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THE MULTIVALUE  TECHNOLOGY MAGAZINE | NOVEMBER/DECEMBER 2019

Seeing 2020 and Recapping 2019

Also in This Issue:

- The NACHA Cha Cha Part II
- Self-Discovery
- Learning to Party



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THE MULTIVALUE  TECHNOLOGY MAGAZINE

NOVEMBER/DECEMBER 2019

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2019 End-of-Year Recap While press releases tell us what's just happened, here at International Spectrum, we always want to know what's about to happen. Hear what seven players in our industry have accomplished in 2019 and hear what they have planned for 2020. Big things are coming.

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Making NACHAs: Part II NACHA is a format for financial transactions. This article continues the deep dive into the hows and whys. If you handle the transfer of money, especially checks, this is a need-to-know dataset. And, you can take that to the bank. **BY KEVIN KING**

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Self-Discovery In a proper merger or company acquisition, there's a discovery phase. Its goal is to determine the company's value, quality, and potential. Those are things we should know about our own company, for the very same reasons another company wants to know them. While Self Discovery is not necessarily as robust or detailed, it should be a periodic process. It's an excellent way to make your business stronger and more agile. **BY SUSAN JOSLYN**

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Business Tech: Building MultiValue Programmers - Part II Time to party. Well, time to plan a party. Well... time to use the idea of party planning to explain the difference between working on paper, working in a word processor, and using a database. Remember: It's not the right tool if you don't know when to use it. **BY CHARLES BAROUCH**

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From the Inside

Another year is on its way out, and we look at all we did this year — what we didn't complete — and what still needs to be completed. Look at all the new technologies which have arrived to make our jobs easier and all the existing technologies that are making our jobs harder.

Too bad we can't live in a vacuum for a few months so we can get something done. We can't, it all marches forward, with or without our consent. If only...

With a new year coming up, we have to consider what new business operations and trends we are going to have to contend with. I've looked around and assembled a list of ideas about what we can expect to see in the upcoming year, and in the years beyond 2020. I've picked out three to focus on.

1. Businesses will have to continue to adapt to the modern customer.

Customers today have more choices than ever, and they have shown that they gravitate towards those who prioritize the delivery of fast, seamless and personalized service. This is true whether they are ordering lunch, getting their car repaired, or making a financial transaction.

Accessing and staying engaged with these customers will go beyond just mobile applications and websites. Companies that don't make it easy for customers to do what they want to do, when they want to do it, will likely see them moving on.

Look for a Unified Customer Communication System as a means to stay engaged. We already have CMS on the back end, it will need to encompass everything from tweets to e-mail to phone and beyond.

2. People are going to be more paranoid about their information.

Cyber threats will increase, and more data breaches are going to happen. New regulations will be created in an attempt to help secure user's and customer's data. Many of the new rules will make no sense to us because they will be based on outdated models. We'll still have to comply while we watch the law try to catch up to the current state of technology.

We've already seen this in Europe with GDPR. There are many U.S. States — including California and New York — that are planning on passing laws that are modeled after GDPR. Compliance with

NATHAN RECTOR
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

<http://www.intl-spectrum.com>

MISSION STATEMENT *International Spectrum* magazine's editorial mission is to be the premier independent source of useful information for users, developers, and resellers of MultiValue database management systems, open systems business database solutions, and related hardware, software, and peripherals. Published bimonthly, *International Spectrum* provides comprehensive coverage of the products, companies, and trends that shape the MultiValue marketplace as well as the computer industry at large — helping its readers get the most out of their business computer systems.

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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. *International Spectrum* retains all reprint rights.

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new laws and regulations will require many changes to our systems. To both the software and to how we use them.

3. Modern Workplace

The shift toward remote workplaces will likely continue. We will see people spending less time commuting and traveling, and more time working remotely. This will drive requirements for info-sharing and increase workplace collaboration. It will also start exposing cracks in VPN and other secure technologies. The more something is used, the more it becomes visible to people looking for a way inside your security.

On April 20th, we will be hosting the 39th Annual International Spectrum Conference in Tampa, Florida. Many sessions will focus

on these three these treads. In the coming months, I will be working with my speakers to produce the content details, so keep watch on the website for changes. As always, many of the sessions will be more than just "PowerPoint" and will demonstrate of what works and what doesn't.

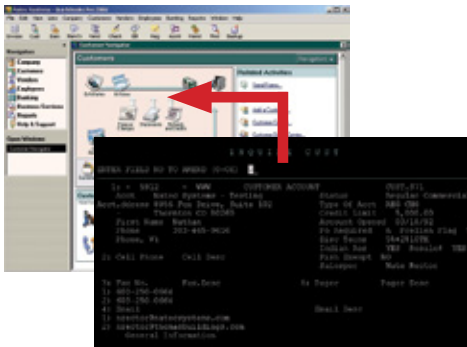
Watch for more information in the coming months!



NATHAN RECTOR
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QuickBooks API for the MultiValue Database



- Read/Write Directly to Quickbooks Databases
Customer, Vendor, Invoices, Purchase Orders, Chart of Accounts
mvQB API is Designed for the MultiValue Program to Use
All routines are simple BASIC calls designed for the developer. No special user interfaces required.
No Need to Learn the Internals of QuickBooks
QuickBooks Pro/Premier/Enterprise

NATEC Systems



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2019 End-of-Year Recap

Recap is our annual tradition. We look back at the end of each year and see how the landscape has changed. Normally, a tradition is about doing and seeing and saying the same things. But if the years have taught me anything, “the same things” are never what we find.

Ashwood Computer

What new features or services did Ashwood Computer introduce in 2019?

ForeMost ERP IV was introduced in August 2019 with:

- Improved Reports and Reporting Functionality
- New Dashboard Displays
- Web Reports
- Production Data Displays of Key Performance Indicators
- Improved Quality Modules
- Improved Performance, Faster System Responses
- Improved Documentation

- Support For All MultiValue Databases

What was the greatest or most exciting thing that happened to Ashwood Computer in 2019?

We have grown our ForeMost user base. We have with several new businesses migrating to ForeMost in 2020! These new ForeMost users benefit from software developed for other ForeMost users.

What would you like Spectrum readers to watch for in 2020?

Watch For Information Systems challenges and consider them opportunities to work with Ashwood’s ‘A-Team’!

We provide legacy MV systems services, mvTools, support, conversions, migrations and also integration with multitude of third party product solutions.

If any legacy PICK or MultiValue user sites are considering projects and have been told they need to scrap their legacy system or upgrade to some other solution to accomplish their goals,

contact Ashwood’s A-Team before you make any decisions!

BlueFinity International

What new features or services did BlueFinity International introduce in 2019?

2019 has seen a number of new Evoke features added, which can easily be incorporated as part of a new or existing app developed using Evoke. These include multiple types of graphs, integrated use of phone cameras, printing and production of documents for external use, user implementation of chatbots, QR and barcode reading, shopping cart functionality, payments, etc.

We have introduced the final phase of the multiple developer system to Evoke which will fully support the deployment and management of a group of developers working on the same app at the same time.

We have implemented the Evoke Premium Support Package, which is delivered as part of the Developer license. This provides Evoke clients with com-

prehensive training, extensive on-line support and unrivalled assistance sessions and on-call support which combined, takes the new Evoke user from the installation of the Evoke Developer through to the successful deployment of their first live app.

This year we have also introduced the Seed App service to our customers where we create and deliver a made-to-order working Seed App to them as a way to get a fully working, mobile or web app, quickly to allow for either immediate deployment or as a base for customization.

What was the greatest or most exciting thing that happened to your company or product in 2019?

The most significant events for Blue-FINITY during 2019 are derived almost entirely from our client base. The number of clients now using Evoke has continued to grow substantially during the year. But probably more significant is the number of clients that have gone 'live' by deploying their apps across important vertical markets. 2019 has seen our first app in the ever-growing healthcare market, as well as live clients in the energy provider and financial services markets.

In addition, one of the most notable aspects of the year has been the big take-up of our new seed app offering which is proving to be tremendously popular. Introduced only mid-way through the year, it is a very effective way of kick-starting the app development, getting the app live and deployed quickly, as well as providing a sound basis upon which the client may further customize and enhance the deployed app.

What would you like Spectrum readers to watch for in 2020?

There are two main things to look for in the Evoke world for 2020. The first is in the growth of the use of Evoke in regions outside of our fast expanding US and European markets. Our distributors in Australia and South Africa have already brought on new Evoke clients and the outlook for many more to follow is looking very good. We will also be adding additional distributors in other geographical regions during the course of next year.

The second is a seismic reaction in the MultiValue market as the full potential of Evoke becomes more widely known and provides a seamless route into the .Net and multi-device GUI User Interface world for existing MultiValue based solutions. As a product designed for the wider SQL market with industry standard technology employed throughout, Evoke is equally powerful when used for any of the MultiValue databases or even SQL and MultiValue together in the same app.

Incorporating Evoke apps with existing MultiValue based systems will prolong the life of those systems as well as providing huge potential to the business users. As Evoke becomes more widely used and better known, it will have a major impact on how legacy MultiValue systems are viewed.

Norse Systems, Inc.

What new features or services did Norse Systems introduce in 2019?

ScreenDriver is now the first and only MultiValue Application Suite to offer 'Integrated Document Management Services' (IDMS) for all of your Microsoft objects. Imagine every enterprise document, spreadsheet, photo, graph or form relationally attached to the relevant objects inside your enterprise database. From your 'Customer'

screen — one mouse click — boom — and there is every contract, correspondence, phone directory, Memo, etc. related to that customer. A second mouse click and boom — its open. Form the 'Supplier' screen — boom — same thing. From the 'Inventory' screen — boom — drawings, manuals, price sheets, ... You get the idea.

Attachment services in ScreenDriver are available for every table, from "InvoiceTermsCode" through 'Customer.'

And every object can have full 'library' services including access security, check-in/out change control, revision numbering, auto archiving, version compare and more.

There are many multi-value development tools which can help if you want to build the multi-value applications of yesterday, but only one with the forward thinking that will let you build the multi-value applications of tomorrow.

What was the greatest or most exciting thing that happened to your company or product in 2019?

Norse Systems settled on a pricing and licensing strategy for ScreenDriver® which sets the stage for the coming revolution. The IT "Environment of the Future" is now accessible to every enterprise. You can transform your multi-value applications for only \$135.00 per user (retail perpetual) with annual maintenance of only \$25.00!

This includes everything! You get computer generated GUI maintenance windows for most of your tables and menus; painless install preserving every functional aspect of your legacy system; Computer generated APIs to facilitate access from Web, phone or other restful service interfaces; The best

multi-value Query tool on the market; Integrated Document Management; Attribute encryption to secure your Social Security, Credit Card, or other sensitive data; A suite of pre-GUIized methods to support easy, swift and equally modern custom programming; Intra-functional ticklers; User and Site administration; Software 'version-release' control; and much much more.

What would you like Spectrum readers to watch for in 2020?

ScreenDriver is going to go viral in 2020! Interest has been growing for the past couple of years, and the product has now been proven in large and ultra-complex enterprises applications. The word is going to spread rapidly among business executives and IT professionals. Don't delay — we're going to be busy.

After decades of road-maps and so-called visionaries which cannot see beyond "Restful Interfaces", the stage has now been set to let multi-value again be what it has historically been - the environment that puts "The Bigs" to shame. Functionality which makes IT better to be sure, but more importantly — Functionality which makes Enterprises better!

Call us at 800-769-8468 or visit us at www.norsesys.com to learn more.

Paradigm Systems

What new features or services did Paradigm Systems, Inc introduce in 2019?

When Mercury Flash was created, our goal was to go beyond the usual analysis and file resizing and provide a complete database administration tool.

To do this we reached out to the community to find out what feature they would like in a MultiValue database administration tool, and they spoke volumes.

During this past year we have introduced the following enhancements:

- Two-Factor-Authentication has been implemented supporting the use for applications such as Google Authenticator as well as six other popular authentication tools on Android and iOS.
- The Master Scheduler has been enhanced to allow better control of commands that can be executed, allowing the administrator the ability to specify Allow/Deny commands, and user definable fields making



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This thirty-fourth issue of Tales from the Canyons of the Damned consists of four sharp, suspenseful, thought provoking short stories—each from a different featured master of speculative fiction.

Exclusionary Symbiosis by Nathan M. Beauchamp

Ship of the Dead by Charles Barouch

Last Visit to the Park by Terry R. Hill

Off-World Kick Murder Squad VII by Daniel Arthur Smith

Tales from the Canyons of the Damned (canyonsofthedamned.com) is a dark science fiction, horror, & slipstream magazine we've been working on since 2015. What is Dark Science Fiction and Horror? Think of it as a literary Twilight Zone, Night Gallery, or Outer Limits, it's Netflix's Black Mirror and Amazon's Electric Dreams in the short story format. And it's a bargain. Each monthly issue has three-to-five sharp, suspenseful, satirical tales from today's top speculative fiction writers.

These are Dark Sci Fi Slipstream Tales like you've never read before.

the Mercury Flash Scheduler one of the most robust in the industry.

- Query Analyzer has been improved to better track the use of selection fields, allowing the user to easily identify indexed and non-indexed fields, and how often they are used.
- Improved AutoTune of the U2 configuration parameters allowing you to keep your system tuned for peak performance.

What was the greatest or most exciting thing that happened to your company or product in 2019?

Mercury Flash has been well received by the Multivalue community, so much so that the number of requests we receive to port the product has been very encouraging; beginning with our latest release, Mercury Flash 5.2 supports OpenQM 3.4-15 and above. Zumasys responded very well to our requests, which at times required additional features to their version of Basic. Zumasys did not disappoint and quickly provided us with the features we needed to successfully port Mercury Flash to OpenQM.

In addition to supporting OpenQM, we have added several new resellers to our global distribution network which now covers 32 countries in addition to the United States and Canada. In addition to new distributors we also introduced our new referral program offering referral rewards for new clients. If you are interested in finding out more about this program you can visit www.paradigm-systems.us/referrals.

What would you like Spectrum readers to watch for in 2020?

Paradigm Systems is constantly enhancing Mercury Flash and providing the tools our clients need to manage

their Multivalue database. Over the past year we have received countless requests for new features, support for other Multivalue databases and various other customizations. In the coming year be on the lookout from the following among others:

- Mercury Flash on D3 and jBASE. We have been discussing enhancements to D3 and jBASE with Rocket Software and Zumasys respectively so that we can complete the task of porting to those platforms.
- Downloadable Applications for Mercury Flash are in the works, which will allow us to respond quickly to customization requested from our clients.
- Database issues don't limit themselves to normal work hours, so why should you have to limit how you manage your database. We are currently working on Smart Phone browser support so that you can handle the most important issues wherever you happen to be.

2020 is going to be a fantastic year for us and Mercury Flash is going to lead the way. If you're not currently using Mercury Flash, take the time to visit us at www.paradigm-systems.us and check out Mercury Flash.

SJ+ Systems Associates, Inc.

PRC just gets smarter every year. Why? Because of all the smart people who use it and all the cool things we think of together that it could do. We're still having fun. If you're using PRC and have some great ideas, let's hear them. If you're not using PRC yet, shouldn't you at least see why you might want to be? Happy New Year.

Zumasys

What new features or services did Zumasys introduce in 2019?

The major milestone for 2019 was the release of AccuTerm 8 and the new AccuTerm Web, which allows you to run your existing app through modern web browsers. The year also saw continued development on jBASE and OpenQM — focused on security, connectivity and increased performance — while road mapping major feature functionality releases to come for 2020.

What was the greatest or most exciting thing that happened to your company or product in 2019?

We're proud to have embraced Open Source and the MultiValue community by way of PickMultiValue.com and the work on the MV Basic extension in partnership with ONgroup and many other members of our community. We have been blown away by the growth and engagement with the Facebook group for Pick MultiValue and we are excited to see such broad engagement.

What would you like Spectrum readers to watch for in 2020?

Watch for growth in MultiValue Open Source projects, with utility type projects such as MV Basic for VS Code and application level projects such as Brent Blair's jBASE/jAgent REST framework, <https://github.com/pickmulti-value/jAgent>.

In the future, we will see the first MultiValue platform offer a free licensing model. While the existing user base has long been accustomed to the pay-for-play model, the barrier to entry for net-new users will finally be lowered by a vendor offering a zero-cost option for those looking to create new applications powered by MultiValue. **IS**

Making NACHAs

Part II

When we last met, we took a first glance at the NACHA file format and discussed a few terms that you'll see in NACHA file specifications. In this installment, we'll be diving into creating the file by looking into the first record of the file: the file header.

Standard NACHA files are composed of a series of fixed-length 94-byte records where the first character of each record defines the type of record. To recap, these types are:

- 1: File header
- 5: Batch header
- 6: Detail
- 7: Addenda
- 8: Batch footer
- 9: File footer

Each record has a very specific format. But as you'll see shortly the format supports a wide variety of financial situations. Each file can contain up to one million batches, though some receivers may impose smaller limits. Also be aware that banks may charge based on the number of files and/or batches you send, so you'll want to know those details when planning your implementation strategy.

I always found it interesting that the record length for the file is embedded in the first record.

The type 1 (file header) record is basically an envelope that defines you and your trading partner. Note that I didn't say "sender" and receiver" because you may be sending and receiving money in the same file. Instead, your trading partner is the person to whom you will submit your file, or from whom you will receive a file. By reading this first record a recipient can identify the sender and also verify that they are the proper recipient.

The first three characters of the type 1 record are always '101'. The first '1' signifies the record type of being a file header, and the subsequent '01' is called the "priority code". Maybe there are other values for priority code, but every NACHA file I've ever built requires this to be '01'.

Following the priority code is a field known as the "immediate destination". This is the ABA# (routing/transit number) for either you (as a recipient) or the external financial institution (if

you are the sender). This is commonly retrieved from a file that holds details for a specific bank account. This field is right-justified in a field of 10 spaces.

Next is the "immediate origin". As the sender, this represents your account number with the destination. As the receiver, it represents the sender's account number with your organization. This field is right-justified in a field of 10 zeroes. (Actually, in every NACHA file I've created, this value is always exactly 10 characters so the fill character hardly matters in that situation.)

After these fields comes the date and time. The date is a six digit field with two digits for year, two digits for month, and two digits for day. The time is a four digit field with two digits for hour (on a 24-hour clock) and two digits for the minute.

Next is the 1-character "file modifier". If you send multiple files per day, the first file should be sent with a '0' in this field. Subsequent files should increment this by 1. You may only use 0-9, and A-Z in this field, yielding a maximum of thirty-six files per day. Considering that some financial institutions charge based on the number of files received, you'll probably want to restrict yourself to only one per day

unless absolutely necessary due to high transaction volume.

The next field is the record length, 3 digits, right-justified in a field of spaces, and ALWAYS sent as '094'. This says that every record in the file must be exactly ninety-four characters long. I always found it interesting that the record length for the file is embedded in the first record. Even more unusual, it's near the middle of the record so to know how many characters there are in a block, you have to ... read a block. (Maybe this is why the NACHA format has never had an upgrade?)

Following the record length is the block size. Theoretically this defines the number of records that the ACH processor will read in at a time. In my experience, this is always '10'. What makes this unusual is that in the final analysis, your file will need to have

enough rows so that the count of rows in your file divided by the blocking factor must be zero. In other words, with a blocking factor of 10, if you have 1 actual transaction, your file must have at least 10 total records. The next legal size is 20 records, 30 records, and so on. Filler blocks — to be discussed later — are used for padding the file to fit the block size.

I cannot stress this enough; with a block size of 10, you will not be allowed to send a 36 record file. It must be rounded to 40. But again, these are issues that are addressed later at the end of the file.

The next field is called a "format code" and I've never seen anything other than '1' here.

Following the format code is the name of the financial institution processing your file. This one has regularly given

me fits. When transmitting a file to a bank, you might think you could just put the bank name here in this twenty-three character, space-filled, left-justified field. For some, that's okay. For others, however, the bank will prescribe EXACTLY what you are to put here and will reject your entire file if the value is not exactly what they require.

Making this even more strange, following this field is a field for your company name. This field, like the former, is twenty-three characters in length, space-filled, and left-justified. To date, I've never known a financial institution that cared a lick about what is included here.

The final eight characters of this 94 byte block is called a reference code. If you want to put a batch number or something here for your purposes (as the sender), go for it. Your trading partner is instructed to ignore this value. If you don't have anything to put here, fill the eight characters with spaces.

At first glance, this looks very straightforward. In fact, at this point the file is very pedestrian. As we get into the next records, you'll see things begin to grow in complexity. Also consider that this is just a rough overview of the file format; while NACHA is a standard, you should always consult the documentation from your trading partner for specifics that they may require. IS

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FROM THE PRESS ROOM



Zumasys Releases QM 3.4-17

Release 3.4-17 of the QM Multivalue Database is now available for download from the Zumasys web site.

- Dictionary I-type item expressions can now use the syntax where a value is followed by a format string with no intervening operator.
- The SAVE.LIST and GET.LIST commands now support use of a multifile.
- QMBasic class modules may now include initialisation values for private and public variables.
- The QMBasic MERGELIST() function now has an additive mode key value to specify that the supplied lists are not in sorted order. This does not affect the MERGE.LIST command.
- Two new keys for the QMBasic SYSTEM() function have been added. Key 1081 returns the current time in milliseconds from 1 January 1970 UTC. Key 1082 returns the time of day as milliseconds since midnight in the user's time zone.
- The !MULTISORT() subroutine provides a way to sort a set of related field mark delimited lists.

- The user written subroutine called by the WEBSVC command now has an optional new argument to pass additional data about the connection.
- Process dump files now include the operating system environment variables. ■

Cloud Accredited Partner Program with their hosting services using Google's World-Class Infrastructure.

Find out more on Rocket Software's Cloud Accredited Partner Program at:

https://info.rocketsoftware.com/MV-Cloud-Webinar-Series-Invites_WebinarRegistration.html ■

everything was compared to our previous solution."

- Tim Millen, Chief Technology Officer, Collaborative Classroom

Read More:

<https://www.pickmultivalue.com/the-center-for-the-collaborative-classroom/> ■



Pick Cloud Inc Joins Rocket Software's Cloud Accredited Partner Program

Rocket Software has developed the Cloud Accredited Partner Program. This program is designed to help companies looking to transition to the cloud who have a need to ensure the best possible hosting options. The program consists of a comprehensive list of requirements that partners must meet for accreditation.

Core categories include:

- SLAs for availability, updates, notifications, monitoring
- Proficiency with Rocket MultiValue technologies
- Track record of exceptional customer satisfaction
- Data center redundancy
- Security and compliance
- ISP connectivity

Pick Cloud, Inc Joins the



Collaborative Classroom chose MultiValue for its new web-based assessment application.

Discover why Collaborative Classroom chose MultiValue for its new web-based assessment application, which provides real-time feedback to thousands of teachers across North America. Learn how a three-dimensional MultiValue solution replaced a classic SQL database spread across 45 different tables. And find out why the teachers who use the solution are raving about the increased performance.

"After migrating to MultiValue, we were showing the new system to a customer, and suddenly there was dead silence on the other end of the phone. They could not believe how fast and intuitive

Rocket Software introduced a new set of enhanced capabilities for Rocket UniVerse. This solution will help financial institutions and other industries better manage today's large and ever-increasing transaction volumes. High performance is crucial today in every industry, and these tools deliver an improved user experience for customers while also enhancing employee productivity; both of which contribute to optimized revenue.

Rocket is committed to modernizing its MultiValue offerings to broaden their usefulness to as many users as possible. Building on last year's introduction of modern language interfaces, the new



Rocket Software Boosts Performance for Businesses with High Transaction Volumes

FROM THE PRESS ROOM

release gives users the ability to program in Python to AIX and also extends Python library support to 3.7 libraries.

Phil Higgins, Chief Risk Officer at Ultradata, said, "We were excited to be selected as the first company to beta test the accelerated performance of Rocket UniVerse. The results were terrific. Our customers are reporting their high-volume ATM transactions are up to 10% faster and data-entry processing is up to 60% faster."

Rocket UniVerse has always delivered an efficient and cost-effective database and development platform, but this latest iteration is specifically

designed to handle the large transaction-based workloads that exist across many companies today. This new release delivers increased throughput capability which means critical applications can handle challenges such as extra loads during peak hours and seasonal spikes, while still supporting everything from online orders to mobile banking transactions. The result is improved customer satisfaction, as well as greater efficiency for employees using critical internal business applications.

"Helping large-transaction-driven companies stay ahead of the technology curve has

always been a priority," said Chris Rizza, Product Manager at Rocket Software. "The sheer volume of transactions is growing at an unprecedented rate, and all transactions need to be processed quickly and efficiently. Our latest release of Rocket UniVerse helps companies not only manage their customer interactions more effectively, but also makes internal processes simpler and more efficient for their employees." ■



Happy Holidays from International Spectrum

We at International Spectrum (Nathan, Tracey, and Chuck) would like to wish you a happy and safe holiday season. We appreciate your readership and participation in the MultiValue Market and in International Spectrum events.

We hope you have a Merry Christmas! Happy Hanukah! Joyous Kwanzaa! And a Happy New Year! ■

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www.intl-spectrum.com/newsletter

Self-Discovery

No, Boomer, we're not finding ourselves again. But we do need to find our software. And our files. Especially the files that are more sensitive or critical. But also, importantly, the software.

Yeah, it's running, maybe it's even running just fine, but *what's* running? If we dare remove even one program will the whole fragile house of cards flutter to the ground in a useless two-dimensional pile? To avoid that fate, we carefully follow a few strands of spaghetti through their Gordian Knot, to little accomplishment. The whole thing, we decide, is best left alone like Fibber McGee's closet. (For the non-Boomers, *Fibber McGee and Molly*, was a mid-20th century radio show. The closet was always a total mess, known to produce a noisy avalanche when opened.)

Fear is a huge deterrent to progress. It stifles the urge to improve or, heaven forbid, to clean up our software and databases. Rooting around in the system is akin, it seems, to looking under the bed. If you never look, you can pretend there is no monster there.

Except, this analogy of closets and monsters loses its appeal when you consider that the success of the company, its competitive edge and sustainable

Our software has been agile before it was a thing.

growth, depend on the forward-going adoption of new technology. We're going to have to grab that boogeyman by the throat and harness it up to new gadgets and ideas. We do get away, for a time, by poking something in blindly and holding our ears. But if we can't see the beast, much less control it, we all know what ends up happening. Someone says, "Oh well. Let's just get something new." The company loses time, money and momentum. People lose their jobs. Often enough the whole effort fails and back we are, still dealing with the amorphous blob and now an angry upper management.

Most of us who might find ourselves on this page know that there is nothing stodgy about our Pick-like system itself. There's no newfangled gizmo we can't accommodate. Our software has been agile before it was a thing. In fact, many innovations come out of our talent pool. So, where does this idea of old, inflexible software come from?

It isn't the platform that has the problem. It's not our fault. It's our applications.

Many of our business applications were written when the whole idea of business applications was very new. There wasn't an older generation to guide us, there wasn't a lot of information about structure and efficiency. We were breaking new ground. And, ironically, the more successful our application has been, the longer it has been around, the more chefs have been in the kitchen, so the bigger mess. (Now that we're out of the closet and into the kitchen.)

So here we are and if we want to stick around, we better bolster the infrastructure so that it can hold up under the pressure of new demands. To do that, we must map out where the software is located, what's running and what's not and where the data is located and which is more sensitive in nature.

Nobody is going to convince you this could be an easy project. Or entirely automated. It's a time intensive, high concentration endeavor. But there are approaches that can be systematized and functions that can be tooled. The results are important. Let's talk about how it can be done.

First, we must know the underlying structure. This may mean that our software was written in an old 4GL

that may or (mostly) may not still be around and supported. But even if it is not supported or actively marketed, there are structural standards that are documented and, at least relatively, consistent. If you have the old manuals, yes, start there. Pick through them for the structural underpinnings. Build yourself a chart of the standards and practices that were first adhered to. If you can't find the manual or can't stand reading it, reach out for other companies whose software had the same genesis as yours. Maybe you can share resources, divide and conquer a bit. There are a few of us old birds that have run into all of them and know a lot of things and a lot of people. (Yes, that's an invitation — if I can help connect people for this; I'm here for it.)

The absolute day zero thing to do, if you haven't already, is build a “little

program” that logs program use and insert it as a called subroutine into ever blasted piece of software you can find on your system. This is a two part project. 1) write this little program (and test it within an inch of its life, it's going everywhere it better be harmless!) and 2) find all the places to put it. This project happens first and then it's busy collecting information for you while you go on to other things. Think of it like the step in a recipe where you place the sauce ingredients together and let them simmer while you chop the vegetables. Fruit, really. The low-hanging fruit. Find all the programs in a file called any prefix or affix to BP, PROGS, PROGRAMS, whatever. You can also look for any files that have compiled items. These will begin with underscore in the program names inside the file (Unidata) or will be in a

corresponding .O suffix of the same file name (Universe).

- Write the subroutine that logs when this program ran,
- Write a program to stuff the subroutine call into all of your programs.
- Find all the programs and
- do it.

You may also have Procs or Paragraphs in the system, too. These will be items with PA, PQ, or PQN on line one. You may have control files or perhaps software files for your software development tools such as the XXPROCESS file in SB+. You can write a crawler program that digs around your system for these ideas. Then of course use human verification.



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What does that program that you are calling from everywhere look like? It could go lots of ways — here's a very simple one:

Disclaimer: Programs are a very basic suggestion, use at your own risk. Better yet, write your own. [Figure 1]

You could certainly log more information like who ran it last, but all we really need to know is that it runs, when and how often.

Now a program to stuff the call into other programs, too. It might look like this. [Figure 2]

What you'll end up with, in all your programs (assuming attribute <2> of the program is a good place for this and it may NOT be if you have INCLUDES) [Figure 3]

Get this program inserted everywhere and let it run for a year — that way all of the year end programs are logged. In the mean time there are some other semi-automated things that can be done. This crawler program mentioned earlier. Building a matrix of programs that update files. Stratifying files by how important they are. Perhaps we can discuss those in another issue. Per-

haps you've worked on a project like this and have something to add? **IS**

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```
SUBROUTINE RUN.LOGGER(ENTITY.NAME)
OPEN "RUN.LOGFILE" TO F.RUNLOGFILE ELSE RETURN
READ LOG.REC FROM F.RUNLOGFILE,ENTITY.NAME ELSE LOG.REC=""
LOG.REC=INSERT(LOG.REC,1,-1;DATE())
LOG.REC=INSERT(LOG.REC,2,-1;TIME())
IF LOG.REC<1,11> # "" THEN
    LOG.REC=DELETE(LOG.REC,1,11)
    LOG.REC=DELETE(LOG.REC,2,11)
END
WRITE LOG.REC ON F.RUNLOGFILE,ENTITY.NAME
RETURN
```

← Make sure it's harmless if the file's not there.

Figure 1

```
CRT "Enter the file name ";INPUT FILE.NAME ← (Or, of course, this could run from
OPEN FILE.NAME TO F.FILENAME ELSE a list of files.)
CRT "Unable to open ":FILE.NAME
STOP
END
EXECUTE "SSELECT ":FILE.NAME:' WITH @ID NE "_]' ← (This last bit if on Unidata)
EOF=0
LOOP
READNEXT PROG.NAME ELSE EOF=1
UNTIL EOF DO
ENTITY.NAME=FILE.NAME:"!":PROG.NAME
READ PROG.REC FROM F.FILENAME,PROG.NAME ELSE PROG.REC=""
PROG.REC=INSERT(PROG.REC,2,-1 ; »CALL PRC.RUNLOG(ENTITY.NAME)"
PROG.REC=INSERT(PROG.REC,2,-1 ; « ENTITY.NAME = « :ENTITY.NAME)
IF PROG.REC<1,11> # "" THEN ← Just keep the last ten times (or more if you like.)
    PROG.REC=DELETE(PROG.REC,1,11)
    PROG.REC=DELETE(PROG.REC,2,11)
END
WRITE PROG.REC ON F.FILENAME,PROG.NAME
REPEAT
```

Figure 2

```
BP BANANA
001 *PROGRAM: I am a program that does stuff
002 ENTITY.NAME = "BP!BANANA"
003 CALL PRC.RUNLOG(ENTITY.NAME)
004 CARRYING ON WITH WHATEVER ELSE THE PROGRAM DOES
```

Figure 3

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Building MultiValue Programmers

Part II

BY CHARLES BAROUCH

Last installment, we discussed different kinds of databases. Now that we have some grounding in what a database is, we should discuss why we use computerized databases. To better understand this, let's throw a party.

Making a List

Grab a piece of paper and put a list of names on it. Congratulations. You've just created a single-table database of potential party guests. Like the electronic version, you can add names and remove names. You can produce changes over time. You can even grab another sheet and build a second table. Or make notes besides the names, creating new attributes (columns).

The problems start with the fact that paper lists don't scale. For tracking a dozen friends, it's probably fine. When the party has a thousand invites, you can do it on paper but you'd be better off with some tools.

One way people solve for increased complexity is to move the lists into word processors or spreadsheets. The big advantage to the word processor is simplicity, ease of use. The spread-

If you're going to suffer a cost (time, trouble, effort, money) there had better be a payoff.

sheet, while more complicated, gives you more sophisticated tools. And this is the fundamental trade-off.

Paper requires the least training. Word processing adds complexity but adds features. Spreadsheets bring both, complexity and features, up a notch. Once we go to a true database, we move up several notches in both.

Party Base

When we step up to the database we gain some validation controls, some more sophisticated entry options, and much more of a learning curve. As we said last installment, if you're going to suffer a cost (time, trouble, effort, money) there had better be a payoff.

Our party base will let us transition people from "invited" to other statuses (going, maybe, not going). It will let us catch late responders so we know who to follow up with in our planning. It

introduces some strategy into our approach.

We can link the food plans to the guest list, scaling up or down the shopping based on who has assured us they are coming. We can add a trim-down for the difference between "said they would" and "actually showed up." Not all promises are equally valid.

We can go further. What if we slot in a restaurant capacity table? Over twenty-five coming? Automatically scratch off the smallest places. Ten dropped out, unscratch. It isn't that we couldn't do all of this on paper, or with a word processor, or by spreadsheet. It's a matter of how fast or easy it will be to manage it.

Of course, if this is the only big party you plan on throwing, the features may not balance favorably against the complexity. But, if parties are your business, investing the time in building a robust database, with robust software, is that way to go.

Directionality

Another argument for databases: I can move structured data from a database

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to a word processing document, or PDF, or spreadsheet. I can't always do the reverse. Moving more complex to less complex is rolling a boulder downhill. Uphill is harder. Much harder.

It is an important idea to absorb: Doing it right the first time is better than doing it over and kludging one-shot solutions. Most things in your profes-

sional career will push you the other way. Employers usually want you to write it fast and then complain that you can't maintain it. Smart design with smart execution makes for less work, less hours, overall.

Writing clean, clear, manageable code is important. Communicating the value of that to your bosses can make a bad job into a better job and a good job into a great one.

Reporting

The big sell for using a spreadsheet or a database is the ability to organize the data multiple ways. We can use party base to generate reports, reminders, orders for supplies, a budget-to-spending analysis for cost control... al sorts of ways to peer into the data. If parties are your business, it can track staffing, not just guests. That helps with payroll, 1099 forms, W2s, and all the other requirements of having full-time or temporary workers.

Once I pay the "education tax" of learning how to use the database and it's software, I can make one session of data entry into many results. I can maximize the value of the work done. This benefits the users of the software, the maintainers of the software, and the beneficiaries (the party-goers).

Retention

The problem with paper is that it is hard to index and manage compared to well-architected data. System-managed indexes can make one set of data act like it is filed many different ways. We can find the caterer by name, EIN, or by the size of party they can handle.

We can find the guests who have attended multiple events (data mining) and suggest they throw their own bash. We can find the people we threw weddings for a decade ago (more data mining) and suggest an anniversary party. We can find the corporate clients from last year and offer a deal on doing another seminar with us.

We can also look at trends. Most people can spot a huge uptick or downtick in business. But knowing that the summer slump is atypical because it is three months earlier than average... that's a place where tech can help.

When we retain data in an actionable format, we generate actions which can benefit the company.

Architecture

Actionable format is often the missing ingredient in most databases, regardless of the technology. In Part III, we'll talk more about data architecture. **IS**

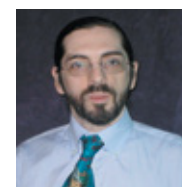
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