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**International**

**Spectrum**

**Conference**

**Recap**

**Also in this Issue:**

- 4GL Spotlight: Evoke
- OWIN Part 3
- Extending MV, Your Way
- Watch Your Language

# International Spectrum 2017 Anthology

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## COVER

**6 37th Annual Spectrum Conference Recap** The International Spectrum Conference for 2018 covered a lot about modernizing systems and re-inventing your IT environment for both new and existing developers. See what you missed at this year's four days of education, networking, and more.

## FEATURES

**9 4GL Spotlight: Evoke** MultiValue is constantly evolving. That's not just a result of the database vendors doing new development. Our community has many companies within it that move us forward. An important segment are the tool vendors. BluFinity, known for mv.NET, has been building a serious, modern, code development environment. Welcome to Evoke.

**BY CHARLES BAROUCH**

**13 Using OWIN Security with MultiValue Data - Part 3** Our series on OWIN continues with even more information about OWIN classes. This will give you the information you need to create the proper connection points between your database environment and OWIN. **BY NATHAN RECTOR**

**16 MV Your Way: Extending mvBASIC** Every developer, regardless of languages used, tends to have a list of commands or processes or functions that annoy them. In MultiValue, it can be things like how the parenthetic version of the LOCATE statement has a parameter order of needle, haystack but the INDEX statement is haystack, needle. Or maybe you wish that OCONV had a few more options. This column is all about remaking MultiValue to work your way. **BY CHARLES BAROUCH**

**19 Business Tech: Watch Your Language** Knowing a new developers roots, and how they were shown to do things is important when training new developers. In this Article, Chuck talks about how to talk at new developers that are coming from different languages.

**BY CHARLES BAROUCH**

## DEPARTMENTS

**From the Inside** page 4

**From the Press Room** page 11

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N  
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# From the Inside

Our community has been battling this issue for years: the perceived lack of entry and mid-level developers. One of the things that I noticed in the last few Spectrum Conferences was that the age demographic of our attendees was trending younger.

What this is telling me is that many of the entry-level developers we didn't see in the past are starting to move into mid-level and senior-level positions, and our senior level developers are starting to let up on the *we can do everything without help or tools* philosophy that is too prevalent in our industry.

The perceived lack of junior level developers has been a hindrance to the adoption of MultiValue technologies, as well as a constant question that new CIO, CTO, and CEO bring up whenever they contemplate moving from their stable MultiValue system, to something else.

We hear this all the time: "I can hire .NET/JAVA/etc programmer directly out of college and they will already know how to *code*. We all know that coming out of college having had classes in a language is not the same as knowing how to use it in business. We all know that there's a question behind the question: Does this system have the long term viability we need?"

What businesses want most is something that helps the bottom-line, has good TCO (Total Cost of Ownership), and is easy to train new users on. There are CIOs who have other motivations, some of them are fighting religious wars where the vendor's name is a bigger factor than the company's specific needs, but that's a different article.

As MultiValue DBAs, analysts, and developers, we know that the TCO of MultiValue – both the databases and the applications – is much lower, not to mention the ease and speed at which we can alter the business rules, processes, and data schemas to match shifts in the real world. As the database providers add new features, APIs, and handle the general *buzzword compliance*, we continue to suffer from perceived disadvantages, not real disadvantages.

The question then becomes, *why* is it so are hard to find junior or entry-level people? Since new hires cannot be expected to walk in knowing the business side of the job – the particulars of how your individual company works – they are expected to already know the tech side when they report for work on their first day. This offloading of IT-specific training, this idea that we have to show up pretrained by our college, or our last job, isn't realistic when applied to entry-level hiring. Companies have to shed

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*President*

CHARLES BAROUCH  
*Editor*

TRACEY RECTOR  
*Layout*



*Learn more about the MultiValue Symbol and see what MultiValue Technologies and MultiValue Communities exist to help you support and manage your business and systems. To find out more visit*

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**NEWS RELEASES/UNSOLICITED ARTICLES**

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

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themselves of the notion that expertise in IT is a magical thing that doesn't require investment by the company itself.

This is an endemic problem in the IT world in general, not just in the MultiValue shops. Any businesses that are doing more than simple web and mobile applications are running into issues finding qualified developers. At some point companies have to accept that entry-level people are made, not born.

To address this in our corner of IT, International Spectrum has created training programs, webinars, mentorships, and our yearly conference. You can find other sources for training MultiValue developers as well. There are options. There are resources.

Any developer you hire will likely have basic knowledge of the nuts and bolts of coding, and translating that into MultiValue languages is

pretty easy. Experience with PHP, for example, with its typeless variables and extensive string handling, is a good starting point for learning mvBASIC. If you can use Perl, Proc isn't going to be terribly daunting.

Can I code in it? For most developers, the answer will be *yes after a minimal amount of training*. How do you use it effectively? That's a harder question. One that has to be approached in any language, with any database, and across all lines of business.

Why would you use one method over another? What in the world where they thinking? Those questions will come from any freshly minted developer when looking at older coding styles regardless of the language or languages used.

This is why International Spectrum Mentoring was designed to help entry and mid-level developers to continue to enhance their

skills. It creates a place to ask question that senior developers intuitively know. For more senior developers, there are new tools and procedures available to solve problems that can be brought into the conversation. Mentoring can help with that as well.

It is very easy to bring additional value and modernization to your existing MultiValue system without losing the years and years of business logic and profit margin. When you can't find developers, it's good to know how easy it is to make some more. Just add training. IS



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# International Spectrum Conference Recap

The annual International Spectrum Conference for 2018 took place in Destin, Florida from April 23rd to April 26th. This week of professional development and networking for the MultiValue Community is always well received, and attendees returned to work with new ideas and reinforcement of existing ideas.

This year's attendees acquired over thirty classroom hours of professional development in MultiValue database technologies and integration. The conference sessions included topics for beginners, as well as, our advanced topics that include information that was not MultiValue specific. And that's not counting the benefits gained from hallway conversations, side meetings, and the information available in the vendor room.

During the Welcome Address on Monday, Nathan Rector, President of International Spectrum, talked about the modernization of MultiValue systems, and how modernization can't be

*He provided specifics on how to create an inviting culture where companies can keep and foster talent that would advance business...*

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approached as one monolithic thing, but instead it's a series of little things. He also talked about how every company has different modernization requirements; there is no one-size-fits-all answer.

In conjunction with this talk, Nathan also did a case study on how he took a MultiValue CLI (Command Line Interface) application and modernized a fraction of it to increase user productivity by fifty percent. He also outlined the ongoing plans for modernization for that client.

At lunch, we had Bennett Barouch, an executive from eBay, give a talk about how to handle the retirement of senior developers and what needs to be done to attract new entry and mid-level developers to your business. Bennett offered a deep dive into how company culture is at the core of everything which draws and keeps developers. It's not the technology.

He provided specifics on how to create an inviting culture where companies can keep and foster talent that would



advance business systems without the pain associated with turnover and loss of expertise.

Along with the four tracks worth of sessions, there were several evening discussions that were not part of the official schedule, but put on by attendees that were very well received. That included the discussion about Multi-Value in the Cloud and the discussion that spilled out of one of the session into an afternoon talked on Standards in the MultiValue Community. We hope to have an article for you in the next issue that provides details on this on-going effort.

These impromptu gatherings are one of the greatest advantages that the conference brings to the MultiValue Community. Lots of experienced individuals talking with newer developers about general topics related to how various MultiValue technologies work, or specific topics related to solving individual's problems. This has been a central feature of the Spectrum Conferences over the years. It has provided a place to reinforce the community of MultiValue Developers and Users. Many companies each year receive hundreds of dollars worth of expert advice for the price of a cup of coffee or a pint of beer.

In addition to all of this, there were many other topics related to cloud and virtualization. With many businesses looking closely at whether to buy new hardware or virtualize their existing systems, these session explored questions of speed, storage, and design. They provided checklists for when and if you plan to virtualize into a private or public cloud.

Security and Encryption was a hot topic as always. Businesses need to understand the threats and need to im-

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plement solutions now. Attendees got advice on how to secure corporate data and protect against Identity Theft, Cryptoviruses, and other dangers. There was a lot of good conversation and information.

Following up on modernizing of existing MultiValue Applications, there was a great deal of interest in mobile and web development, as well as using cloud BI (Business Intelligence). These are no longer new technologies to the enterprise but are turning into required technologies that companies need in order to manage and expand.

On Tuesday, the attendees were able to talk to our sponsors about tools and products that would help their business. This year we had a Breakfast with the Sponsors to start the day. This allowed everyone to hear what the sponsors were promoting, and to get a taste of all the interesting things the sponsors were going to be showing that day. At lunchtime, we opened our exhibit hall so the attendees could lunch and talk with our sponsors more in-depth.

As we had in previous years, we also provide a way for attendees to make appointments with speakers and sponsors outside of the session and networking events. These appointments help enhance and organize the networking aspect of the conference.

Wednesday was the final full day of the conference and was packed with sessions, and ended with the traditional Closing Conference party on the beach. We all got to enjoy the excellent food and a little relaxation with our community before having to return to work.

Most of the attendees took advantage of our post-conference downloads

and on-demand session videos as well. These downloads and videos are one of the many perks of coming to the yearly conference. They provide attendees a chance to revisit sessions or review information contained in the sessions they didn't get to attend due to scheduling.

If you didn't get a chance to attend this year, and would like to access to the session videos and downloads, you still can. The details are here:

<http://www.intl-spectrum.com/conference/show/18/SessionDownloads.aspx>.

Now that this year's conference is over, we are already hard at work planning for the 2019 Conference. If you have a topic or session you would like to see at the Spectrum Conference next year, please let me know. I am always looking for new ideas, as well as, presenters. **IS**



# 4GL Spotlight

## Evoke

BY CHARLES BAROUCH

**T**his is the first in a series of articles about systems which write code for you. While that sort of technology has existed for decades, there have been vast improvements in recent years. Each installment of the 4GL Spotlight will offer you details about some of the current offerings.

Today I had a chance to talk to Bob Markowitz and Simon Theobald of BlueFinity about Evoke.

**SPECTRUM:** *When I first started talking to Bob about this interview series and I referred to Evoke as a 4GL (Fourth Generational Language) he felt that understated it and undersold it.*

**BOB:** Evoke is a develop-once, deploy-everywhere, platform that happens to work with MultiValue, SQL, Oracle, and lots of other databases out there. Evoke is low-code, no-code. That means that the tool itself generates an app which will run on all devices without the need for any hand coding.

**SPECTRUM:** *When you say all devices, are you talking about PCs and Macs? Web-only?*

---

*With Evoke, you simple tick a box and Evoke will mimic the culture of the device the app is running on.*

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**BOB:** Yes. The desktop, as a web app or a native app. Android phones. iPhones. Watches. Tablets. That one set of code will run on all of those devices.

**SPECTRUM:** *Can you give an example of a use-case? What sort of things are people doing with Evoke?*

**SIMON:** Evoke is currently being used by customers in Australasia, Europe, and North America. The type of people using it is very diverse. As Bob said, the resulting app runs on every platform. Because of that we have organizations that are using it for stock-taking, for contractors and employees to put in timesheets and expense forms. During the week, they'll create an app that their contractor can use on their phone when they are commuting in, on their desktop during the

day, and on their tablet on the sofa during the evening.

We have organizations using it to track VATs, machines, various components. You can have citizen-developers, people who really aren't down-and-dirty developers. They simply use drop-and-drag, point-and-click, option-select to create an app that will help meet fairly sophisticated business requirements. Without all the coding, you can meet the needs of industries such as banking, health care, recruitment, manufacturing, service industry, etc., etc., etc. So you've really got a diverse range.

**SPECTRUM:** Are we talking green screen screen-scraping, or something more sophisticated?

**SIMON:** We are talking a lot more sophisticated than that. Evoke itself is an app. It will create for you a brand new software app that is ready to run on all the those different devices against all those different databases and all those different operating systems.

You will be able to build apps that can interact with your phone camera, that will adapt automatically, based on

# Evoke

Account :  remember :

Login name :  remember :

Password :  remember :

[forgotten your login details?](#)

[Help](#)

Login

whatever screen size or operating system they find they have. An app that will automatically use the culture of the different devices.

So no, we aren't talking screen-scrape, we're talking about full function.

**SPECTRUM:** *Culture of the device?*

**SIMON:** Everyone has their favorite device. And they like to have a different style, a different font for their words, a different way of showing entry fields. Things that make it instantly recognizable.

In order to create, what people have done in the past, is they've created separate apps for separate devices to embrace the cultures. With Evoke, you simply tick a box and Evoke will mimic the culture of the device the app is running on.

We also have customers who have a corporate style and we really don't care what device our app is running on, we always want it to look the same. Just check another box.

More about Evoke: <http://www.bluefinity.com/whatisvoke.php>

The full interview, which includes a mini-demo, is on YouTube: <https://www.youtube.com/watch?v=ZY6Ik0pUnMIS>

The screenshot shows the Evoke application interface. On the left is a navigation menu with options like 'Generator', 'Web App', 'Native App', 'Repositories', and 'Data Mappings'. The main area is titled 'Data Repository Mappings' and contains a table of repositories and a section for 'Entity general mapping details'. The table lists repository ID, technology, platform, connection type, and connection string. The entity details section shows a dropdown for 'Repository object name' set to 'SOPUSERS' and a table of properties with their positions and data types.

Repository ID	Repository technology	Platform	Connection type	Connection string
MV	Multivalue	JBASE	CoreObjects	SOP
SQL	SQL	MYSQL	ADO.NET DynamicDML	STUDY016\SQLEXPRESS\SOP-EVOLVE

Property name	Attribute position	Data type	Data conversion
LogName	1	AlphaNumeric	
LastName	10	AlphaNumeric	
Account	11	AlphaNumeric	
Email	12	AlphaNumeric	
UserType	13	AlphaNumeric	
Password	2	AlphaNumeric	
DateLastLoggedIn	4	Date	

This is another screenshot of the Evoke application interface, showing the same 'Data Repository Mappings' and 'Entity general mapping details' sections. The layout and content are identical to the previous screenshot.



**CHARLES BAROUCH** is the CTO of HDWP, Inc. and the Publisher at HDWPbooks. You can read his writing in

International Spectrum, Theme-Thology, Novo Pulp, Pax Solaria, PerhelionSF, and the Interrogative series, which begins with Tiago and the Masterless.

# FROM THE PRESS ROOM



## Kore Technologies Announcing Kourier Integrator Release 4.5

Kore Technologies, a leading provider of enterprise integration and eCommerce solutions, announced today that Release 4.5 of its award-winning Kourier Integrator Data Management Suite is now generally available. This release is optimized for “Cloud” environments such as Amazon Web Services and Microsoft Azure. The update provides enhanced functionality and higher performance when doing integration and data warehousing with Microsoft SQL Server in the cloud.

Microsoft SQL Server 2017 is supported in this release in addition to other performance and product improvements to Kourier’s ETL (extract, transform and load) and EAI (enterprise application integration) capabilities. Key enhancements include:

- **Increased ODBC Performance** : Kourier’s Net Change engine was redesigned to provide significant performance increases when loading Microsoft SQL Server databases from non-UniData/UniVerse data

sources.

- **Kourier REST Enhancements** : API developers have more control of serialized JSON output and enhanced support for JSON with inbound REST APIs. The Swagger API documentation includes additional information and is more interactive and easier to use for API consumers.

Everything in Release 4.5 supports Kourier’s continuing mission of being the most complete and easiest to use ETL and EAI solution for MultiValue and Microsoft SQL Server-based systems. ■



## Ashwood Is Excited To Announce – The A-Team Is Growing!

Jim Hogg, a Cincinnati based MultiValue developer, is joining the ATeam as he transitions from a position held with one of Ashwood’s legacy customer sites. Jim brings 34 years of MultiValue development and support experience to the ATeam. His work with MV VARs and database support organizations and his experiences working with PC and web-based products, such as those in the Microsoft

Office realm, Crystal Reports, and Cognos Report Studio throughout his career will benefit both the ATeam and Ashwood’s customers.

“We’re happy to have Jim join our ATeam because he is an extremely talented developer and data analyst. Jim will be assisting the A-Team in our quest to exceed our customers’ expectations while adding new functionality to our existing ForeMost ERP, Fast-Bac DR, and mvTools products”, said Rod Owens, President of Ashwood. ■



## Ladybridge Releases QM 3.4-12

The installer and the CREATE.ACCOUNT and UPDATE.ACCOUNT commands now look for an optional NEWVOC.MODS file and, if found, copy its content to the VOC file of the account being updated. This allows the creation of a site-specific set of items that should be in the VOC of all accounts.

The SET.QUEUE command now has an option to delete a form queue definition.

Use of terminal type MSVT in a Windows QMConsole session enables the use of the Microsoft Virtual Terminal control codes on versions of Windows that support this

feature.

The data encryption operations now support an additional set of algorithms that use a random initialization vector instead of a fixed value. This is available via three new algorithm names when setting file or record level encryption and by a new QM-Basic QMEncryptx() function which also has equivalents in the QMClient API.

There is a significant improvement in performance when using the query processor to produce reports with a very large number of values in a field.

The QMBasic @BUILD.TIME constant returns the date/time epoch value at which the program in which it appears was compiled.

The QMBasic CONVERT() function normally adopts the argument order used by Information style products. The PICK.CONVERT setting of the \$MODE compiler directive can be used to select the argument order used by Pick style products.

The QMBasic GETLOCKS() function returns information about file and record locks.

The QMBasic MATSTR() function provides a simple way to convert a two dimensional matrix to a dynamic array.

The QMBasic REGEX() function matches a string against a regular expression. This function is currently not available on Windows.

A new command line option, -status, has been introduced

# FROM THE PRESS ROOM

to show the QM version, start time and current process counts.

The QMClient encryption functions now have wide character (Unicode) versions. ■



## Entrinsik release Enrole v7.3.3 Upgrade

Entrinsik recently announced the release of the newest version of its Enrole software, a

complete registration and course management platform.

Enrole v7.3.3 includes maintenance updates, enhancements, and bug fixes. ■



## Texmug names Jeff Teter as new President

Texas MultiValue User Group is pleased to announce that Jeff Teter is officially the new

President. Jeff has already been making a huge contribution as VP of Texmug South, and so this is a very natural transition.

Baker Hughes is to assume the title of Immediate Past President. The current Officers are: Dick Thiot of Mavsys; Nora Roales Nevers, Secretary; VP of Texmug North Texas - Bobby Worley; Jill Orsini is to become Program Chair.

At the 12 year mark, Texmug continues strong and gaining synergy, thanks to the support of our members and the MultiValue vendors and service providers. ■



## Revelation Software release Security Patch for O4W in OI 9.4

Revelation software release a pack for OI 9.4 that will resolve a potential security vulnerability in OpenInsight 9.4 O4W routines.

Works members can download this patch from the Works Downloads section of the web site. ■

## eXtra Newsletter

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# Using OWIN Security with MultiValue Data Part 3

In the first article, I explained a little bit about what OWIN was, and the basic setup for creating a connection between an OWIN application and a MultiValue framework. In the second article, we covered the basic interface you need to implement in order to get the minimum requirements for using OWIN's identity/security framework in place. There are a few connection points left to create before it will be complete. Ready?

## Quick Review

`ApplicationDbContext` - This class does all the work of connecting to the database and making the subroutine calls to return or update data.

`ApplicationUser` - This class is used to hold information about the user that the rest of the OWIN Identity system will use. This class will call the `SPECTRUM.OWIN.USER` subroutine and return a dynamic array of information about the user.

`ApplicationUserStore` - This class does most of the work of interface between OWIN and the `ApplicationUser` class. As you saw in the Part2 this class is very modular in design, so you

---

*... does all the grunt work of the sign in/out, password validation, and external tokens and two-factor authentication.*

---

only have implemented the interface requirement that you need.

## ApplicationUserManager

The `UserManager` is designed to configure all the account management settings required for OWIN to handle your logins for you. Over all it is a pretty simple class [Figure 1]

Looking at the code you will notice that this class require the `ApplicationUser` class and the `ApplicationUserStore` class. It only has method that you need to be concerned with: `Create()`.

The create method will be used in the `Startup.ConfigureAuth` method. Similar to how the `ApplicationDbContext` was created in the first article in the series.

## User and Password Policies

The first thing you will need to do is define how you want to set your username and password policy. The properties `UserValidator` and `PasswordValidator` are used by OWIN to help create client side validation for your `UserName` and `Password` [Figure 1, lines 15-25]

There are many different options you can set here, but the minimum I would set are `AllowOnlyAlphanumericUserNames` and `RequireUniqueEmail`. If you set the first one to true will only allow A-Z and 0-9. Setting `AllowOnlyAlphanumericUserNames` to false allows *any* character to be included in the user name. You want it to be false so that email addresses can be accepted as valid user name.

The `RequireUniqueEmail` address is also important if you are going to be using OWIN's create new users system. If you plan on allowing OWIN to create and manage the user information, *and let's face it, why wouldn't you*, then make sure you set this property to true.

Of course, if it is set to true, then you should also implement the `IUserEmailStore` interface in the `ApplicationUserStore`. This interface implements the `FindByEmail` method so that you can look in your database to make sure the email address doesn't already exist.

This will force OWIN to look into the database to make sure the email address hasn't been duplicated. If it has been duplicated then, it will generate an error message and allow the user to send an "Forgot my User" email. It will allow your database to manage the email conformation when a password

is reset and allow OWIN to implement two-factor logins.

The `PasswordValidator` is just as important, and you will need to take a really close look at what your password policies are. Consider these settings:

`RequiredLength` - Minimum length of the password.

```
Imports Microsoft.AspNet.Identity
Imports Microsoft.AspNet.Identity.Owin

Public Class ApplicationUserManager
    Inherits UserManager(Of ApplicationUser)

    Public Sub New(ByVal Store As ApplicationUserStore)
        MyBase.New(Store)
        Me.PasswordHasher = ApplicationUser.PasswordHasher ` New
ApplicationPasswordHasher
    End Sub

    Public Shared Function Create() As SpectrumUserManager
        Dim manager As New SpectrumUserManager(New SpectrumUserStore)

        ` Configure validation logic for usernames
        manager.UserValidator = New UserValidator(Of SpectrumUser)(manager) With {
            .AllowOnlyAlphanumericUserNames = False,
            .RequireUniqueEmail = True
        }

        ` Configure validation logic for passwords
        manager.PasswordValidator = New PasswordValidator With {
            .RequiredLength = 4,
            .RequireNonLetterOrDigit = False,
            .RequireDigit = False,
            .RequireLowercase = False,
            .RequireUppercase = False
        }

        ` Configure user lockout defaults
        manager.UserLockoutEnabledByDefault = True
        manager.DefaultAccountLockoutTimeSpan = TimeSpan.FromMinutes(5)
        manager.MaxFailedAccessAttemptsBeforeLockout = 5

        ` Register two factor authentication providers. This application uses
        ` Phone and Emails as a step of receiving a code for verifying the user
        ` You can write your own provider and plug it in here.
        manager.RegisterTwoFactorProvider("Phone Code", New
PhoneNumberTokenProvider(Of SpectrumUser) With {
            .MessageFormat = "Your security code is {0}"
        })
        manager.RegisterTwoFactorProvider("Email Code", New EmailTokenProvider(Of
SpectrumUser) With {
            .Subject = "Security Code",
            .BodyFormat = "Your security code is {0}"
        })
        manager.EmailService = New EmailService()
        manager.SmsService = New SmsService()

        Return manager
    End Function
End Class
```

Figure 1

RequireNonLetterOrDigit - Password must contain at least one symbol. The @ and the . in the email address with satisfy this condition.

RequireDigit - Password must contain at least one number.

RequireLowercase - Password must contain at least one lowercase character.

RequireUppercase - Password must contain at least one uppercase character.

### User Lockouts

OWIN can also handle your user lockout for you. You can define how many times the user can attempt to login with the incorrect password before locking the user out, as well as the

length of time that the lockout will be in maintained.

To really be effective with this option, you should also implement the IUserLockoutStore interface in the ApplicationUserStore. This way your database will be notified of the lockout status of each user, how many times a bad password has been attempted and as well as allow you to unlock it from the database.

If you don't want to have user lockouts, just setUserLockoutEnabledByDefault to false, and you don't have to implement anything, or worry about users calling asking why they can't get in.

### ApplicationSignInManager

This class does all the grunt work of the sign in/out, password validation, and external tokens and two-factor authentication.

There really isn't anything you are required to do here, other than make a class that connects all your custom classes together [Figure 2].

### Startup.Auth

Once you have these classes implemented, you need to update your Startup class [Figure 3].

While this seems like a lot to do to make OWIN work, it really is more of a cut-and-paste kind of coding that anything complex. That's about it for implementing the OWIN identity framework. **IS**



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

```
Public Class ApplicationSignInManager
    Inherits SignInManager(Of ApplicationUser, String)

    Public Sub New(ByVal UserManager As SpectrumUserManager, ByVal
AuthenticationManager As IAuthenticationManager)
        MyBase.New(UserManager, AuthenticationManager)
    End Sub

    Public Shared Function Create(options As IdentityFactoryOptions(Of
SpectrumSignInManager), context As IOwinContext) As SpectrumSignInManager
        Return New ApplicationSignInManager(context.GetUserManager(Of
SpectrumUserManager)(), context.Authentication)
    End Function
End Class
```

Figure 2

```
Public Sub ConfigureAuth(app As IApplicationBuilder)
    ...

    app.CreatePerOwinContext(AddressOf ApplicationDbContext.Create)
    app.CreatePerOwinContext(Of ApplicationUserManager)(AddressOf ApplicationUserManager.
Create)
    app.CreatePerOwinContext(Of ApplicationSignInManager)(AddressOf
ApplicationSignInManager.Create)

    ...

End Sub
```

Figure 3

# Extending mvBASIC

BY CHARLES BAROUCH

Most flavors of mvBASIC have a little used, often misunderstood structure called `FUNCTION`. It isn't exactly like `FUNCTION` in other languages. In PHP, JavaScript, nearly every language that has it, you can stack dozens of `FUNCTIONS` into a single script or source record. The one in mvBASIC requires its own document. One function per source record. On a quick glance, this makes it look like a poor cousin of `SUBROUTINE`. You couldn't be blamed for thinking it has no real purpose.

That's what I thought for most of my career. Now, I'm beginning to develop a deep respect for it instead. In this article, and the next, I hope to sell you on the value of the humble `FUNCTION`.

*It sure would be nice to have a built-in library of any-to-any math conversions.*

The line of code in Figure 1 will not compile in mvBASIC

It sure would be nice to have a built-in library of any-to-any math conversions. If `XCONV` existed, it could convert radius to circumference. It could change liters to ounces. There are plenty of standard conversions that I don't need to recode over and over again.

If we write a subroutine to solve this, it would look something like Figure 2.

We'd support that with a routine like Figure 3.

It'll work. It just isn't as elegant. However, we can recast the `SUBROUTINE` as a `FUNCTION` and keep our original syntax [Figure 4].

Now our original line 19, the one that looks like mvBASIC has always had an `XCONV`, will compile and work. We just need to add a `DEFFUN` to connect the `FUNCTION` to the calling program [Figure 5].

I haven't scanned the documentation on every MultiValue flavor, so you may need to check your version and make minor tweaks. I believe this should work for most or all of them.

So, what really is the difference between a `FUNCTION` and a `SUBROUTINE`? While they can be pressed into equiva-

```
019 doz = xconv(quantity, 'unitsToDozens')
```

Figure 1

```
019 call xconv(doz, quantity, 'unitsToDozens')
```

Figure 2

```
001 subroutine xconv(result, value, rule)
002 begin case
003 case rule = 'unitsToDozens'
004 result = int(value/12)
005 result<2> = rem(value/12)
...
```

Figure 3

```
001 function xconv(value, rule)
002 begin case
003 case rule = 'unitsToDozens'
004 result = int(value/12)
005 result<2> = rem(value/12)
...
xxx return result
```

Figure 4

```
005 deffun xconv()
```

Figure 5

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```
001 function search(needle, haystack)
002 result = ''
003 locate(needle, haystack; pos) then
004 result = 'ATTR'
005 result<2> = pos
006 end else
007 pos = index(haystack, needle)
008 if (pos > 0) then
009 result = 'CHAR'
010 result<2> = 'pos'
011 end
012 end
013 return result
```

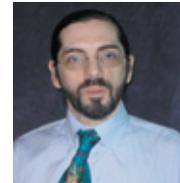
**Figure 6**

lent service, the FUNCTION is more organic. It extends the language. See a quick example in Figure 6.

Now we have a combined command that can easily be extended to search for multivalued or subvalues or any case insensitivity... many, many options. Once again, yes, we can do this more awkwardly with SUBROUTINES but why? The same way that we use multiplication when repeated addition can

achieve the same result. Multiplication is clearer and cleaner.

Next issue, we'll show you how to use FUNCTION to do a massive MultiValue makeover. **IS**



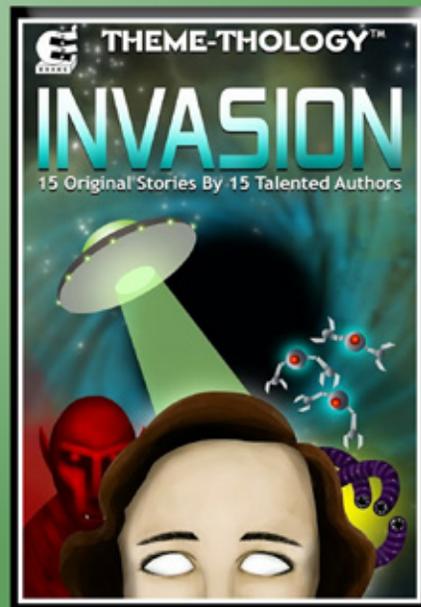
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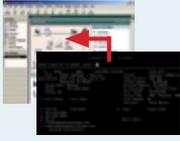
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# Watch Your Language

BY CHARLES BAROUCH

## Whorfianism

**John Lennon:** *You speak English?*

**Jeremy Hillary Boob, Phd.:** *Old English, middle, a dialect, pure.*

**Paul McCartney:** *Well, do you speak English?*

**Jeremy Hillary Boob, Phd.:** *You know, I'm not sure!*

**Ringo Starr:** *He's so smart, he doesn't even remember what he knows.*

The theory of Whorfianism states that language is a critical part of how we form thoughts. We've all heard this, we know it, accept it. There's a fair amount of scientific evidence that it isn't true. Let that sink in for a minute. Language has a huge effect on how we communicate thoughts but it has less to do with the way we think. For more on this: <https://www.scientificamerican.com/article/does-language-shape-what/>

Despite that, I'd like to submit to you that programming languages are a critical part of how we form code. And, I'd like to further assert that the biggest impact is from the first language — or languages — you use professionally or extensively.

When we try to bring non-MV people into MultiValue, it is useful to know their roots.

---

*Most programmers are accidental programmers. They don't have any training, not formal training. They mistake code that works for good code.*

---

## A Million Words

When you start with a wordy, long-winded language like COBOL, you tend to plan a bit before committing your ideas as code. Even those of us with a high typing speed and a low error rate are more likely to cowboy our way through a coding project in a terser language.

But once the plan-first perspective takes hold, many programmers find that they keep that habit long after they've changed languages. If you don't believe me, watch a COBOL programmer — they still exist, there are a lot of them — try their hand at PHP, Python, or mvBASIC. You can almost see the thoughts forming.

## Stop Java-ing

At the risk of offending a lot of very smart people I know who code in Java: Stop. Java is based on C and C++. These are mid-level languages. They should be used to build compilers, in-

terpreters, operating systems, and engine. If you are using Java/C/C++ to write LOB (Line of Business) software, please take a deep breath and step away from the keys.

The problem with learning Java and applying it to application development is that you are drawing with sledgehammers. While scraping the head of a hammer on paper might make a mark, it isn't really drawing. Likewise, I try not to break down walls with crayons. Java is an amazing and powerful language when it is applied to the correct sort of problems.

Watch a Java-indoctrinated programmer develops in any language and it will likely look as if they got the memo about segmenting code but missed the memo on making each segment clean and distinct. When you build operating systems in Java, the reasons for the division of code make sense. When you write accounting in Java, you end up with code that is much harder to support than if you worked in a high level language.

Please note: C# is not really in the C family. Swift is C but it tends to avoid the issues I'm discussing in this article.

## PHP... Python... JavaScript...

These are languages that are brilliant at solving short problems. People who

work in them are often very efficient on those sort of projects. When the work gets longer and more complex, the solution tends to be libraries of third-party code, often open source. Using these assets makes big projects somewhat smaller because a lot of the complexity is off-loaded onto pre-existing code.

### Bad Programmers

No one language has a monopoly on bad programmers. They come in all shapes and sizes. It helps if you think of them as people speaking a broken dialect. I don't blame a person who speaks broken English for speaking broken English. Most bad programmers, in my experience, are parroting what they already saw someone else do. If all I've ever seen is bad code (written by people who knew better but were rushed) then I will think that's how

code is supposed to be. If all I've ever seen is the code with dozens of poorly documented patches, I won't know that it started out well structured. If all I get is  $X=A+Q$  then I won't likely think about good variable naming.

Most programmers are accidental programmers. They don't have any training, not formal training. They mistake code that works for good code. That it works is not enough. Code needs to be supportable, modifiable, and provable. People who speak broken dialects can be shown how to speak better.

### What Would Chuck Do?

I have an advantage because I am a professional trainer. But, if I weren't, I would do for others what was done for me when I started in the business. I would send them to a class. However expensive training is, in time and

money, if it prevents errors, there's an argument for it.

Ask yourself if your industry has regulations — they all do — that can result in fines — many do — if data is mishandled or misrepresented. Weigh those fines against training fees. Many companies are at risk for SLA (Service Level Agreement) penalties that can be prevented by improving the language skills of your people. Some of us are in businesses where chargebacks — essentially fines created by our too-big-to-lose customers — make certain mistakes insanely expensive.

So, as a business professional and as a technical person, I wave the flag of get-them-trained proudly and publicly. But it isn't enough to train them. You have to make sure that the training takes into account their current perspective. The way they already tilt their head when they want to see a path through the code will have an impact on how they code.

I'll leave you with a parting thought that's been oft quoted to me:

**Big Boss:** What if we train them and they leave.

**IT Manager:** What if we don't train them and they stay? **IS**

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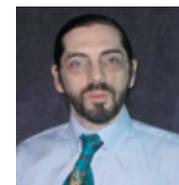
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