A BZ Media Publication

SD Times

SOFTWARE DEVELOPMENT

APRIL 2016 • ISSUE NO. 324 • $9.95 • www.sdtimes.com

A BZ Media Publication

SD Times

SOFTWARE DEVELOPMENT

The Buyers Guide: ALM & Agile Suites

Are you a hireable developer?

SQL building blocks: Taking it to the next level

What kind of mobile dev is right for you?

APRIL 2016 • ISSUE NO. 324 • $9.95 • www.sdtimes.com

TEXT CONTROL

ASP.NET MVC REPORTING

The first cross-browser, true WYSIWYG HTML5-based document editor.

Now with full ASP.NET MVC support.

Give your users an MS Word compatible editor to create powerful documents and reporting templates anywhere - in any browser. Feature-complete including mail merge, sections, headers and footers, drawings and shapes, tables, barcodes and charts.

Available for ASP.NET Web Forms and MVC.

```
PM> Install-Package TXTextControl.Web
```

Live demos and 30-day trial version download at:

www.textcontrol.com

Visual Studio Partner

HTML 5

TEXT CONTROL

Data entry errors. Consolidation headaches.
Quality data shouldn't be a pain.

Try a little Vitamin Q.

We supply Vitamin Q – "quality" – in data quality management solutions that profile, clean, enrich, and match your customer data – and keep it healthy over time. Add Vitamin Q to your data integration, business intelligence, Big Data, and CRM initiatives to ensure accurate data for greater insight and business value.

ACT NOW

Get a FREE 30-day trial!
www.MelissaData.com/vitaminQ

Solutions for 240+ Countries

10,000+ Customers Worldwide

30+ Years Strong

1985

Data Quality & Mailing Solutions

Cloud • On-Premise • Services

Germany
www.MelissaData.de

United Kingdom
www.MelissaData.co.uk

India
www.MelissaData.in

Australia
www.MelissaData.com.au

MELISSA DATA®
Your Partner in Global Data Quality
www.MelissaData.com | 1-800-MELISSA

DOMAINS | MAIL | HOSTING | eCOMMERCE | **SERVERS**

APPS

READY FOR THE CLOUD!

CLOUD SPECTATOR
WINNER
Jan. 2016
Best price/performance ratio

intel Powered by Cloud Technology

1&1 CLOUD SERVER
TRY IT TODAY!*

With the **1&1 Cloud App Center** you can get your applications up and running in no time. Choose from more than **100 cutting-edge apps** and combine them with the superior speed and performance of the **best value cloud server around.**

- ✓ **Secure and powerful platform**
- ✓ **No prior server knowledge necessary**
- ✓ **Billing by-the-minute**

1 TRIAL TRY FOR 30 DAYS

1 MONTH FLEXIBLE PAYMENT OPTIONS

1 CALL SPEAK WITH AN EXPERT 24/7

1 (877) 461-2631

1&1®

1and1.com

*1&1 Cloud Server is free for one month, after which the regular pricing starts from $4.99/month. One-time setup fee of $9.99 applies. 1&1 Cloud Server comes with a 30-day money back guarantee. If your package is not canceled within the first 30 days, you will be charged in accordance with your agreed billing cycle. Visit 1and1.com for full offer details, terms and conditions. Intel, the Intel Logo are trademarks of Intel Corporation in the U.S. and/or other countries. 1&1 and the 1&1 logo are trademarks of 1&1 Internet, all other trademarks are property of their respective owners.

Contents

ISSUE 324 • APRIL 2016

NEWS

COLUMNS

The building blocks of SQL

page 30

FEATURES

Evolving ALM brings all hands on deck

page 39

The state of mobile: Exciting times, exploding choices

page 50

What's your mobile device testing strategy?

page 56

Software Development Times (ISSN 1528-1965) is published 12 times per year by BZ Media LLC, 225 Broadhollow Road, Suite 211, Melville, NY 11747. Periodicals postage paid at Huntington Station, NY, and additional offices. SD Times is a registered trademark of BZ Media LLC. The price of a one-year subscription is US$179 for subscribers in the U.S., $189 in Canada, $229 elsewhere. POSTMASTER: Send address changes to SD Times, 225 Broadhollow Road, Suite 211, Melville, NY 11747. SD Times subscriber services may be reached at subscriptions@bzmedia.com.



Sharpen your Android skills at

AnDevCon

The Android Developer Conference

World's Largest

BOSTON

August 1-4, 2016

Sheraton Boston

"Simply the best Android developer conference out there! A must-go if you do Android development."

—Florian Krauthan, Software Developer, Hyperwallet

Get the best Android developer training anywhere!

- Meet Google and Google Development Experts
- Network with speakers and other Android developers
- Check out more than 50 third-party vendors
- Women in Android Luncheon
- Panels and keynotes
- Receptions, ice cream, prizes and more!

A BZ Media Event

GET UP TO SPEED ON: Android Marshmallow 6.0 • Android Lollipop 5.0 • Android Studio Gradle • Kotlin• UI/UX • Android Wear • Embedded Android • ViewGroup, WebView, TextView and RecyclerView • Material Design • Memory Management Battery Consumption Android Runtime (ART) and Dalvik • Concurrency and Android Thread Communications Animation • Android Security • Testing and Debugging • Enterprise Android Apps App Indexing • Espresso • Bluetooth LE • Automotive Android • Push Messaging Notifications • Android TV • High-Performance Android Apps • Architecture

Register by April 22
SAVE $550!
Go to AnDevCon.com for details!

Choose from more than 75 classes and in-depth tutorials!

Offering mobile app development training, embedded Android secrets, and Android app development tutorials and classes, AnDevCon is the most practical Android conference for developers.

TAKE YOUR SKILLS TO THE NEXT LEVEL WITH THESE CLASSES:

Android (in)Security
Jonathan Levin

Android Graphics
Jonathan Levin

Android Platform Debugging and Development
Karim Yaghmour

Android Push Messaging
Mark Wickham

Android TV: Building Apps with Google's Leanback Library
Joe Birch

Enterprise Mobility Management with Android for Work, Parts I & II
Rim Khazhin

Firebase and Android: A Real-Time Match Synced in Heaven
Adrián Catalán

Test-Driven Development
Godfrey Nolan

High-Performance Android Networking
Clay Smith

In a Bind: Untangling Android's Inter Process Communication
Jonathan Levin

Brillo/Weave Internals
Karim Yaghmour

Easy Secure Internet Access in Android
Mark Murphy

IoT for Everyone Using Proximal Context and the Google Cloud
Nick DiPatri

Kotlin and Android: Better Together, Parts I and II
C.L. Kim

Persisting Data with SQLite Database and Content Provider
Margaret Maynard-Reid

Project Ara: Redefining Handset and Android Architecture
Karim Yaghmour

ShadowOS: Modifying the Android OS for Mobile Application Testing
Ray Kelly

Think About Async: Understanding the Complexity of Multi-Threading
Ave Kabizon and Amichai Nitsan

Material Design implementation for Android Developers
Yash Prabhu

MVC, MVP and MVVM Design Patterns
Godfrey Nolan

GO IN-DEPTH WITH THESE TUTORIALS:

FULL-DAY SESSIONS

Android Bootcamp 101
James Harmon

Embedded Android with Marshmallow
Karim Yaghmour

HALF-DAY SESSIONS

ART/Dalvik Reverse Engineering
Jonathan Levin

Prototyping Wearable Devices Using Android
Lance Gleason

MORE CLASSES AND TUTORIALS BEING ADDED!
Check www.AnDevCon.com for updates!

SD Times SOFTWARE DEVELOPMENT

EDITORIAL

EDITOR-IN-CHIEF David Rubinstein
631-421-4158 x105 • drubinstein@bzmedia.com

SENIOR EDITOR Alex Handy • ahandy@bzmedia.com

SOCIAL MEDIA AND ONLINE EDITORS Christina Mulligan • cmulligan@bzmedia.com
Madison Moore • mmoore@bzmedia.com

COPY EDITOR Adam LoBelia • alobelia@bzmedia.com

SENIOR ART DIRECTOR Mara Leonardi • mleonardi@bzmedia.com

COLUMNIST Larry O'Brien

CONTRIBUTING WRITERS Lisa Morgan, Alexandra Weber Morales

CONTRIBUTING ANALYSTS Rob Enderle, Michael Facemire, Mike Gilpin, Mike Gualtieri, Jeffrey Hammond, Al Hilwa

CUSTOMER SERVICE

SUBSCRIPTIONS subscriptions@bzmedia.com

ADVERTISING TRAFFIC Mara Leonardi
631-421-4158 x109 • mleonardi@bzmedia.com

LIST SERVICES Shauna Koehler
631-421-4158 x112 • skoehler@bzmedia.com

REPRINTS Stacy Burris
631-421-4158 x108 • sburris@bzmedia.com

ACCOUNTING Viena Ludewig
631-421-4158 x110 • vludewig@bzmedia.com

OTHER QUESTIONS 631-421-4158 • info@bzmedia.com

ADVERTISING SALES

PUBLISHER David Lyman
978-465-2351 • dlyman@bzmedia.com

WESTERN U.S., WESTERN CANADA, EASTERN ASIA, AUSTRALIA, INDIA
Paula F. Miller
925-831-3803 • pmiller@bzmedia.com

EASTERN U.S., EASTERN CANADA, EUROPE, MIDDLE EAST, WESTERN ASIA
Jonathan Sawyer
603-924-4489 • jsawyer@bzmedia.com

PUBLISHING DIRECTOR Ted Bahr
631-421-4158 x101 • ted@bzmedia.com

BZ Media

PRESIDENT Ted Bahr

FOUNDING EDITOR Alan Zeichick

BZ MEDIA LLC
225 Broadhollow Road, Suite 211
Melville, NY 11747
TEL 631-421-4158
FAX 631-421-4130
www.bzmedia.com
info@bzmedia.com


Realize your Vision
Award winning modeling & design tools for Software, Business & Systems
Model Design Simulate Build Manage
ENTERPRISE ARCHITECT
ALM and Development Tools
SD Times 2015 100
Collaborative modeling & design environment
Analyze, design & build with exceptional quality & efficiency
UML® based core, plus many standards based extensions
BPMN™, SysML, SoaML™, BPEL™ & many others
Simulation, coding, debugging & visualization tools
Performance, price & precision
Full lifecycle support with end-to-end traceability
SPARX SYSTEMS
www.sparxsystems.com
Join the community www.community.sparxsystems.com
UML | BPMN | DDS™ | BPEL | SysML | TOGAF® | C++ | .NET | Java™ | ASP | PHP | Delphi | SoaML™ | ArcGIS™ | SOMF™ | XML™ | XSD | XMI® | WSDL | *More

Work With Relational Data, Not Complex APIs or Services

Whether you are a developer building Apps with ADO.NET, JDBC, OData, or Xamarin, or a systems integrator connecting systems with SQL SSIS or BizTalk, or even an information worker using ODBC or Excel – our state-of-the-art drivers give you live and direct access to any data source. Get simple, standard SQL access to Salesforce, Microsoft Dynamics, MongoDB, BigQuery, Cassandra, SAP, NetSuite, Google Analytics, SharePoint, and much more.

Download a free trial today: www.cdata.com

cdata
SEE THE WORLD AS A DATABASE

SD Times ON THE WEB

Keep your MVPs to a minimum

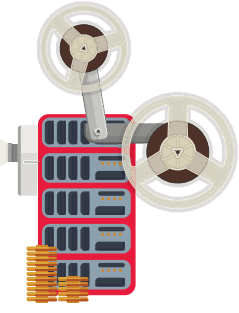
Everyone thinks they know how to create a minimum viable product, until they start thinking of ways to expand it beyond its original scope. That's when things get out of hand. Fortunately, Amadeus Consulting's John Basso has words of advice for keeping your MVPs minimal: "This approach will force the conversation to be about priorities, which is essential. This allows the organization to build the most important, simplest versions of the features first." You can read more at bit.ly/1UenfE5.

Pre-built testing comes of age

QASymphony's Kevin Dunne is keeping an eye on test-driven development. "Software testing is changing for the better with the rise of agile and DevOps. Instead of testing occurring at the end of the development cycle, modern methods integrate testing into every step of the process," he says before going in-depth about what TDD has accomplished so far. You can read it all at bit.ly/21u3fwA.

Where the binge watching happens

Netflix's blog has started a series about how the company makes its software. The first entry is about how they pre-deploy code to their Continuous Delivery platform, Spinnaker. Future installments will cover the other tools and processes that they use, but if you ever wanted to know where "House of Cards" comes from, you can start at bit.ly/1pmE82z.



All the cool kids do polyglot persistence!

Polyglot persistence means using different database technologies to handle specific needs for your organization. Businesses have moved beyond having only one kind of database, while polyglot persistence "means freedom for developers who should not be forced to use a single corporate-approved database for all their data-management tasks," writes Tesora CEO Ken Rugg. If you don't want your databases to be left behind, you should read the rest of his article at bit.ly/1YGiPp5.

What have we learned from this year's International Day of Women?

Every year it's the same: We need more women in tech, we need more women programmers, etc. Why does it seem we're not making progress with this? It may be that the problem in getting girls to stick with coding emerges in middle school: "Girls Who Code wrote that in middle school, 74% of girls express interest in STEM, but when choosing a major in college, only 0.4% go into computer science," reports Madison Moore. Fortunately, she outlines some organizations that are helping to change things for the better, which you can read about at bit.ly/1pcZO19.

SD Times wants to hear from you.
Join us on LinkedIn and Facebook.

NEWS WATCH

Protoship aims to simplify Web app development

A new code generator wants to make it easier for designers and front-end programmers to create Web applications. Protoship is a code generator designed to create HTML, React and SASS components from design, without having to write CSS and HTML manually.

"Unlike the output from typical code-generation tools, Protoship will produce good code indistinguishable from what a developer would painstakingly craft themselves," wrote Jasim Basheer, cofounder of Protoship, in a blog post. "It eliminates mundane work like exporting and assembling assets, measuring margins and paddings, tweaking positions to achieve pixel-perfection, DRY-ing up the CSS using mixins, and similar tediums of front-end programming."

In addition to Protoship, the company has introduced Protoship Teleport, a tool that allows users to convert an existing website into a Sketch design and use it to build something new.

MapR Converged Data Platform provides new advances for containers

MapR Technologies wants to further Big Data containerization in the enterprise. The company has announced an updated version of its MapR Converged Data Platform that provides new advances for containers such as persistent storage and integrated resource management.

The MapR Platform also introduces Apache Myriad, an open-source project designed to remove barriers between resources managed by Hadoop YARN and Apache Mesos.

Other features include new security, data governance and performance enhancements; database and messaging/streaming capabilities that many containerized operational apps require; the new MapR POSIX Client to provide a fully distributed, secure, reliable, read-write file system to Docker containers; and a new modern data architecture that provides enterprises with flexibility and scale to deploy an interoperating network of computing technologies.

Developer Workforce Initiative looks to empower developers

The software developer fills a vital role across all industries, and the Application Developers Alliance wants to make sure developers have the tools and knowledge necessary to succeed. The organization has announced the Developer Workforce Initiative designed to increase the size, expertise and understanding of the workforce.

The global effort looks to engage, educate and support software developers across all platforms, technologies and industries.

According to the alliance, as businesses take on a digital transformation, there is a growing demand across all industries to hire software developers. The workforce will provide plans and programs to help meet that demand.

Initial supporters of the Developer Workforce Initiative include Apcera, AT&T, Built.io, Ericsson, Facebook, Ford, Google, Intel, MapR and other Alliance members.

Swift, HTML and C++ in high demand

Developers and companies seeking talent should be keeping up on the latest languages and frameworks in the industry. This is why Toptal—a company that connects enterprises and startups with freelance software engineers and designers—has released its findings on what coding languages and frameworks are in highest demand for 2016.

According to the report, Swift, HTML and C++ rank at the top for coding languages. For the list of developer frameworks and technologies, Drupal, Elasticsearch and Unity made the top three spots of the list. This data is based on the requests that Toptal has received from thousands of companies seeking employees. It also shows the percent growth of employers looking for a given language or framework in the last year.

HTML came in second with 267% growth. He said seeing C++ at the top of the list could be because of embedded software and the Internet of Things. C++ came in third at 244% growth.

As for the languages and frameworks that didn't make the top of the list, Oliveira was surprised to see Python down at the bottom with only 120% growth.

Tasktop goes DevOps with Sync, Data updates

Integrations across the development tool chain have been Tasktop's domain since the Eclipse Mylyn project kicked off way back in 2005. Since then, Tasktop has carved out a niche in offering robust, scalable integrations on the developer side of the ALM equation. The company introduced further integrations on the operations end of the spectrum.

Tasktop Sync and Tasktop Data both added support with new releases that added a Gateway capability. This adds, for the first time, integrations for the popular IT service management, project portfolio management and IT

process automation toolsets.

Tasktop Sync can now bridge the gaps between development tools and operations platforms. That means, said Mik Kersten, CEO of Tasktop and creator of the Mylyn Project, "Tasktop Sync flows information so DevOps and development can collaborate. Tasktop Sync gives you is the ability to flow, in real time, information across any agile, DevOps and ALM tool. Tasktop Data is a bit more interesting because you can gather metrics across the DevOps pipelines. You can see how many defects are fixed, and how many features are delivered across projects."

Tasktop Sync 4.5 and Tasktop Data 4.5 are available now. Tasktop does not publicly disclose pricing.

JetBrains Toolbox introduces new tools and release changes

JetBrains provides a variety of tools for every developer, including IDEs for Java, JavaScript, Ruby and others. Now, with its shift to subscriptions, one of its new goals is to move away from one major release per year and focus on continuously delivering value independently of versioning.

With this new model, JetBrains has noticed a few issues that it wanted to address. To start, some questions that JetBrains' users have are what exactly a version number represents, what the tools provide, how they impact a developer's work, and their availability to the developer.

JetBrains is moving to a single versioning scheme for all its products under the JetBrains Toolbox—specifically, all its IDEs as well as its .NET tools. JetBrains is also introducing a new versioning scheme that will follow the "YYYY.R" format where YYYY represents the year and R the release within that year.

This change aligns the company's releases, meaning that all products in the JetBrains Toolbox will have the same number of releases throughout the year and will be released within a certain timeframe from each other.

Hortonworks collaborates with HP to improve Spark

Hortonworks, one of the three major Hadoop vendors, announced that it has been collaborating with HP to improve Apache Spark. The work has already yielded faster sort and in-memory computation for the project, as well as improved performance and usage for scalability.

Hortonworks also announced the inclusion of Apache Kafka and Storm in its Hortonworks DataFlow product. These inclusions allow Hortonworks' Hadoop platform to better ingest and process streams of data flowing through enterprise data centers.

Hortonworks is also planning on solidifying its core Hadoop distribution, according to the company. Core elements of the platform, such as HDFS, MapReduce, YARN and Apache ZooKeeper, will only see updates once a year from Hortonworks, ensuring stability between point releases.

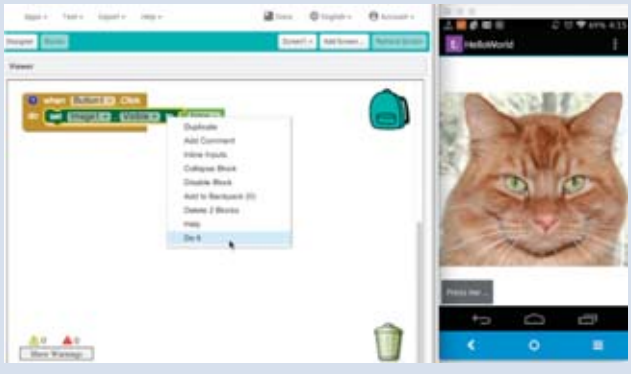
The extended services within the Hortonworks Data Platform, such as Apache Spark, Hive, HBase, Ambari and others, will see continuous releases throughout the years, enabling the supporting Hadoop projects to mature and grow while the core remains solid for enterprise use.

Microsoft to bring SQL Server to Linux

Microsoft has announced plans to bring SQL Server to Linux in order to deliver a consistent data platform across Windows Server, Linux, on-premise platforms and in the cloud. The company is releasing a preview of SQL Server on Linux, with general availability expected in mid-2017.

SQL Server 2016 features security encryption capabilities to protect data at rest, in motion, and in memory; in-memory database support; improved data-warehousing performance; business intelligence for employees and new mobile BI support for Android, iOS and Windows Phone devices; advanced analytics using R support to provide real-time predictive analytics on operational and analytic data; and cloud capabilities that allow users to deploy hybrid architectures across on-premises and cloud-based systems.

According to Guthrie, SQL Server on Linux is just one way the company is trying to make tools more accessible. The company recently acquired Xamarin, and announced Microsoft R Server.



Thunkable turns programming into a drag-and-drop solution

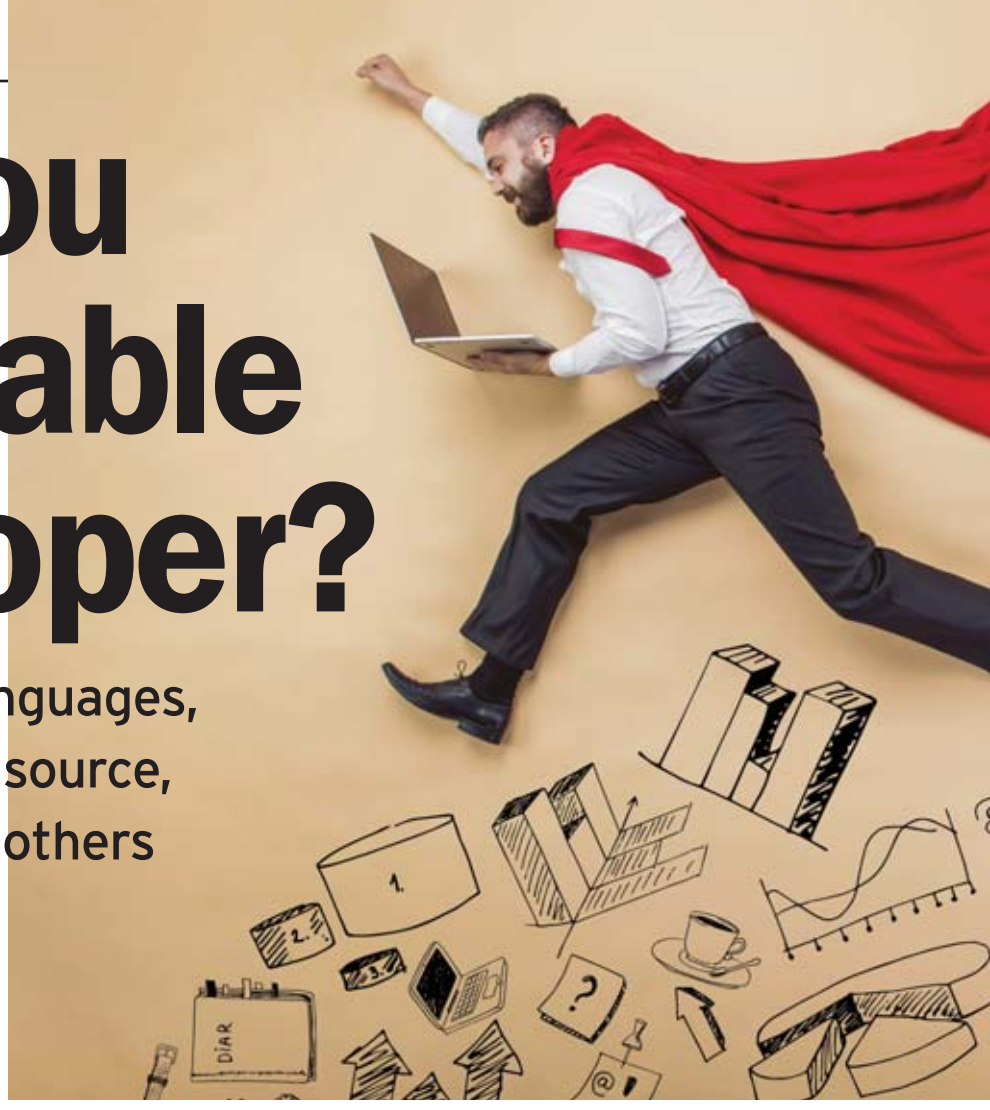
A new programming solution wants to make it easy for anyone to build native mobile apps. Thunkable is a drag-and-drop programming solution that aims to bring simple design and code techniques to everyone.

Thunkable is built on top of the open-source MIT App Inventor project. According to Arun Saigal, cofounder and CEO of Thunkable, MIT App Inventor was largely designed for the education community, and Thunkable is designed to expand that.

The solution is a cloud-based tool that features real-time testing, built-in app templates that can be customized, and the ability to upload apps directly. Professional developers can contribute to the open-source MIT App Inventor project, according to Saigal.

Moving forward, Thunkable plans to provide a market where developers can share, collaborate, and/or sell new features and functionality.

Are you a hireable developer?



Know the newer languages, contribute to open source, and work well with others

BY MADISON MOORE

Whether it's a soon-to-be STEM college graduate or an experienced developer looking for a change in scenery, the information age is upon us, and there is a large demand to fill these technical roles.

Last year, 38,175 computer science students graduated into a workforce where 604,689 jobs existed, according to Code.org. The Bureau of Labor predicts that there will be 1 million jobs in computing available by 2024. And even in 2016, these positions in computing and software engineering remain unfilled.

Initiatives to change these statistics increased this past year: from President Obama signing the STEM Education Act of 2015, to the annual Hour of Code, to Fullstack's all-women coding school. The will to get more people into coding and programming seems unanimous.

Experts in the industry and hiring managers highlight skills and experiences that can be emphasized to fill these jobs to become a hireable next-generation developer.

Learn the language(s)

There are hundreds of programming languages in the world, but languages like Java, JavaScript or PHP continue to be supported by some developers because of how long they have existed. But, there are plenty of languages that are on the rise like the Go, Swift, Julia and Rust, and some of the more innovative and fast-moving companies are picking them up.

According to a TIOBE Programming Community Index report for February 2016, some of the most popular languages include Java, Python, C++ and C#. Java even made it as the report's programming language for 2015.

Point being, there are plenty of languages out there waiting for those lines of code. But what language will set one coder apart from another? Red Hat's Chief People Officer, DeLisa Alexander, said that her company is looking for strong fundamentals in coding and a variety of languages. She said that they look for new languages and old, and with the industry continuing to change, she suspects there will be plenty of languages emerging in the next year. Some languages Red Hat looks for on a resume are Python, Java, Ruby, C++ and Go.

Genefa Murphy, vice president of product and partner marketing for HPE application development and management, said that languages all depend on what the position entails. She said employees need to look at the type of organization they are applying to, because the kind of developer the company is looking for depends on what languages are emphasized. An enterprise developer might look for more traditional languages like Java or .NET, while a startup might be looking for languages that support modern technologies, like Go.

Murphy said it's not enough to just mention that you have experience in a particular language. She said to look at the architecture of the industry and know that there are different development technologies and approaches. Having an understanding of what other developers are doing with those languages matters as much as the languages themselves.

"Yes, you want people who have got skills in Ruby, like Python, like Perl and Java, but you also want to look at the developers who have an understanding

or acknowledgement/appreciation of things like PaaS, microservices and containerization," said Murphy.

Most companies are working across a wide variety of languages, according to Stephanie Mardell, head of human resources at Button, a mobile startup. She said that getting exposure to a few different languages is "key to getting hired."

"One of the things I look for is to see if someone has dabbled across a couple different languages," she said. "It shows that they are curious and versatile and adaptable, and I think any great engineer can code across a wide variety of languages."

Emphasize contribution in a portfolio

According to Murphy, developer designers aren't the only ones that need to have a portfolio to showcase their work. Having a portfolio can be an easy way to demonstrate where a developer has applied his or her skills, what projects he or she might have worked on at previous companies, and most importantly, what their contributions to the open-source community might have been, she said.

Murphy said one of the things a developer or programmer can do while applying for a job is to show where they have applied their skills outside of a job. She said employers will look for contributions on Git or Stack Overflow, and it shows a company that the developer is keeping up with technologies and trends, and is remaining an active member of the dev and open-source communities.

"These are all things that we look for, so it's not just what is [on] your official resume, but what you do in your spare time? How are you contributing back to the dev community?" said Murphy. "The portfolio of a developer looks at the actual deliverables and their work outside of their job."

Button's Mardell also recommends contributing to an open-source project. She said producing high-quality, publicly accessible code is "a great way to show off and there are so many [sites] to choose from."

She said if she sees a developer writing and opens-sourcing cod, it gives them some credibility and respect.

"The beauty of software development is so many companies and so many teams are using open-source software today," said Mardell. "I don't know of any company—or I'd be surprised to see a company—not using an open-source tool."

Red Hat's Alexander said that open-source contribution is a way for candidates to differentiate themselves, especially if they are well-known in a particular community for their contributions.

"We are looking for people who produce value; we aren't looking for titles," she said. "We are looking for contribution."

'The portfolio of a developer looks at the actual deliverables and work outside of their job.'
—Genefa Murphy, HPE

Go to boot camps

Coding boot camps seem to be popping up all over the place, but they've actually been a part of the technology boom for some time. According to director of admissions at Fullstack Academy, Huntly Mayo-Malasky, the total number of boot camp graduates has increased from 6,700 in 2014 to roughly 16,000 in 2015. Participation for boot camps has been higher, and according to Murphy, large companies are even using them as recruitment tools, getting teams together to work on projects, or using them as a way to garner new ideas.

"Immersive coding schools prepare people for jobs in a few ways," said Mayo-Malasky. "One is by focusing curriculum on the skills and knowledge areas that companies seek in job candidates."

The idea is that these sometimes intense, multiple-month-long programs teach individuals the skills they need to become coders or developers, without having to go to a four-year institution. Boot camps often have a tough program, and not everyone is accepted into them. One Fullstack graduate, James Nissenbaum, said that you have to be dedicated, no matter what kind of student you are, because everything is "jam packed" into three months (or however long the program lasts).

Nissenbaum now has a job as an associate Web developer for an e-commerce company called Media Hive. He said it took him about two months to secure the position, but other friends of his found jobs "instantly" after leaving Fullstack.

App Academy recently announced that it is running a boot camp prep program, guaranteeing participants acceptance into a coding boot camp or their money back. It won't just give an introduction to programming, but instead help students put together an application for whatever boot camp they choose.

Gregg Pollack, CEO and founder of Code School, said that immersive boot camps are a way to learn enough to get a junior programming job, and they are great for experienced programmers looking to switch to using a new technology.

"What these boot camps do better

continued on page 18 ▸

How to become a hireable next-gen developer

◂ continued from page 17

than most colleges is simulate the real-world environment," said Pollack. "One way they do this is by having them build lots of projects in groups, so by the time they graduate, they have a portfolio they can point to."

Code School is like other boot camps, except it is an online hub where developers can learn new content. It provides self-guided experiences, combined with videos, coding challenges and gamification principles. Plus, everything is done in the comfort of a browser, which could be ideal for experienced developers who might not have the time to go to class for a few months.

'Agile requires strong communication between developers, and also with management.'
—Huntly Mayo-Malasky, Fullstack

Pollack said that they do hear success stories of people who started learning their skills on Code School, but a majority of its customers are experienced developers who want to pick up a new technology, which reflects the company's stated goal.

Pollack added that boot camps put developers in groups where they have to build projects "mimicking the real world." He said that when he graduated with a computer engineering degree, the four-year institution he attended didn't prepare him to get the job he wanted. But he believes if boot camps were around during that time, it would have prepared him.

At Fullstack, some of the preparation helps individuals become working professionals. Beyond writing code, Mayo-Malasky said that students at Fullstack practice pair programming, use agile to manage their development workflow, and get feedback in formalized code-review sessions.

He also said that skills learned from Fullstack will help during the job search process. In today's job market, 97% of Fullstack graduates found employment within three months of finishing the program.

Red Hat's Alexander hopes that boot camps will be developed to help people shift their careers, especially for those who might not have had prior coding or programming experience. She thinks that these boot camps are a great way to learn basic skills or how to use a new language.

"[It helps them] start to make their first contributions," said Alexander. "It takes a first step."

Basic skills

Besides knowing the fundamentals of coding and having a wide variety of languages in their arsenal, coders and programmers are also expected to have basic skills like communication, writing and grammar. Developers are being called out of their cubicles and having to speak at conferences, and they're actually doing some of the presentations, according to HPE's Murphy.

"Devs don't just need to have the tech skills, but have that ability of interpersonal communication skills," she said. "Also, because of the rise of DevOps, it means it's more important for developers to be able to understand and interact with other members of the application delivery cycle."

Alexander said that coders are not always coding, and one of the most important things they can be doing is communicating.

"Coders are out representing Red Hat in evangelist roles, they are representing Red Hat at different meetups and conferences, so they need to be able to do presentations and be advocates for open source," she said.

Alexander also said that working well across all cultures and communities is important to emphasize. Many organizations have people that contribute to open-source communities, and many come from all over the world. Being able to influence without necessarily having authority can affect other coders or contributors, and this is something Red Hat in particular looks for in potential candidates.

Mayo-Malasky agrees, adding that companies hire based on culture fit as well as technical ability. Most developer positions require working with programmers as well as managers and designers, he said. Doing well in the behavioral and communication aspects of an interview is important for today's developers.

"Agile and other environments require strong communication between developers, and also with management and other teams," said Mayo-Malasky. "Communicating well via e-mail and in person is key for success."

He also said that software documentation is important, especially for open-source projects. As more individuals try to learn code, and as more companies begin sharing their software, developers will need to write better documentation.

Some other basic skills for a resume include having a technology element or familiarity on modern development technologies. Familiarity with DevOps and agile can make a difference, according to HPE's Murphy. She also said that there should be another layer to a resume, which can include larger ecosystem knowledge of the app world.

"The developers have to not just understand how to build high-performing, good user experience [apps], but they also need to understand how to test that, how you are going to look at performance, or leverage for example, assets which might be used in testing," said Murphy.

Button's Mardell said that simply emphasizing that a developer is curious and being able to back that up on a resume or portfolio is one way to get noticed. Whether you're a developer in your 20s or someone who has been in the industry for years, showing that you understand that the industry is changing and new technologies are being introduced will get you one step closer to being the final candidate in a round of job interviews. ▮

A culture of 'genuine inclusivity'

Katherine Daniels' work at Etsy shows how to change perceptions of women

BY MADISON MOORE

It might be a surprise to hear that Katherine Daniels, senior operations engineer at Etsy, studied art and creative writing before she switched to computer science.

Feeling "burned out" in the liberal arts program, Daniels instead went on to obtain a degree in computer science from Colorado State University. She appreciated how her computer science classes required some creativity, and they lacked the subjective grading that is found in creative disciplines. Simply put, it was clear in computer science, whether you were getting something right or not.

She does very little programming in her spare time, but she has written a script to crawl a subset of Wikipedia pages looking for metal bands with violins in them. Most of her free time is spent rock climbing and taking cello lessons, and she's helped write an eBook on effective DevOps.

While the cello is one of the hardest instruments to pick up as an adult, Daniels has seen more challenges in the software industry. She's watched it come to terms with ideas like DevOps, discussed how principles can be expanded to benefit more roles in the modern software development worlds, and seen barriers rise between engineers and non-engineers.

The biggest challenge she's seen—one that she has experienced herself—is working in what's still considered a decisively male-populated industry. Given where she is right now, it's safe to say she knows that women can—and will—thrive in programming and other technology careers.

From Linux to Etsy

Daniels started her career doing research and development and systems engineering on workstations, with a focus on Linux storage and Windows graphic solutions. She then made a big move from Colorado to New York, where she landed a job as a system administrator for Livestream, a video livestreaming platform.

Daniels loved tackling the problems in operations but never felt like she had a lot of time to go in-depth in an area, since she was working in a "one-person ops team," as she puts it.

WOMEN in technology
AN OCCASIONAL SERIES

After a few years, she happily landed a job at Etsy, but during that time she said she dealt with a lot of challenges that came with being the only woman on engineering teams. In the past, Daniels has dealt with unwelcome advances and sexual harassment at professional events, and was told she was everything from "too aggressive," "too money-focused," and that she needed to be "more assertive" to get her ideas heard.

Daniels also said she is the only out queer person in the organization, which "led men to thinking that I will be on board with their objectifying or harassing other women in front of me.

"It was incredibly frustrating, and I gave serious consideration to leaving the industry in the past, and probably would have by now had I not joined Etsy."

According to Daniels, Etsy has 1.6 million active sellers and 24 million active buyers as of Dec. 31, 2015. The architecture is "straightforward," using Linux, Apache, MySQL and PHP for the site itself; Solr and Elasticsearch for search; and Hadoop and Vertica for data management.

"Engineers deploy code, whether that be for the site, for configuration, or for any of our other stacks, upwards of 30 times a day on average," said Daniels. "Different engineering teams collaborate a fair amount to make sure everything is working as it should be."

Daniels said that the Etsy culture is far different from other stereotypical tech companies that everyone seems to love (Daniels says to picture the beer/pizza/ping-pong idea culture). The culture is one of "genuine inclusivity," and she said that in the workplace, people are much more mindful and considerate than what she has seen at other organizations. Recently, the company even placed gender-neutral bathrooms in its headquarters.

"[Etsy] thinks about how their decisions will impact other people both technically and interpersonally," said Daniels.

She has been able to push past her own barriers that she faced in the industry. For others, she suggests getting women into technology and software, but with more of a focus on

retaining the women that are already in the industry. She said there are few senior women in either engineering or management positions, which is caused by women leaving the industry entirely early in their careers.

"This leads to things like fewer women being involved in the types of organizational decisions that can affect other women's experiences in the workplace," said Daniels. "This also means less guidance and fewer role models for women just entering the industry, so they might not have people to talk to about these gender-specific challenges or someone who has been there and can advocate for them."

Daniels has taken matters into her own hand, and when she's away from her computer, she tries to help the New York City feminist community grow. She has volunteered with "Lesbians Who Tech" and has spoken at five O'Reilly Velocity DevOps conferences. She also cofounded MergeSort, a feminist hackerspace in the city, which she recently had to step down from as co-organizer due to time constraints. The events that the group has put together have all been "hack nights," where people bring their projects to work on together.

Recently, she has been helping organize events for Ladies Who Linux NYC, where the meetups generally involve talks followed by some hand-on coding around related topics, said Daniels.

At Etsy, Daniels has been thankful to have an ops team that has the time and ability to take the "tools from good to great," she said, which she finds "incredibly rewarding." She has worked to provide operational support, performance and availability for both the customer-facing site and internal tools for the company. Some big projects she's worked on have included helping the data platform team to install a new Hadoop cluster, as well as moving their existing cluster between datacenters. She has also built and maintained multiple ELK (Elasticsearch, Logstash, Kibana) clusters, along with managing multiple hardware upgrades and creating tools to make maintenance easier. ▮

Developers are still questioning OpenStack

BY MADISON MOORE

OpenStack has come a long way since NASA and Rackspace first launched it in 2010. Even with recent successes, technology professionals and those who use OpenStack still have a few questions and concerns surrounding the system.

Talligent, a provider of cost- and capacity-management solutions for OpenStack and hybrid clouds, released its 2016 State of OpenStack Report. In the report, it identified some concerns of OpenStack, its use cases, barriers, and what's currently driving OpenStack.

The report was commissioned by Talligent through CloudCow and VMblog, and it surveyed 647 virtualization and cloud IT professionals and executives around the globe.

The survey found respondents in varying states of familiarity with OpenStack. Thirty percent said they currently use it to support projects or production workloads. Thirty-six percent said they are familiar with OpenStack, but have not yet implemented it.

Once OpenStack is in place, respondents said they expect to quickly expand beyond development environments, with lab growth moving from 43% to 89% and QA/Test to grow from 47% to 91%, both within the next 12 months, according to the report.

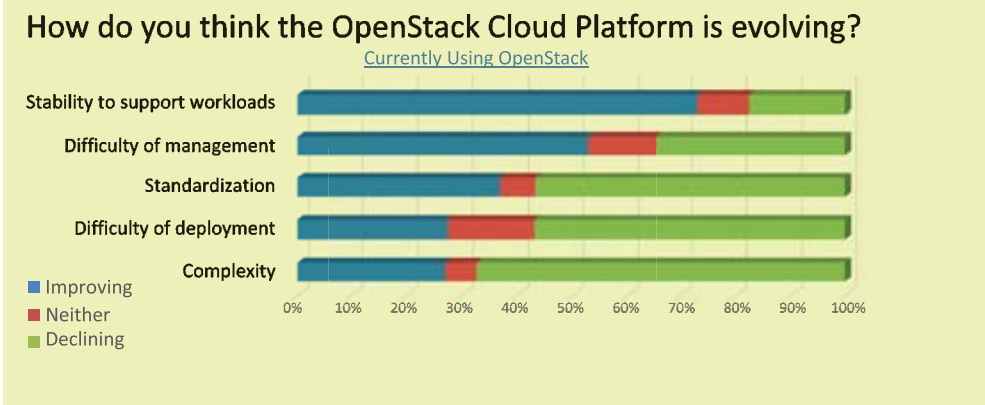
John Meadows, vice president of business development at Talligent, said that businesses should have confidence in the path that OpenStack is taking. He said that at Talligent, they were surprised to see the expectations that OpenStack will support such a wide range of workloads across various IT environments, and that the data shows support for the direction of the OpenStack community.

"Companies considering adopting OpenStack should understand that there are still challenges with regards to complexity and deployment," said Meadows. "A successful OpenStack deployment will include some mix of technical expertise, operational tools, and the support of a solid OpenStack partner."

Additionally, the shift to an on-demand cloud for IT service delivery requires a new approach to tracking, managing and comparing IT resources, said Meadows. Management tools should be designed to support automation and deliver real-time insight for OpenStack adoption.

Other key findings from the OpenStack survey include:

- Sixty-one percent of respondents are adopting OpenStack to combat the expense of public cloud alternatives
- Challenges of OpenStack adoption include its security model (26% of respondents) and lack of operational tools (23%)
- Private clouds will not be replaced by public clouds; 54% of respondents still expected their cloud use to be all or mostly private within the next five years
- Fourteen percent of respondents expected a balance of private and public cloud over that same time period. ▮



FTC chief technologist says it's time to rethink mandatory password changes

Research shows changing them often may make them less secure

BY MADISON MOORE

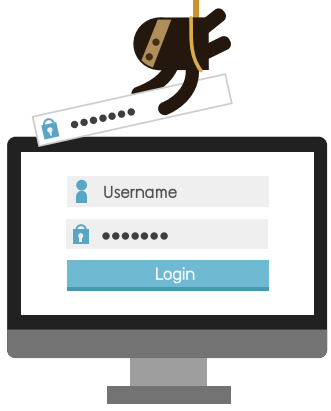
There's a lot of emphasis nowadays on having secure passwords, as well as changing passwords often to keep your information and accounts safe from hackers. Despite what some IT professionals have said in the past, one woman with the Federal Trade Commission has suggested that changing passwords less will actually keep systems safer.

Lorrie Cranor, chief technologist with the FTC, recently shared her case study and the FTC's advice to companies who wish for stronger data security. She said that the FTC's advice in the past has been to conduct risk assessments, taking into account factors like the sensitivity of information they collect and the availability of low-cost measures to mitigate risks. The FTC has also advised companies to keep up with security research. Cranor said that what might have been reasonable in 2006 is no longer reasonable in 2016, and she also emphasized why keeping up with security advice is important.

Cranor conducted research on making passwords more usable and secure, and she wrote that this always prompts a lot of interesting comments and questions.

"People complain about having so many passwords to remember and having to change them all so frequently," she wrote. "Often, they tell me their passwords (please, don't!) and ask me how strong they are. But my favorite question about passwords is: 'How often should people change their passwords?' My answer usually surprises the audience: 'Not as often as you might think.'"

Cranor said that there is a lot of evidence to suggest that users who are required to change their passwords frequently select weaker passwords to begin with and then change them in predictable ways that attackers can guess easily. She said unless there is a need to change the password—like there is evidence that the password has been compromised or shared—changing passwords frequently could actually do more harm than good.



Cranor cited the results of a 2009-2010 study of password histories from defunct accounts from the University of North Carolina at Chapel Hill. Those researchers obtained the passwords to 10,000 defunct accounts of individuals who had to change the password for them every three months. The researchers then used password-cracking tools to crack the hashed passwords—meaning the passwords themselves were scrambled using a mathematical function called a hash.

Offline attackers aren't limited to guesses before being locked out. These attackers gain access to a system and steal the hashed password file, and take it to another location to make as many guesses as they want. When the researchers tried to hack into the accounts, they used a password cracking system that ran for several months until it eventually cracked at least one password that was not the last password the user created for that account.

Cranor wrote that the bottom-line results of this long study "are striking." She said that the UNC researchers found that for 17% of the accounts they studied, knowing a user's previous password allowed them to guess their next password in fewer than five guesses. An attacker who knew the previous password has access to the hashed password file, most likely because they stole it. This hacker can then go on to carry out an offline attack.

"These results suggest that after a mandated password change, attackers who have previously learned a user's password may be able to guess the user's new password fairly easily," Cranor wrote.

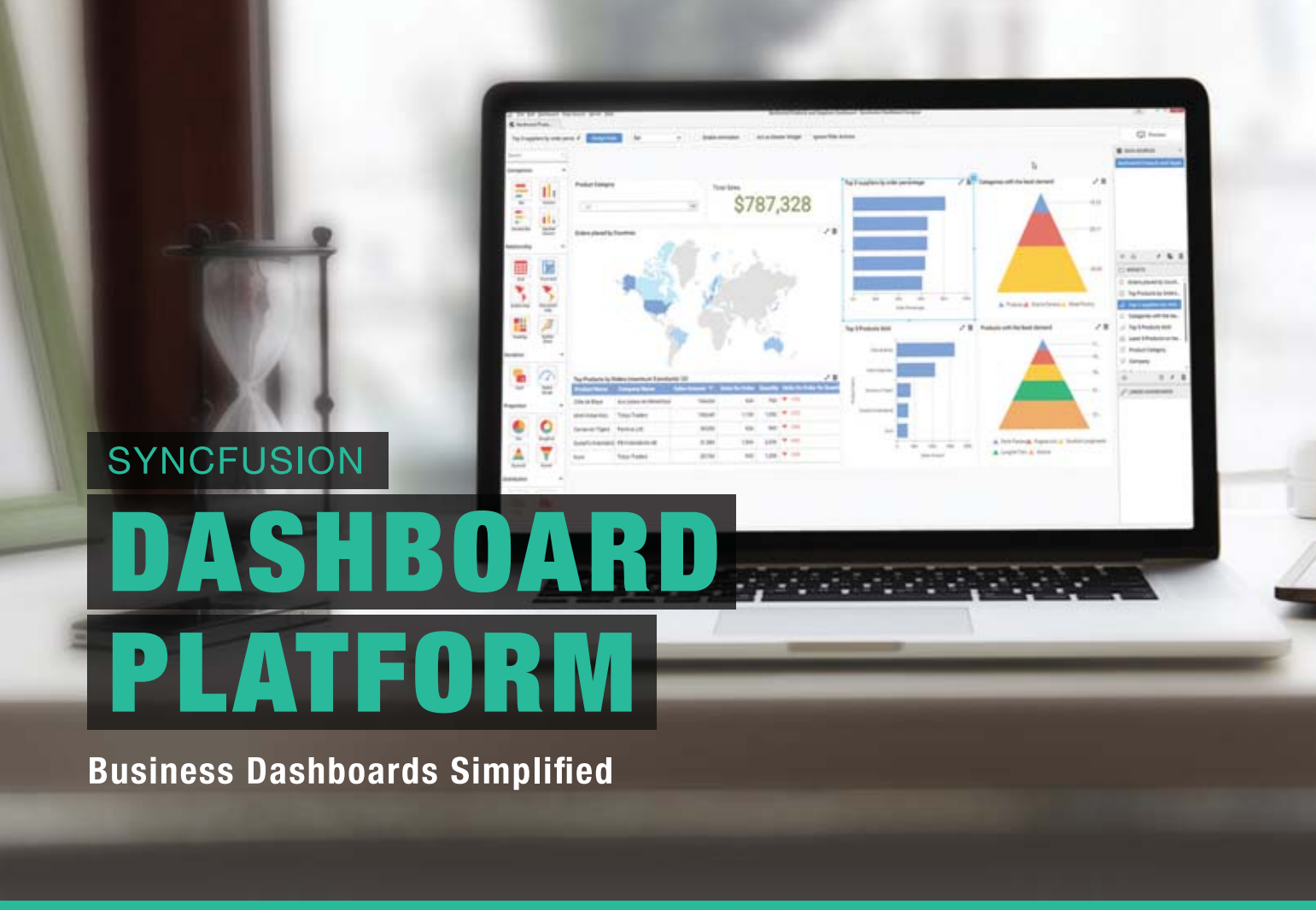
To change or not to change

Where does that leave a user or a company that wants to make sure its passwords are safe? Cranor said that if you have reason to believe your password has been stolen, you should change it and make sure you change it—including for the accounts that have the same password.

"If you shared your password with a friend, change it," she said. "If you saw someone looking over your shoulder as you were typing your password, change it. If you think you might have just given your password to a phishing website, change it. If your current password is weak, change it. If it will make you feel better or if you just feel like it's time for a change, then by all means go ahead and change your password."

Cranor said that depending on a company's situation, there may be good reasons as to why it would require users to change their passwords. Before doing so, she suggested assessing the risks and benefits for the organization, as well as alternative ways of increasing security.

"Organizations should weigh the costs and benefits of mandatory password expiration and consider making other changes to their password policies rather than forcing all users to keep changing their passwords," she said. ▮



SYNCFUSION

DASHBOARD PLATFORM

Business Dashboards Simplified

- The complete solution for creating and sharing interactive business dashboards.
- Includes a user-friendly drag-and-drop designer and widgets to visualize your dashboards.
- View, manage, and share dashboards through a web interface.
- Integrates seamlessly with the Syncfusion Big Data Platform.
- Connects to commonly used data sources like Microsoft Excel, CSV, SQL Server, and Spark SQL.

Deploy to 50 users for only **$1,995** per year

FREE COMMUNITY LICENSE AVAILABLE!

Ready to get started?

Download a free trial

www.syncfusion.com/sdtdashboard

Syncfusion

When focus is functionality, security takes a back seat

RSA chief architect laments changes in development life cycle

BY ALEX HANDY

It's no secret that computer security is a difficult area of expertise. At the annual RSA Conference in San Francisco last month, attendees were treated to a host of solutions to solve their security woes. As usual, however, software development was not the focus.

Robert Griffin, chief security architect at RSA, agreed that developing secure software is difficult, and said that typically features trump security in the software development life cycle.

"The pressures I felt in the '80s and '90s looking for when code would cause problems; that pressure doesn't seem to be there at the moment," he said. "The model built by Google and Microsoft has supplanted so much that it's hard to think about security. There needs to be a new methodology that reinserts security models into the rapid development life cycle."

Griffin, who has been promoted to the point where he no longer has to write software, said that back in his days of being a coder, his team used three tools to ensure software security.

"One was code review," he said. "Clearly we did that as a way of looking for obvious and less obvious errors. Second was vulnerability scanners. In the early days in the '90s especially, they searched for known coding errors. Third—although it was the hardest goal for us—was to find errors in the design phase. That was the hardest thing. You could find some errors in terms of assumptions, in terms of approach. The real errors occur as you were getting to the coding. It was so difficult to really identify vulnerabilities and significant issues at the design phase."

When asked about the current state of OpenSSL, Griffin stated that he felt it was difficult to build secure software through an open-source process.

RSA's Bob Griffin is calling for a new development methodology that incorporates security.

"It is very tough to deal with security issues when the focus is on the functionality," said Griffin. "For the reference implementation around key management (for OpenSSL), it was much harder to drive security properties of that, even though it was a security protocol. I think there was a shift in the OpenSSL community after the RSA patents. Due to the sense that this supplanted [those] patents, there was a rush to move to that software without the level of inspection needed. Customers did rigorous reviews of our SSL code. I don't know of customers who did that with OpenSSL."

New tools, old problems

The conference offered hundreds of security tools for attendees to evaluate, but only a few that were focused on software development. It has grown considerably over time, showing proof positive that enterprises are looking for security solutions—and many different types, as well. At the show, vendors displayed tools, platforms and services for identity management, device management, threat detection, threat assessment, threat elimination, penetration testing, firewalling, proxying, networking, and encryption. Some even sold custom hardware to solve these problems.

Still, there were some software development solutions on hand, such as those from Veracode. The company demonstrated its SaaS vulnerability scanner, which, over the past year, has irritated Oracle, which has asked customers not to pass Oracle binaries through Veracode and other binary scanners. Oracle claimed these devices bring up false positives for vulnerable code in their binaries, specifically.

Rogue Wave was at RSA to show off Klocwork 2016. This new version enables security testing within the build process, alongside Jenkins. This Continuous Integration-enabled version of the popular in-IDE secure code-development monitoring tool will bring security testing into the nightly cycle, supplementing a reliance on developers to be compliant as they are writing code.

Palamida demonstrated its code scanner, which detects open-source code. While this may not have been important to folks outside the legal department, with the current state of OpenSSL and with vulnerabilities popping up in other open-source codebases, it could help developers control their teams' urges to crib code snippets.

While many, many companies on the show floor were talking about how they use machine learning to filter packets or monitor logs, there was only one company on the floor that seemed to have the infrastructure software to be able to support such a system. X15 Software has been working in the Hadoop world for five years, and it offers a set of tools for building security-monitoring systems within Hadoop. Customers run their own instance of Hadoop, then layer the X15 software on top to help them aggregate and analyze log files. ▮

LEADTOOLS®

THE WORLD LEADER IN IMAGING SDKs

TRANSCODE MULTIMEDIA FILES AND LIVE STREAMS FOR REAL-TIME PLAYBACK

Media Streaming Server SDK

High-level media streaming server framework with minimal coding required

Stream media from files, cameras, HDTV devices, TCP and UDP streams for playback on any client

Restream live IP audio/video feeds from RTSP and ONVIF devices

Automatically transcode on the fly for clients requiring different protocols

DOWNLOAD OUR 60 DAY EVALUATION
WWW.LEADTOOLS.COM

LEAD TECHNOLOGIES

SALES@LEADTOOLS.COM
800.637.1835

Aspose updates Java, .NET solutions for email, PDF

BY CHRISTINA MULLIGAN

Aspose is adding features and improvements to its .NET and Java products. The file-management solution provider recently announced the release of Aspose.Email for Java 6.3.0, Aspose.Pdf for Java 11.2.0, Aspose.OCR for .NET 3.4.0 and Aspose.Diagram for Java 6.1.0.

Aspose.Email for Java is a Java class library that lets Java applications read and write e-mails in a variety of formats without relying on Microsoft Outlook. In its latest release, Aspose.Email for Java 6.3.0 features the ability to detect input file format, enhances its ability to convert e-mail messages to HTML output by also exporting message headers to HTML output; and resolves issues using its detached signature option.

Aspose.Pdf for Java is a PDF document development component that allows developers to build Java apps that read, write and manipulate PDFs without requiring Adobe Acrobat. Version 11.2.0 introduces a new feature that allows users to change a PDF document color space from RGB to grayscale in order to print PDF files faster. The company noted that when a file is converted to grayscale, the size of the document decreaces, but the quality may also drop. Other features include converting XML files to PDF, adding transparent text in PDFs, and drawing with transparent color.

The .NET character and optical mark recognition component was updated to include the ability to perform OCR operation on images with transparent backgrounds. In addition, Aspose.OCR for .NET 3.4.0 introduces an "OMR template is busy" indicator while processing images in the OMR template editor. Other enhancements include improved exception handling processes while performing OCR operation on barcodes, and save preprocessed binarized image process improvements.

Aspose.Diagram for Java is an API that lets developers load existing diagrams, create them from scratch, save them in any supported file format, and manipulate Microsoft Visio drawings within a Java app without using Microsoft Visio. According to Aspose, the 6.1.0 release has four noteworthy upgrades: It allows developers to set the orientation of the Visio page; protects shape-ID attributes in SVG; manages image quality by setting its brightness level; and gives users the ability to comment in Visio diagrams in order to give additional or more detailed information. ■

Aspose.PDF for Java allows users to transform a variety of file formats into PDFs, and to add PDF capabilities to their applications.

In other component news...

■ **Accusoft's** Document View and Sign module has been made available for Sugar 7. The document and imaging solutions provider announced users can now redact, search and sign attachments within SugarCRM's SugarExchange. The module also features the ability to view dozens of document and image file types within browsers, and the ability to view any document within Sugar.

■ **Dynamsoft** has improved its barcode reader and PDF rasterizer in the latest version of Dynamic Web TWAIN, its Web-based TWAIN scanning and imaging SDK. Dynamic Web TWAIN 11.3 features added support for reading binary barcode; an updated barcode reader library that improves its positioning algorithm; added IsTextBased PDF API to the PDF rasterizer in order to determine whether a PDF is text-based; improved event OnPostLoad; and improved AcquireImage API.

■ Developer productivity solutions provider **GrapeCity** has announced a collaboration with Microsoft. Microsoft has incorporated Wijmo's line of HTML5 and JavaScript products into the 2016 update of Microsoft Dynamics CRM Online. Wijmo is a collection of HTML and JavaScript UI controls. According to Microsoft, Wijmo 5 provided the company with touch support, mobile-friendly user interactions, broad device support, a clean and highly customizable design, support for more than 40 cultures, and flexible input and gauges control.

■ **Telerik** has announced the first major release of Kendo UI for 2016. Kendo UI R1 2016 features documentation improvements; a new dashboard template; spreadsheet and grid enhancements; the ability to disable dates in calendar pickers; new VS app templates; and an update on ASP.NET Core 1. In addition, the company announced it is currently building a new version of Kendo UI from the ground up as a set of React and Angular 2 components. Telerik will continue to manage the jQuery version of Kendo UI with new features and widgets. ■

Registration Open!

InterDrone

The International Drone Conference and Exposition

September 7-9, 2016

Paris Hotel, Las Vegas

www.InterDrone.com

The Largest Commercial Drone Show in the World!

125+ exhibitors • Demos • Keynotes • 110+ Classes and Panels • InterDrone

"It looks like the drone industry has chosen their go-to event!"

—Robert Rodriquez, President of the Society of Aerial Cinematography

InterDrone is Three Awesome Conferences:

Drone TECHCON

For Drone Builders

Content will focus on advanced flying dynamics, chips and boards, airframe considerations, hardware/software integration, sensors, power issues, and software development.

Drone ENTERPRISE

For Flyers, Buyers and Drone Service Businesses

Classes focus on enterprise applications such as precision agriculture, surveying, mapping, infrastructure inspection, law enforcement, package delivery, and search and rescue.

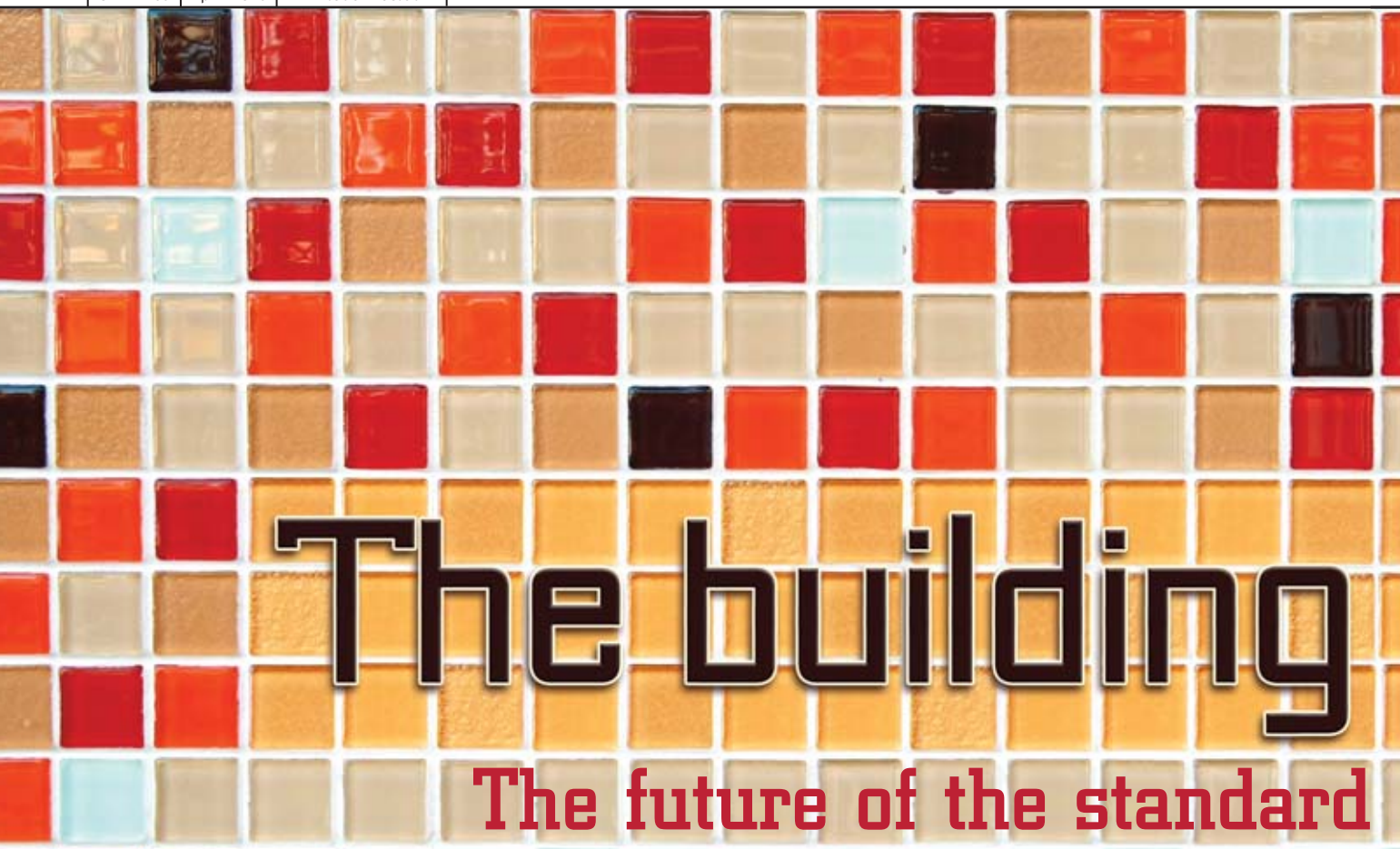
Drone CINEMA

For Flyers Engaged in Aerial Photography and Videography

Class content includes drone use for real estate and resort marketing, action sports and movie filming, newsgathering — any professional activity where the quality of the image is paramount.

Film Festival • Women In Drones Luncheon • 100+ Industry Expert Speakers

A BZ Media Event



The building

The future of the standard

BY ALEX HANDY

SQL is the prime building block of the modern enterprise. All those exciting applications, nifty mobile apps and massive back-end projects are, essentially, useless without the data behind them. That data may not be so important at runtime if the application is just saving logs or form information, but at the end of the day, that data has to live somewhere.

Today, wherever that data ends up, it's highly likely it will be accessed with SQL (or at the very least a SQL offshoot, be it Oracle's PL/SQL or Microsoft's Transact-SQL). At their cores, even the modified versions of SQL all aim for the same goal: making data stores accessible to analysts and business people.

In the beginning, Edgar F. Codd, Donald Chamberlin and Raymond F. Boyce laid out the basics for relational databases in their work at IBM between 1970 and 1974. That work would form the foundation for databases for decades to come, and included the invention of not only SQL, but also the schema model for storing and organizing data into tables.

The SQL we use today bears little resemblance to the original language, created at IBM's San Jose Research Laboratory. Originally dubbed SEQUEL, which stood for the Structured English Query Language, it was designed as a tool to help access the data in these newfangled things IBM was playing with: relational databases.

By 1979, the original SEQUEL ideas (by then shortened to SQL due to trademark concerns) had percolated within Relational Software, the company that would become Oracle. By the end of 1979, Relational offered the first commercial implementation of SQL with its Oracle V2 database for VAX.

It would take another seven years before ANSI would standardize SQL. The SQL-87 standard would lay the foundations for modern software development and data management by ensuring that different database vendors would be able to run the same queries. This made knowledge workers vastly more valuable, as they could move from company to company and not require retraining to use a different database.

Two revisions later, SQL-92 saw the first sweeping changes to the language. The actual spec itself grew exponentially in this release, though new features only

blocks of SQL

is use beyond the enterprise

accounted for double the size of the standard. The primary goal for SQL-92 was to be much more specific about how things should be done, thus lowering the amount of divergence between the various relational database platforms in the market.

SQL has continued to grow over the years, gaining recursive queries in 1999, adding XML support in 2003, and taking in XQuery support in 2006. Which brings us to today, when the SQL 2011 standard rules the roost.

SQL:2011, as it is called, was primarily about temporal support. This version of the standard brought in more handlers for doing work related to time series inside databases. This means most SQL databases (such as PostgreSQL, Oracle and DB2) can now treat time as a top-level function across SQL, and there are new temporal predicates, such as overlaps, equals and precedes. This means time-series database work should be easier to sync up across different vendors.

Oracle, for example, supports SQL:2011 in 12c, but versions 10g and 11g use Oracle's Flashback queries to ask time-based questions to their databases. IBM, on the other hand, calls its temporal features Time Travel Queries.

This, perhaps, all points to the future for the SQL standard. As SQL has evolved over the past 40 years, it's consistently taken on the common data challenges of the day with an approach that comes close to making everyone happy.

The Big Data connection

One place where the future of SQL is evident is in the world of Big Data. When Apache Hadoop burst onto the scene in 2010, there were no SQL tools in sight. But as of 2014, SQL on Hadoop has become essential.

A major reason for the continuing popularity of SQL, said Vicky Harp, corporate strategist at Idera, is that open source has democratized the language, opening it to more than simply enterprise users.

"For a long time, [SQL] was something people saw as [for the] big enterprise, but now we have other open-source alternatives, so people don't have to make the big investment that they did before. You have a lot more developers who know SQL now," she said.

"I think the analytics platforms are coming along with access to data. We've had a large data accumulation phase, and people are seeing that you can get things out of that. When you're asking, 'What do we do with all these marketing visits to our website?' it winds up being more data than you could point Crystal Reports at."

More data analytics will be needed with the growth of SQL, says Idera's Vicky Harp.

Because all of this data is being saved, the natural business instinct is to do something with it. The trick is to actually get information out of the data, a task that

continued on page 32 ▸

◄ continued from page 31

requires highly skilled workers—and more often than not—SQL.

Unfortunately, said Harp, the market has realized this as well, and has essentially flooded customers with choices. That means there's a lot of turbulence and no clear market leader when it comes to SQL on Hadoop, or even analytics on Hadoop.

"You need to have more data science and actual analytics capabilities," said Harp. "The space is a place where there's a need. We're seeing there's a lot of jostling in the Gartner Magic Quadrant on that in 2015 and 2016. We saw a lot of people drop in terms of their ability to execute, which I thought was interesting. It's a space to continue to watch. We're also seeing vendors move in and out of that magic quadrant. It's not like they're having trouble finding vendors. In the 2016 version, even Oracle fell off.

"There is demand in the market for people to do what they're comfortable with, and at the same time, it's the relational database providers who are seeing what their users want. It depends on what you're looking at it. Is this relational on top of Hadoop versus...Hadoop working with SQL Server or some other platform where you are mixing the two types of data?"

Indeed, Hadoop has muddied the waters around big enterprise data analytics, thanks to hundreds of vendors now offering compatible products to analyze the mountains of data that come from a modern enterprise.

Monte Zweben, cofounder and CEO of Splice Machine, has built a company to deliver ACID transactions on top of Hadoop. That means SQL users can use their Hadoop cluster as they would typically use a relational data store.

"I don't think it's the language [SQL] that I would argue is the new innovation; it's the workload using the language that's going to be unique," he said. "I see the world bifurcating. What I mean by that is, there was this heavy push to do rapid ingestion of data. The NoSQL guys glommed onto that. Then there's this other world of people doing big batch analytics. This is where the Hadoop world has gone. All SQL on Hadoop is focused on that: big batch analytics.

"The one piece of the pie nobody addressed was powering concurrent applications. That's where you need ACID semantics. That's what relational databases had done for years and years. If you have all three of those, you have what's typically remarked as a dual workload. The magic of this next generation of architectures is supporting the dual workload, where those workloads are isolated from each other, and don't interfere with each other.

"Think of a database that's trying to

The Calcite layer: Key to SQL's future

BY ALEX HANDY

SQL's big contribution to humanity is providing a singular way to access data, regardless of the underlying storage medium or vendor. The various compromises currently required by cloud infrastructure, however, are beginning to cause divergence once again, as numerous data stores compete in the cloud. Many have their own little SQL quirks or oversights.

That's why the Apache Calcite project is so important to the future of SQL and to the future of Big Data. The project was created three years ago by Julian Hyde, a data architect at Hortonworks The goal of the project was to clean up the mess around how SQL is run across Big Data. Essentially, Calcite is a generic query optimizer that is compatible with anything for which developers desire to write a plug-in.

Calcite builds the mundane aspects of databases, says creator Julian Hyde.

"I'm a database guy. I've been building databases for most of my career: SQL databases, open-source and otherwise," said Hyde. "I wrote the Mondrian 11 engine, the leading open-source LDAP engine. I'd done query optimizers before. What I saw was—and the Hadoop revolution was one big part of it—was the fact that the databases was no longer a monolithic entity anymore. People were choosing their own storage formats and algorithms.

"Federating the data across a cluster (or several clusters) and a query optimizer were going to be key to keeping those all together and keep your sanity. I thought to liberate the query optimizer from the inside of the database so people could integrate disparate components.

"There is a diverse community of users, but not everyone wants to write Scala, not everyone wants to write SQL, not everyone wants to write R. But all those communities exist, and they need to be served. It was fairly clear to a lot of us that a SQL interface to Hadoop was going to come along, and two years ago about 10 came along at once. There's not a single paradigm that will win, but the SQL community is very strong and doesn't show signs of going away. Tableau is still the way the majority of users get to their data."

Calcite brings some coherence to this multiple-language world. Instead of implementing its own database, Calcite is, essentially, the building blocks for a database. Calcite includes the framework for managing data, but does not include traditional database capabili-

ties, such as managing storage locations, hosting a repository for metadata, or including algorithms for processing data.

"What I think is interesting about SQL is the declarative approach to data, where you have a query planner," said Hyde. "You say 'Here's what I want to get,' and the system goes and gets it. That isn't limited to SQL: Pig has an optimizer in it, Storm has an optimizer in it. The general approach extends beyond SQL.

"Another part of our mission is integrating together data federation. That's why an open-source project is a good way of solving it: We have various people who are solving these individual problems that find that Calcite is the way they can pool their resources. Just last week someone contributed an Apache Cassandra adapter. They also recognize that there is some basic stuff that query optimizers do that applies to Cassandra, just as it applies to MySQL or Apache Drill."

Calcite, said Hyde, allows database engineers "to start 80% up the mountain and climb the interesting 20%." That means all the mundane things databases must do to handle queries can be handled by Calcite, while the more important differentiation features, such as storage medium, built-in algorithms and a metadata store, are handled by the engineers.

"Another thing this particular contributor wanted from was Calcite's support for materialized views," said Hyde. "That's a table whose contents are defined by a query. This table always contains the highest salary of each department, so if someone writes a query, they can go to this table instead. That avoids actually scanning all the data. Calcite has the features for defining these materialized views."

Enterprises are addicted to those highly important data queries, and Calcite can help to eliminate some of the headaches associated with them. "On the mundane level, we are using Calcite to build really high-quality cost-based optimizers for some really high-performance systems," said Hyde. "Hortonworks is investing in Apache Hive very strongly, and we're building a world-class cost-based optimizer in Hive. It's a massive ongoing engineering effort. Oracle, Microsoft and IBM have spent a lot of effort building their cost-based optimizers for their systems.

"My prediction is that people will want a SQL interface on top of streaming data for the same reason they wanted SQL on top of Hadoop. Not because SQL is the ideal language, but because of its interoperability. Existing skill sets can use them, and the system can self optimize."

Jim Scott, director of enterprise strategy and architecture at MapR, said that SQL still drives the needs of many enterprises. "When it comes down to it, most people need the rudimentary basics of ANSI SQL, and the tiny subset of that in Hive is usually less than adequate," he said.

"Calcite is just sitting out there waiting to be used. Drill helped open that one up. When it comes down to it, look at the history of SQL on Hadoop technologies. Apache Hive was a great entry into expressing SQL at scale. Apache Impala came along and took a step forward and said, 'We need to make this faster.' They didn't necessarily fix the problems. They just made something run faster, so it has a complete dependency on Hive."

Scott predicted change will come to the SQL-on-Hadoop market, mainly because existing solutions are not optimum. "I think what it comes down to is the logical model these platforms have been built on are not the easiest to adapt to the complexity of SQL will support," he said.

"Idealistically, people are going to put their hands on a tool like Apache Drill [and] say, 'I can start with this on my laptop and can query every data store in my enterprise.' Drill supports utilizing the Hive metastore, but does not require Hive to use it. There has been a competitive landscape of SQL on Hadoop." ▮

Apache Calcite

Perhaps the best way to describe Apache Calcite is to let the project describe itself. According to the Apache site:

"Apache Calcite is a dynamic data-management framework.

"It contains many of the pieces that comprise a typical database-management system, but omits some key functions: storage of data, algorithms to process data, and a repository for storing metadata.

"Calcite intentionally stays out of the business of storing and processing data. As we shall see, this makes it an excellent choice for mediating between applications and one or more data-storage locations and data-processing engines. It is also a perfect foundation for building a database: Just add data." ▮

—Alex Handy

do both analytics and transactions. What typically happens is you run analytics on a single-lane highway, blocking all these little cars behind them. Those cars are the transactions. If someone kicks off a report to summarize the last six months of sales, and all of a sudden your resources are shot, that's what traditional databases struggle with: resource isolation.

"In the new architectures, you can use different Big Data compute engines for different purposes. We have one lane for transactions powered by HBase, and one lane for analysis powered by Spark."

And that is, perhaps, the biggest draw to Big Data for SQL users: the potential to unlock massive troves of data without the potential to lock up the entire dataset with a single miswritten query. ▮

Read this story on sdtimes.com

Why SQL still dominates business intelligence

Business intelligence is all about actionable information, and the fastest, most economical and powerful way to extract it just happens to be SQL

BY ALEXANDRA WEBER MORALES

With all the hype about NoSQL document stores and other types of semi-structured and unstructured data being the way of the future, it's important to remember that structured query language (SQL) is still the dominant currency for data transformation. We spoke with Brody Messmer, Principal Software Architect and Head of Product Innovation in charge of DataDirect ODBC and JDBC connectivity solutions for Progress Software in Raleigh, N.C.

SD Times: Are rumors of SQL's demise greatly exaggerated?

Messmer: Yes. Ultimately, SQL is everywhere, and we really don't see it going away anytime soon. Banks, governments, hospitals, businesses use it... it's even on phones and embedded devices.

How old is SQL?

The standard itself actually turns 30 this year. It's been around a long time, which is surprising in the tech industry. Its popularity is readily visible. A 2015 Stack Overflow survey found SQL was the second most popular software technology, after JavaScript.

But isn't there a sense that SQL is dated, compared to NoSQL?

Some have opinions that SQL isn't all that great, but it has a very low learning curve, and the query language is very English-like. But what's really interesting is that if you look at the market five years ago, the number of data storage systems started to explode. You had SaaS, NoSQL, New SQL. And when NoSQL first came out, the definition was no SQL—not going to support SQL, never will. And now it means "not only SQL." What we see now is data storage companies realizing there's an incredibly strong demand in the market for SQL.

What's happened is the explosion of data and data store systems have created a lot of data silos, and these silos contain information that's all related. You need to query various silos and withdraw key information. SQL is ingrained in all of our uses of querying data.

How has SQL evolved?

If you look at SQL itself, the standard is not changing all that much. The most popular standard was released in 1992. There have been a few revisions since, but the majority of developers base their usage all around that SQL-92. So while the data that people interact with is changing in shape and size, SQL remains the most common standard to enable access to all those data formats, anywhere, anytime—especially when using analytics tools for business intelligence (BI).

Although the standard hasn't changed much, there's been an enormous amount of activity throughout the tech industry to bring SQL to SaaS, Big Data and other semi-structured and unstructured sources in a variety of ways. For SaaS, there's Oracle Service Cloud and Marketo, which are now providing SQL through our DataDirect Connectors.

NetSuite, ServiceNow and Plex ERP have built their own SQL connectors. Looking toward NoSQL vendors, MongoDB built their own SQL connector. VoltDB provides a SQL connector, which they built themselves using technology from Progress.

In the Big Data industry, Hive, Spark, Impala, Presto and others are all working to provide SQL access to Hadoop.

What are the technical challenges of providing SQL access to these different types of data stores?

Many of the systems are object-based. That's one of the common complaints about SQL, that it expects a flat structure, a table with a set number of columns and rows—it always expects data in a rectangle format. Objects aren't necessarily rectangular. One individual might have a single phone and address; another might have multiple. That ability to represent a person as an object with information nested in them is how newer systems tend to operate. Being able to use SQL when

continued on page 36 ▸

Why SQL still dominates business intelligence

◂ continued from page 35

accessing these object-oriented database systems is a challenge for the connector. That object base problem is really present in all of these sources, but most applicable to NoSQL sources.

What about SaaS sources?

The service provider needs to limit how taxing you are to their system, which is serving multiple customers. If you attempt to execute a SQL statement that's going to bring the relational database to a halt, that's a problem. Their APIs impose limitations to prevent this from happening. Some SaaS sources provide multiple APIs to help address different querying needs. Being able to provide easy SQL access that works within these confines is pretty challenging.

We've helped quite a few of our larger customers overcome this problem via our connectors—and it is always a rewarding experience.

So why is BI so dependent on SQL?

Business intelligence is our most common use case. There are a bunch of BI apps that are able to use standard APIs to execute SQL statements. Native interfaces will be custom SOAP or REST APIs—BI systems either straight up do not support or have poor support.

Similarly, implementing proprietary connectivity to query the data; it's just not feasible to build quality connectivity into the application for all the data silos that exist today. That's what's driving the need for all these vendors to revisit these solutions, so people can at least report on the data.

Wasn't machine learning and Big Data going to revolutionize BI with things like IBM Watson?

From a straight-up reporting point of view, I think it's probably exaggerated. Watson just wants to ingest data. The easiest way to ingest that data from any source is going to be SQL. Apple has Siri, Microsoft has that—it's based on a Halo character—oh yes, Cortana. Amazon has similar technology. They all have the ability to respond to a simple question and scour a variety of data sources to answer it. There's a small number of very large companies focusing on that. But on a daily basis, there's a very large number of regular-sized companies that are looking to run relatively simple BI, relying on SQL.

Ultimately, I feel like any project I look at that relies on data relies primarily on ODBC or JDBC interfaces to execute SQL.

What about NoSQL displacing SQL on mobile?

A lot of things on mobile interact with Web services. Aside from SQL, the standard that we're invested in significantly is OData, the Web-friendly (REST) query language. OData may not be widely adopted today, but I predict that in the future it will play a much larger role in the mobile space.

As for SQL, every smartphone has some sort of database internally and the phone is interacting with that in SQL.

Microsoft SQL Server 2016 is finally adding support for JavaScript Object Notation (JSON) due to massive developer demand. What does that mean?

That's definitely them attempting to combat the NoSQL revolution. SQL has been enhanced to support JSON methods and query within JSON documents. What's interesting there is, the ways in which we provide a connection to a NoSQL database like MongoDB right now are generally more powerful than the methods available via SQL Server.

The BI vendors see that changes in the SQL space are just now being adopted by relational vendors. I don't think it's going to quite support the needs of end users to dive into JSON docs.

In our previous SD Times Spotlight ("MongoDB and SQL: Bridging the divide"), our Chief Data Evangelist Sumit Sarkar talked about how we normalize unstructured data, which allows you to use SQL the way it's meant to be used. The methods present in SQL Server today are not as powerful and easy to use. Now, there are some databases, such as Postgres, that have implemented some proprietary SQL commands that are powerful, but they are far from intuitive.

What BI tools are most in use right now?

Sometimes it's easy to overlook the most popular BI tool: Excel. [Laughs] But there's also Tableau, Qlik, MicroStrategy and Jaspersoft, among others.

Why is hybrid data connectivity important?

I talked to a guy from a major bank at MongoDB World. He explained that they had adopted new technologies, stored data in them, and it was working great. But they suddenly found the requirements of the project expanded to include the need to run analytics on this data.

At that point, his organization is backed into an unpleasant corner where they either have to buy a brand new BI tool that supports a NoSQL database, or they have to write it—and support it—themselves. Connectors provide a more cost-efficient solution.

In SaaS data sources, the use case is even stronger. You've got Salesforce, Marketo or Google Analytics with all your sales and marketing info—it's all about your leads. Without SQL connectivity, you're unable to query that data and really understand the health of that database.

When you look at it that way, SQL truly is the power behind the BI analytics and hybrid data connectivity scene. The fact of the matter is that, at 30 years old, SQL is still an important standard that no organization who wants to fully leverage BI can afford to ignore. ▮

Register Early and SAVE!
All-Access Pass ONLY $695
Register before May 13, 2016

"This is an excellent conference to attend to get an understanding from both a business and technical sense of Wearables and IOT."
—Kevin Jones, Electrical Engineer, Dept. of Defense

Come to the Largest Wearable-IoT OEM Expo of 2016!

Go under the hood of the hottest wearable devices!

A BZ Media Event

Wearables TechCon

July 18-20, 2016

San Jose Convention Center
The Heart of Silicon Valley

PLUS! Internet of Things TechCon

Learn how to design, build and develop apps for the wearable technology revolution at Wearables TechCon 2016!

More than 60 Tech Sessions and Panels

- Product Design
- Software Design
- Leading SDKs
- Embedded System Development
- Application Development
- Electronic Engineering for Wearables Devices

...and more tricks and techniques that will set your wearable project apart!

www.WearablesTechCon.com

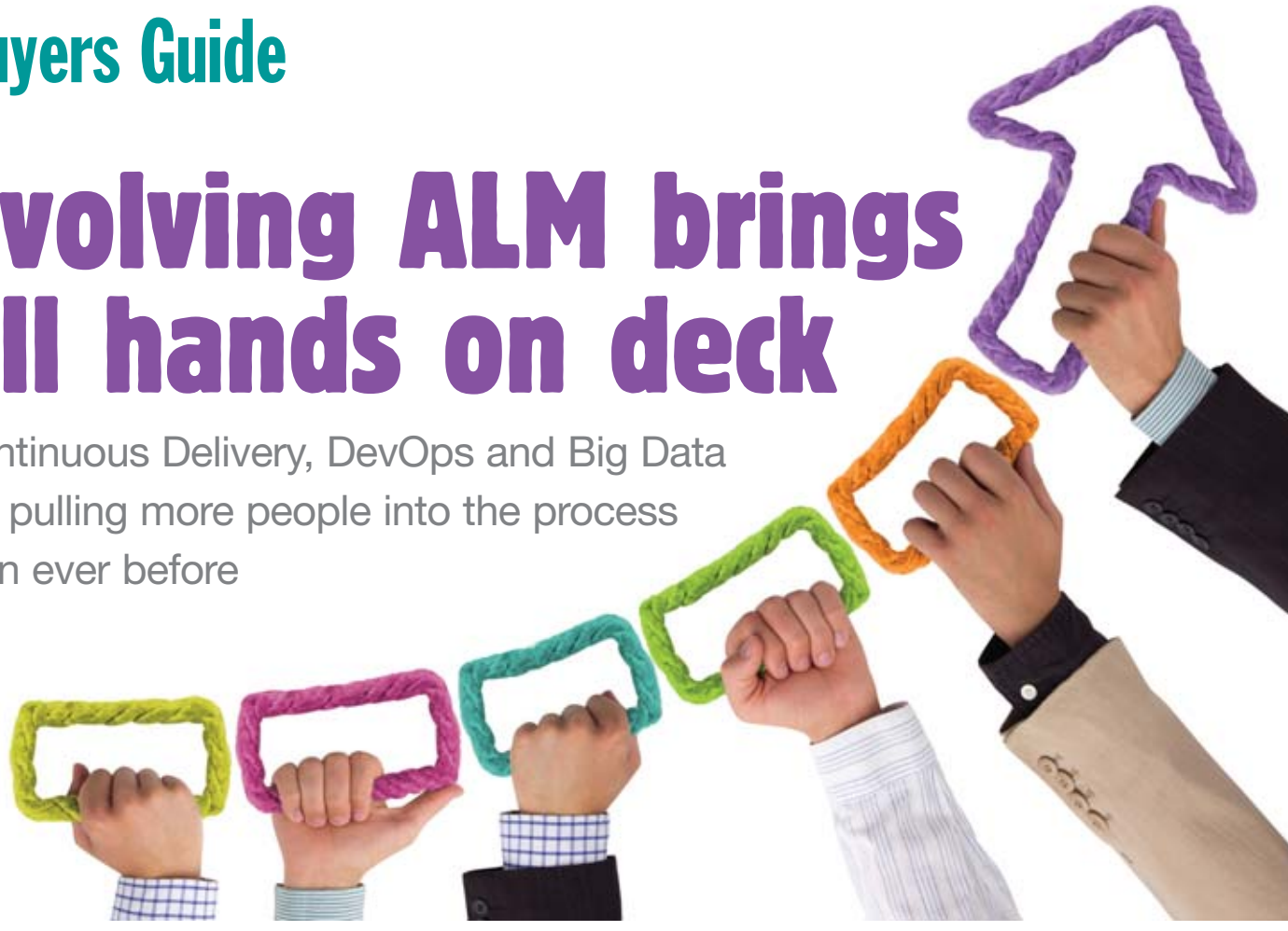
TeamForge by CollabNet

With flexibility at scale, hybrid development with Git and Subversion, and actionable traceability, CollabNet TeamForge® improves productivity while reducing cost and risk. So let them play and watch what happens.
CollabNet.com/Play

Buyers Guide

Evolving ALM brings all hands on deck

Continuous Delivery, DevOps and Big Data are pulling more people into the process than ever before



BY MADISON MOORE

Before the shift in software methodologies, the application life cycle was fairly simple—or at least straightforward. Now, contextual elements of ALM have changed drastically because of the evolving nature of the industry. Where the old ALM process was all about managing application development, today's faster pace of delivery and more complex applications are forcing companies to create a new model that works with current practices.

ALM started in the "waterfall" age, but now it has a close relationship with Continuous Delivery, DevOps and agile. Releases that used to take weeks or months now only take a few days. The entire software development industry has experienced a huge shift in culture, and the role of developers (along with their tools) has modernized.

ALM's value is that it gives insight to testing and develpment teams, and the scope of ALM has been broadened to include capabilities around collaborating, getting feedback from customers, and having some sort of strategic plan in place. It's hard to imagine doing DevOps or agile without ALM, but perhaps with this shock to the system, it's time to rethink the application life cycle.

Embrace the culture shock

Waterfall culture is in the past for ALM processes. Large organizations that were siloed experienced many problems that could have been solved by tapping into the right tools. Often, teams in different silos would blame others when things went wrong, and that's when big projects would fail.

"In many cases this became part of the enterprise ALM culture," said Flint Brenton, CEO of CollabNet. "However, in healthy collaborating organizations, this was never part of ALM practice. [But] I have heard war stories of badly behaving organizations that played this out in the context of a painful ALM experience."

Before agile, there were a variety of these barriers. The siloed teams were certainly part of the problem, but most of the roadblocks of ALM were cultural. Removing these barriers has allowed software development to become a cohesive unit with other parts of the organization.

"I personally think the best thing that ever happened to the ALM was agile and the DevOps movement," said Paula Rome, senior product manager at Seapine Software. "That really brought into focus [that] it's not the tool, it's the process and the people and how you are working with each other."

Organizations realized there were best practices that could get their teams to collaborate together. The variety of tools helped with consistency and allowed ALM to overcome process, technology and functional barriers, and ALM really gave opportunities to organizations to communicate effectively, according to Tye Davis, senior

continued on page 41 ▸

◂ continued from page 39

product marketing manager at Hewlett Packard Enterprise (HPE).

The integration of things such as agile and DevOps, QA, development and product management has resulted in a wider team responsible for delivering software. The challenge is that the old tools can't handle the scale of collaboration and visibility needed, said Brenton. Companies must use a comprehensive platform that provides a way to show different stakeholders the big picture, while also allowing the flexibility of different source-control systems, DevOps tools, and tracking systems that the individual teams are currently using, he said.

While some define agile as a culture and some call it a movement, the change the industry has been experiencing has been brought about by new principles and procedures, not by a strict set of rules.

"This means that every organization adopts agile at its own pace and with its own twists, and so the application lifecycle management also must be adopted to each individual organization," said Alex Haiut, vice president of R&D at BlazeMeter. "I do not see any solution that gets closer to a one-size-fits-all. If someone looks at ALM in a few different organizations, the steps and stages might be the same or similar, but the flow and tools are different."

Developers and ALM

The new development world has changed ALM, but it's also changed the role of the developer. The environment looks and feels different, and for someone who has been coding for a long time, this new way of working can come as a struggle.

Kelly Emo, director of life-cycle and quality product marketing at HPE, said that developers want to become more successful and do their jobs better, but they don't want additional overhead. Developers want to focus on the tools they want to work in, and focus on their code. ALM can help developers ensure that what they are developing is better, but if additional steps are being created for them before they can even code, she said this is considered to be just more roadblocks.

"As organizations embrace DevOps, code becomes everyone's problem, and so developers are starting to care more about ensuring that what they are contributing to the business and that the application is going to give them amazing user experiences and have that great quality," said Emo.

ALM was never intended to be static or inflexible, said Brenton, so developers need to start thinking about ALM as building "more collaboration"—not simply with other developers, engineers and project team members, but with teams working on corporate plans, broader portfolios and business owners. Visibility and transparency are two key buzzwords that will help organizations that want truly fast-moving ALM teams.

"When they are partnering in the selection of an ALM solution, [developers] should insist on a platform that allows them to use their tool set as it exists today or that allows the to migrate to different tools, or adopt new tools as they change the way they operate," said Brenton.

It's no longer a world where a developer throws code over the wall to someone to deploy it. Now, the world developers live in is one where they invest in deployment channels and deployment pipelines themselves.

As a developer writes code, they are thinking about where the code is going to run and how it's going to be maintained or supported. According to Aaron Bjork, principal group program manager at Microsoft, developers need to invest in deployment and understand it because it's their job now.

"Developers are very interested in technologies that allow them to write once and target many platforms, so that's what many developers are paying attention to these days," he said. "We want code reusability and we want to make sure the investments we are making from a tech standpoint are going to stand the test of time across a breadth

continued on page 45 ▸

Microservices with ALM

Microservices are applicable in the modern ALM world as they are helping teams deliver products faster. Microservices introduce some challenges, and yet simplify the life cycle at the same time.

"Microservices do introduce challenges as integrated testing and deployment become more complex and require automation," said Flint Brenton, CEO of CollabNet. "Poorly designed microservices can shift what were previously monolithic applications into the network, but the problem still exists in the form of data marshaling, load balancing and latency issues, and availability and fault tolerance of those services."

ALM can solve this complexity problem by making it easier to find the DevOps pipeline, said Kelly Emo, director of life-cycle and quality product marketing at Hewlett Packard Enterprise. She said that when you have a microservice that is contained, it's really focusing on a specific function or user story.

Instead of having a monolithic application with multiple requirements, there are now pipelines that can manage these specific services to give you clear visibility on how it's progressing.

"You're going to have a lot more data points going into the system, and you're going to have all these pipelines managing these different services," said Emo.

There will be so many data points that the team won't be able to absorb them all, she said. This is where ALM is really aggregating that data. It's been integrated with development, build and Continuous Integration tools, and all that data is flowing into ALM, she said.

Emo said that ALM solutions could start to apply analytics to that data, and that there's a lot of innovation in the industry around analytics already.

"I think it's exactly what the industry needs to support microservices," she said. "So yes, in the beginning it could make things more complex. But I think we as the industry have the opportunity to use analytics to simplify that, and then it becomes much more seamless in terms of Continuous Delivery." ▮ *—Madison Moore*

Is it time to rethink 'ALM'?

BY MADISON MOORE

The traditional application life cycle is no more. Past ALM processes were created in the waterfall age, where large organizations relied on silos to deliver software in a slower fashion. This way of delivering software will no longer work, as there is an emphasis on fast delivery and less time to market. With this evolution, we asked some ALM experts what ALM looks like in the modern software development world, and if it might be time to rethink the definition of ALM.

Aaron Bjork, principal group program manager at Microsoft

"Yes, it's absolutely time to rethink ALM. Why? Simply because the applications we ship today, and the environments in which we ship them, look substantially different from the era in which traditional ALM practices were first established. We ship more frequently: What used to take months, if not years, now happens continually. We ship to new environments: Instead of printed media, we're often cloud-first. And we ship to a new customer: a customer who demands visibility into the road map and plan for the software they're using or buying.

I don't believe however that rethinking ALM means that we should abandon ALM. Instead, it means adjusting our approach to accommodate the needs of this new landscape. Every organization building software, regardless of size and shape, still has a need to gather requirements, plan for what's next, write and share code efficiently, and release with confidence. Our approach to these activities (which are encompassed in ALM) should look and feel different from the approach of the past. If they don't, I'd argue that an organization isn't progressing."

Alex Haiut, vice president of engineering at Blazemeter

"Yes, definitely. I am developing commercial software for over 20 years, and I have to admit that the user expectations for application stability, richness and performance are at their highest level these days. So is competition between the software vendors.

Agile Development, Continuous Delivery and other methodologies are here to help. But methodologies and practices don't work well without tools supporting them. As anyone adopting these methodologies quickly realizes, there's no 'one size fits all' in these things. Each process and methodology must be carefully adjusted to fit the team skills and culture. So are the ALM tools; they should be carefully selected (or crafted) to match the company, team, procedures and culture again.

Experience shows there's rare chance one tool will satisfy all organizational ALM needs, most of us will end up with tool chain containing multiple tools, each one helping specific parts of the process or team. Therefore, if I should pick one criterion to pick the tools, I'd go with integration capabilities. And if we are going to add another one, it'd be reporting capabilities.

Smart, well-developed APIs and other integration features will make multiple tools play well together. Reporting will make the process clear and transparent to all stakeholders, which is an essential part of its success."

Flint Brenton, CEO of CollabNet

"Yes. ALM is a technology category that dates back more than three decades. It is time to rethink it because major contextual elements that shaped our understanding of ALM have changed considerably in the last 10 years. Material changes have taken root in the operational environment, development tools, engineering best practices, and application development methodologies.

So, whether we realize it or not, we are always rethinking ALM. The tools shape the daily activities, the activities shape the culture, the culture shapes the practices and force the previously established processes to find a new model that works to explain, support or inspire practices and promote more collaboration with the extended team members. But some organizational structures are supporting a specific ALM practice as a static model, and they may have forgotten about the original roots of ALM and the adaptive 'change' nature of software development practices.

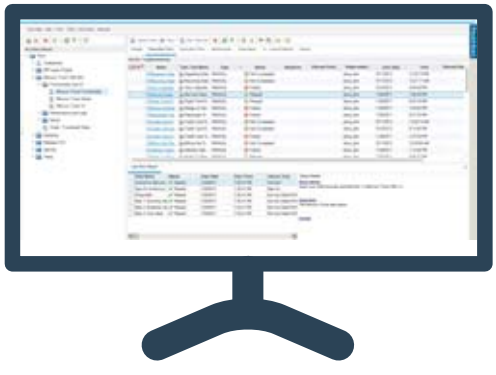
The art of creating great software has always relied on a number of subjective decision-making and collaborative activities relative to the constraints, challenges and requirements of any individual project. Successful teams leveraging a legacy ALM platform have always understood this. But the efficiencies gained by a past generation's centralized, inflexible and monolithic ALM platform that was optimized for a waterfall-only methodology, cannot cope with increasingly fragile and complex data centers, the emergence of global development teams, and limiting variables that complicate projects that we see today."

continued on page 45 ▸

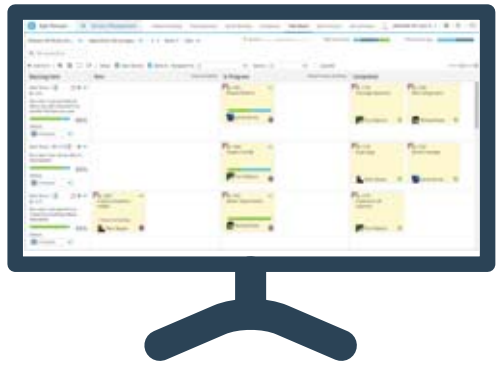
Hewlett Packard
Enterprise

Finally, Agile for the Enterprise

Combining the power and scalability of two industry-leading technologies



HPE Quality Center
Complete Test Management



HPE Agile Manager
Taskboard

Try for FREE today!

hpe.com/software/qualitycenter | hpe.com/software/agilemanager
@hpe_alm

DevTest

The Integrated test management and requirements traceability solution

- Manage your test cases, requirements and automation scripts in a central repository
- Create test plans using previous test results, bug status and requirements
- Execute test assignments and submit bugs into DevTrack, JIRA, Bugzilla or other defect tracking tools
- Track manual and automated results with real-time dashboards and reports

Call 1.800.439-7782 to start your free evaluation today

TechExcel
www.techexcel.com

◂ continued from page 41

of platforms."

While organizations are becoming more agile, developers still need to make sure that they are keeping track of their deliverables and making sure that they match what customers' expectations are, according to Jason Hammon, director of product management at TechExcel.

He said that with agile development, some people moved away from ALM and had gotten less formal in their requirements tracking or test management. This, he says, is great because of the flexibility. But, in the end, you aren't tracking what you are supposed to be doing and validating what you've actually done.

Speed of delivery

Fast delivery is a driver because that's what users demand, and it's how companies remain competitive. But Continuous Delivery requires better and more timely visibility into the engineering team's efforts, not only for operations but also for other stakeholders in the organization so they can understand what the business is delivering and when. This allows them to coordinate on time to market, sell it, and support it, said CollabNet's Brenton.

"This requires your ALM platform to handle the speed of delivery, provide visibility into every step of development for quick escalation, impact assessment, and problem resolution, and provide traceability and accountability for compliance and security practices—all across an increasingly heterogeneous and quickly changing toolset," he said.

"In the old ALM world, we celebrated your birthday, and in the new ALM world we celebrate every day," said Microsoft's Bjork. "It's a mindset shift; when you have a practice like Continuous Delivery or Continuous Deployment, you're thinking about incrementally getting to the finish line instead of getting there in big jumps."

It's more important than ever to find an ALM process or solution that is lightweight and easy to use, according to Hammon. He said that because of the faster release cycles, if people feel that documenting or validating those

continued on page 48 ▸

Is it time to rethink 'ALM'?

◂ continued from page 42

Jason Hammon, director of product management at TechExcel

"I think it actually is time to reexamine ALM. Specifically, it's time to reassess the benefits of ALM and why we use it. Only then can the decision be made as to whether these benefits still apply for software development today.

The primary benefit of application life-cycle management is to ensure that the software delivered matches what was intended. By linking requirements, development tasks and test cases we can increase the chances that all of the stakeholders are on the same page.

With the increase in the speed of delivery and the complexity of software, it's more important than ever to closely track and validate software deliverables. The challenge is to find a process and/or solution that allows teams to manage the software life cycle efficiently."

Kelly Emo, director of life-cycle and quality product marketing at Hewlett Packard Enterprise

"ALM as a process and as reflected in software tooling is evolving to support the aim of high-quality delivery at high velocity. As more organizations adopt agile development and DevOps delivery methodology, the patterns and way that their ALM processes and tools interpret their activity and the data that results from the delivery of software will evolve.

First, we will see more ALM tools evolving their user experience and architecture to deliver functionality to manage Continuous Integration, Continuous Testing and Continuous Delivery, the key elements of an integrated DevOps pipeline. In addition, ALM software will make use of the data that is created in the life-cycle process as well.

ALM tools, looking forward, will integrate tools widely used by developers and testers such as Git for source-code management and Jenkins for Continuous Integration, and interpret and deliver data from those tools with data created within the life cycle itself, to deliver insights to users in ways that enable app development and test teams to predict outcomes, optimize resources and remove latency from key decision making. ALM is rapidly becoming a Big Data challenge, but when leveraged to deliver life-cycle insights, ALM will become pivotal to increase overall quality, reduce rework and grow trust and interaction between Dev and Ops.

Paula Rome, senior product manager at Seapine Software

"Companies should rethink ALM in terms of what they want versus what they actually need—both now and as they grow. Too often, companies only focus on the now. They find a low-cost ALM tool that is actually one part of the tool chain—issue management, for example. It meets their core needs, even though it has a weak workflow, no triggering capabilities, no traceability, can't merge defects, etc.

At this point, most companies start adding on other tools to fill in the gaps. It seems cost-effective, because they're only paying for what they need when they need it, right? The problem with this a la carte approach is that it creates a patchwork ALM solution with multiple points of failure, multiple versions of the same information, and no one to help when the system breaks.

Additionally, patchwork ALM solutions, by their nature, lack end-to-end artifact linking and traceability. Without these capabilities, real-time access to critical relationship information is unavailable, and quality-specific analysis techniques, such as impact analysis, are tedious, time consuming, and often inaccurate.

In the end, they wind up paying more for all the disparate tools they had to cobble together than they would have paid for a single, flexible tool that covers their application life cycle from end to end." ∎

A guide to ALM suites

FEATURED PROVIDERS

BlazeMeter: BlazeMeter ensures delivery of **high-performance software** by enabling DevOps teams to quickly and easily run open-source-based performance tests against any mobile app, website or API at massive scale to validate performance at every stage of software delivery. The rapidly growing BlazeMeter community has more than 100,000 developers, and includes prominent global brands such as Adobe, Atlassian, Gap, NBC Universal, Pfizer and Walmart as customers. Founded in 2011, the company is headquartered in Mountain View, Calif. and Research & Development in Tel Aviv.

CollabNet: CollabNet offers enterprises and government organizations of all sizes the platform to accelerate development and delivery of quality software at speed with its flagship product **TeamForge**. CollabNet is a pioneer in open-source, agile and collaborative solutions for large, distributed software environments. It provides innovative development tools at enterprise scale and agile consulting and training services. CollabNet services more than 10,000 customers, supporting 6 million users in more than 100 countries. It has been recognized for the past 12 years as a SD Times 100 industry innovator in the ALM & Dev Tools category.

HPE ALM Software: **HPE ALM**, **HPE Agile Manager** and **HPE Quality Center** provide a software platform and open integration hub to accelerate delivery of high-quality software at scale. Manage requirements and user stories, developer changes, builds, tests and effects and share and reuse asset libraries and workflows across projects. Support scaled agile with insight and visibility from Scrum team to enterprise agile release. Deploy flexibly on premise or as a service in the cloud.

Microsoft: **Visual Studio Online (VSO)**, Microsoft's cloud-hosted ALM service, offers Git repositories; agile planning; build automation for Windows, Linux and Mac; cloud load testing; DevOps features like Continuous Deployment to Windows, Linux and Microsoft Azure; application analytics; and integration with third-party ALM tools. VSO is based on Team Foundation Server, and it integrates with Visual Studio and other popular code editors. VSO is free to the first five users on a team or with MSDN.

Seapine: Seapine Software's **integrated hybrid-agile ALM suite** enables product development and IT organizations to ensure the consistent release of high-quality products, while providing traceability, reporting and compliance. Featuring TestTrack for requirements, issue and test management; Surround SCM for configuration management; and QA Wizard Pro for automated functional testing and load testing, Seapine's tools provide a single source of truth for project development artifacts, statuses and quality to reduce risks inherent in complex product development.

TechExcel: TechExcel **DevSuite** is a product development life-cycle platform that automates and streamlines requirements, development and QA processes for faster, more frequent release of high-quality products. Whether your process is agile, traditional or hybrid, DevSuite ensures your most current requirements are built and tested. With dynamic linking of requirements to all development artifacts, DevSuite enables full bidirectional requirements traceability from product design through development, testing, bug fixing and release. DevSuite also allows you to completely customize development environments to increase the speed and efficiency of your teams, including custom workflows and rules, personalized page layouts, tailored workspaces with defined access control, specification reports for instant project status, and more. DevSuite also enables you to leverage TechExcel strengths and plug it into third-party applications using RESTful APIs. With DevSuite, you'll more quickly deliver products that are bug-free and include the features, functionality and user experience customers require.

Atlassian: Teams use Atlassian tools to work and collaborate throughout the software development life cycle: **JIRA** for tracking issues and planning work; **Confluence** for collaborating on requirements; **HipChat** for chat; **Bitbucket** for collaborating on code; **Stash** for code collaboration and Git repository management; and **Bamboo** for continuous integration and delivery.

Borland: Products such as **Caliber**, **StarTeam**, **AccuRev** and **Silk** make up a comprehensive ALM suite that provide precision, control and validation across the software development life cycle, and are unique in their ability to integrate with each other—and with existing third-party tools—at an asset level.

IBM: IBM's **Rational Collaborative Lifecycle Management** is designed to deliver effective ALM to agile, hybrid and traditional teams. It brings together change and configuration management, quality management, requirements management, tracking, and project planning in a common unified platform.

Inflectra: **SpiraTeam** is an integrated ALM suite that provides everything you need to manage your software projects. It includes features for managing your requirements, testing and development activities all hosted either in our secure cloud environment or available for customers to install on-premise.

JetBrains: JetBrains offers tools for both individual developers and teams. **TeamCity** provides Continuous Integration and Deployment, while **YouTrack** provides agile project and bug management, and **Upsource** facilitates code review and repository browsing. Tools for individual developers include IDEs for the most popular programming languages on the market, as well as .NET tools for boosting one's productivity, profiling apps and more.

Kovair: Kovair software specializes in the domain of integrated application lifecycle management. Our objective is to make the software development process better, faster and collaborative in a synchronized tools environment. Kovair provides multiple solutions to the market such as the **Kovair ALM Studio**, **Kovair Omnibus Integration**, **Kovair iTM—the Integrated Test Management Solution**, and

continued on page 48 ▸

Building Your Own

Solution?

A patchwork ALM solution introduces multiple points of failure, multiple versions of the same information, and no one to help when things fall apart.

Seapine ALM is a single solution for managing all product development phases and artifacts from requirements and user stories through QA cycles and deployment.

With **Seapine ALM**:

- Know you have **accurate information** with all development data stored in one place.
- Get work done fast with **blazing performance**—even on the largest projects.
- Develop the way you want to, whether **Agile, Waterfall, or a combination**.

It's time to upgrade from your patchwork ALM solution to a fast, reliable, single source of truth.
It's time for Seapine ALM.

Learn more at ***www.seapine.com.***

Seapine Software™

A guide to ALM suites

◂ continued from page 46

most recently **Kovair QuickSync** for data migration between multi-vendor tools when legacy data must be migrated.

■ **Orasi: Orasi** is a leading provider of software testing services, utilizing test management, test automation, enterprise testing, Continuous Delivery, monitoring, and mobile testing technology. The company is laser-focused on helping customers deliver high-quality applications, no matter the type of application they're working on and no matter the development methods or delivery processes they've adopted. In addition to its end-to-end software testing, Orasi provides professional services around testing, processes and practices, as well as software quality-assurance tools and solutions to support those practices.

■ **Rommana ALM: Rommana ALM** is a fully integrated set of tools and methodologies that provides full traceability among requirements, user stories, scenarios, test cases, issue reports, use cases, timelines, change requests, estimates and resources; one common repository for all project artifacts and documentation; and full collaboration for all team members.

■ **Serena Software:** Serena provides secure, collaborative and process-based ALM solutions. **Dimensions RM** improves the definition, management and reuse of requirements, increasing visibility and collaboration across stakeholders; **Dimensions CM** simplifies collaborative parallel development, improving team velocity and assuring release readiness; and **Deployment Automation** enables deployment pipeline automation, reducing cycle time and supporting rapid delivery.

■ **Sparx Systems:** Sparx Systems' flagship product, **Enterprise Architect**, provides full life-cycle modeling for real-time and embedded development, software and systems engineering, and business and IT systems. Based on UML and related specifications, Enterprise Architect is a comprehensive team-based modeling environment that helps organizations analyze, design and construct reliable, well-understood systems. ▮

◂ continued from page 45

requirements are a burden, then they're not going to do it. There is a need to keep a close connection between what the desired project is and what is actually being created, and ALM provides a mean of doing that, he said.

"That's still a very important project in terms of connecting what the business analysts and the marketing folks are expecting to see in the product and what actually shows up when it's released," said Hammon. "With the shorter cycles, it's more important to get it right."

Tools, methodologies and rules of ALM

Rethinking ALM in this modern software development world means keeping those same steps and building on top of them as the company moves toward a more agile way of operating. Hammon said that there are examples of people losing their way in the sometimes chaotic world of shorter release cycles. Formally documenting requirements and having a validation step to them is one rule companies should be concerned about.

While there are many rules or best practices of ALM, there are a few crucial components that testers or project managers should follow. Emo said companies must maintain visibility as they progress through the life cycle, ensuring consistent continuous quality. She said that one of the ways to get continuous quality, security and performance is by making sure you have those ALM capabilities built into the DevOps pipeline.

In terms of methodologies, more and more organizations are paying attention to lean principles and their workflow, said Bjork. He said that streamlining methodologies is the next big movement. Since Scrum and many agile methodologies taught companies to work faster, now they can learn how to do that at scale while also eliminating waste.

When it comes to choosing the right ALM tool, Haiut said to think about what integrates well into your company. He said everyone hates surprises, especially stakeholders who are outside of the development team. The best tools are not only what's comfortable for the team, but what can also provide transparency, he said.

One principle to follow is to define a cadence that fits the culture that's been established, and have it fit into the delivery pipeline, said Bjork. "If you want to move quicker, you've got to be able to deploy quicker, and you've got to be able to deploy with confidence," he said.

And while companies might have their Dev and Ops teams working closer, the modern software development world allows companies to constantly stay engaged with its customers. Customers are the people that will give feedback on what you are and are not doing well, said Bjork, so it's healthy to have a channel to talk to customers.

What's in the future for ALM?

Tools are more flexible and can add value to ALM, but with the new pace of technology and innovation, the industry is rapidly approaching the point where the amount of information that gets generated through ALM is both valuable and a problem, said Emo. She said that because of this, there are going to be Big Data problems and solutions for ALM, sparking a huge jump in efficiency and effectiveness.

ALM will also need to become more strategic as teams leverage the flexibility to securely adapt and adopt what is best for their team, said Brenton. It will have to work best for the team so they can deliver quality at speed, and the ability to deliver working software products rapidly is a "critical weapon for a company to be successful in fast-changing markets," he said.

If companies are rethinking the way they are doing ALM, Rome suggests thinking about what the company actually needs instead of what it wants. She said that in the past, companies would pick a vendor, and it would be like "signing up for a mindset." She said that today, customers and the industry need to have a conversation of what they need, and that as an industry, she said they should be doing a better job at supporting where that wants to go. ▮

Read this story on sdtimes.com

The state of mobile: Exciting times,

Enterprise mass adoption will accelerate mobile software development maturity

These days, everyone has a best friend: Their smartphone.

"On the Web, personalization is a constant struggle, whereas on mobile it's pretty accurate," said Nancy Hua, cofounder and CEO of Apptimize, a mobile A/B testing platform. "You know everything they've ever done. You also know their context at that moment: Are they on the go? Are they inside or outside? Who are they with? The time-of-day effects are pretty big. Context lets you deliver an experience that's a lot more magical."

A "magical" experience molds itself to the user's preferences as well as observed consumer behaviors. Hua notes that people tend to browse shopping sites in the morning, "so you might optimize for adding things to wish lists," while in the evening, shopping happens, so making the "buy" button more visible makes sense.

And increasingly, magic is necessary. Mobile users are impatient with apps they download through stores. Battery life, storage limitations, privacy lapses, security nightmares and competing interests all make going mobile a great money-losing opportunity. Beyond that, "We look at retention, engagement, revenue, virality, funnel and flow through the app," said Hua. "The ones who have biggest gains are the ones who test and make changes all the time."

That said, there is no denying that mobile apps are no longer optional. Where options abound, however, are in the architectural, contextual and application life-cycle models to choose from. Mobile has grown past the dichotomy of Web view vs. native apps, ad hoc vs. cumbersome app store updates, viral vs. instant failure. Enterprise adoption is a huge force pushing for mobile app development maturity. As devices proliferate and unprecedented consumer options abound, Gartner predicts that enterprise software is poised to be the next mass mobile adoption.

The appeal of Progressive Web apps

The way apps are developed, delivered and maintained is poised for a massive shakeup as the market moves past viral consumer apps to encompass mission-critical functionality.

"The big news moving into 2016 is progressive Web apps," said Karolyn Hart, COO of InspireHUB, a mobile charity engagement software vendor in Richardson, Texas. "Google's announcements in early, mid and late 2015 have sent leading-edge developers on the hunt for the next big thing. Progressive Web apps take on a number of issues currently facing native apps, including extending battery life, universal mobile access, and less space on the user's phone. Issues with mobile browsers not being as responsive are already being dealt with, plus customers benefit from not having to make evergreen updates every time there is a change to the phone OS."

Positioning itself to enable enterprise software to make the leap from the cloud to employees' handheld devices in 2016, Microsoft recently acquired Xamarin, the cross-platform .NET development environment. But most agree that cross-platform mobile frameworks like Xamarin, React Native, AngularJS, Cordova/PhoneGap and the like—while they have their fans—are an incomplete answer to the mobile imperative.

According to a seminal June 2015 blog post by Google developer Alex Russell, "Many platforms have attempted to make it possible to gain access to 'exotic' capabilities while still allowing developers to build with the client-side technology of the Web. In doing so, they usually jettison one or more aspects of the shared value system. They aren't bad—many are technically brilliant—but they aren't *of the Web*."

exploding choices

According to Russell, the alternative is a new class of applications that:

- responds to form factor
- can work offline
- have app-like interactions
- refresh in the background
- are secure via Transport Layer Security
- use W3C manifests to be discoverable as apps
- use push notifications
- are installable to the home screen, and
- are linkable, because "The social power of URLs matters."

Why "progressive"? According to Russell's blog, "Sites that want to send you notifications or be on your home screen have to earn that right over time as you use them more and more. They progressively become 'apps.'"

Certainly no one will miss the plaintive request to install a website's native app for a mobile experience. Much of the magic of progressive Web apps comes from the new ServiceWorker

continued on page 52 ▸

◄ continued from page 51

specification, a JavaScript-based replacement for the arcane Application Cache. ServiceWorker lets apps use persistent background processing, intercepting network requests so that the sites that have been visited at least once can function while offline. Push notifications, background sync and adding to the home screen are also features of ServiceWorker, which is primarily a Google/Chrome project and is under consideration by Apple (though simple Progressive Web apps can be implemented for Safari, according to Buenos Aires-based JavaScript consultant Nicolás Bevacqua). Meanwhile, Mozilla Firefox and Opera are already on board.

JavaScript exceeds mobile expectations

Even without progressive Web apps, JavaScript is enjoying new prominence as a mobile enabler for companies providing Web services.

"Software developers have long sought a way to create a portable logic engine where business logic can be written once and then run across multiple platforms," said Alex Balazs, vice president and fellow architect for Intuit, makers of TurboTax. "Attempts using C++, Java and Flash came close, but never quite solved the problem for Web, desktop and mobile. With the prevalence of Web browsers on all platforms, JavaScript has reemerged as a means to build a truly portable business logic engine."

How did Intuit pivot from Web to mobile? In a word: quickly. Balazs describes how it only took a year to be able to offer the full version of its tax-filing software for 30 million customers.

"We created a development platform for Intuit engineers—codenamed 'Fuego'—that has played a pivotal role in our mobile transformation," he said. "Fuego enables the development team to write once and deploy everywhere across the 50,000 screens in TurboTax by delivering user experience as a service."

Development teams are paired with content teams, and their combined efforts are then sent to renderers that would render correctly for each platform. "The Fuego platform that the team developed for TurboTax is now being adopted as a company-wide standard going forward. It has led to a 10x productivity improvement for developers," Balazs said.

Node.js, React Native gain fans

Intuit also credits Node.js, the platform built on Chrome's JavaScript runtime, for platform-agnostic user experience design. "The use of Node.js in enterprises is growing, since it helps large organizations expedite development for multiple platforms by breaking monolithic enterprise architecture into smaller, simpler service components," said Balazs. "At Intuit, we're building enterprise-grade services that accelerate innovation without upending the experiences that millions of customers rely on every year. We're using Node.js as we continue to re-platform to increase speed, flexibility, and deliver new capabilities."

Another option many are excited about is React Native. According to mobile developer Evan Rose, this hybrid mobile application framework built by Facebook has helped him build applications in nearly half the time it takes to build fully native codebases (with no app performance penalty).

Built on top of the same engine that React is, Rose predicts it will eventually be included as an additional import from React, while being easy to learn for developers familiar with React. "There's a terrific community behind React Native developing highly useful packages like a camera plug-in, a slack-like drawer view and many other things you don't get from React Native out of the box," he said.

"You can check out some of the options at React.parts. These plug-ins are now really easy to link with your project by using rnpm [React Native Package Manager], which does all of the file imports and xCode linking."

Achieving native iOS or Android performance with React Native apps all depends on how they are written, according to Rose. "Some of React Native's secret sauce is in the fact that they have two JavaScript threads running: one for UI and then a main app thread. This makes it so that application JavaScript doesn't block the UI and create jank," he said.

Native Apps

PROS: Higher performance, app store approval (which provides safety, security and support), and easy accessibility are among some of the many reasons to use native apps, according to Moovweb. Further, through a variety of alerts and push notifications they keep users engaged every step of the way. By tapping into the native UI components of an operating system, developers can get as close to the native OS bits as possible to capture a unique look and feel that runs quickly and smoothly.

The native app approach can also allow for optimum performance, both online and offline, with the ability to access a variety of an OS' native components, such as the camera, GPS or accelerometer. There is a reason why native apps have been around so long: They offer an end-user experience that is unparalleled by the Web, according to About.com.

CONS: Native apps by definition are developed for one particular mobile platform at a time, such that if you build an app for iOS, it will not function or perform on another device such as Android. This is the native app's Achilles heel.

In today's environment, it may be cost-prohibitive to build, test and support an app for even just one type of device. In order to not alienate a large segment of mobile users, multiple app development groups may be required to build and support native apps across device types within an organization. This approach may be neither cost- nor time-effective. Consider the time it may take to build one app for one device; now multiply that by the types of devices you want to support.

In addition, once the app is completed, it must be approved by the app store before it is put on sale and/or available for downloading. Apps are subject to the will and whims of each App Store operator. Plus, if any app updates are needed (as they always are), they must be pushed through the App Store as well. ▮

—Eric Overfield

Small tweaks matter for mobile development

A/B testing and Continuous Delivery are critical to discovering what makes your users tick

When it comes to mobile apps, getting the user to not only open the app but use it to its fullest is critical to avoiding abandonment. So how do you increase a push notification opt-in rate from a measly 22% to an industry-leading 62%?

Last Minute Travel did it by removing the push notification prompt that appeared when a user initially opened the app. Omer Chehmer, head of mobile communications, and his team replaced it with multiple touch points along the customer's journey. By expressing the benefits of push notifications to the user at the appropriate time—including asking the customer for permission to send updates on potential flight delays after they booked their trip—Last Minute Travel celebrated a push notification opt-in increase of 182%.

The New York Times, long thought to be marching toward oblivion thanks to Internet news, has finally managed the transition to paid online journalism, and is seeing even more success in mobile thanks to recent usability redesigns. A mid-2015 iPhone homescreen redesign not only increased visit frequency, it resulted in users reading more articles and spending more time on the app. According to the company, six months into the new look, new user retention was 60% higher year over year.

Small user experience changes that are A/B tested on customers are critical for mobile success during the initial launch period when the vast majority of new users abandon the app, according to Apptimize, a mobile-first testing startup.

"Retention curve: I think that's the first thing you should think about," said Nancy Hua, Apptimize's cofounder and CEO. "When we first started the company, we put a lot of focus on user acquisition. But if you don't have good retention, you're pouring money into a leaky bucket."

Using her tool, you can not only scientifically test theories about usability and flow, you can also hotfix copy and other minor changes, bypassing the app store review process. Of course, A/B testing (indeed, testing of any sort) still seems aspirational for many mobile efforts. Clearly it shouldn't be, especially with so many options for mobile testing around. Testing also becomes critical in the highly competitive world of mobile apps.

"Successful apps are cloned pretty rapidly. Every random utility app is cloned soon after launch," said Hua. The answer is to keep testing new features–and never assume the app has finished evolving.

MOBILE CONTINUOUS DELIVERY

Patrick Debois hopes you don't think of him as a DevOps one-trick pony. At least, that's what he said in his 2015 O'Reilly Velocity Conference talk, "Mobile continuous delivery—with a DevOps mindset." During the presentation, he listed a vast array of open-source and commercial tools his team uses to build mobile apps that report real-time results to a live television show.

These include:

- Hosted Continuous Integration options for mobile, such as Hosted CI (for iOS and Mac), Circle CI and Travis CI
- Mobile security testing with dexter.dexlabs.org
- App metrics with Fabric
- Flight recording with Flight Recorder
- Scenario testing with Appium
- A/B testing and retention rates with Apptimize
- Ranking with App Annie

—Alexandra Weber Morales

"Another great thing is the ability to seamlessly utilize native components and APIs. The React Native Bridge is extremely easy to use with minimal Objective-C or Java knowledge. In some other hybrid frameworks like Ionic/Cordova, you run into issues with long lists or trying to display a lot of media. You get around that in React Native by using native components, which get much better performance."

Finally, React Native's recently added Android support lets you reuse business logic and most of your UI code, Rose notes. "The team is working on creating abstracted components, which can be used in Android or iOS, but there are still some which only work on one platform (i.e. Navigator vs. NavigatorIOS)," he said. "From a UI perspective, Android apps often have different flows and paradigms, so the platform-specific components to match these paradigms makes sense."

Messaging as orchestration

Cross-platform frameworks will continue to mature, meeting the needs for many enterprise mobile use cases. But another approach is to choose a prebuilt mobile app platform, such as a social network, and run microapps on it.

"Look what Facebook Messenger has done with Uber integration: You can book an Uber cab from within Messenger," said Vijay Sundaram, cofounder and vice president of products for SpotCues. "That's a hybrid approach that they've taken, and it's also in some ways a microapp. Look at Kik Messenger, a very popular messag-

continued on page 54 ▸

Web Apps

PROS: Preferences for Web apps stem from their ability to offer affordable cross-platform development solutions. The main appeal of going progressive is the ability to code once for multiple devices, in addition to saving both time and money. Going progressive also alleviates the burden of App Stores by removing delays when updating a mobile app. Service workers increase the ability for the app to work despite limited internet availability and quality.

As Alex Russell stated at the Chrome Dev Summit 2015, PWAs are "low friction"—they don't require as much clicking and loading. A recurring roadblock with those developing native apps is the amount of time and money it takes them to develop an app and then market it. The low-friction environment enforced by the Web can increase users, while providing cost savings for development.

CONS: As promising as PWAs are, the techniques are new and not fully vetted. PWAs still do not provide access to all native features such as the camera and GPS. They do not work on older browsers/devices. Also, as painful as getting a native app approved in an App Store can be, once in, the App Store does provide a measure of credibility. With PWAs, app developers must find ways to get visitors to find and use their Web app outside of the App store.

PWAs do show great long-term promise, but what happens when we combine native and Web apps? Can we get the best of both? Possibly. —*Eric Overfield*

◂ continued from page 53

ing app. They have a bunch of HTML5 apps that live in the Clay.io marketplace. Messaging apps are moving from pure chat to becoming orchestration platforms. They're more participatory, with a highly integrated experience."

His company's offering is a customizable context and location-based social network that uses Wi-Fi or geofencing to connect people and apps. While the app is native, the microapps that a corporate human resources department might install within it are simpler HTML5-based fare, often built from templates provided by SpotCues. The difference between this and other location-based apps like Tinder or Foursquare is that context is layered on top of location for a more compelling user experience. "Spot owners can offer content and features customized for that location, whether it's a stadium or a multinational corporation," said Sundaram.

SpotCues' social networking app is an example of HTML5 apps synergizing with native-code software.

But if context awareness is mobile magic, data is an important ingredient in the potion.

Why flexible data models work for mobile

The data requirements of mobile apps are different from legacy enterprise software: They must scale to millions of users, not break despite constant revamps in a competitive world, then gather and use unstructured data. NoSQL data on mobile is a relatively new development, however.

"The biggest thing we saw last year was that we spent a lot of time educating developers who were asking, 'What is NoSQL?'" said Wayne Carter, chief architect of mobile at Couchbase, a NoSQL document store vendor. "In the client-side mobile world, they didn't know what it was. NoSQL grew up on server-side, utilized by back-end engineers. We were explaining why data flexibility is important, why bringing data to the app tier allows you to evolve apps faster and be more iterative."

Further, local databases can enable offline app capabilities. "Offline-first is the hottest trend in mobile-first movement," said Carter. "That's about removing the barriers to delivering functionality and features that were bound to the availability of the network or Internet."

Building an app on top of a local database like Couchbase Lite, which the company claims is the first mobile NoSQL database, lets the app continue to operate offline while the database reconciles any differences that occur between lapses of network connectivity, according to Carter.

But another architectural approach is the headless app, or Data-as-a-Service. "If you take Couchbase Lite out of the picture and just use our stack as a microservices or services stack, you can configure the gateway layer to expose secure REST, stream and batch APIs to the Web," said Carter. "It means you don't have to build a middle tier. It's

Hybrid Solutions

PROS: Hybrid apps allow for rapid development, while still encasing desired functionality and design. Hybrid apps can access native features because they are hosted within a native app. While the base of the Hybrid app is native, the content is built from coding used for the Web, thus most changes won't have to go through the app store, saving both time and money.

CONS: Hybrid apps are still not as tailored as native apps. They will always lose to native apps in terms of speed and responsiveness. While Hybrid apps do offer a native feel, they are never truly native. Like native apps they must be downloaded to your device, sometimes an unappealing feature that pushes others to go the more progressive route. In addition, WebView requires Internet access unless you are using HTML5/service worker/caching. —*Eric Overfield*

Options for building hybrid mobile apps

The hybrid app world continues to be where mobile app development is headed at the moment. A solid number of frameworks, open-source toolsets and platforms are gaining sizable user bases to create mobile apps.

Apache Cordova: Introduced in 2012, Apache Cordova (formerly PhoneGap) is an open-source framework that provides a mobile development framework using HTML5, CSS and JavaScript. Cordova allows for cross-platform development without regards to each platform's native language. Custom applications execute with a wrapper, provided by Cordova, tailored to each device. Using API bindings, the wrapper can communicate with a device's features while the apps then communicate with the wrapper.

Ionic: Ionic is an open-source framework built on top of Cordova that uses AngularJS to provide a native look and feel for apps. These apps use Web technologies such as HTML, CSS JavaScript while also being cross-device ready and available in an app store.

Xamarin: Xamarin, created in 2011 and recently purchased by Microsoft, provides a platform to build and design native mobile apps for different device types with ease while only having to maintain one codebase. Xamarin uses C# as the common language, thus it is great for .NET developers, yet can then be used to publish native apps for iOS, Android and Windows. Write once, use anywhere for sure, when Xamarin also allows for a WebView that can then be combined with PWAs to leverage their appeal as well.

React Native: React Native, an open-source project maintained by Facebook, is similar to Xamarin in that it provides a platform to build cross-device applications with one toolset. Based on JavaScript and React, React Native is used to create a truly native app (it's not just JavaScript/HTML running in a WebView). "React Native helps developers reuse code across the Web and on mobile. Engineers won't have to build the same app for iOS and for Android from scratch, reusing the code across each operating system," wrote Margi Murphy for Techworld.

Trigger.io: Trigger.io is a platform like Cordova and Xamarin that provides cross-device development for iOS and Android. The primary cross-platform language in this case is JavaScript, but Trigger.io offers a more feature-rich API (including UI modules) than many of their competitors. ▮

—Eric Overfield

Eric Overfield is a Microsoft MVP, and president and cofounder of PixelMill, a digital branding consultancy specializing in Responsive Web Design, UI/UX and branding for SharePoint websites and portals.

also called layer consolidation, and it's gaining popularity. We're excited to start talking about it this year."

Always the afterthought: Security

Meanwhile, all that data must be encrypted, both at rest and in transport. Indeed, the very collection of data should be carefully considered, given that keeping precise location information, for example, can put an app developer at legal risk. Just ask any software vendor that stores location data if it's ever been subpoenaed in a divorce case.

And the problems will only get worse as "data exhaust" from mobile users is hoovered up by governments, programs and attackers alike. That's why professional security is a mandate.

"First things first: You are probably not a cryptographer. I'm not a cryptographer. It's easy to think that you understand the subtleties of an encryption algorithm or to copy and paste crypto code from somewhere online, but you will generally mess up if you try to do crypto yourself," writes David Thiel in his new book, "iOS Application Security: The Definitive Guide for Hackers and Developers." "That said, you should be aware of the Common Crypto framework, if only so you can tell when other developers are trying to play cryptographer," he continues, recommending that the only method you should play with is CCCrypt.

Because it supports bad encryption methods such as Data Encryption Standard, and because it lets the developer switch from the default cipher block chaining to Electronic Code Book mode, the framework is dangerous. According to Thiel, who works as a penetration tester, he still sees this happen often.

Three quarters of all mobile security breaches are due to misconfigured apps, Gartner says. In the wake of the FBI's case against Apple in the matter of cracking Apple's own file system encryption for counterterrorism purposes, the need for application-level security has never been stronger.

"I think people are watching that case. It will definitely change the way they build apps," said Couchbase's Carter. "They're not going to lean on the device manufacturer to build the security in. In the banking and medical fields that's already the case: They need data-level encryption."

What else is new?

With WiFi direct, iBeacons or NFC complicating the wireless communication field, the attack surfaces are only going to expand. But security will always be less exciting than the new ways our devices can anticipate our needs, as well as the proliferating SDKs to help developers achieve them. "Integration of various technologies like camera vision, voice recognition and machine learning will help to improve user experience by allowing the user to perform complex tasks without having to reach out to the device," said Dhaval Sheth, senior software engineer at Events.com.

As mobile apps become ever more predictive, progressive and responsive, we eagerly wonder: Will we be best friends forever? ▮

Read this story on sdtimes.com

What's your mobile device

BY MICHAEL HACKETT

Mobile apps are a necessity for companies of all sizes, and apps are getting more complex all the time. That along with the dizzying array of devices requires a well thought-out mobile testing strategy. And it will involve a bit of risk/reward analysis.

Mobile apps come with inherent risks. For usability, compatibility and responsiveness testing, what might be considered a minor issue on a laptop could be critical on a mobile device. People are generally hurrying, multitasking and have limited time and attention spans when using mobile devices, so it's not just bugs in apps that aren't well tolerated. Buttons, menus and forms that are easy to access on a desktop can be small and frustrating to use when resized for mobile. Testing too many devices creates unnecessary expenses; too few devices risks lost revenue from app abandonment. However, taking time to understand the device ecosystem and the customer the application is designed for will enable creating a test strategy that will balance risk and return.

Michael Hackett is cofounder of LogiGear, where he leads the company's training operations division.

Platform matrix

The diversity in devices, operating systems and screen resolutions makes determining the right mix of devices to test complicated. A little basic data analysis will provide a lot of insight into determining the best device matrix. Three manufacturers account for 80% of devices used in the U.S.: Apple (43.5%), Samsung (28.7%) and LG (8.2%). Using that information and looking at specific target demographics can give a pretty good composite picture of the devices predominantly used by them (which will provide insight into the operating system version), and hence which ones to focus the majority of testing on. Also, the product type (such as business vs. consumer apps or games) will influence the target devices.

After identifying the device matrix, there is also the option to use a mix of emulators and real devices. The testing implications of when (and when *not*) to use emulators vs. real devices are large and complex; hardly anyone would argue that nothing takes the place of testing on actual devices. Holding the device is everyone's wish. Seeing page load and performance issues on the real device is the most efficient, but we know we can't physically test every device. Usability testing on emulators and browsers with any extensions is getting better, but won't always represent what will be seen on the actual device. Emulators can be good for testing new functionality or a new component design, and they have some advantages over using actual devices. Logging faults and capturing screenshots are much simpler when working from a desktop, and some conditions that are hard to duplicate on real devices, like low battery power, are easy to simulate.

Emulators also tend to be slower than real devices. Depending on what type of app is being tested and whether tests are manual or automated can limit testing on emulators. Native apps talk directly to the operating system, while Web apps talk to the browser, which talks to the OS. The more layers there are, the slower the response time. By being aware of the limitations, selective use of emulators is an option to increase test coverage with minimal cost.

testing strategy?

Test execution

Normally it is not practical or cost effective to conduct full testing or full functional testing on multiple devices. A practical approach is running a full set of tests on one or two primary devices, and then running the smoke test on additional devices to identify any obvious issues. However, it depends on the nature of the application. If the app is cutting-edge and can possibly stress the device's capability (processing power, memory, GPS, or other device-specific hardware), then more extensive testing is in order.

One thing to keep in mind when running basic tests is that most handheld mobile devices give priority to the communication environment. For example, an incoming phone call always receives priority over a running application. This makes it important to test the various events and the OS' multitasking ability.

A mobile testing strategy is not complete without testing the integration between the application and back-end system. This is especially true when the release cycles of mobile apps and back-end systems are very different, which they often are.

Manual or automated

A lot of basic compatibility and basic functional testing can be done efficiently with manual testing, but when it comes to testing lots of devices and applications that need to be retested frequently, automation can be an efficient way to scale. The efficiency gain will depend on the experience and skill of the automation team—the standard disclaimer "results may vary" is even more applicable to mobile test automation due to all the variables. Also, various test automation tools will impact your choices of emulators vs. real devices.

Device management

A big challenge of mobile testing is sourcing and then management of devices. Creating the initial matrix is just the beginning. It's common for each manufacturer to introduce three or more new devices each year, and, on average, devices are upgraded every two years. For most companies this makes it impractical to maintain an inventory of devices. The growing numbers of cloud service providers make it possible to completely "outsource" device management, and are a good way to go most of the time. However, there are limitations to relying solely on device rental. An option is to own a manageable number of the key devices for a majority of testing and then utilize devices in the cloud for basic compatibility and functional testing. The knowledge and research for doing this is a big task.

Fully outsourced option

Completely outsourcing mobile testing is a strategy that works well for a lot of organizations. This eliminates the challenges and headaches of managing and maintaining an inventory of mobile devices. Firms with mobile specialists typically understand the unique device and emulator testing nuances, and likely have mobile automation expertise as well. Better firms, because of their experience, can also help develop the device and testing matrix that will provide the optimum test coverage at the lowest cost.

Mobile is rapidly becoming the primary user interface; with the Mobile First movement, it already is the primary interface, which means mobile testing will continue to increase in importance. Applying a thoughtful approach and rational analysis will go a long way in developing a mobile strategy that will provide the right level of testing. ▮

Read this story on sdtimes.com

FREE TRIAL

DocuVieware

Universal HTML5 Viewer & Document Management Kit

supports nearly 100 file formats

- zero-footprint solution
- super-easy integration
- fast & crystal clear rendering
- fully customizable UI look & feel
- mobile devices optimization
- annotations, thumbnails bookmarks & text search

HOT FEATURES IN THE NEW MAJOR VERSION

- Office Open XML (.docx) support
- TWAIN acquisition
- PDF form fields interactions
- Custom snap-ins
- Higher speed and lower memory usage

Download the **Free Trial** and check the **Online Demos** at www.docuvieware.com

Code Watch

BY LARRY O'BRIEN

Larry O'Brien is a software developer who lives on the Big Island of Hawaii. Read his blog at www.knowing.net.

Those who can, code

If it were illegal to program a computer, I'd have a machine under the floorboards. I sold my first program when I was 16 years old, in 1980, and with any luck I'll be making my living this way for another couple decades. I've been trying to improve my craft for longer than some readers have been alive, but still the other day I read some code that made me feel like a fraud for even claiming to be in the same field as that programmer.

Being a programmer is as close as a human can come to being a magician. You conjure, by concentration and will, a string of arcane symbols that your silicon brazier converts into anything that relies on information. When I was a kid, it was a trope in science fiction that computers were limited to uses of pure, formal logic ("They deal only with 1s and 0s"). Wrong! Our industry is a great unending field of rich soil, and all of our accomplishments are just the first shoots of grass.

As I write this, my wife is downstairs, immersed in a virtual fight across a post-apocalyptic wasteland with a group of allies, the nearest of whom is sitting on a couch 3,000 miles away. On a whim, I could stop mid-word in my writing, drive to a cafe, and pick up the sentence by tapping with my thumb on the screen while waiting for a coffee. For that matter, I could dictate while driving and have that stream of text available to me before I made my order (via a subscription to Nuance's Dragon Anywhere, which I honestly don't use nearly as much as I intend to). An epic battle is being waged between the greatest Go player of his generation and a system that combines Monte Carlo Tree Search (essentially, a random walk) with deep neural nets (no predefined rule structure or semantics). As far as I can tell, there's no reason to think that AlphaGo (and similar architectures) cannot grow superhumanly competent simply by competing against variations of itself. Oh, and we also write code to help our companies deliver value.

But while non-programmers live in this brave new world, with its digital over- and underlays, only programmers can call the thunder and harness the lightning. In our day-to-day work we get hints of mystery and small hits of reward, but too rarely do we get the unbridled glory of the fans spinning, the console filling up with long lines of "..." to assure us the calculation continues, and then some number astonishingly close to 0 or 1 telling us that, somehow, our code has found a solution that we couldn't have found in a hundred years.

I remember that first astonishment over a program I wrote that solved an optimization problem, but unlike the cliché of never being the same as the first time, equal and greater thrills have come to me over the years (interesting algorithmic challenges are not nearly as common as the textbooks say, but they're out there!). We are as privileged in our lives as those who witnessed the harnessing of fire, or who lived in the great cities of Europe during the Renaissance.

I've also had the privilege of sharing my perspective over the years. In the early 1990s, I edited a few programming magazines and worked with Ted Bahr and Alan Zeichick: the B and Z in BZ Media. More than a decade ago they and editor David Rubinstein were kind enough to give me this column and a free hand to write about the challenges and joys of software development. I'm grateful to them, and the eternally patient Adam LoBelia, for their forbearance on some of my topics and my tardiness on some (many) of my deadlines.

We are as privileged in our lives as those who witnessed the harnessing of fire.

There's an old saying that goes, "Those who can, do. Those who can't, teach." Or, perhaps, "Those who can't, write columns and consult." My deepest thanks go to the readers who have mostly been too polite to stand up and shout "How dare you spout such gibberish?"

My impolitic views have occasionally caused some heartburn to management, but Bryan Costanich and other executives at my company have always forgiven my excesses. That works at a small company that has a narrow focus. But, as has been covered in SD Times, my company was recently acquired by a much larger one, where it would be vastly harder to avoid stepping on toes and where people mistaking my stupid opinion for company policy would have greater consequences.

So this is my last "Codewatch" column. I still have many opinions about the right and wrong ways of writing software, but it all boils down to this certainty:

Those who can, code. ▮

Read this story on sdtimes.com

Andrew Phillips is vice president of DevOps Strategy for XebiaLabs, a provider of software for Continuous Delivery and DevOps.

Guest View

BY ANDREW PHILLIPS

Increasing software deployments

More and more enterprises are realizing that a streamlined Continuous Delivery pipeline is an integral part of extracting maximum business value from the DevOps movement. The potential benefits of rolling out more frequent software deployments are enormous, but speed, agility and innovation must be balanced with stability and quality. Refocusing everything on delivering customer value quickly is much easier said than done.

How do you overcome the challenges of implementing such a massive change in a large enterprise? How do you shift mindsets and find an effective strategy? Every business is different, but here are some practical tips to keep in mind that worked for ING Bank.

1. Simplify and streamline. Complexity is your enemy if you really want to be agile. If you can standardize products and build simple services, then it's much easier to deliver quickly. Develop shared services that will work across different countries and portals. Always look for ways to simplify what you're doing and streamline processes, starting with your IT landscape.

It's important to remember that your Continuous Delivery pipeline is also software. You have to maintain it carefully.

2. Start small. Don't try to implement a full Continuous Delivery pipeline on day one. Start small and create the feedback loop you need in order to learn and improve. What is the minimal viable product for the business? What is the minimal viable product for IT? What needs to be in place for you to get started? It's only by beginning with these small steps and getting feedback that you can work out the right strategy.

3. Focus on adding value. Remove obstacles so that your engineers can work on developing valuable software. Figure out where you can automate repetitive operations activities and testing. Keep compliance in mind from the outset. When changes are tested automatically, you can get fast feedback that shows you how to improve, keeping the focus firmly on adding value. Your Continuous Delivery pipeline is a means to an end, which is to deliver great software to the customer. Never lose sight of that.

4. Build and maintain your pipeline. It's important to remember that your Continuous Delivery pipeline is also software. You have to maintain it carefully. You need to upgrade swiftly, but be aware of compatibility challenges between tools. As you start with an automated build process and stir automated testing into the mix (followed by the QA process and automated deployment), the management becomes complex. You are building a system that should evolve and improve, not something that's set in stone.

5. Orchestration and the big picture. You need a vision that allows you to orchestrate, identify issues in advance, and mitigate risks. If you can't accurately analyze what's going on inside your Continuous Delivery pipeline, then it's hard to improve the development process. Release orchestration can give you the insight and control you need. Senior Analyst Amy DeMartine of Forrester Research recommends that companies automate the delivery pipeline to improve speed, flexibility, visibility and control. "Creating a standard delivery pipeline as a service removes variability from the delivery process, creating checkpoints where you can apply visibility and control. Visibility across the entire pipeline gives an easy and instant view of release health," she said.

The same principle that prizes fast end-user feedback in agile methodology also applies here.

6. Continuous improvement. When you have all this data, you can use it to identify bottlenecks in your process and work out how to remove them. Visibility is also good for cohesion, encouraging the whole team to pull together around a shared goal. Where can you speed things up? What can be tweaked to reduce the cycle time without impacting software quality? You should always be looking for ways to streamline the release process, but understand that it takes time and effort to improve.

7. Prove and challenge. Compile evidence as you work to improve your software delivery process. It should be clear that each step you take provides some business benefit. Transparency makes it easier to audit and ensure compliance, but it also helps to secure a wider buy-in across your enterprise. Armed with evidence, you can challenge other departments or existing processes that may set barriers to even greater speed and efficiency.

These attitudes and principles will help you to focus on delivering the best software possible quickly, regardless of the apparatus you use. If you can propagate the right mindset within your enterprise, you're on the path to accelerated software delivery. ▮

Read this story on sdtimes.com

Analyst View

BY AL HILWA

Al Hilwa is program director of application development software research at IDC.

Microsoft and the new market realities

Microsoft releases SQL Server for Linux. Microsoft joins the Eclipse Foundation. Microsoft strikes a deep partnership with Red Hat. Microsoft open-sources .NET and C#. Microsoft releases Office for iOS. At this point we should collectively let our jaws rise to their natural closed position and understand that the game has changed.

The reality is that Microsoft means business as a multi-platform open-source player. In fact, we should have every expectation that in the future Microsoft will release more big products for Linux and more technologies in open source. The question is what has changed and why is Microsoft doing this? The simple answer is because the market has changed.

In the new cloud and devices world, what matters is not the software licenses you sell, but the volume and value of services and devices you support. Amazon has proven this formula with the success of AWS, and Apple and Google with the success of iOS and Android. To be clear, software continues to eat the world, and the provisioning of great cloud services and the making of great devices requires constant innovation and evolution of software IP. But the value created with the software is no longer monetized exclusively with a license sale. Instead, it may be monetized with cloud usage fees (AWS), subscriptions (Adobe), advertising (Google) or devices (Apple).

We are witnessing Microsoft execute a long-term shift to wean itself off license-based software monetization to a broader set of monetization strategies. Enterprises and consumers don't want to own software like they used to, having learned that the perpetual licenses afforded them little in the way of control. Enterprises are now more comfortable renting software and letting its creators manage it. Similarly, consumers are comfortable paying for shiny new devices every year or two, and buying apps or app subscriptions. Vendors have to adapt to this shift, and Microsoft, to its credit, has.

Azure is a full-service cloud that is intended to compete for every cloud workload. Providing a diversity of Linux images to run enterprise apps is an imperative for business success. That Microsoft products like SQL Server have to come to Linux over time is also an imperative if these products are to compete on an equal playing field with multi-platform alternatives. We should notice that as Microsoft transforms and the market business models change, the platform wars remain alive and well.

The platform wars are not going away

Eclipse traces its roots to efforts inside IBM to battle Microsoft's encroaching inroads in application development in the late 1990s. Microsoft's low-priced Visual Basic and later .NET and Visual Studio tools were winning developer hearts and minds in a world of more expensive Unix IDEs. IBM made a decision to turn the Eclipse tools framework into open source and later formed a foundation to evolve it. The effort largely accomplished its mission of creating a rich tool ecosystem for Java.

The strategic battles over tool platforms have not gone away, but have morphed into cloud platform wars, where IBM is moving fast to become a top full-stack player, and also into language wars, where IBM's partnership with Apple is pushing the recently open-sourced Swift language into cross-platform mobile development to compete with Microsoft's C# and its Xamarin acquisition.

As Microsoft transforms and the market business models change, the platform wars remain alive and well.

Microsoft SQL Server traces its roots to a partnership with Sybase to support OS/2 in the late 1980s. Sybase pioneered a client-server model for its Unix-based relational database, and Microsoft wanted it for the new operating system. After the 1990 breakup with IBM over OS/2, Microsoft proceeded with Windows and acquired code rights for SQL Server from Sybase to evolve it exclusively for Windows—until last month, when a Linux version was announced.

While by now the SQL Server code has been effectively 100% rewritten (at least once), it is a point to marvel that its lineage goes back to Unix. Being available for Linux will ensure that the database wars will continue no matter the OS or cloud. The difference now is that Microsoft is playing without a handicap.

Those of us observing the market for a couple of decades may not stop marveling at the broad shift Microsoft is making, but in the context of new cloud and devices economics, this is really the only sane path forward for the company can take. ▮

Read this story on sdtimes.com

David Rubinstein is editor-in-chief of SD Times.

Industry Watch

BY DAVID RUBINSTEIN

Are you paying too much for software?

People can find out in as little as 15 minutes if they're paying too much for their auto insurance. There's even a little green gecko to tell them so.

Determining if you're paying too much for software, though, might be a more complex task. Failure to understand and manage your licenses can lead to staggering costs, and even risk to your organization.

A recent survey by Flexera Software, a software licensing solutions provider, reveals that a large percentage of companies are out of compliance with their software licenses, meaning they have more software installed than to which they're entitled. The study also found that 93% of organizations claimed to be spending on software they're under-utilizing—so-called "shelfware." This kind of waste is the most common expense, and according to Flexera, "is running rampant in enterprises."

Enterprises are paying as much as 25% more than they need to, because 25% of what they pay for isn't used.

"Clients have waste and own more software than they need, and with other software, they're using more than they've paid for," said Ed Rossi, vice president of product management at Flexera. "The ways that software can be installed and distributed are difficult to track."

There are a number of reasons why organizations pay for software that ends up not being used, and most of them come down to a lack of software asset and licensing management, Rossi said. Say a person leaves his job. In a development shop, this could mean an IDE instance or a build tool is sitting idle while the company searches for a replacement for the developer. But when one is hired, the company will often provide a newer, updated computer on which to work, and then license more tools while still paying for the other instances.

Or, Rossi pointed out, when companies add server capacity, they could be doubling the use of software without knowing it due to the complexity of much of today's licensing. "This," he said, "is exacerbated by virtualization. You can easily lose track of licensing associated with that."

Flexera's survey focuses on proprietary, commercial software, and does not look at open-source licensing, which Rossi said "has its own unique challenges."

So, he said, does the growing trend of cloud-hosted software, even as he acknowledged that the vast majority of licensing today remains perpetual and on-premises. "There is more subscription and Software-as-a-Service being seen," he said. "This can address in theory the problem of compliance. With SaaS, you have monitoring. You pay for 100 users, and the 101st user can't log in."

But the other side of that coin is buying a SaaS product for 100 users, but only 60 employees are using it. "If you don't make use of what you licensed, you'll never recover that money. With software you own, you know you'll install and get value and benefits of the product," said Rossi.

He made a point to say that asset management can be an important part of an organization's cybersecurity strategy. By ensuring that only licensed software can be installed and executed, it cuts down on the risk of malicious attackers finding software that can be exploited from the outside.

So what's the bottom line on all of this? According to Flexera's 10th "Key Trends in Software Pricing & Licensing" report, for 2016, enterprises are paying as much as 25% more than they need to, because 25% of what they're paying for isn't being utilized.

Rossi did note that vendors are increasing the number of audits they're doing of their customers to help them save money. That is a change from the old days when over-licensing was overlooked by vendors who were profiting from unused software. But increased audits can be problematic. "It can put a damper on the relationship [between vendor and customer], and it's taxing in a number of ways. And then, from a straight-up dollar perspective, it's an unplanned expenditure," he said, that has not been budgeted.

Where companies really get hit is with "true-up" costs of licensing, which apply when vendors find that companies are using more software than they've paid for. "The costs there can exceed US$1 million or more," Rossi said. The study showed that 20% of respondents admitted to paying more than $1 million, with 2% admitting more than $10 million in true-up costs."

So it might take more than 15 minutes, and there's no gecko to guide you, but your enterprise should get a handle on this and find out if you're spending too much on your software. ▮

Read this story on sdtimes.com

Attend

SPTechCon
The SharePoint Technology Conference

June 27-30, 2016
The Sheraton Boston

Register Early and SAVE!

"This is the most informative conference I have been to in years. The technical discussions gave me a much better understanding of direction, advantages and challenges we face with this massive platform."
—Jamie Tyndall, Manager, Application Development, Business Information Group

Learn what's new in SharePoint and Office 365!

Whether you want to learn about what's coming in SharePoint 2016, are still making the most out of SharePoint 2013 or even 2010, or getting started with Office 365, you will find the SharePoint and Office 365 training you need at SPTechCon.

"This was a great conference that addresses all levels, roles and abilities. Great variety of classes, great presenters, and I learned many practical things that I can take back and start implementing next week."
—Kathy Mincey, Collaboration Specialist, FHI 360

THESE POPULAR SESSIONS ARE BACK!

- Branding Modern SharePoint
- Building Simple Dashboards in SharePoint
- Creating a Great User Experience in SharePoint
- Simplifying File Organization with Enterprise Keywords
- Cool Dashboards, Charts and Visualizations for Power Users
- Tackling Search – How to Create a Winning Search Strategy

STAY CURRENT WITH NEW SESSIONS!

- Hybrid Dilemma: Dividing Content Between Cloud, Office 365 & SharePoint 2016
- Power User Tools of the SharePoint Trade
- Stand Back, We're Going to Do (SharePoint) Data Science
- Demoing Live Protection – DLP in SharePoint 2016
- Building a Native Mobile SharePoint App with React Native
- Navigation: A Step Towards Success in SharePoint

www.sptechcon.com

A BZ Media Event

MORE THAN 50 CONTROLS

FOR XAMARIN.iOS, XAMARIN.ANDROID, AND XAMARIN.FORMS

ESSENTIAL STUDIO FOR XAMARIN

- The most feature-rich chart and data grid components available.
- Create cross-platform mobile apps in C#.
- Design an attractive native UI for any device.
- Reuse your existing .NET code assets.

Visit us at **Xamarin Evolve** in Orlando, FL
April 24-28

Also available for free as part of the Syncfusion Community License!

Get started today!

www.syncfusion.com/sdtxamarin

Syncfusion®