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THE MULTIVALUE TECHNOLOGY MAGAZINE | SEPTEMBER/OCTOBER 2016

When You Hire

Also in This Issue

- The Exiting Employee
- Paul Giobbi Speaks
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FEATURES | SEPTEMBER/OCTOBER 2016

DEPARTMENTS

From the Inside

I've been talking to a lot of people about hiring Millennial developers again. It goes back to the whole "The Millennials are Coming" and "How to Keep Them" questions that we talked about at the 2016 Conference.

I seem to have a different perspective than most people about working with Millennials. It may help that my younger brother is actually a Millennial, and I have to work with him quite a bit. He is also in the same boat as many of you: a Millennial that is hiring and managing other Millennials, but also having to manage Gen-X and a few Baby Boomers. This makes for some interesting conversations between him and me sometimes.

Millennials Communicate

Technology, to Millennials, is like breathing. They didn't watch it evolve, or help it evolve. It just always was there. Most people outside of this generation still remember when cell phone calls were charged by the minutes, and data plans didn't exist. We remember paying for every call made on the house phone. Some of them have never used the term "house phone."

We weren't always connected to people, to data, and to social media. We didn't have alternatives to in-person meetings and social events – aside from conference calls. Millennials, however, always had this connectivity through technologies. They are always talking with each other through their IMs, social media posts, group chats, and other means. They always know what the others in their group are doing, and they work in a group out of habit. This is common place for them.

Many hold the perception that phone calls are a burden, and daily meetings are a waste of time, because they already know what's going on. This is different than the Boomers, who are more likely to work independently on tasks and then go to meetings to update everyone on what they are doing or have completed.

Millennials Want Freedom

Boomers tend toward structure, controls, and discipline. Gen-Xers also have a tendency to follow along with these ideals as well; or at least don't have issues with them. While Boomers tend to be workaholics, Gen-Xers like the freedom to come and go as needed. They are still willing to put in their eight or nine hours, as long as they can pick which eight or nine hours of the day it is.

Millennials tend to want to conform to a specific start time and to a specific end time. If they have been told that their days ends at 5 o'clock, then regardless if they have reached their 8 hours for the day, they are done with their work day. They are ready to move on to experience life. Many Millennials tend to view work as a necessary evil that is required in order to spend time experiencing life.

Many Millennials view "Experiencing Life" as their primary accomplishment, instead of the sense of accomplishment that Gen-Xs and Boomers have when they "complete" a project.

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INTERNATIONAL Spectrum
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A partial antidote is to offer them some flexibility in their schedule, but very specific start and end times, to help them plan. This will often leave them more open to schedules beyond the standard 9-5.

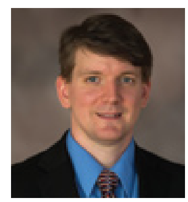
The Line Between Millennials and Technology is Blurry

I mention this above, but I need to point this out again: Millennials are highly connected to technology. It's comfortable, well known, and they have the idea that they know everything there is to know about it. It isn't a thing they use so much as it is an extension of themselves.

While we've grown up expecting that expertise is something we earn, they see ease of use as the developer's obligation. Their idea of technology is shaped by the cell phone, Excel, Outlook, and Mac. This leads to the expectation that software shouldn't require training. It should be intuitive and pretty. While I would agree with them – ideally software and technology *should* be all these things – that is just not the case for business systems. Business systems have evolved into being bulky, clunky, and cranky. This often offends Millennials. They see it as a problem. And they *will* try to bypass it.

Since they "know technology," they will not think twice about doing this bypass to make their job easier. They will not understand why IT is telling them they can't. After all, if they can make it work like a cell phone app, which is better than the clunky business system, what's the problem?

If you don't accommodate, or understand these ideas, then you may find high turnover until you find people that are willing to do it your way. If you provide for these considerations, then you are likely to find Millennials hanging around longer, and easier work with. IS



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When You Hire

BY BENNETT BAROUCH

Hiring is quite a fraught subject. What are the roles of HR, line management, and up-chain management? How do you know how to advertise, and where? Do you use internal recruiters, external recruiters, or no recruiters? How do you set a salary range, who negotiates salary with candidates, and how? Who participates in the interview process, and in what ways? Do you use in-house or external technical tests, or none at all? How much attention should you pay to which school someone attended or where they have worked so far? Should you only consider someone who has been in essentially the same role before? If not, how much difference in previous experience is too much difference?

Talk among yourselves and let me know what you decide.

Just kidding, but hoping to make the point that there is quite a lot to figure out. Let's start with first principles — what are you trying to accomplish with this pending hire? Let's say you want to hire someone to work in a code development or test role, or as a manager of such employees, since these are the kind of hires most of us are concerned with. To what purpose?

> ***Nothing you do as a manager has more positive or negative impact on the business than who you hire.***

We need to challenge our reasoning.

I'm hiring to fill the hole left by Dave's departure. *Not much of a job description.*

I'm hiring them to be the technical lead on a new project. *Could be a good reason, but why is this not someone who already works for you?*

I'm hiring them to be the intern / new hire person who will do all the odd bits and pieces so the more senior people can focus their time on work requiring more expertise? *Is this a real job or a dumping ground?*

Am I hiring them to rescue the project / product / company? *Or be the next sacrificial lamb when the company refuses to address the real impediments to progress?*

Am I hiring them just to add capacity? *Do you know what work they will do if they start tomorrow? And what they will likely be doing six months later?*

I'm hiring them to bring in expertise that is not strong enough on the current team. *Is that really a trainer, a manager, an architect, a technical lead, a project manager, an automation expert… and is the team ready to accept someone coming in from the outside as an expert?*

We set ourselves up for a bad outcome when there is no clarity on all of the above and more, across the team. We have to resolve these issues before the ad goes out and the interviews begin. If your answer is something like: *"But we are fast-paced … and we don't have time for … and I am already working on …"* Then stop reading this article.

You will never have complete clarity on all of the above. It is also a given that things come up in the process of hiring that are not anticipated at the outset. The hiring manager has responsibility for making that new hire successful or for taking care of the consequences in the absence of success. Because of these points, the hiring manager *must* be allowed to take the lead.

Regardless of the many differences that exist across companies, this is invariant and non-negotiable. The hiring manager can delegate some initial screening to senior individual contributors, can work with HR to establish parameters, define the job and how it is advertised, and should ensure they are in sync with their boss on the goals and measures of success… but they *must* be the lead on the project called *hiring*. If you have any doubts about this, make a bad hire and see who they think is responsible.

"But I don't have time …" Nothing you do as a manager has more positive or negative impact on the business than who you hire. Consequently, this is your main responsibility. If you are too busy for your main responsibility, you need to make some changes. Nothing you do affects the business more than good or bad hiring. Nothing. No thing. Not one thing.

All of the questions above, and more are *your* questions to answer. If you hire the right people for the particular jobs you have, and the particular culture you have, they will amaze you in ways you could never predict. If you hire people who are a poor fit for the job or culture, you cannot manage (force, coerce, trick, encourage, train) them into being first class performers in that setting. Thinking that anything is more important than hiring is counter-productive.

* * *

Depending on the company, HR can be a huge help, a passive partner, or a minor (perhaps major) hindrance. If they can help you catalogue and answer pertinent questions, select your interview team, roles, and method, place effective ads, manage interview logistics, coach you on compensation discussions, and probe candidates for concerns in the offering phase, you'd be a fool not to partner with them. If they can provide none of those things, it's your job. If they get in your way, discuss that with them and go from there. If you think they should do the initial screening or the final reference checks, you are mistaken.

They can screen resumes if you tell them the kinds of backgrounds you have in mind. They cannot screen candidates on the phone because they are not software engineers. The entire set of questions they can ask to save you time, will at most save you minutes out of a process that spans weeks. And for that, you will annoy any really good candidate, and begin your relationship with them by signaling that you are not a strong enough manager to do your own hiring. More importantly, HR doesn't have the background to ask any questions central to whether or not this person is a good fit for the job, or for your team. The same thing applies to internal and external recruiters.

Similarly, neither HR nor recruiters can do reference checks because they are not engineers, and they are not you. While it's a rare candidate who gives a reference who will spontaneously say anything bad about them, there is a world of difference between a strong reference check and a weak one. A non-expert will not be equipped to peek under the covers. You can. When the reference says, "She was great at blah," you know what *blah* is. You know if being great at *blah* is no big deal, or something exceptional. Your unplanned follow-up questions will prove to be the value of making the reference check. This brings up a closely related point. Actually do reference checks!

You should have several people interview each candidate, preferably back-to-back over the span of a few hours in a single day, or two days in the same week. (If a candidate flames out early, you should make some excuse for curtailing the rest of the interviews and save everyone time.) Don't let each person ask redundant questions because you have not discussed things ahead of time. This wastes your opportunity to learn more, annoys the candidate, and because it lacks competence, it signals to your candidate that you lack competence.

* * *

Based on the strengths of the people on the interview team, decide who will focus on architectural knowledge, coding hygiene, testability, maintenance, performance, security, dealing with a tough technical decision, dealing with something emotionally challenging at work… the list goes on. Have each person cover one to three of the areas you consider salient for the job.

This is a good time to note that interviewing is a two-way process. Candidates, however much they may need or want a new job, are also checking you out. Your own twin goals are to assess them, and to have them leave feeling incredibly eager to work with you. Assuming it's true, you want them to go home feeling that yours is a culture they will do well in, that they can do what will be required of them, and that *they will learn from working with people like the ones they met in the interviews*. This last part is the strongest emotional component of getting an engineering candidate to want to become part of your team, to begin with a great attitude, and to face any initial setbacks or drudgery with resilience.

If you put two team members in the same interview, they can take turns. The one doing less talking at a given moment can often make observations missed by the one more verbally engaged. It can also give a view of how the candidate deals with multiple points of view and multiple people at the same time, a real-world work skill we need to use frequently. A three-way design discussion will demonstrate your and the candidate's collaborative styles to each other. It will also give insights into your candidate's on-the-fly knowledge and thinking that is hard to uncover in any other way. Give a lot of "points" to those who shine in this context, and run away from those who fall apart in this real-work activity.

Immediately after interviews if possible, but definitely quickly, get the team together to discuss each candidate. Especially for busy teams, details of discussions with candidates can be forgotten, and recollections of multiple candidates can mush together. To avoid more junior team members just following the lead of more senior members, have junior members speak first. To avoid junior members learning not to speak at all, ensure senior members are respectful where they see things differently. (This is a good general practice across many contexts, to develop your junior teammates, as well as your more senior ones.)

People are usually uncomfortable discussing compensation. As you might guess from things said above, addressing that discomfort is absolutely in the hands of the hiring manger, not HR, not your boss. If you cannot politely and directly ask a candidate what they are currently earning and ultimately make the actual offer compelling, get help. It's your job.

"Hi. I want to be your manager, your leader, spending years telling you what to do, evaluating you, having employment power over you, and I am too weak and queasy to discuss your compensation so I'll just go hide in the corner while someone else does that." No. Not a winning move.

If you are interested in a candidate, say so. Indicate likely next steps, and matter-of-factly ask about their current (or most recent) compensation. Be prepared for them to ask in turn for what you have in mind to pay for this job. Know the answer before you start any interviews. Don't make any promises — it's too soon in the process, but give an honest indication if their expectations are roughly in range or if finding common ground on compensation is likely to be difficult. Later, when you make the offer, you will have already established that you are comfortable in that discussion (huge courage and leadership points for free), and that you know what you are talking about. That goes a long way toward moving the candidate to "yes" with a minimum of last-minute negotiations. If they respond badly in this pre-discussion, that's a strong indication that you should not hire them.

I have not answered all the questions I raised, which are themselves only a representative subset of all the questions there are. Deciding which questions are most pertinent and getting them answered is your job, in the context of each particular job opening.

We often get to (have to) choose between two or three people who might likely to work out well. Cultural fit will result in people amplifying each others' contributions. Talent (intelligence, attitude, and problem-solving of a type suited to the job) will result in learning new skills and improving existing ones. Domain knowledge is important, especially if the point of a particular hire is to bring in focused expertise. Without the right problem-solving smarts, it's a short term fix (or not even that). And without a cultural fit, its value can be eaten alive by negative impacts on the team and on the individual. So, when you get to pick, choose cultural fit over talent, and talent over specific knowledge.

Happy hunting! **IS**

BENNETT BAROUCH has over 30 years of industry experience spanning design automation for integrated circuits deployed in satellites, financial portfolio software, high transaction volume and big data systems, information management, secure on-site and mobile networking, and IT operations software. His customers run from individual retail consumers to the largest companies in the world.

Groundbreaking work under Bennett's leadership produced a virtual assitant that could understand 20 million English phrases and respond with a wide array of information and with complete computer-telephony integration. This work was made part of the permanent collection of the Smithsonian Institution, for Outstanding Achievement in Information Technology, 14 years before Apple released Siri and became the basis of the OnStar virtual assistant found in GM automobiles. Bennett has been certified in ITIL, and as a Scrum Master and as a Scrum Product Manager.

FINDING AN EXIT

BY CHARLES BAROUCH

Since Bennett is talking about hiring in this issue, I thought we should also cover the other way that the door swings. Fired is not the opposite of hired. It is one of the possible exits. People leave for better jobs. People are excessed, laid-off, and take sabbaticals. Leaving isn't always permanent. Leaving isn't always leaving. Sometimes we are seeing Sally out the door in Marketing so she can walk in the door for Sales in the same company.

Going Gently

When Sally moves from the Denver office to the Miami office, what should change? When she goes from Marketing to Sales, how does that affect her rights and privileges in the organization?

Those are good starting questions, but IT doesn't stop there. We should also think about communication: Who should be notified? Should Security be reminded to change her badge color? Should the HR department be reminded to determine who her new boss is? Should Sales be tasked with officially assigning her a territory?

Yes, we do need to do the obvious IT things, like move or replace her computer (and phone and tablet and so on), change her network storage access, update her sharing privileges, and update the corporate directory.

Who should be notified? Should Security be reminded to change her badge color? Should the HR department be reminded to determine who her new boss is?

We still need to go beyond that and use our tools to streamline the entire process. Hopefully, your HR software has much or all of that built-in. If not, why not?

Bigger and Better

When Andrew leaves us for a new opportunity, we have to address half the issues that we looked at with Sally. We are shutting things down, but not adding alternatives. Now we have challenges like retention of data. How long do we need Andrew's ID to persist? Do we use it as a datapoint? We have obligations like COBRA, where HR still needs to track some information about Andrew. And what if Andrew returns?

That last one is often a gaping security hole. Watch the issue unfold: Andrew leaves. We disable his password(s), mark his account(s) inactive, and leave his ID out there because performance reports, sales data, and all sorts of other metrics refer to individual employees. Everything is good. We don't need to modify his permissions because the account is inactive and the passwords are dead.

Six months later, Andrew calls up and asks for his job back. Bigger and better wasn't either of those things. His boss doesn't have an opening, but another team does. We put Andrew back to life and give him his new permissions. The problem is that we never voided his old permissions. It seems obvious when we look at it like this, but I've seen it happen before. Sally's change is immediate; we do all the steps. Andrew's changes are in stages. He ends up with all his old rights and all his new ones. As the British say, "Mind the gap."

Square Peg Meets Round Hole

When Joe's department reorganizes, Joe loses his job. He isn't bad. We aren't dissatisfied; we just aren't doing the sort of jobs that Joe did for us. This is, from an IT standpoint, a situation much like Andrew's. Joe is leaving. Joe might be asked back, or ask to come back, when things change again. However, Joe may also present a different situation. We might keep Joe as a consultant.

The reorganization does not magically end every project and tie all the open issues up with a neat bow. So, Joe might be Schrödinger-ed, working for us but not working for us. If your system is HR-based, this can often be more difficult because in nearly every respect, Joe isn't an HR entity. He's a vendor. But, and this is a big but, he does need many things which an employee needs. He has to have an ID, password(s), and access to systems. At the same time, he doesn't need a paycheck, health insurance, invitations to the company retreat, and so forth.

The same thing may apply to layoffs.

Gimme a Break

Sabbaticals are normal in certain industries. Close variants, like maternity leave, family leave, or FMLA (Family Medical Leave Act), would also fall into this category. You should — SHOULD, SHOULD, SHOULD — have a policy of deactivating accounts when people will be out for extended periods. This is not the same as Joe's situation because some things will be handled differently.

A perfect example is e-mail. When Ronnie leaves for six months, we probably need to auto-forward her e-mail, perhaps copying her on it, perhaps not. While we will suspend her computer access, we might elect to let her continue to have access to e-mail and voicemail. And these answers are likely to change on a case-by-case basis. Ronnie's sabbatical from teaching might be substantially different than Nick's FMLA from janitorial services.

Divorce

Some exits are firings. When Matt is caught raiding the corporate accounts, we have to treat that exit differently than the more friendly sort. In the extreme case, like the one we are discussing here, there may be legal action. Or the legal issue might be on the other side. If someone is fired unjustly — or sees it as unjust — there may be unexpected legal actions. Therefore, we should have procedures and software in place to treat all firings as potentially actionable.

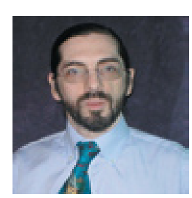
All means all. The previous examples are not guaranteed to be litigation-free either. Sally might see her move as a form of harassment. Joe may feel that he was targeted. Whether they are right or wrong, we need to take the same steps.

The normal things need to be done. Deactivate, disable passwords, remove permissions, and so on. But everything needs to be documented first. What did they previously have access to? What e-mails did they send? For larger businesses, a forensic accountant can be an excellent resource for helping to shape these policies and procedures.

My Exit

Some final thoughts: I don't just have my own passwords. For example, I might have VPN passwords, access codes for the front door, the credit card number for the departmental account. Don't micro-focus on the individual's accounts. Look at all the ways we grant them rights and make sure that the changes ripple out as far as they need to go.

Remember, the software is an agent of policy. We need to make sure that our systems do the right steps in the right order. And we can't underestimate the value of documenting access. **IS**



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, PerehelionSF, and the Interrogative series, which begins with Tiago and the Masterless.

Interview with

Paul Giobbi, President

Zumasys Inc.

BY CHARLES BAROUCH

Paul Giobbi has been investing heavily in the MultiValue market. His company is simultaneously a vendor, a VAR, and a master distributor. Paul took the time to have a sit-down with us and talk about the next steps planned for his company.

IS: ***You've invested heavily into MultiValue, buying jBASE, buying AccuSoft, partnering with Ladybridge on OpenQM... What do you see as the Zumasys's role in the future of MultiValue?***

GIOBBI: We have also have a partnership with Rocket. What interests us is the wonderfully powerful, customizable applications which are already out there. We feel that a lot of the Pick market wisely passed the client-server revolution. We don't want them to miss the Software-as-a-Service revolution. Because they didn't do client-server, N-Tier, and all of that, they are actually better positioned than some to move to SaaS.

IS: ***What does moving to SaaS mean?***

GIOBBI: Our strategy for the last ten years was to grab those Pick systems and move them to the cloud. We want to do much more now. We want to give them single-signon, rental licensing, browser-based access, and session persistence. As we do that, the applications look and feel just like any other SaaS. Pick is, in our heart, the best application platform. People choose apps like Salesforce or NetSuite because they are presently the best. Not because of the database or tech behind them. We are able to add the plumbing to interlink our Pick applications with other SaaS apps. That lets people manage financials on NetSuite but manufacture or handle inventory on Pick, for example.

Pick is, in our heart, the best application platform.

We don't have to move their applications to the cloud to do this. It does make it easier, but most of our clients are running Pick on local hardware while still benefiting.

IS: ***What was Zumasys at the start?***

GIOBBI: Sixteen years ago, we were an infrastructure company. We did virtualization, storage, and remote access technologies.

IS: ***How did you get from there to here?***

GIOBBI: Ten years ago, we launched a cloud platform. Pick has always been a part of what Zumasys does. We've found that the applications, our client's existing applications, are what drive business. We bought jBASE and AccuTerm to get closer to those applications, to better serve our customers.

IS: ***What's on the roadmap? What are you looking to do next?***

GIOBBI: Executing on the SaaS strategy. That's why we needed to own a database, to adapt jBASE to be multitenanted. We already knew how to do that in D3. We are looking into multitenancy with OpenQM as well.

Releasing 5.5 of jBASE was a necessary step toward building our future. The new release, 5.6 is even bigger: REST, a graphical system manager — for backups, monitoring, license control — and native data encryption. If you think about what jBASE did originally, it was a liberator of Pick. It had more options for integrating other software. We want to keep liberating Pick from a marketing and engineering standpoint.

IS: ***How did you get started in MultiValue?***

GIOBBI: I was testing dumb terminals for my dad's business, which is now part of Epicor. I was a grunt. Then I moved into sales. I sold ad space for Spectrum in the '90s. I moved out of the Pick market. And my experiences with the ISV market, working for Jones Business Systems, connected me with my partner Joe Cupp, who passed away a few years back.

All of that led me back to Pick. In a way I never really left. I was only out of that market for a year or two.

IS: ***Tell me about Zumapalooza.***

GIOBBI: Zumapalooza started as a free user conference 10 years ago. Initially the goal was to simply connect our customers with our engineers and we have our engineers lead all of the breakout sessions. Nowadays, it draws over five hundred people. We provide education about infrastructure, cloud and of course our MultiValue solutions. Zumapalooza will be held on May 15-18 at the M Resort and we invite all MultiValue users to attend. With our event and our products we are trying to bring energy and enthusiasm to the market. And it is resonating."**IS**

From the Press Room

Brian Leach Consulting Releases Self Paced Training Series on Kindle

Brian Leach Consulting has announced that the first two volumes of the Self Paced Training series for UniVerse are now available on Kindle.

This allows Brian to offer them at much reduced prices over the paperback editions - which are costly to have printed - and without the expense of shipping which has made them unaffordable in parts of the world.

These volumes are created using Kindle Textbook Creator, which preserves the format of the paper copy more accurately; in books containing large numbers of listings and screen output examples, this is a must. It does mean that you are restricted to reading them on devices that support the Kindle Textbook format: Kindle Reader software on PC, Mac or iPad, or tablets like the Kindle Fire.

The third volume in the series, dedicated to client-side development, is undergoing a thorough rewrite to bring it up-to-date with the changes Rocket has made to the various APIs, and will concentrate far more heavily on the U2 Toolkit for .NET. Once this has been completed, the updated volume will also be offered on Kindle. ■

Ontario Systems Acquires Columbia Ultimate Business Systems

Ontario Systems announces it has acquired Columbia Ultimate Business Systems (CUBS) of Vancouver, Wash. Joining together two ARM market software and services experts, the acquisition will benefit both organizations' customers through expanded product offerings and access to an even broader set of compliance consulting services.

Both Ontario Systems and Columbia Ultimate are well-known brands in the ARM market, and each holds distinct market leadership positions in adjacent verticals. Ontario Systems provides RCM software and services to the healthcare market, counting five of the fifteen largest and three of the top six best health systems in the U.S. as customers, actively managing more than forty billion in receivables with its products. With thirty-five years in the government sector, Columbia Ultimate serves more than one hundred state and municipal government customers in twenty-seven states.

"Over the past thirty years, both companies have proven themselves as consistent innovators, attracting the best ARM customers in the space," said Ron Fauquher, President and CEO of Ontario Systems. "We have always respected Columbia Ultimate as an organization who puts its people and customers first. We welcome their team to the Ontario Systems family, and we're excited about the expanded growth opportunities that await us as a result of Columbia Ultimate's leading position in the state and municipal government markets."

In addition to opportunities in adjacent verticals, the merger combines two companies with broad product and services offerings and creates benefit opportunities for existing users of both companies. In the future, Ontario Systems plans to offer add-on software and services to Columbia Ultimate's customers, such as the Contact Savvy cloud-based contact management solutions, CFPB consulting services and managed services.

"Finding a partner who is as committed to client service and employee culture as Columbia Ultimate was our priority, and we found this shared philosophy in Ontario Systems," said Fred Houston, former President and CEO of Columbia Ultimate and current VP at Ontario Systems. "Beyond the people, I'm confident our customers will benefit from several of the Ontario Systems product and services offerings, helping move their businesses forward."

The agreement includes Columbia Ultimate and RevQ products and brands such as The Collector System, ManageMed, RPCS, Revenue Results, Ajility, and the Ultimate line of solutions. The Intelitech Group will continue to be owned and operated independently. ■

Ladybridge Releases QM 3.4-7

This release introduces a pure Java version of the QMClient API, removing the need for the Java Native Interface which required different versions for each supported platform. The old JNI versions will continue to be supported for at least one year.

The COPY command has been extended to allow record IDs to be forced to either upper or lower case when copying items from a directory file on a case insensitive file system to a case sensitive file.

When using the CREATE.FILE command to create an element of a multi-file, the INHERIT.MFILE.PATH mode of the OPTION command can

From the Press Room

be used to make the default location of the new subfile the same as the default subfile.

The RPL.STATUS command can be used to display a summary of the replication system status.

The SED editor now has a SCROLL1 option to control scrolling from page to page.

The SED editor can take a sequence of edit commands from the data queue.

The SELECT.DIR command can be used to build a select list containing the names of files or subdirectories in a specified directory.

The TERM command now supports setting the default printer page dimensions.

For improved compatibility with other MultiValue products, the query processor COL.HDR.SPACE keyword inserts a blank line under the column headings in a tabular report.

The OPEN.FAIL.ZERO.FVAR setting of the $MODE compiler directive causes a failed open to set the file variable to zero instead of unassigned.

The QMBasic SADD(), SCMP(), SDIV(), SMUL(), and SSUB() functions have been extended to support non-integer values.

About Ladybridge Systems Ltd

Ladybridge Systems was founded in 1992 by former Prime Computer personnel and is headquartered in Hardingstone, Northampton, England. The primary activity of the company is the OpenQM multivalue database for which Zumasys were appointed as worldwide sales and marketing partner in January 2015. Ladybridge Systems also provide training, consultancy, development, and maintenance services to MultiValue databases in the UK and worldwide. Ladybridge Systems remains a small privately owned company, offering a personal level of service to clients around the world.

For more information, visit http://www.ladybridge.com ■

Anzio 17.1 Released

Anzio Lite and AnzioWin version 17.1 have just been released. This version has support for Windows 10, and improves on prior support for Vista, Windows 7, 8, and 8.1. Updates are free (and encouraged) for holders of version 17 licenses. Licensees of version 16 and earlier are encouraged to purchase updates, via this website. Note that we no longer support versions earlier than 16.3 on Vista and later, and we no longer support ANY version on Windows XP or earlier ■

Northgate Arinso Releases Service Pack 245 For Reality V15.2

This Service Pack includes fixes and enhancements to Reality V15.2.

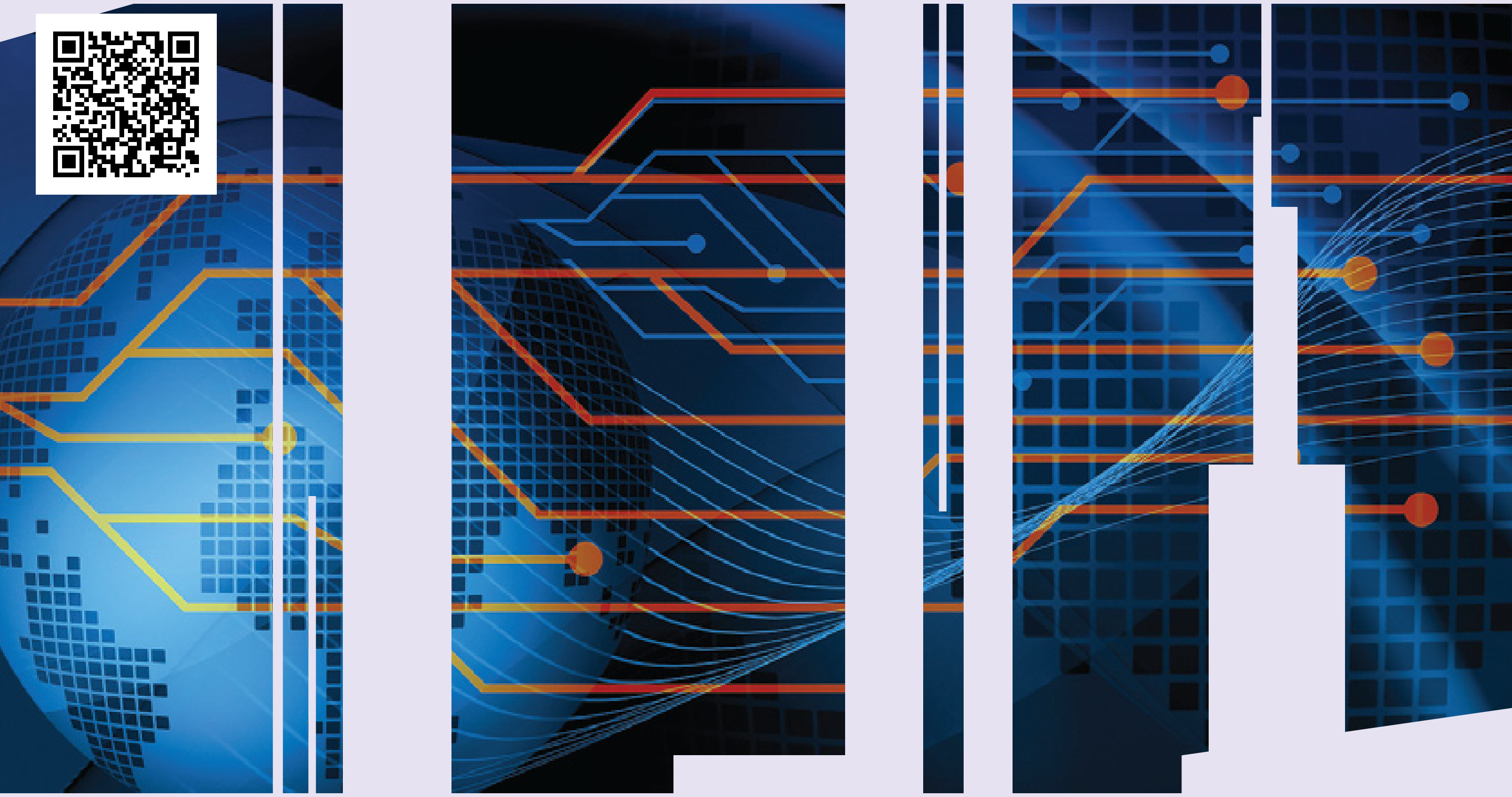
Some of the these are:

- Fixed PCL2PDF line graphic converter
- Enable sizemon to calculate new modulo for files larger that 2GB.
- Allow Hyper Files to open QPTRs and remote files
- Includes Simple DataBasic Email API with Authentication
- Enhances DataBasic Object usage syntax
- Enhancements to RHTTP interface
- Enhancements to JSON Parser ■

Rasmussen Releases Print Wizard 4.2

Full of fixes and a handful of features, Print Wizard 4.2 is now available. If you have a license to version 4.x, that includes this version. Simply download the latest version. By default it'll go into its own directory, and it should use your current configuration files. The prior version should remain, so you can run either version while you test operations.

If your license is for 3.anything, you're long past due for an update, especially if you're on Windows later than XP (which you should be). ■



IS.HASH.SHA1

Generating SHA1 Values with Generic MultiValue BASIC

In cryptography, SHA-1 (Secure Hash Algorithm 1) is a cryptographic hash function designed by the United States National Security Agency and is a U.S. Federal Information Processing Standard published by the United States NIST. SHA1 is used in many places to generate a unique Hash value representing a string or file. It is widely used in place of MD4 and MD5 hash because it has a more secure hash value. While not as secure as SHA256, it is still used in many places for data integrity, version control, and other features that need unique one-way signatures.

SHA1 Function

SHA-1 produces a 160-bit (20-byte) hash value known as a message digest. A SHA-1 hash value is typically rendered as a hexadecimal number, 40 digits long.

SHA1 ("The quick brown fox jumps over the lazy dog")

gives hexadecimal: 2fd4e1c67a2d28 fced849ee1bb76e7391b93eb12

SHA1 will detect even small changes in the string and cause the returned hash value to change. You can always read more about SHA1 at:

https://en.wikipedia.org/wiki/SHA-1

MultiValue BASIC Hashing

Most versions of MultiValue BASIC do not include built-in hashing functions. This requires developers to create their own.

This can be done in pure, generic MultiValue BASIC, but you may see a performance hit depending on how bit math is handled. For hash values like SHA1, the performance issues of generic bit math do not seem to be a problem.

Dave Meagher has done all the work to provide hash functions like SHA1 and MD5 in his FOSS4MV/mvCrypt code on BitBucket:

https://bitbucket.org/foss4mv/mvcrypt

The IS.HASH.SHA1 program attached to this article used Dave's mvCrypt SHA1 code, but formats it so that it is interchangeable with other versions of the IS.HASH.SHA1 <http://www.intl-spectrum.com/resource/755/ISHASHSHA1-Generating-SHA1-values-with-Generic-MultiValue-BASIC.aspx> code on the International Spectrum website.

Example

See Figure 1 below.

Output

See Figure 2 below. **IS**

```
SHA1.MESSAGE = "The quick brown fox jumps over the lazy dog"
CALL IS.HASH.SHA1(SHA1.MESSAGE,HASH.VALUE)
*
TEST.VALUE = "2fd4e1c67a2d28fced849ee1bb76e7391b93eb12"
CRT HASH.VALUE : " =" : TEST.VALUE :" - "
IF (HASH.VALUE EQ TEST.VALUE) THEN
  CRT "Ok"
END ELSE
  CRT "Failed"
END
```

Fig. 1

```
2fd4e1c67a2d28fced849ee1bb76e7391b93eb12 =
2fd4e1c67a2d28fced849ee1bb76e7391b93eb12 - Ok
```

Fig. 2

MARKETPLACE

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Building a Modern Line-Of-Business Application

Part 5 – Business API

BY NATHAN RECTOR

Line-of-Business applications contain lots of parts which make the whole things run smoothly. And that's what we've been talking about so far; pieces. We need to start linking things together. That leads us to the Business API.

And that comes with its own planning problems. If we don't take that into account early on, we will run into some of the issues our existing systems have.

What is It?

The Business APIs have two parts: Internal API and Connection API. We'll start with the Connection APIs because they are the easiest to explain. They are what most people think of when they think of an API. These are the routines and processing that are used by ODBC, REST services, JAVA, .NET, PHP, and Python objects.

Connection APIs translate the data from whatever format the database holds it in into the language needed by the receiving process. If a developer is connecting using a REST service, then it might be designed to create JSON or XML from the internal data structure. If the Connection API is used from JAVA, .NET, PHP, or some desktop style language, then the routines are usually used to translate this information into memory objects.

> *Our Internal APIs are our actual business rules. You use them within your LOB application already.*

Sometimes Connection APIs are created using native code and other times they are dynamic objects with schema-based definitions depending on the environment. For example, if you are working in .NET, then .NET assemblies can be created to represent the same structure as what REST service would produce.

One of the pitfalls of many existing systems is that the structure, and content, which returns through REST is different than what is returned through JAVA or .NET. This causes a problem with versioning. This restricts what some external applications can do because we may not have provided the same features from connection type to connection type. Any differences should be intentional, not accidental.

Connection APIs should contain your actual business rules. This is where the Internal APIs come in. They should be translating the internal structure to the structure needed for the Connection API.

Internal APIs:

These routines are what the developers are used to writing. Our Internal APIs are our actual business rules. You use them within your LOB application already. In a MultiValue system, these are generally subroutines. They can interact with each other, be called from each other, process data, change data, update data, create additional processes; anything but transmit data outside of the system.

Examples

What about EDI and transmitting e-mails from your business systems? We still consider those as Connection APIs because their primary purpose is to transmit and receive data; we can see them as separate events, sending notifications to people or outside processes from your business systems. They may or may not be powered by your database engine.

If you remember from my first article in this series, we were talking about the background processor and the asynchronous processor. Separating the two types made the work of development easier. Likewise, if you keep the notification processes and the data transmission processes separate from the Internal APIs it becomes easier to modify and replace either side when they have to evolve beyond the current requirements.

Process Naming

I'm going to steal an idea from JAVA and .NET here. Both languages have a concept called namespaces. In these environments, the namespace is used to group functions and methods together; or at least that is what it looks like on the surface.

For example:

```
Namespace Core.Accounting
   Sub CreateCustomer()
   Function GetCustomerAvailableCredit()
   Sub UpdateCustomer
End NameSpace
```

The reality is that a namespace is really a compiler prefix. The above would compile into:

```
Call Core.Accounting.CreateCustomer
Call Core.Accounting.GetCustomerAvailableCredit
```

This namespace idea has been used in several different programming languages for a reason. When building a system that allows for customization, it is very important to make `core` and `vendor` processes which can be overwritten as needed but still keep the existing functionality. Namespaces allow you this sort of re-use of an action name (for example, CreateCustomer) in both a standard way and, when needed, in a variant way. This allows you to set rules for how you create a customer while still giving you a controlled way to make exceptions. This is the concept of code isolation.

```
Core.Accounting.CreateCustomer()
Nathan.Accounting.CreateCustomer()
DotNet.Accounting.CreateCustomer()
REST.Accounting.CreateCustomer()
```

The example above shows how the namespace name would change based on either the customization or connection specific API.

Why do This?

Creating routines this way seems like extra work, but in the long run, it will help you manage your code as you move forward. You have to plan for the fact that the LOB applications are very long lived and very complex. Interfacing with the next generation of features will be a constant challenge in any healthy business. We need to spend the extra effort up front if we want to enjoy the downstream benefits.

Connection API Planning

The power of any LOB system relies on the ability to access, update, and process the data that is collected by the user. Connection APIs are important in this because they are the collective term for all of the ways we get the data into and out of our LOB system. In our increasingly interconnected world, much of its data is generated from outside the LOB itself.

If you provide a .NET assembly to access your data, then you should be prepared to provide a PHP and Python module to access the business data because the request will come. Your trading partners, the people you exchange data with, will especially appreciate it if you form these APIs into SDKs (Software Development Kits) by adding documentation and standardizing as may parts as possible.

Now, there are some very special processes, like EDI, which might not be attached to a specific internal process. The data used to generate the information for these processes should still be available through all Connection APIs.

Conclusions

Segregating Connection APIs from the rest of the system allows developers to focus on interchange without having to understand your business logic. Internal APIs hold the business logic apart from the connectivity. The Internal APIs process what the LOB needs and what the Connection APIs need. This provides more flexibility when dealing with connections to other applications. IS