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# INTERNATIONAL Spectrum®

THE MULTIVALUE  TECHNOLOGY MAGAZINE | SEPTEMBER/OCTOBER 2013

## Developing for Google Glass

*Part 1*

### Also In This Issue:

- Automated Testing — Legacy Code
- Wearable Tech — Beyond Eyewear
- Dealing with Unstructured Data

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**Glass, Part I** You have revamped your MultiValue applications by replacing the old green screens with robust GUI interfaces, made your applications web-accessible, shared your data through web services and other technologies, and gone mobile with smart phones and tablets. Well, get ready. Here comes the next wave — wearable technology.

In this new series, Charles Barouch, a very experienced MultiValue Developer, will chronicle his story of what it takes to incorporate the new Google Glass device with a MultiValue Inventory application. **BY**

**CHARLES BAROUCH**

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16 **Unstructured Data** In the world of data storage and retrieval, life used to be simple. You had elements of data. Data had various types. Data elements went in columns in a table. And those of us in MultiValue had it even easier because we weren't even bound by those rules. But now we have to deal with unstructured data — email, social media posts, videos, etc. This article explores some of the issues that will cause even a MultiValue Developer to react, “Oh, my...” **BY NATHAN RECTOR**

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# From the Inside



Why do I still program?

I get asked that by various people several times a year: Why do you still program? Mainly this is at the Spectrum Conferences, but I do get it other times as well.

The easy answer, and one I always say with a smile, "Because I like doing it!" Well, that is not the only reason. I really do like programming, and the puzzles that are involved, but there is more to it than that.

As many of us get older and more experienced in application development, people expect you to give up practical programming and do more "noble" tasks such as managing a team of programmers or architecting systems; or in my case, take over a magazine.

While this is all important, it points to a model of management with which I'm not always in agreement. There are two management models that people usually chose from — Vertical and Horizontal.

Vertical management basically means that the people on top supervise other, cheaper employees. They spend all their time making sure the job gets done correctly and on time, attend meetings, and make design decisions. The major trap with this management style is sometimes the design decisions do not take into account how the cheaper developers decided to implement the "design," or how the upper management thinks the design was implemented, when it may have been done differently for practical reasons.

This model works well in large companies and gives you the ability to "scale up" quickly and easily.

Horizontal management means the top people are deeply involved with a lot of the work. This creates a major trap that I'm sure all of us know a lot about. It means we do so much of the work, that it is hard to pass projects on to cheaper developers because it would

"just be easier and faster for me to do it." This model does not "scale up" well. Especially if you are a control freak and never want to let go of things.

I have a tendency to like the Horizontal management style, even with its major trap, because it means I'm more involved with how something is implemented, in addition to the why something is implemented. Many times the great ideas from "upper management" sound good on paper, but the practicality of implementing it means the project fails.

By doing some of the coding, then I understand these limitations better, since I have to implement the work within the same confines as the other developers that I'm asking to do the work.

The other reason I program is because, time and time again, I find that my "Grand, Solve All The Company's Problems" ideas, are not well defined. This causes design decisions to be placed on the other developers. While in some cases this is fine, in others they are missing a lot of background regarding why something should be done one way instead of another.

Programing and implementing some projects helps me find those places that are not already well defined, and in turn helps me define them.

Don't get me wrong, programming is time consuming, and it takes away from the management time. The trick is to find a good balance between architecting, project and people management, training, and programming. The management should come first; the programming comes second. But I feel that programming is still just as important as the management.



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# INTERNATIONAL Spectrum

SEPTEMBER/OCTOBER 2013

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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., 8956 Fox Drive #102, Thornton, CO 80260; Tel: 720/259-1356; Fax: 603/250-0664 E-Mail: request@intl-spectrum.com. Copyright 2013 International Spectrum, Inc. All rights reserved. Reproduction in whole or in part, without written permission, is prohibited.

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# Developing for Glass

## Part 1

BY CHARLES BAROUCH

### Con Job

At the International Spectrum Conference, last April, I was given the opportunity to deliver the lunchtime speech on Augmented Reality. When I got up to the slide on Google Glass, the room went silent. Slowly, I reached into my pocket. Everyone was curious about Glass. They wanted to see. I pulled my sleep mask out and put it on, blindfolding myself as if for execution and apologized that I did not make the cut in the #ifihadglass contest.

We have a good group at the conference. They laughed and forgave me. I quipped that it was the best \$1,500 I never spent, since I got a good response without having to invest in Glass. Then, a few months later, I got the news — I made it on the second round of contest winners. Google would grant me the privilege of spending my \$1,500 and getting Glass.

### Getting Glazed

To paraphrase Tolkien: One does not simply walk in to buy Glass. You have to attend an orientation. There are only three places in the world (all in the U.S. do to legal issues, as I understand it) where you can get oriented. Lucky for me, one was

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*[With Google Glass] like MultiValue, and every other technology, there are assumptions baked into the design.*

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in Manhattan. It was a very — forgive me Google — Apple experience. The loft space was set up with a big open central area. The whole place was designed with the understanding that us happy few would be taking pictures while there and sharing them as our first baby steps with Glass. What was missing? Live developer training. Why? Because there is a ton of resources on the Internet.

### Initial Development Plan

I wanted to start with something breath-takingly practical. I won my spot by saying that I want to develop inventory applications for faster warehouse management. So, that's where I started. My process was simple:

- Hook up Glass to a database with Inventory data.
- Use the scanner capabilities to read product and box labels.
- Create an X-Ray effect, where looking at the labels pulled up information about the inventory.

### What Would It Take

My first challenge was to build or borrow an inventory database. We all know that was the easy part. Then I started looking at the Glass API. The API details are publicly available on the Internet, so you can see them for yourselves. I started realizing that using Glass as a scanner was far less efficient than simply sending the picture and letting the back-end services parse out the label.

This told me a lot about the inner logic behind Glass. While I could do what I wanted, Glass is optimized to the out-of-the-box experience. When you get it, it has built-in voice commands for "Take a Picture" and "Take a Video." I'm not saying Glass is too low horsepower to do what I want. Far from it. What I am saying is that, like MultiValue, and every other technology, there are assumptions baked into the design. Swimming upstream can be very productive: The web was designed for stateless, anonymous requests and people are subverting that every day.

Wanting to have an optimal experience for the user, I started rethinking my design. I wouldn't be going directly to MultiValue with a decoded code now. I would need something in the middle to convert the picture to a number.

Then I hit a brick wall. I could see how to send the picture. I could see how to return results. But the critical bridge was miss-



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ing. I didn't see a way to return the results while staying in the app. The return pops you out.

### Live Developer Training

The Project Glass team started offering informal, AMA-style developer training: Office Hours. It happened just as I hit my wall. I met three amazing developers, two in person, one by remote video hook up. And they set me straight: you can't find a way to do it because the answer is on the roadmap. Glass, as it exists today is a series of services. The glue is coming. Everyone who is developing wants the same glue that I do.

So, here I am, at a dead end. Except, this is Part I of the article, so you know there's a solution. While Glass API is built as the preferred API, there is a full (nearly full) Android O/S inside of Glass. To get my app out faster, I need to rethink it as an Android app. The bonus is that, if developed as an Android app, I can release it

sooner, because it will work on tons of devices which are already available for sales. It will work on the devices a huge number of people already have. And, it will also work on Glass.

Even better, since I have the Glass API and a sense of the roadmap (as it applies to my plans), I can organize my code to make a future Glass-specific version easy to implement.

### So...

In Part II, I'll talk about the OpenQM database I'm using for this project, the Android side of the project, and how the different Android worlds — phone, tablet, and Glass — handle my approach. **IS**



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# Automated Testing

## Part 4 – Legacy Code

BY BRIAN LEACH

In the series so far, we have looked at automated testing in general, with a focus on unit and integration testing. Underlying this has been an implicit and dangerous assumption that you are writing new, modern, well structured MultiValue code. Adopting a test supported development methodology, despite being a change in attitude and practice, is relatively simple if you have a clean starting point.

Many readers will not have the luxury of being able to write new, modern code. For them the daily lot may be hacking away at the code face of a long established application, complete with archaic coding conventions and years of unstructured organic growth.

So in this article we turn our attention to the most complex issue of automated testing — how to test and refactor your legacy code.

### Setting your Expectations

Don't Panic.

The first advice in approaching legacy code is to set realistic expectations in what you can achieve. You probably won't end up with your code fully covered or even fully testable in a single iteration. But any testing and code cleansing is better than none, so unless your code is already perfect,

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whatever time you spend can still leave you in a better place than you are now.

What is important is to leave each iteration with a clear knowledge of what has and what has not been refactored and test covered, so that the next time you approach the tangled mass you can feel confident about the parts that have been tested and can move on to unravel the next piece.

It is also important to realize that your first attempts to refactor and harness your code will be slow — painfully slow — but don't lose heart because this will get better and quicker with time and practice.

### What is Refactoring?

Refactoring is key part of the cycle for modern development — “Red, Green, Refactor” is the mantra of test driven development, and roughly translates as “start with a failing test, write the code to make it pass, then refactor the code to make it

good.” Refactoring involves a series of small incremental changes made to improve the structure of a body of code *without* changing its operations. This is an important distinction to make from all other forms of development that aim to improve or extend the operation of the code. Refactoring is a purely internal matter, to leave the code base in a more manageable meant discoverable, and testable format.

With any new development, refactoring should be proven by unit testing. At each incremental change the unit tests are re-run so that the developer can check that the change has not broken anything. Inevitably, with legacy code those tests will not be in place from the start, so the first stage is to simply try to open up the code to get any level of unit testing in place at all, and then work outwards from there, extending the amount of code under test piece by piece.

### Refactoring MultiValue Code

Pick up almost any book on working with legacy code and you will find broadly the same recipes being offered to get that code under test: firstly, splitting the code down into ever smaller pieces so that each piece can be refactored and brought under test, and at the same time handling any dependencies between the code and its environment by mocking out anything external that has an influence on the code, such as database connection, web service call, library or API routine, or anything else that is not quickly testable.



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Whilst these techniques clearly have merit, they don't always translate well when dealing with MultiValue code. The biggest problem is the code splitting.

By "legacy code," today's authors generally mean previous generations of applications built using modern, object-oriented and reflective languages such as C# or Java, and it is the very nature of these languages that makes this type of splitting and mocking possible. In these languages, an application or assembly is built from a set of classes, and each class can choose to expose member functions and properties. Taking a large, complex and untidy function, possibly with dependencies on the user interface or some other external feature, and splitting it into small discreet units is relatively simple when the class can expose each of these as public methods so that they can be individually tested (fig. 1).

MultiValue code does not have a similar way of exposing individual parts of a program for outside scrutiny. The naive answer would be to split out the code into lots of tiny external subroutines and user defined functions (where supported by the database) and to then test each of these in isolation. That works up to a point, but can soon reach the stage where there are code management issues with the number of such routines; and taking something like a data entry screen that may need to hold onto a lot of data whilst it is running and splitting that down into lots of external subroutines can end up with messy common blocks or hugely long inefficient parameter lists. Clearly then, this is not the answer.

How then to "get at" parts of the code in order to test them?

### Use Generic Routines

The first step is to look for genuine commonality that can be replaced with the use of generic routines. If your legacy application has entry screens, how much of the validation, lookups, and navigation is hard-coded into the programs? In almost all cases this can be easily ripped out and replaced with a standard screen driver that can handle parameter driven screen input and display, regular validation styles, and lookups. For an example see the free ENTER screen runner on my web site.

The same approach can be taken with most reporting, security, menus, imports, exports, and other paraphernalia. By substituting common routines, you can quickly and immediately reduce the amount of code you need to get under test and also deal with many of the dependencies at a single stroke. It can also increase the resilience of your system by reducing the opportunities for error.

Once you have dealt with the generics what remains is the core of your business logic. This is the code that we need to get under test, and that does mean addressing its constituent parts.

### Use Code Blocks

One option is to split your code into blocks and use a pre-compiler to bind these together again in a similar way to a Basic INCLUDE statement. Unlike the use of external subroutines the final code still contains everything you need and so the overheads involved in handling large numbers of external subroutines can be avoided.

Those same code blocks should then be separately wrapped into subroutines purely for the purpose of unit testing. Again you will probably find a lot of commonality as you do so and thus reduce the overall code burden. Each block will then be tested before it is included into its destination programs. I use a standard library of such blocks to cover such mundane things as command line argument handling, socket interfacing, clipboard functionality, and so forth for the different MultiValue platforms. These blocks I can expose either as standard subroutines or bind them directly into utility code. Most of my free utilities are built with these.

### Use Action Parameters

The last option is to use an addressing scheme within the code itself. If we return to the object-oriented languages above and the class structure with its exposed member functions, the way to represent this in MultiValue code is not as lots of external subroutines sharing a common block, but as a single external subroutine taking the place of the whole class. A class is like a well structured subroutine with lots of smaller internal subroutine branches:

```
SUBROUTINE MyClass
GoSub DoX
GoSub DoY
RETURN
```

How then to address these branches?

The simplest way is black box testing, in which the subroutines are run under predictable conditions and the results alone are examined. That is a good starting point but does not offer much confidence in terms of code coverage.

My preferred technique when approaching a legacy subroutine or program is to simply divide it into two parts. The first of these has the same name, arguments or conventions as the original routine so that any calls made to it will be unaffected, and initially this will contain all the code.

The second part is an external subroutine that will become a library of calls needed to support the functionality in the first part and with a simple calling convention:

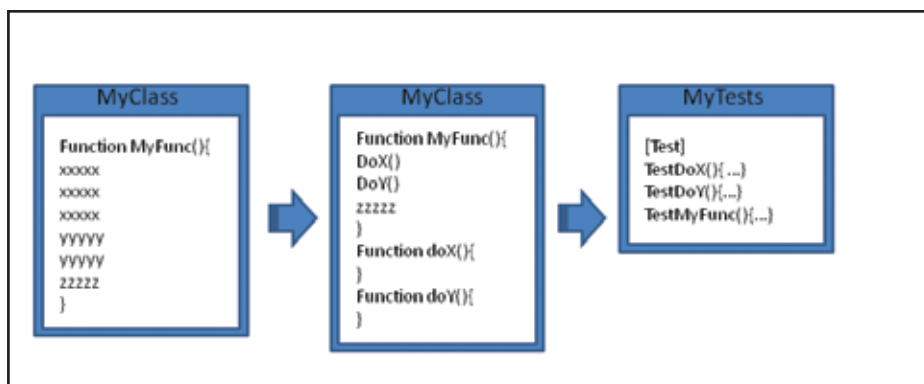


Fig. 1 Legacy code splitting OO style

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## AUTOMATED TESTING PART 4: LEGACY CODE

Continued from page 9

```
SUBROUTINE mysub.lib(Action,
    → InData, OutData, ErrText)
```

With these in place I can begin to move pieces of functionality out of the first part and into its supporting library as separate internal subroutines, and I allow each functional piece to be addressed through a separate action:

```
Begin Case
  Case Action = ACTION.DOX
    GoSub DoX
  Case Action = ACTION.DOY
    GoSub DoY
End Case
```

Over a short period of time, the code in the original routine is replaced by calls to the library subroutine until it becomes merely the orchestrator of events. And naturally,

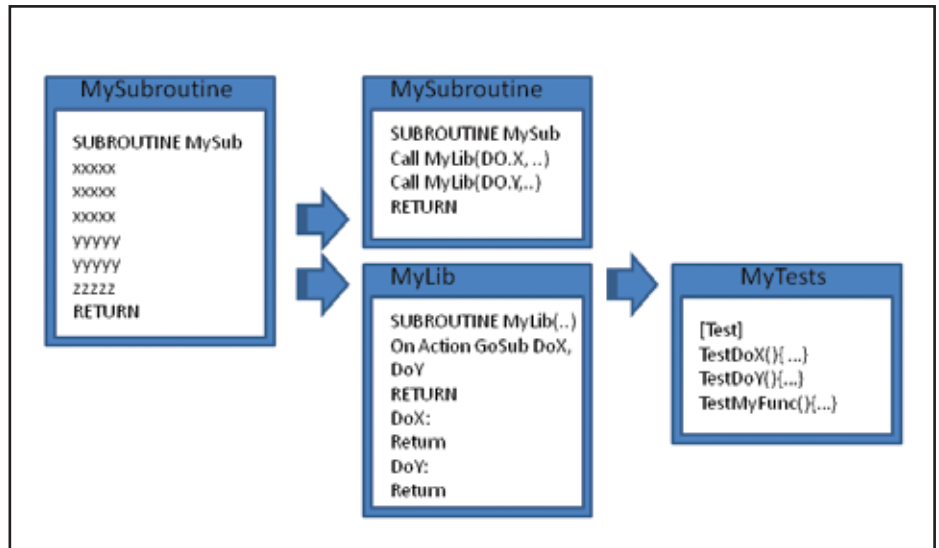


Fig. 2 Legacy Code Splitting MultiValue Style

as each piece of code is moved into the library routine a new unit test is developed for that code until all the working parts are harnessed.

There will be overheads, but not of the same magnitude as the overheads from splitting into large numbers of separate routines. The caching schemes operated by some MultiValue databases will mitigate most of the effects of this. On UniVerse systems, for example, the first call to a subroutine loads it into memory where it persists until the session returns to TCL, so repeated calls to the same routine have very small overheads. UniData's shared code manager is designed for similar purposes (fig. 2).

Techniques such as these, combined with adopting good programming conventions and modern development methods, make it possible to get your legacy code under control and to refactor your code to be both testable and intelligible.

In the next article we will turn our attention to two more techniques you can harness to start dealing with the dependencies in your code: UI testing and subroutine mocking. **IS**

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## Entrinsik Informer and Wynne Systems Deliver a Robust Ad-Hoc Business Intelligence Solution to the World's Largest Caterpillar Equipment Dealer

Entrinsik, Inc. develops, implements, and supports Information Management Solutions that enable organizations to maximize performance and improve bottom lines. Entrinsik Informer is an agile, web-based reporting and business intelligence (BI) solution that integrates real-time data from multiple sources, delivering ad-hoc reporting and dashboards in one complete solution. Informer OEM Partners are organizations that have chosen to integrate Informer within their own application or solution offering to deliver more advanced reporting and BI capabilities to their customers.

Entrinsik partner Wynne Systems is a global software company producing rental equipment software for the equipment industry and business intelligence tools for a large variety of sectors. One of their customers, The Cat Rental Store, is a subsidiary of Finning International, Inc., the

world's largest Caterpillar equipment dealer. The Cat Rental Store is a full service rental organization, featuring a full line of midsize and smaller Caterpillar machinery as well as a variety of other name brands and equipment.

The team at the Cat Rental Store used a combination of different reporting tools and data sources including Axiom ERP, IBM Cognos, Showcase, AS400 Query, SQL, and SugarCRM with Excel in order to get the reporting results they needed. However, they needed to introduce an integrated BI tool into the organization that would put advanced reporting and dashboarding capabilities into the hands of managers so they could respond quickly to continuously changing business conditions.

The Cat Rental Store originally learned about Entrinsik Informer through SugarCRM (Entrinsik is a SugarCRM partner) and various BI publications where it was consistently given a high BI rating, and they were excited when Wynne Systems announced the integration of Entrinsik Informer into their Axiom ERP.

"Our users are now able to get the answers they need from our data using the self-service, ad-hoc data analysis tools available in Axiom Reporter," said Brenda Sheplaw at The Cat Rental Store. "We no longer have to create multiple reports on the same data based on individual user requirements. It is very exciting to see this happening. It is an invaluable tool. It allows our users to easily analyze our data and provides actionable results for better decision making by your business leaders at every level. The results are amazing!"

"I have a hard time saying how much time that it saves me," said a Regional Manager at The Cat Rental Store (Southern Division). "There's info that I pull out of it that would be incredibly difficult to get any other way. The other part is that is excellent for being able to export it in Excel spreadsheet and manipulate from there. It's incredibly user friendly."

Read the full case study at [www2.entrinsik.com/CatRental-CaseStudy](http://www2.entrinsik.com/CatRental-CaseStudy).

### About Entrinsik

Entrinsik Informer is an innovative, award-winning agile reporting and business intelligence solution used by tens of thousands around the world. To access a free trial or schedule a personalized demo visit [www2.entrinsik.com/informer-free-trial](http://www2.entrinsik.com/informer-free-trial). For additional details contact us at [sales@entrinsik.com](mailto:sales@entrinsik.com) or call 888-703-0016.

For more information about Wynne Systems, visit [www.wynnesystems.com](http://www.wynnesystems.com) or call (949) 224-6300. ■



## mvTest Version 1.3 Released

Brian Leach has released a new version of his testing framework for MultiValue applications.

mvTest 1.3 now contains an updated User Interface Test recorder through which developers and testers can generate

test scripts as they run their applications, reducing the time and effort needed to craft user interface tests by hand.

mvTest 1.3 also now contains an editor for MultiValue Basic code, so that developers can build their application code and run their unit tests in the same environment, making it quicker to adopt test driven practices and reducing the number of database connections required.

mvTest 1.3 is currently available for UniVerse and for UniData with planned support for other MultiValue database types. ■



## New Entrant to Bangladeshi Banking Market Goes Live in Two Months Using jBASE Technology

Temenos (SIX: TEMN), the market leading provider of mission critical solutions to the financial services industry, recently announced that South Bangla Agriculture & Commerce Bank (SBAC) has commenced operations using Temenos T24 as its core banking software.

According to Mr. Clive Ketteridge, General Manager of jBASE at TEMENOS, the underlying run-time and database of the bank's implementation is jBASE.

"One of the prerequisites for TEMENOS' T24 banking application is the jBASE open connectivity technology integrated with the banking functionality and coupled with an open database such as Oracle, IBM's DB2, Microsoft's SQL Server or jBASE, which provides clients with numerous options with regard to future direction."

SBAC Bank chose Temenos due to the global reputation of T24, Temenos' strong local presence and the shortest implementation time provided by the availability of a T24 Bangladesh Model Bank. The implementation took only two months from signing with Temenos to go-live. Temenos now has 5 banks live on T24 in Bangladesh.

SBAC Bank is one of 9 new entrants to the Bangladeshi banking market in 2013 and aims to help strengthen the on-going financial inclusion programmes through bringing unbanked people into the banking network. Despite strong, sustained growth in the economy (GDP has more than doubled in the last decade), around 60% of Bangladesh remains unbanked. The new banks will help increase the quality of banking services by increasing competition in the banking sector. They will also be able to meet the unfulfilled demand for credit by the private sector whose needs have grown in line with a fast expanding economy.

Mr. S M Amjad Hossain, Chairman of South Bangla Agriculture & Commerce Bank Ltd, commented: "We are delighted to have partnered with Temenos. The speed in which we have reached go-live is testament to Temenos' experience and ca-

pabilities...our aim is to be the leading bank in Bangladesh and, with the support of Temenos, we believe we can achieve this."

For more information, visit [WWW.jBASE.com](http://WWW.jBASE.com).

### About jBASE International

jBASE International, a member of the Mpower1 group of MultiValue companies, is a leading supplier of database management software and web enabling tools for developing, deploying, and maintaining business applications solutions. The flagship product, jBASE, was designed from the ground up to be an open database product that would bring the strengths of MultiValue technology into the mainstream computing market. With exclusive worldwide distribution rights, jBASE International offers technologies and assistance that allow businesses to thrive into the future.

### About Temenos

Founded in 1993 and listed on the Swiss Stock Exchange (SIX: TEMN), Temenos Group AG is the market leading provider of banking software systems to retail, corporate, universal, private, Islamic, microfinance and com-

munity banks, wealth managers, and other financial institutions. Headquartered in Geneva with more than 59 offices worldwide, Temenos software is proven in over 1,500 customer deployments in more than 125 countries across the world. Temenos' products provide advanced technology and rich functionality, incorporating best practice processes that leverage Temenos' expertise around the globe. Temenos customers are proven to be more profitable than their peers: in the period 2008-2010, Temenos customers enjoyed on average a 30% higher return on assets, a 46% higher return on capital and an 8.5 percentage point lower cost/income ratio than banks running legacy applications. For more information please visit [www.temenos.com](http://www.temenos.com). ■

of deploying web services with a MultiValue database to divorce the user interface from the business logic and database server.

These principles have been developed further and a new web site [pwchest.no-ip.com](http://pwchest.no-ip.com) established using openQM and JavaScript to showcase this. The web site provides an opportunity for registered users to update records and view reports all generated from the openQM backend.

Mike said, "I wanted to show that there was life in an old Pickie still and that you don't need web development skills to make this work. The user interface can be developed by a web designer without any knowledge of the backend, and the backend MultiValue developer can build the tables and business logic without knowing how to make it look good as a web site." ■



### Multi-Value on the Web

In the May/June 2012 issue of International Spectrum magazine, Mike Ryder described a method



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# Wearable Tech Going Beyond Eyewear

BY CHARLES BAROUCH

**W**e sat down with Michael Holmlund of Plantronics to talk about the wearable tech his company provides and how to develop for it.

**IS:** *So, Mike, how long have you been working on this sort of technology?*

**MICHAEL HOLMLUND:** I have a 15 year background in hardware/software ecosystem development — spanning across a variety of technologies from digital logic to power analog to wearable technology. In a previous life I was an analyst focused on developer relations and now I run a developer community for Plantronics: the Plantronics Developer Connection or PDC.

**IS:** *For most people wearable tech is eyewear, Google Glass, Georgi's VISOR on Next Gen... what you are talking about is a little different. Can you explain?*

**MICHAEL HOLMLUND:** Of course. We just launched a new community in support of our latest wearable concept initiative called PLTLabs. Plantronics has been a player in wearable voice technology for over 50 years including participation in

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*Plantronics has been a player in wearable voice technology for over 50 years including participation in the first Apollo Moon landing. The first words spoken on the moon were actually through a Plantronics headset.*

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the first Apollo Moon landing. The first words spoken on the moon were actually through a Plantronics headset. That said, as our technology has evolved, we have added a variety of sensors and additional capabilities through firmware and software that now allow users to do a lot more than just transmit and receive audio. Today we support a number of products in our portfolio with free open APIs, and in addition to a very cool out of the box experience, developers can now actually hack their headset and improve their applications and business processes through device level integrations.

**IS:** *Our readership is mostly doing IT in the business world. Can you give an example of how the PTL technology would be used — for example — in making company data work with your tech.*

**MICHAEL HOLMLUND:** We support four APIs that are being used across the enterprise in production today:

1. Wearing state — via capacitive sensors in the device your applications can now determine if a user is wearing a headset or not. This information can be used for very accurate presence information, for example, or to escalate an IM session to voice.
2. Proximity — we expose proximity events via Bluetooth connectivity. This means if you walk away from your workstation, your apps will know if you have left, and could forward voice calls to your mobile device, or even launch a security app that would lock your work station automatically.

If you have one of our legend UC devices, you can download a free trial app called smartlock in our developer community that will show you how to improve network security across your enterprise in a simple non-invasive way. ([intl-spectrum.com/s1060](http://intl-spectrum.com/s1060))

3. Unique serial ID — Some of our devices have unique serial ID's which can be read out using this API — effectively converting your headset into an authentication token for multi-layered security protocols or shared resources — like you support public / shared ter-



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minals, or have deployed VDI across your enterprise.

4. Mobile caller ID — Plantronics studies have shown that knowledge workers receives as many as 40% of their work calls on their mobile phones — higher for mobile professionals, like sales people. We have an API that uses the data-path in Bluetooth to pass the mobile caller id from your mobile phone to your applications on your workstation. This API is predicated on the ability of the PLT device to maintain an active pairing state with two devices – in this case, the user’s PC and the user’s mobile phone, simultaneously. Users can toggle between calls and use this API to pass data over the active connection.

This is in use and in market today with a number of our partners. One such example is Popcorn from Threewill which integrates with salesforce and Jive to pop screens with information about an incoming call on your PC screen before you even answer the call. You can get a free demo and more information at ([intl-spectrum.com/s1061](http://intl-spectrum.com/s1061)).

**IS:** *Can you tell me a little about the process of using these APIs? Are they only available for one language? Can they work with non-SQL databases?*

**MICHAEL HOLMLUND:** Currently we have three major development languages a developer can use: C variants (C++ and C#) and JavaScript / REST. We

also recently productized some Java wrappers to further facilitate integrations.

**IS:** *PHP? Web service calls? Are those options?*

**MICHAEL HOLMLUND:** Our primary interface is REST, but we do have some use cases published utilizing PHP. The beauty of our device integration is that PLT allows users to benefit from sim-

ple state changes and events that are often fairly simple to integrate, which means there are generally several options open for any implementation.

**IS:** *Published use cases... I guess that leads us to the community and support part. Tell us what people get when they join the community?*

Michael **HOLMLUND:** We have a fully productized SDK which is built around the set of free open APIs. Our community can be located at <http://developer.plantronics.com/welcome>.

There are currently no barriers to entry to join our community, other than a simple, minimal registration process, to access the tools and technical documentation.

We are also now accepting registrations on PLTLabs from developers who are interested in getting their hands on one of our

*Continues on page 18*

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# Unstructured Data

BY NATHAN RECTOR

**U**nstructured data is a generic term for describing any information that is not in a database. Unstructured data can be textual or non-textual. Textual unstructured data is generated in media like email, PowerPoint, Word, instant message, and social media. Non-textual unstructured data is generated in media like images, audio files, and videos.

If left unmanaged, unstructured data can pose a costly liability when the information cannot be located, or a versioning issue between the database, or just between multiple copies of the same file.

As our users become more tech literate, they expect to be able to use their skills to work with information in the tools they know. This introduces the version control issues I just mentioned and the User Expectations vs. IT Governance controls and policies.

Let's face it, the user doesn't know, and doesn't care, that you have to report reliable and audited data to someone else.

These are some of the important issues of trying to get a handle on unstructured data. But deciding how to work with it, manage it, and parse the import data points from it is just as important.

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*MultiValue allows us to create relationships to data in other locations, manipulate databases in the same location, or even parse, extract, and transform unstructured data blobs into structured contents. You now have a database with an slight identity crisis.*

---

## Management of Unstructured Data

When working with unstructured data, and the files that contain the information, the natural reaction for a system administrator is to create an index. But, the "index" is just one part of working with unstructured data.

The real trick is figuring out what is important about the unstructured data, and how, when, and why we have the unstructured data. This will help you decide how to index and what to do with "data fluff."

We know from our existing databases that indexes will evolve over time as users want to interact with the data differently. Traditionally, we use these indexes to speed up access to the data.

In this case, we are not talking about indexes in the sense of speeding up data retrieval, but indexing as in categorizing, exploring, and relating the unstructured data to existing structured data. Without this relationship, the unstructured data is just "data fluff."

What is "data fluff"? Data fluff is data that is stored because the designer or developer thought it would be important, but has no real value or use to the business process. Every database has "data fluff." Sometimes it is just transitory data to indicate flags needed later or during a record correction, or audit information like date and time created, user who created it, an so forth.

Many log files can be considered "data fluff" because they are used only for debugging and not actually used to help define, isolate, or refine important business processes.

Don't get me wrong, "data fluff" can be important and useful information, but if it is not being used, it is just "fluff."

## Overlooked Unstructured Data

The most overlooked unstructured data we have in the enterprise are emails, documents, faxes, images, and videos. In the good old days, all we really worried about was scanned images or "cold" stored print-outs.

Now scanned images are only part of the problem we have to address. These days, emails are the biggest unstructured data source that people are ignoring. Chat and social media comes after that, but they are all basically the same types of unstructured data as email.

If someone wants to manage their own email, they build a structure of folders that fits that person's need at the time. Fast forward a few years, and the structure doesn't handle the needs of that user, and the information they have "indexed" is unavailable to others who may need it.



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The classic example of trying to relate this unstructured data to a structured data source is a CRM. A true CRM is designed to present anyone with relevant information about a customer. The keyword here is “anyone,” not just the person directly involved with that customer.

What happens is the relevant information for that customer is in a salesperson’s email or voice mail, but the email and voicemail systems are disconnected from our enterprise data. If someone in production needs access to information that was emailed to a salesperson, it is not available. Hence the development of the CRM, or the continued search for an adequate CRM that handles all aspects of the enterprise.

Another overlooked data source is our Windows files systems. Everyone is using Excel and Word these days for something; Printing labels, creating warranty documents, and data mining statistical data. Some of these files are duplicates or versions of the structured database data. Some are not, but are relevant to some aspect of

the company. Even if it’s just to the person who created it, they created for a reason.

### What to do with Unstructured Data

We all can see the value of indexing emails and documents sent to customers and having it available to access from our CRMs. This is the indexing aspect of working with unstructured data — creating a relationship between the unstructured data source and the database’s structured data.

Now what do you do with it? Our production systems all have enterprise alerts for various things, like low quantities, out of date prices, and upcoming order statistics.

Let’s look at some alerts and data you may be able to generate using email and instant message history. You can use this information with a predictive modeling API (Google has one) that would tell you if the mood, or sentiment, of the message is Good, Bad, or Ugly.

Wouldn’t be nice to know if the communications between your people and the customer is positive or negative or indiffer-

ence? Or if the message that the user just received showed a critical issue or negative message that needs to be addressed.

Another thing you can do with unstructured data is to map trends from your web logs — which customers visit, which ones don’t.

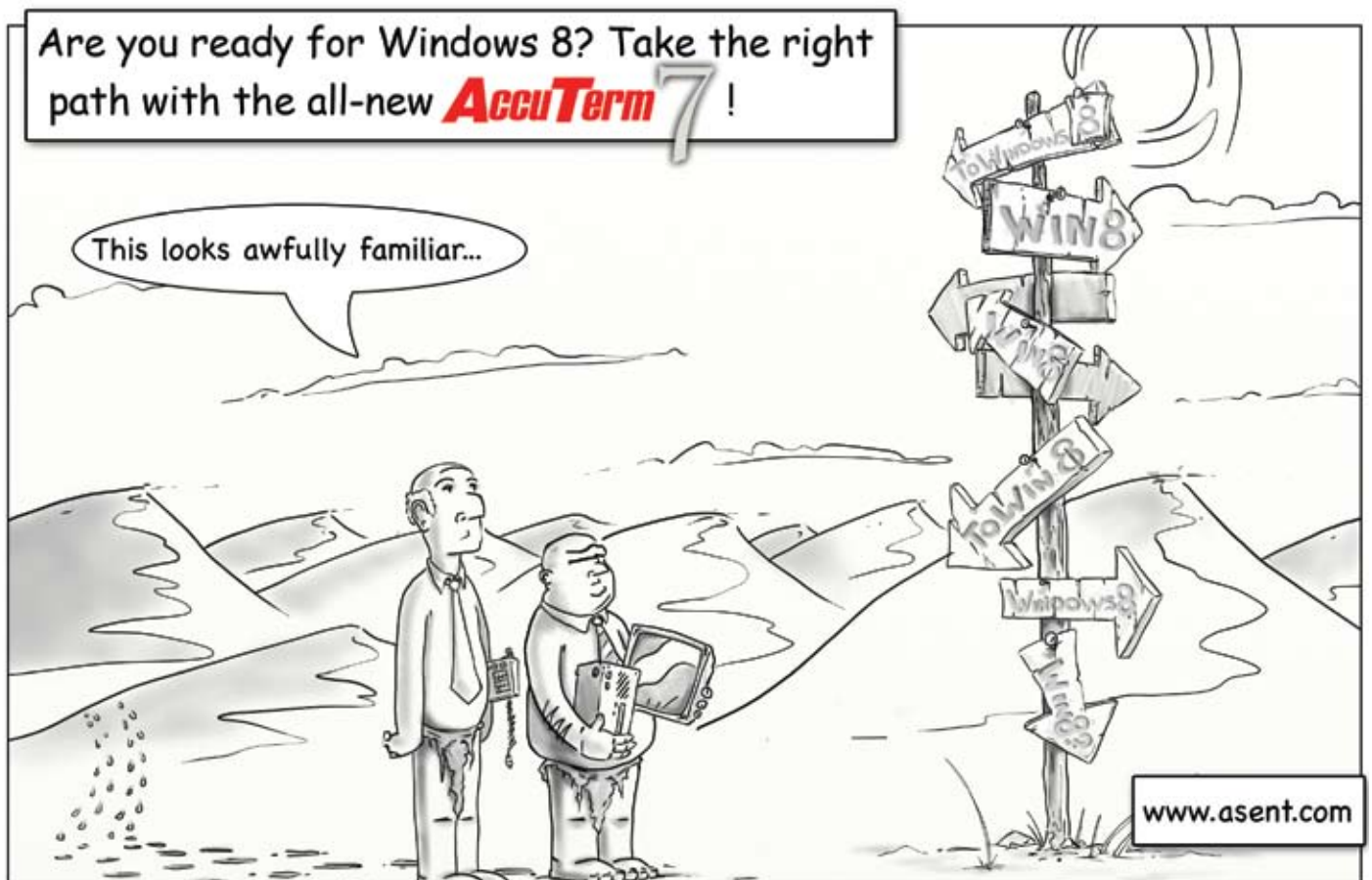
### Unstructured MultiValue Data

Let’s back up a few steps and look at our existing database and the data we have collected.

While we generally assume our MultiValue databases are structured data stores, we also likely have tons of unstructured data as well. For example, product descriptions, notes, and text blobs associated with customers and vendors. Much of this information can provide useful valuable information, over and above the structured data it is associated with.

Also add into the design mix the fact that MultiValue databases are not inherently structured data sources.

*Continues on page 19*



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## WEARABLE TECH: GOING BEYOND EYEWEAR

*Continued from page 15*

new Concept devices that incorporates a much more complex sensor module and supports greatly expanded capabilities.

**IS:** *New devices. Let's talk about that.*

**MICHAEL HOLMLUND:** PLT-labs, our innovations team, has been doing demos with our latest wearable concept that does some very cool things. Our Concept 1 device, which is the platform that was featured at the Wearable Tech Expo in New York, incorporates a very powerful set of features and capabilities:

- Real-Time device orientation data stream
- Free-fall detection
- Pedometer
- Tap detection
- Yes/No gesture recognition
- Support for simultaneous voice and data
- Wear state (on/off)
- Proximity (near/far) to host devices
- Bluetooth (HFP and A2DP)
- Onboard MFi (Made For iOS) chip for data transmission over Bluetooth with iOS devices

We will be shipping these units to developers in the next 60 days with some initial tools to support integrations for iOS Android and Windows.

[Examples are in the video link to Scoble video with our CTO/VP engineering ([intlspectrum.com/s1062](http://intlspectrum.com/s1062)) and the blog ([intlspectrum.com/s1063](http://intlspectrum.com/s1063)).

With this platform we have already been exploring use cases with complex BT pairing implementations using Low Energy Bluetooth beacons to explore use cases around indoor navigation. And, even more exciting, using the gyros and accelerometers we have done a Google Streetview mashup that shows how someone wear-

ing a headset anywhere in the world could replicate their precise view and location to anyone through Google Streetview. Uses could include EMS dispatch, who could guide fire and rescue real time around a site at night even if poorly lit or obscured by smoke and fire. We have started doing some really cold demos with spatial audio — enabling a user to direct audio around a room based on their head orientation and direction.

**IS:** *It sounds like you have a real passion for this.*

**MICHAEL HOLMLUND:** I am extremely excited about what we are doing here at Plantronics, and PLTLabs. It's important to note that many of these initial experiments / building blocks are all aligned with some of the most fundamental problems that impact all knowledge workers in the Enterprise today, namely call transitions — getting from your home phone to your mobile in your car for the drive in, and then transitioning to a squawk box in a conference room, seamlessly and without sacrificing audio quality. The fact that our headset can pair with multiple devices, know where you are, and can enable spatial audio, will all help solve some of these basic issues that drive us all crazy.

**IS:** *If you had to make an elevator pitch for why people should join your community and invest time in developing with Plantronics, what would you say?*

**MIKE HOLMLUND:** Plantronics has already shipped tens of millions of units of wearable tech. Our products are ubiquitous across the enterprise, and now we are solving some of the most important problems across the enterprise. Be a part of it. It's easy and free. **IS**



**CHARLES BAROUCH** is the CTO of HDWP, Inc. He can be contacted at [www.hdwp.com](http://www.hdwp.com)

## UNSTRUCTURED DATA

Continued from page 17

Yes, we do create dictionaries to impose a structure, but we are not required to follow that structure when storing information. This feature gives the old referential integrity proponents fits.

Now add into the mix the correlatives, I-types, and virtual fields that allow us to create relationships to data in other locations, manipulate databases in the same location, or even parse, extract, and transform unstructured data blobs into structured contents. You now have a database with a slight identity crisis.

### Parsing, Indexing, and Imposing Structure to Non-MultiValue Data

The type of unstructured data you are working with will dictate the structure you need to, or want, to impose on it.

Let's say we have a web log, or analytic file, and we want to see the relationship

between sales, time of day, and how many phone calls you have received from a customer. Ok, I realize that this data is not exactly unstructured since it is a formatted log, but that is where you and the rest of the world differ. Parsing, extracting, and transforming information is the nature of our business, so this doesn't seem out of the ordinary.

To other people, this data is totally unstructured and takes time to manipulate. Or they just do it by hand.

Let's look at a totally different type of unstructured data: emails, chat logs, CRM notes, and social media posts. All this data is in textual blobs. Extracting meaning, issues, or just searching for a specific conversation is important to your business.

While many unstructured documents, like Word, Excel, or video files, look like they are unstructured, many really are not. Many of the files you want to create relationships with have MetaData storage fea-

tures in them. Yes, even images and video files have metadata storage.

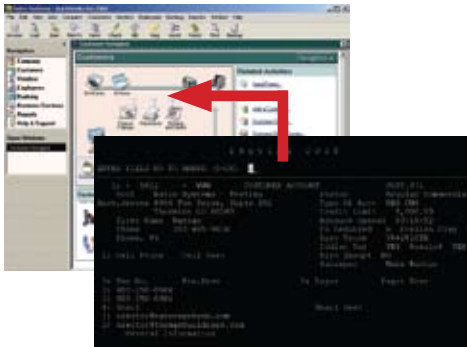
What is metadata storage? It is the ability to enter information about the rest of the file, or blob, like author, customer, dates and time, and other structured information about the document. This provides links and relationships that you can access or populate from your structured database.

### Summary

This article should have provided you a starting point to think about how to work with unstructured data. Keep watch on the International Spectrum website and other magazine articles that talk about the "nuts and bolts" of access, parsing, and indexing various unstructured data. **IS**

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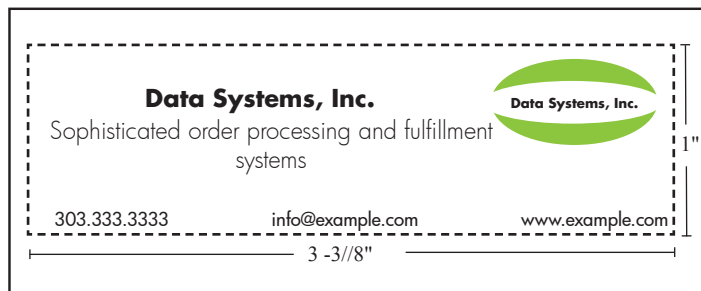
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## CLIF NOTES: KEEPING IT IN CONTEXT

Continued from page 23

“It was the worst marketing strategy imaginable: the wrong location, the wrong time, and (with his street clothes) the wrong image. If the goal had been to attract attention, even a few little adjustments would have gone a long way: picking a place in the station where commuters naturally stand still, placing a banner displaying his name, or hiring a few fans to serve as his cheering section, to name just a few examples. In many ways, everyone who is competing for attention in the workplace needs a strategy, too — even paying attention to seemingly minor details can go a long way.”

Some of the comments her article received opine, perhaps correctly, that she missed the point. The goal was not to figure out the optimum way of attracting attention during rush hour in a busy Metro station. Nevertheless, her comments did get me to thinking.

We in the MultiValue community know that we’ve got a great product. It is robust, less expensive than the alternatives, runs rings around the competition performance-wise, and has a much lower Total Cost of Ownership. And, unfortunately, we know from painful experience that doesn’t get us much. Go to any user group meeting, mailing list, Google or LinkedIn group, and you are sure to hear a number of people grouching like a bad Rodney Dangerfield imitator, “We get no respect.”

And we do seem to have a problem getting attention. But I think that there is another element that needs to be considered. Although the good professor did not explicitly mention that, it is implied in the first sentence of the paragraph I quoted. Wrong location, wrong time, wrong image.

The term that I use is “context.” It sums up not only what the professor said, but it also takes into account several interesting psychological phenomena, which I won’t go into now (you’re welcome). I have often told the story of my first experience with Context when a business colleague and I who had known each other for years shared a three seat row with the middle seat empty on a flight to a conference we were both attending. Because we were both dressed radically different than we had ever seen each other in the workplace, neither of us recognized the other until we were greeted by a mutual friend at the baggage claim. (Embarrassing, and then hilarious.)

Context is not only about location, timing, and image. It’s also about the recipient’s mental state, expectations, and receptiveness to what they are seeing or hearing. I think that a lot of the discussions we see about making MultiValue more successful fail to take into consideration context. Trying to market it directly against products like Oracle and DB2 as a database is the wrong context, and I don’t think will ever be successful. At least I can’t remember it ever being successful in the last 30+ years of my involvement with it.

MultiValue has never been seen in the context of a database. Its success came

from VARs using it to quickly craft sophisticated, high-performance for the buck, solutions to application problems. So I think that if MultiValue is to not only survive but thrive, we need to concentrate on getting the message out about its ability to solve problems. That’s its context. Not a feature to feature comparison with other database products, not in trying to claim that it is something that it is not (true multidimensional or noSQL comes to mind), but rather a more cost-effective way to quickly solve business problems in an ever rapidly changing world.

That’s my take on the lessons that we can learn from the professor’s take on the lessons from the experiment that she was talking about.

Maybe next time we’ll talk about failed MultiValue marketing campaigns and what we can learn by comparing them to studies of why dolphins beach themselves. **IS**

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# Keeping it in Context

BY CLIFTON OLIVER

One of the few things I find useful about LinkedIn anymore is their weekly collection of interesting articles that they email to me. A few weeks ago I spotted an article about the topic of context. Actually, it was an article about an article on the topic. Kind of.

In 2007 the Washington Post decided to do an informal experiment about context, priorities, and perceptions. They talked a highly acclaimed virtuoso violinist (Joshua Bell) into participating. One morning during a rush-hour commute, posing as a street musician wearing jeans, tee-shirt, and a cap, Bell stood in a Washington DC Metro station playing classical music on a Stradivarius violin. The goal of the experiment was to see whether or not, “In a banal setting at an inconvenient time, would beauty transcend?”

The Post asked a symphony director what he thought would happen. He guessed that even if Bell were not recognized, if 1,000 people walked past, he would still draw a crowd of about 75 to 100 people. Think about it for a moment. What do you think happened? Did he draw crowd? How much money do you think was tossed in his violin case?

I suspect that most of us are more in tune with the crowd psychology of the unwashed masses, most of us belonging

to that category, than the symphony director. And I bet that your predictions were closer to what actually happened than his.

Bell played for almost 45 minutes and performed six pieces of classical music. 1,097 people passed by. 27 of them tossed some money into his case. Only seven of them stopped for at least 60 seconds to listen and appreciate the music and his skill. He made a whopping \$32.

Like me, I’m sure that you see all sorts of problems with this experiment. Who in their right mind would expect to get commuters rushing to catch their train on their way to work (no doubt after having hit the snooze button on their alarm clock three or four times that morning and running late) to stop, gather around, and take in an impromptu classical music concert.

“You’re an hour late, Sid! We had an 8 o’clock presentation for our largest client, and you missed it. What the hell happened?”

“Sorry boss. I had to stop and get a classical music fix. It won’t happen again. At least not until the next time something beautiful comes up.”

Oh, right. I think you’d find more sympathy from the boss if you told them that the Starbucks kiosk at the Metro station had burned down and you had to get off at each one of the next five stops to find

one that was open. At least the Boss can probably relate to coffee.

Still, I found this article interesting and very well written. I would recommend it. ([intl-spectrum/s1064](http://intl-spectrum/s1064))

The LinedIn article that led me to this was written by a business professor at the Harvard Business School and was about the lessons she thought this experiment had to teach her MBA students ([intl-spectrum/s1065](http://intl-spectrum/s1065)). Now we all know that business professors are extremely good at finding object lessons in things that bear little if any resemblance to their own field of endeavor. (Second only, perhaps, to two-bit writers desperately searching for column fodder.) Nevertheless, I think she did make a couple of good points. And, of course, I will proceed to extrapolate from them to the MultiValue world.

She points out that having a great product is not enough. Just because Joshua Bell is great didn’t mean that he was going to “sell.” You can have an outstanding product that beats your competition hands down, but if it’s not packaged correctly and marketed appropriately, it is basically worthless.

She then goes on about it being a failed marketing plan because it had no strategy to truly compete for people’s attention.

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