while using Google

Maps is free, there is a limit of 15,000 geocode calls per IP address per day. Hopefully your site will stay below that threshold, otherwise you will need to pass latitude and longitude numbers yourself.

Based upon the documentation at Google and found at other sources, a call to Google Maps via HTTP requires the following components:

1. A call to the webpage and an language indicator: `http://www.google.com/maphp?hl=en`
2. A parameter for either an address: `&q=123 Main Street`
3. Or a parameter for a latitude and longitude: `&sll=36.1205,-115.1865`
4. If wanted, a parameter for a zoom level, which is an integer between one and twenty: `&z=18`

*Continues on page 32*

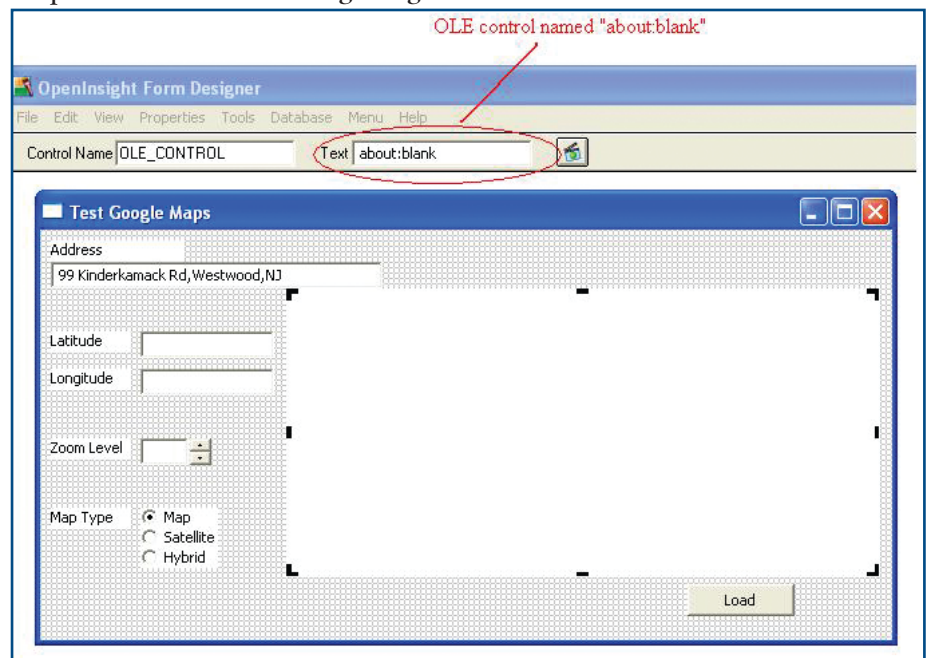


Fig. 1



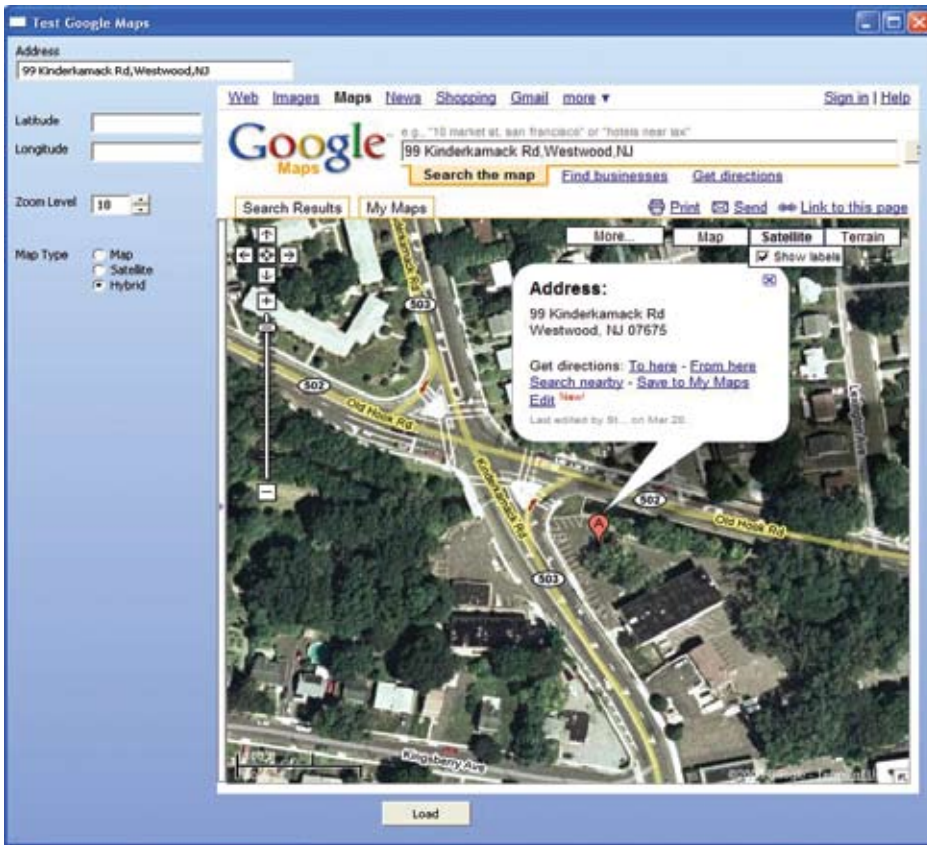


Fig. 2 The Google map as requested.

## USING GOOGLE FEATURES IN AN OPENINSIGHT APPLICATION: BROWSER-BASED FUN

Continued from page 31

- If wanted, a map type indicator. This must be either m for Map, k for Satellite (an homage perhaps to the fact the Google purchased Keyhole digital mapping in 2004), or h for Hybrid. &t=m

So, in order to get a pretty comprehensive call to Google Maps, we need to pass the following:

```
http://www.google.com/
maphp?hl=en:&q=99 Kinderkamack
Rd,Westwood,NJ &z=18&t=h
```

Which translates to: give me a hybrid map of 99 Kinderkamack Road, in Westwood, NJ, with a zoom level of 18.

Figure 2 shows the result of the search.

Once the Google Map has appeared in the browser control embedded in the OpenInsight form, it works just as it does when in the browser window proper. The user can change the zoom level, or scroll the map around, or change the map type, and so on.

While the above is a relatively simple example, the user can readily see many applications where providing a map reference to address in a user screen can provide tremendous value.

### How's It All Looking: Google Charts

If your application can benefit by charting some of the information contained within the data, Google Charts offers a possible solution. Just like Google Maps, it is relatively easy to use. It is powerful with multiple chart types. And again, it is free. While full documentation can be found on Google's website (intl-spectrum.com/s1003), this example will limit itself to just a few types of charts.

Similar to using Google Maps, the user must send a string of HTTP to a browser control and have it execute. However, there are more options with a chart (such as chart type, axis labels, chart

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label, etc), and the data has to be sent as well.

Based upon the documentation at Google and found at other sources, a call to Google Charts via HTTP requires the following components:

1. A call to the webpage: `http://chart.apis.google.com/chart?`
2. A parameter indicating the chart size in pixels (this is required): `chs=200x100`
3. A parameter for a chart type. Some possible values are `p3` for 3D pie chart, `lc` for a line chart, `bhs` for a horizontal bar chart, `bvs` for a vertical bar chart, and `gom` for the Google-O-Meter: `&cht=p3`
4. A parameter for chart data. Data values must be separated with commas: `&chd=t:6,4,2,5`
5. A parameter for chart labels. If depends upon the chart type, but labels values are usually separated with pipe characters: `&chl=0|50|100|`
6. If wanted, a chart title can be added. Spaces in the title must be converted to plus signs: `&chtt=My+Chart+Title`

There are many other possible combinations and permutations to creating charts; those documented above are just a few. Please refer to the web site for full documentation.

So, in order to get a pretty comprehensive call to Google Charts, we need to pass the following:

```
http://chart.apis.google.com/chart?chs=540x250&chd=t:10,120,38,25,61&cht=p3&chl=mike|pat|kelly|kevin|brian&chtt=Sample+Google+Chart
```

Figure 3 shows an example of the chart created with the above parameters. Figure 4 shows the same data but with a chart type of Google-O-Meter. Figure 5 shows a snippet of code used to generate the Google Charts Google-O-Meter example.

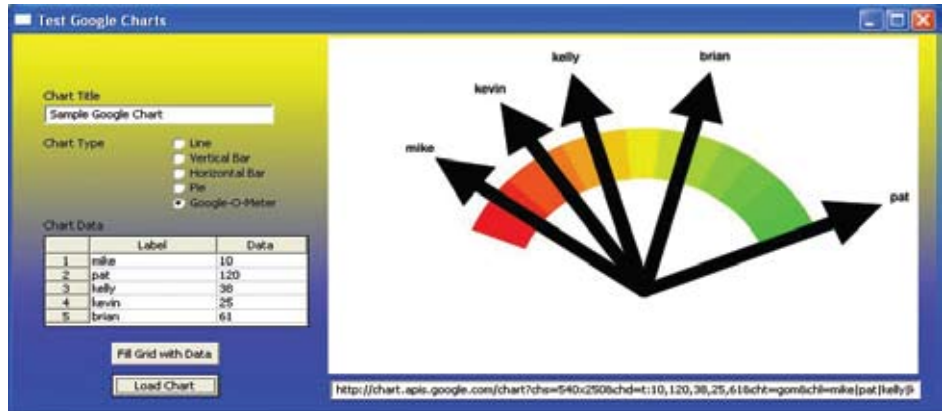


Fig. 3 A sample 3D Pie chart

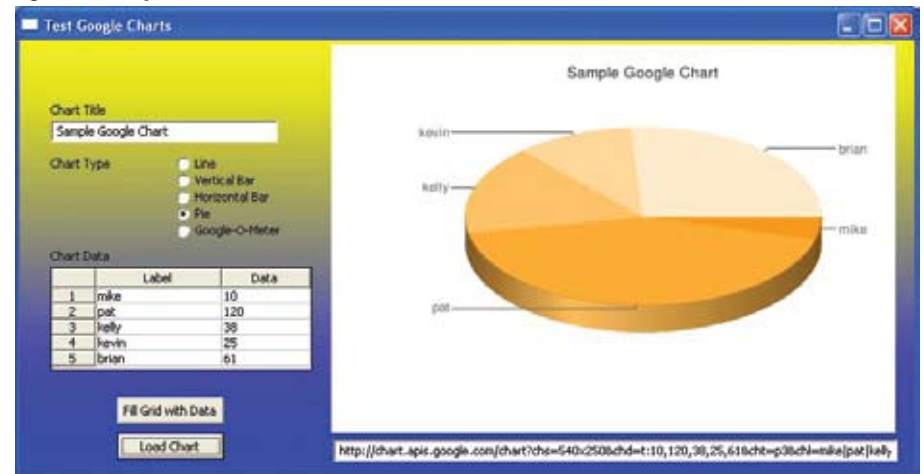


Fig. 4 A Google-O-Meter chart of the sample data

As in the case of embedding Google Maps in your OpenInsight application, the Google Charts capabilities really help prove the phrase, "A picture is worth a thousand words."

### From Maps To Charts To Dashboards

Given that an OpenInsight application now has the capability to show a chart or graph, the next logical step might be to show multiple graphs at once, similar to many of the Dashboard products available. While this example is not meant to take the place of those products, it does provide a possible stopgap solution.

In both of the prior examples, there has only been one OLE control on the screen with a value of 'about:blank'. It makes perfect sense that three could be multiple controls with that value, with different names. Figure 6 shows such a window in design mode, and figure 7 shows the same form during a test run.

*Continues on page 37*

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## Reporting and Business Intelligence Tools:

# C-7 Reporting

**C**ontinuing our series on Reporting and Business Intelligence tools for the MultiValue market, we sat down with Larry Christensen, the president of C-7 Reporting Solutions, LLC. He's been in computers professionally since his days at Pertec and General Automation, and has spent the last two years building up C-7 Reporting.

**SPECTRUM:** *Most of this series has been about interviewing the company that developed the tools they sell. I understand that your relationship is different.*

**LARRY:** My company, C-7 Reporting Solutions, is a U.S. and Canadian distributor and reseller for the Via Systems Quantum VS myViewpoint dashboard and business intelligence tool.

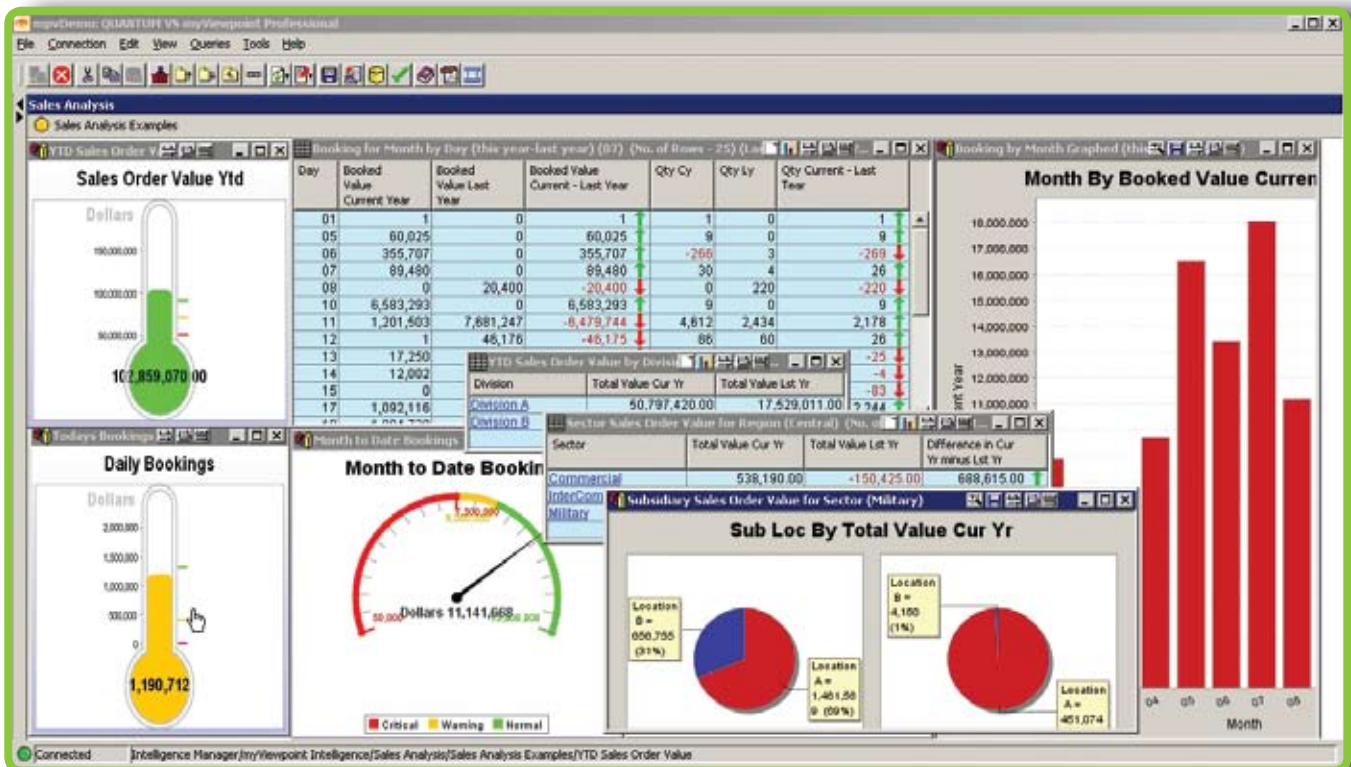


Fig. 1 Sample myViewpoint dashboard

**SPECTRUM:** *Why did you choose that tool?*

**LARRY:** We chose the myViewpoint product because the market is moving more and more toward the visualization of data. Business is moving at a faster pace and managers are anxious for information faster than ever before. So having access to the raw data throughout the day is becoming a requirement. We find this capability in an operational BI tool such as myViewpoint.

**SPECTRUM:** *So this has an edge over standard reporting?*

**LARRY:** Prior to this technology the best that company management received was a comparison of historical data — which is Tactical BI. So, the difference is Operational BI vs. Tactical BI.

Tactical is an important component but not the end all in BI any longer. Operational BI opens all the files on a system and makes them available for query, versus only having access to a single file in a tactical-based environment.

**SPECTRUM:** *Since you started breaking BI into types, I read this excellent article in Spectrum last month which referenced three parts: Operational, Tactical, and Strategic. How does your tool play in these three areas?*

**LARRY:** myViewpoint plays well with all three types of BI. In Operational, the product has access to updates and changes to the data throughout the day. A simple example would be with bookings. Let's say it is the end of month and quarter and we are in the last few days of this time period. An operational dashboard approach will have a thermometer or speedometer set up to automatically update throughout the day as orders are input into the application by Order Entry.

The thermometer/speedometer will track bookings throughout the day and, by clicking on the graphic, you may wish to see the orders that have arrived so you know what is still outstanding. You may also want to compare actual versus budget and compare this year versus last year. All of this is available because all the files are available and we can get to the live data. Operational views are about what's going on right now.

**SPECTRUM:** *So the graphical widgets aren't just summaries, they also let you drill into the data?*

**LARRY:** Yes, the graphics on the screen are available to drill through. You may have as many drill paths of any length as you desire, to as many files as you desire.

**SPECTRUM:** *Sounds, well, desirable. What about the other two types of BI?*

**LARRY:** Tactical means you have the ability to look not just at the current data but also at the historical data. You have the ability to look at trends and differences referenced by time: this year versus last year, for example. If the budget information is available, it is always beneficial to see actual versus budget. With strong dashboard capability you have the ability to visualize your data and drill through current and historical information.

**SPECTRUM:** *So that just leaves Strategic BI..*

**LARRY:** In a study by Business Week — I don't remember the exact date — the human brain can remember six things on a report. Now imagine being able to see the visualization of an entire company's Sales, Profit, Cost, Inventory, Financial position, etc. Now you see what is going on with your entire area of responsibility.

Strategic BI is meant to look at how decisions by management affect a company. Management needs to see that their team is really collaborating. An example may be the change in pricing for a particular product type. Did sales and marketing work well with the factory? Did the pricing change have the desired affect? If you use the operational and tactical aspects of the product a little differently, you will have a strategic view on the company.

**SPECTRUM:** *So BI is designed to help management grasp the whole picture in summary because it is virtually impossible to grasp the whole picture in detail? It sounds like this is strictly a management tool, right?*

**LARRY:** Not at all. All levels of management and users will find the information useful. Operational shows them what's happening now. Tactical is viewed by management and line personnel to track how they and their part of the company are doing. Strategic is viewed by management generally on a periodic basis to see that the ship is going in the right direction and the collaboration by the team is on track. myViewpoint handles all three aspects of BI and allows the user the ability to drill through the information into the detail information.

*Continues on page 36*



## REPORTING AND BUSINESS INTELLIGENCE TOOLS: C-7 REPORTING

Continued from page 35

**SPECTRUM:** *How much work is involved in getting myViewpoint to handle all of this?*

**LARRY:** The hardest part of any BI installation is the thinking on the front-end of the process. Once the users' team knows what they really want to track and see, the rest is like pushing over a domino. The tool is very easy to use.

**SPECTRUM:** *So, assuming we know what we need to know, how long does it take to push over that domino?*

**LARRY:** We have an interview process we work with on the front-end with the user to help us help them. Training on the product is measured in hours,

not days or weeks. A user can be up and running the same day it is installed. And, we have Certified Business Intelligence Professionals on staff. We are members of TDWI, The Data Warehouse Institute ([www.tdwi.org](http://www.tdwi.org)). Having the correct talent and understanding is critical to a successful installation.

**SPECTRUM:** *So you offer the support which makes set up reasonably easy?*

**LARRY:** Not just that. The nice part about myViewpoint is if the user needs to make a correction, changes are no big deal to make and may be deployed in minutes.

**SPECTRUM:** *So what parts are we setting up when we buy myViewpoint? What comes with it? Am I stuck drawing thermometers?*

**LARRY:** Thermometers and Speedometers as well as charts and graphs are all included and are used by the user. No creation of widgets is required. This is a complete suite with nothing hidden. myViewpoint has everything you need in the base package. You create queries with a wizard and use them in a GUI or Web environment. Security, training videos, administration tools, and everything you need are included. We have options for additional training and services if required. What the user needs to bring to the table is the knowledge of their data.

**SPECTRUM:** *It sounds like this is much more than just a sales job for you. You seem to be deeply invested in understanding and promoting BI.*

**LARRY:** I love BI and advanced reporting. Others may find it dry but I find it utterly fascinating but, it's not just me.

Continues on page 42



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## USING GOOGLE FEATURES IN AN OPENINSIGHT APPLICATION: BROWSER-BASED FUN

*Continued from page 33*

The ability to embed multiple browser controls in a screen, when coupled with the power of the Google suite of tools, makes for a powerful combination indeed.

### Google: A Great Number of Possibilities

Although only two of the various Google tools have been shown, nearly all of the tools available from Google can be used with OpenInsight. OpenInsight's ability to call the APIs directly, instead of the HTTP/URL examples shown in this example, makes this possible.

And since the moderate use of these Google tools is free, a developer can really give a quick and easy update to the features and functionality of their own applications for a very small investment of time and effort. We recommend that you, as a developer, take a look at these great tools. **IS**

```

36
37
38 * Get chart specifics
39 title = Get_Property(@window:'.CHART_TITLE', 'DEFPROP')
40 chart_type = Get_Property(@window:'.CHART_TYPE', 'VALUE')
41 data = Get_Property(@window:'.DATA', 'ARRAY')
42
43 * hardcoded, but should be retrieved dynamically
44 width = 540
45 height = 250
46
47 labels = data<1>
48 values = data<2>
49 swap %vm with '|' in labels
50 swap %vm with ',' in values
51
52 * start building the URL
53 url = 'http://chart.apis.google.com/chart?'
54 url+= '%s=width:%s;height'
55
56 * based upon the map type, build the URL differently.
57 * the order of the different parameters is important!
58
59 if chart_type = 'gom' then
60 * Google-O-Meter:
61 url+= '%s&cht=:values'
62 url+= '%s&chl=:chart_type'
63 url+= '%s&chl=:labels'
64 end
65
66 * show a title if we have one
67 if title then
68 convert ' ' to '+' in title
69 url+= '%s&chtt=:title'
70 end
71
72 * Navigate the OLE control to the chart
73 Call SendMessage(@window:'.VIEWER', 'Navigate2', url)

```

Fig. 5 Code sample for generating the Google-O-Meter example.

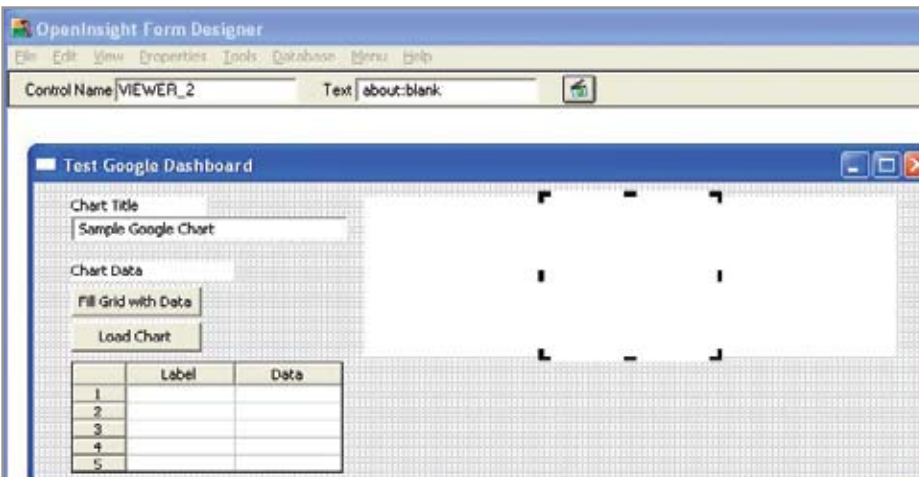


Fig. 6 A dashboard example using Google Charts, development mode view.

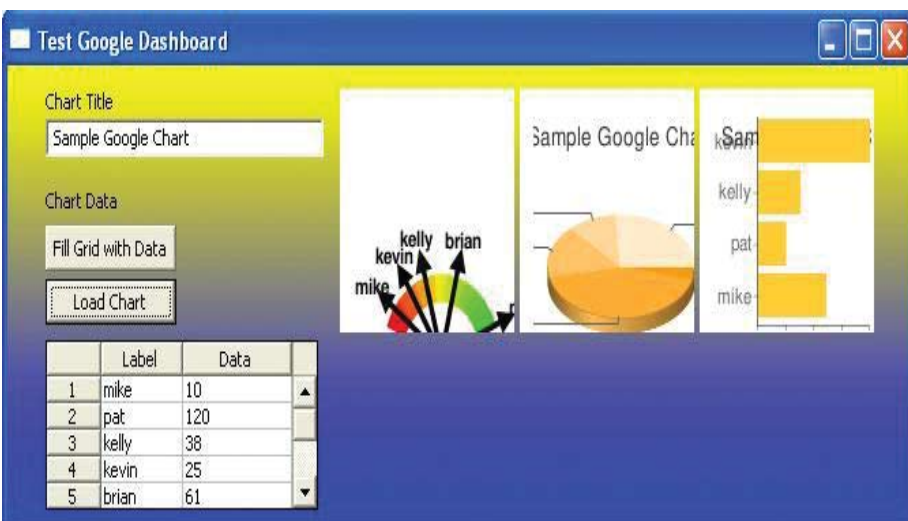


Fig. 7 A dashboard example using Google Charts, during a test run

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TECH TIP FROM CHARLES STEVENSON

## Program Layer Stack in UniVerse

**As of release 10.0.6** of IBM's UniVerse, the Basic function SYSTEM(9001) will return a dynamic array that contains roughly the same information that PORT.STATUS LAYER.STACK or RAID "T" command provides.

Figure 1 shows a sample subroutine that displays the data and figure 2 lists a dummy program that calls it.

```
SUBROUTINE SYS9001
CRT "Depth Executing..... Address"
S = SYSTEM(9001)
FOR A = 1 TO DCOUNT( S, @AM )
  CRT S<A,1> "4R##: " S<A,2> "40L#40": S<A,3>
NEXT A
CRT QUOTE( S )
RETURN
END
```

**Fig. 1 Subroutine SYS9001**

```
CALL SYS9001
STOP
END
```

**Fig. 2 Program DUMMY**

Then from the menu, I get to pseudo-TCL and execute the dummy program. The output is shown in figure 3.

```
----: XEQ RUN CDS.BP DUMMY
Executing the command "RUN CDS.BP DUMMY".
Depth Executing..... Address
 3: CDS.BP.O/SYS9001          0x6
 2: CDS.BP.O/DUMMY           0x0
 1: /dbms/uv/catdir/*UVPRINTMSG 0x4b40
 0: /dbms/uv/catdir/-MATBLOCK  0x0
-1: /dbms/uv/catdir/-PERMISSIONS 0x0
-2: /dbms/uv/catdir/-GET.FILE.NAME 0x0
-3: /dbms/uv/BP.O/ED.B       0x0

"3}CDS.BP.O/SYS9001}0x6~2}CDS.BP.O/DUMMY}0x0~1}/dbms/uv/catdir/*UVPRINTMSG}0x4b40~0}/dbms/uv/catdir/-MATBLOCK}0x0~-1}/dbms/uv/catdir/-PERMISSIONS}0x0~-2}/dbms/uv/catdir/-GET.FILE.NAME}0x0~-3}/dbms/uv/BP.O/ED.B}0x0~"
```

**Fig. 3 Output from test run**

One caution: the data is turned 90 degrees from the conventional way MultiValue data is handled.

*Continues on page 42*



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# Staying Alive

Last month I brought up that Ajax is often misunderstood. So, as part of an ongoing effort to make sure that we know what Ajax can and cannot do, I thought I'd start talking up some real world ways it's useful. As a reminder, Ajax is a way to call a URL automatically from a web page, without having to type the URL or click a submit button.

Here's a rather flexible Ajax tip. The concept is to use Ajax to make its background call to perform a function, but to do so on a periodic basis. The various components are used here and there in various pages using basic JavaScript, but when applied with some Ajax calls, you get to reuse it in several clever ways, such as:

- Check to see if a report is finished and then present it, without "refreshing" the HTML page;
- Keep your session alive, to keep a user from set time out; or
- Report a current inventory or other type of count, without refreshing the HTML page.

Fig. 1 Sample Ajax Code

```
<html>
<head>
<title>Eagle Rock Information Systems Webonomics - by Melvin Soriano</title>

<script language="javascript" type="text/javascript">

/* Section 1 - The timer */
var time = 10; //time in seconds
var interval = time * 1000;
var timer = setInterval("KeepAlive()", interval);

/* Section 2 - Basic Ajax Setup */
/* Create a new XMLHttpRequest object to talk to the Web server */
var xmlhttp = false;
/*@cc_on @*/
/*@if (@_jscript_version >= 5)
try {
    xmlhttp = new ActiveXObject("Msxml2.XMLHTTP");
} catch (e) {
    try {
        xmlhttp = new ActiveXObject("Microsoft.XMLHTTP");
    } catch (e2) {
        xmlhttp = false;
    }
}
@end @*/

if (!xmlhttp && typeof XMLHttpRequest != 'undefined') {
    xmlhttp = new XMLHttpRequest();
}

/* Section 3 - Keep Alive */
function KeepAlive() {
    var url = "/cgi/wwiz.exe/wwiz4.asp?wwizmstr=X.CURRENT.TIME";
```

*code continues on page 41*



The code is shown in figure 1. You can also get the code from the ERIS web site ([intl-spectrum.com/s1001](http://intl-spectrum.com/s1001)).

The key scripting code is isolated in several main sections. First, you need to have a timer. If you look towards the top of the code, you'll see the Section 1 Timer. It is currently hard-coded to a 10 second interval (ten multiplied by a JavaScript time, which is in milliseconds). At the set intervals, a function called "KeepAlive" is called.

In Section 2, you'll see the basic Ajax initialization routine. You've seen me use it in previous examples. Basically, it will create a new XMLHttpRequest object, regardless of which browser family is used. Since it works against Internet Explorer, Firefox, and Mozilla, most browsers will be able to use it.

When we get to Section 3, you'll see the KeepAlive function defined. First, for demonstration purposes, it's calling one of our WebWizard URLs. It can be used in a web service to give the current time, as it merely reports the time in raw text and nothing else. It attempts to do a GET on that URL. Upon successfully retrieving the URL, it performs the FreshenPage function, which is found in Section 4.

So far, everything in the code is re-usable, and only the URL needs to be changed. If all you are trying to do is keep your session alive, then you've accomplished it. Many web pages, for example, are integrated via some log in method to a portal or time-sensitive site that will log itself out if not visited. This typically isn't a problem if you happen to stay on that site the entire time.

*Continues on page 44*

**Fig. 1** *code continued from page 40*

```
// Open a connection to the server
xmlHttp.open("GET", url, true);

// Setup a function for the server to run when it's done
xmlHttp.onreadystatechange = FreshenPage;

// Send the request
xmlHttp.send(null);
};

/* Section 4 - Fresh the page */
function FreshenPage() {
    //If we have recieved a response
    if (xmlHttp.readyState == 4)
    {
        var imageElement = document.getElementsByTagName("processingIcon")[0];
        //If the parent node exists and is not null, process this
        if (imageElement)
        {
            var parentElement = imageElement.parentNode;
            parentElement.removeChild(imageElement);
        }
        //Create the element to contain our returned HTML page from BIRT
        var childElement = document.createElement("report");

        //Set the innerHTML code to the returned report page
        childElement.innerHTML = xmlHttp.responseText;

        //Go through the DOM tree until we find the body element
        var bodyElement = document.getElementsByTagName("body")[0];

        //Find and remove the old section, if it exists
        if (bodyElement.hasChildNodes()) {
            for (i=0; i<bodyElement.childNodes.length; i++) {
                var oldElement = bodyElement.childNodes[i];
                if (oldElement.nodeName.toLowerCase() == "report") {
                    bodyElement.removeChild(oldElement);
                    i--;
                }
            }
        }

        //Append our Report result into the HTML body
        bodyElement.appendChild(childElement);
    }
    else
```

*code continues on page 44*

## EXTENDING UNIOBJECTS.NET

Continued from page 18

cheat for the sake of brevity and assume right justified searches are numeric and ignore error trapping in this example (fig. 10).

So that's the guts of the function written ready to be added to my extension class. Adding this to the initial argument attaches it to the UniDynArray class so I'm home (fig. 11).

Now I can use this in my test project. Note that UniObjects requires a session before it can create a new UniDynArray (fig. 12 and fig. 13).

Extension methods are a neat way to add your own functionality while preserving the feel of the existing classes and supporting IntelliSense. You might want to try adding a Field method to a String or emulating the Matches operator using regular expressions. **IS**

---

**BRIAN LEACH** is a consultant living in the UK. A self-confessed geek, he is serving Past President of the International IBM U2 User Group.

## REPORTING AND BUSINESS INTELLIGENCE TOOLS: C-7 REPORTING

Continued from page 36

We have a team of professionals that have been fully involved in the BI community for years. We all came from MultiValue and we have not forgotten the database roots we have been involved in for so many years. MultiValue has been good to us and we enjoy working in this environment. We saw a need to bring our passion of BI to the MultiValue community.

For more information about C-7 Reporting, call 909-349-1736 or visit [www.c-7reporting.com](http://www.c-7reporting.com).

**Editor Note:** Do you have ideas for other reporting or business intelligence systems for us to profile here? Please e-mail your suggestions to [editor@intl-spectrum.com](mailto:editor@intl-spectrum.com). **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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## TECH TIPS: PROGRAM LAYER STACK IN UNIVERSE

Continued from page 38

- Value 1 of each attribute is the depth in the return stack. The non-negative numbers mean that those programs are all part of the return stack. The negative numbers simply mean those subroutines were called and returned from in the past.
- Value 2 is the program.
- Value 3 is the hexadecimal address (the obj address you see when you VLIST a program). For the negative depths, n/a. (0x0 on DUMMY is real. They are small programs.)

The number of values is constant, the number of attributes grows or shrinks. **IS**

**CHARLES STEVENSON** can be contacted at [Charles.Stevenson@getronics.com](mailto:Charles.Stevenson@getronics.com). Do you have a Tech Tip to share? E-mail it to [editor@intl-spectrum.com](mailto:editor@intl-spectrum.com)

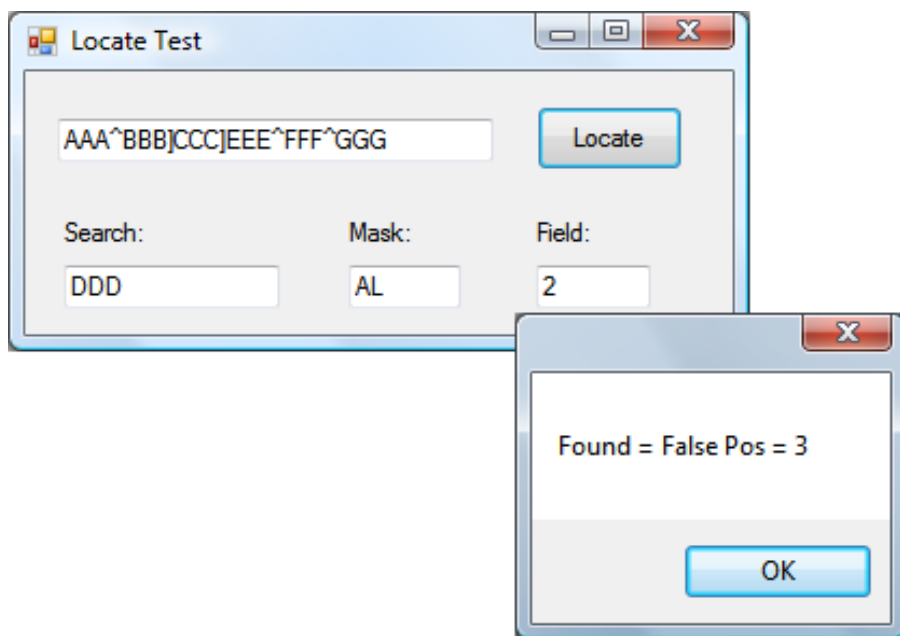


Fig. 13

## Feedback

*What came first, the letters or the letters-to-the-editor department?*

We are making another change to International Spectrum Magazine — a Feedback Department, sometimes known as Letters to the Editor.

We want to hear your comments, your reactions, your agreement or disagreement with what you see. Also, do not hesitate to let us know about things happening in the MultiValue Community we may not have heard about yet.

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- The activity has clear goals and provides almost immediate feedback as to whether or not the goal has been met, or evidence that you are at least making progress;
- It requires enough concentration that it can consume all of your attention to the point of shutting out other thoughts;
- It provides a sense of being in control;
- In performing the activity, you lose your awareness of the passage of time.

Think about the last time you were working on something on the system and three hours went by before you knew it. Unless you are new to MultiValue platforms, it probably wasn't just because you were writing another MultiValue Basic program. You were probably using that skill to solve a new (to you) or tricky problem, hence requiring skill but also providing a challenge. The goal is clear — get it to work. And programming does provide almost instant feedback, and a certain sense of control. And, if the problem is tricky enough that you cannot sit down and just code it but have to really think about it, yet not so complicated that you have no clue how to do it, you start nibbling away at it, make a little progress, two steps forward, maybe an occasional step back. And before you know it, you stop to admire the sunset and then realize you are looking east.

Now, maybe I'm just weird, but I'd much rather enjoy myself than be bored. So I've been experimenting with ways to induce flow experiences on purpose. And I have been having a bit of success, so I thought I'd share some ideas with you. Of course, every person is different, but maybe this will give you some ideas. (And if you find some techniques that work for you, I hope you will share them with us. Drop me a line at [wco@oliver.com](mailto:wco@oliver.com)).

Let's say that you have a new program to write that you estimate is going to take two days. If it is going to take you a day and a half to cut the code before you can compile and start testing, that is likely to be a day and a half of pure boredom and drudgery. However, if you use top-down programming and stubs (GOSUBS that print a trace message and simply return; details to be coded later in the process), you can get the main structure of the program completed, compiled, and tested in an hour or two. There is your first goal accomplished with quick feedback and a reward feeling of success.

Moving to the first stub, you decide how to test that function, code it out, and repeat the process. So instead of a full first day of "workin' in the code mine" as the clock drags, you get sucked into a quick day of constant progress with feedback and reward all day long. In effect, you have created a flow experience by tweaking the goal and feedback loop.

The other requirement for flow that is readily manipulated is the skill-challenge balance. Perhaps you have a rather mundane set of changes to make to a program that does a lot of work with multivalues. Rather than looping through them the way you have for the last 10 years, you decide to use the (new to you) multivalue subroutines provided by your platform, or the debugger instead of PRINT and INPUT statements during testing. Anything that, within reason and time constraints, makes you think a little bit harder about what you are doing.

Give it a try and see if it doesn't improve your work experience over the next few weeks. If it does, great. If not, you can always go...

...back...to...watching...the...clock. **IS**

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## WEBONOMICS

*Continued from page 41*

If, however, your web software must run or be integrated from an external source, then you may need to keep the log in session alive. Just blank out the FreshenPage function and this bit of code will do just that for you.

Of course, the whole point of using Ajax is that it's not necessary to refresh the entire page or to smack the web user across the head with the idea that you're going out hitting the Internet. Instead, the request to do these actions is done in the background, without any direct user intervention. Think of it as a phantom process.

Now, if you are not merely pinging the URL but actually deriving some bits of information from it, then you will want to use the FreshenPage function in Section 4. It is somewhat hairy, so let me summarize what it's doing:

Check to see if the URL has come back. If it has returned, then remove the busy icon and create an area to

show the report. If it's not yet back, then create a busy icon.

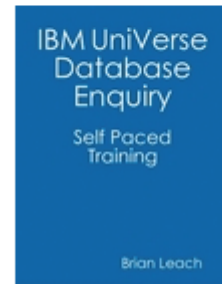
And that's it. Now, the information returned in the example can be anything at all, though what we return happens to be a current time. Every 10 seconds, it refreshes.

One thing to recognize is the difference between this and using a meta tag. The meta tag would refresh the entire page. Though that may be acceptable for some pages, it doesn't fit all needs. Moreover, if the URL fails for some reason, you get a "Page not found" error. In an Ajax call, the error doesn't appear. Google uses this to great effect. Notice that when you use Gmail and a background Ajax transaction takes too long, you get a message about the server being busy, rather than a broken HTML page.

Another difference is the transmission of the results into the main HTML document. One traditional (ha ha, allow me to laugh at the term traditional when discussing the Web, since apparently 10 years is considered historical) way

*Continues on page 45*

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**Fig. 1** *code continued from page 41*

```
{
    //Display a animated gif to give the impression of a processing bar
    var childElement = document.getElementsByTagName("processingIcon")[0];

    if (!childElement)
    {
        var childElement = document.createElement("processingIcon");

        childElement.innerHTML = '';

        var bodyElement = document.getElementsByTagName("body")[0];
        var reportElement = document.getElementsByTagName("report")[0];

        if (reportElement)
        {
            bodyElement.insertBefore(childElement, reportElement);
        }
        else
            bodyElement.appendChild(childElement);
    }
};

</script>
</head>
<body>
The current time is
</body>
</html>
```



## OPTIMIZING UNIDATA BASIC VIA CODE PROFILING, PART 2

Continued from page 10

Even more importantly, our 148 second runtime has been reduced to a mere 2 seconds — a considerable improvement indeed!

Throughout this demonstration we've been using the profile.elapsed.pid file — the one showing clock time, not CPU time — as a measure of the performance of this program. You could actually use either as a basis for your investigation. But if we're trying to improve the user experience, our user is likely going to be more interested in getting more done in less clock time, regardless of what it might mean to a CPU they've never met. Later we'll dig deeper into the differences between the two profiling reports to see when CPU time can actually be a better metric than clock time.

So what about the READ/MATREAD issue? Clearly in this situation MATREAD would not have helped because the I/O overhead is basically the same for both

commands. But beyond that, MATREAD hides a dirty little secret that could make it less of the panacea than you may have been led to believe. Is MATREAD *really* better, faster, and cheaper than READ? Stay tuned as we investigate that question next time.

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**



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## WEBONOMICS

Continued from page 44

of such an effort is to send results into a frame. Though the frame can be useful as an organizational container, it's clumsy and problematic. Using style sheets and dynamic HTML instead provides clean control that works on most browsers. **IS**



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%time	cumsecs	seconds	calls	name
50.0	1.00	1.00	1	TRAINPROGS\_ZIP.RPT4:2000
50.0	2.00	1.00	1	TRAINPROGS\_ZIP.RPT4:1000
0.0	2.00	0.00	1	TRAINPROGS\_ZIP.RPT4
0.0	2.00	0.00	44919	TRAINPROGS\_ZIP.RPT4:2100

index	%time	self	descendents	called/total called+self called/total	parents name children
					<spontaneous>
[1]	100.0	0.00	2.00	1	TRAINPROGS\_ZIP.RPT4 [1]
		1.00	0.00	1/1	TRAINPROGS\_ZIP.RPT4:2000 [2]
		1.00	0.00	1/1	TRAINPROGS\_ZIP.RPT4:1000 [3]
-----					
[2]	50.0	1.00	0.00	1/1	TRAINPROGS\_ZIP.RPT4 [1]
		1.00	0.00	1	TRAINPROGS\_ZIP.RPT4:2000 [2]
		0.00	0.00	44919/44919	TRAINPROGS\_ZIP.RPT4:2100 [4]
-----					
[3]	50.0	1.00	0.00	1/1	TRAINPROGS\_ZIP.RPT4 [1]
		1.00	0.00	1	TRAINPROGS\_ZIP.RPT4:1000 [3]
-----					
[4]	0.0	0.00	0.00	44919/44919	TRAINPROGS\_ZIP.RPT4:2000 [2]
		0.00	0.00	44919	TRAINPROGS\_ZIP.RPT4:2100 [4]

Fig. 6 Updated profiling statistics

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(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

do it even at great cost, for the sheer sake of doing it." (Oh, stop twittering. This is not Freud.)

He first started becoming aware of this phenomenon when he was doing his graduate work in psychology studying artists. He noted some trends that when I read about them seemed familiar. See if this doesn't sound like the inner workings of a geek to you, too.

While working, they would go into almost a trance, "zone out," as it were, oblivious to whatever was happening around them. This reminds me of someone working for hours on a Wyse50 *terminfo* definition because the old terminal emulator worked, and the new one doesn't. Now, this near trance state was interesting enough itself. But after further inquiry and study, he discovered something quite unexpected.

The doing was more important than the done. In other words, the actual work was more important than the external reward. Although this went against the conventional wisdom of the time, you probably don't find it all that surprising. We all know geeks who will spend a lot of time, including their own nights and weekends, digging into some new feature of the system even though it is not part of any project, there are no immediate plans for its use, or even if there are no plans to use it anywhere in the company in the near future. But that doesn't matter; it is the process of learning it that gives them their satisfaction.

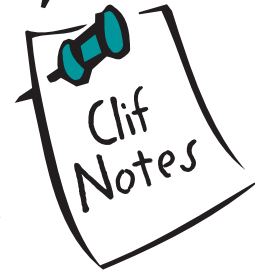
As Csikszentmihalyi continued his studies, he discovered that this phenomenon occurred in other groups than just artists. Looking for common features of each person's flow experiences, he found that flow experiences had the following general requirements and characteristics:

- The activity has to both require some skill but yet be challenging;

*Continues on page 43*

# Don't Go With Flow; Create It

B Y C L I F T O N O L I V E R



Sometimes...the...clock...just...seems...to...drag.

We have all been there. You know what it's like. You are working on some task, look at the clock, and note that it is 2:15 P.M. You put your face back in the screen and work for what seems like another hour. Looking back at the clock, you are dismayed to see that it is now 2:21 P.M. Muttering to yourself, "I can see it is going to be a long afternoon."

Making it to five o'clock seems like a feat akin to climbing Mt. Everest, only not as pleasurable. At least on Mt. Everest you can lay down in the snow, go to sleep, and be out of your misery. Here in the reality of the workplace, you can lay down, go to sleep, and find yourself out in the cold in an entirely different context.

Of course, I think most of us have experienced the exact opposite effect also. You get into work, get a cup of coffee, process some e-mail, and then start in on that new web services proof-of-concept project you got tasked with last week. A few minutes later, one of your coworkers breaks into your concentration asking, "Aren't you going to go to lunch today?"

"Huh?" you wittily reply. "Are you guys going already?"

"We just got back. We asked you if you wanted to go, and you just ignored us, so we went without you."

It is 1:15 P.M. You realize that either the clock is broken and always reads 1:15, or you completely zoned out and haven't moved from your desk since 8:30. Fortunately, you also forgot to drink your coffee.

Once when asked to explain relativity in simple terms, Albert Einstein said, "When a man sits with a pretty girl for an hour, it seems like a minute. But let him sit on a hot stove for a minute and it's longer than any hour. That's relativity."

Well, it was a clever sound-bite. But, either Einstein was talking about our sense of time, not time itself, or it demonstrates that time still confused him, too. For all practical purposes, time is a constant. It doesn't really speed up and slow down. But as AI pointed out, our perception of time is something else entirely. Some days an hour is forever; some days an hour is a heartbeat. One perception results in pain; the other is experienced as pleasure. The painful experience is called "boredom, work, or maintenance programming." The pleasurable one is called "flow."

The term "flow" was coined by psychologist Mihaly Csikszentmihalyi (pronounced chick-sent-me-high-ee). He defines it as "the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will

*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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