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7 ways APIs, microservices, and DevOps can transform your business

Co-edited by
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FOREWORD

Ross Mason

We've all heard the phrase, "Change is the only constant." It has never been more true than now, where nothing stands still and digital disruptors are changing the pace of business at an alarming rate. As a result, organizations are increasingly looking for ways to become more agile. This has left us with a variety of technology buzzwords, from microservices to DevOps to digital platforms to APIs, all promising great gain.

In a buzzword-laden landscape, it's worth asking which are worth the cost and time to implement. Which actually provide enterprise value? The answer is that they all could—or none could.

The type of transformation enterprises are looking for isn't a simple matter of buying software and optimistically hoping that it will magically transform the issues in a business. To get good at constant change and thrive in today's hypercompetitive business environment, organizations need to be deterministic and create an organizational capacity for change.

This means leadership needs to set and frequently reinforce the expectation that roles and processes need to change too, in order to support a new way of operating. It also means leadership and their teams need to define how the changes will be measured so that everyone is on the same page around what is working and what is not.

In this book, we will present several points of view on DevOps, microservices, and APIs, all of which are designed to help you create that organizational capacity for change. The pieces in this book will serve as thought starters to help you reach your digital transformation goals.

It's time to look beyond the buzzwords and make the tech trends serve the larger enterprise. Don't let fear of missing out get the best of your judgement; make these trends and technologies uniquely work for you.

APIs, microservices, and the changing role of IT

BY ROSS MASON

To succeed in today's digital economy, organizations need to drive at a very different clock speed and embrace change in their customer's market, competitive landscape and products. Below are five technology trends that I predict will have a major impact on businesses.

1. The changing role of IT

With new digital disruptors knocking down the door and competition growing fierce across all industries, I predict we will see an uptick in organizations making an effort to change the way they operate internally to innovate more quickly at the edges. The role of IT is fundamental to this organizational change, as it starts with IT unlocking core systems with APIs and then working cross-functionally with development teams to encourage and empower them to build some of their own solutions using IT-provided,

self-service assets like APIs and templates. The broader development team is also encouraged to add new assets or improve existing assets, scaling the network effect of these assets.

Aligning the broader business around the same mindset fosters a collaborative environment, where teams will automatically inquire into what assets exist that can accelerate their current projects, or what assets don't exist that they can create for others to reuse in future projects. As the asset base grows, more teams become self-reliant and can drive new products to market faster. With consumer expectations changing frequently, organizations require a new IT operating model to build and iterate faster to stay competitive. Taking five months to build a mobile API that adds a customer-expected service and then another five months to implement the change won't cut it any longer.

2. The rise of internal API economies

I predict we'll see more organizations participate in the external API economy by opening up services to third parties via APIs in an effort to drive revenue by joining as many value chains as possible. According to a Harvard Business Review article, Salesforce generates 50 percent of its revenue through APIs, Expedia generates 90 percent and eBay generates 60 percent, showing that APIs are real revenue drivers if leveraged properly. Many banks, for instance, are starting to leverage APIs to not only unlock data from core systems but also to build whole ecosystems around their product offerings. With ProgrammableWeb's directory now surpassing 16,500 open APIs, the opportunities to participate in the external API economy are only growing.

However, in order to participate in the external API economy, organizations first need to establish an internal API

economy. This is accomplished by using APIs to help remove the limitations of legacy systems and empower the broader organization to be self-reliant. As a result, organizations can move faster, be more agile, deliver products and services more cheaply and quickly and react to changing market conditions.

3. API security is now a top-level concern

The role of APIs in securing enterprise data is hugely important, yet undervalued. Imagine a house with many closed doors and windows that represent access to enterprise data. Over the years, people have likely opened up most of the windows, the back door and even dug tunnels to gain access. With all these visible and hidden points of entry, it's extremely difficult to lock down the data, understand who uses it, where they use it and where it goes when it leaves the four walls of the enterprise.

The internal value of APIs is to provide a single entry point for all data sources, removing any unwanted back doors, windows and tunnels. IT can make sure access is only gained through the front door, or the API, which is secured by design. Secured by design means an API would never be released that doesn't have credentials that are signed and regulated. While it's beneficial to have data move around the enterprise freely to speed up efficiency, IT needs to govern and control it and even shut it down if the information has been syphoned out without proper authority. I believe more companies will start to mitigate data risk internally with APIs.

4. Microservices architecture keeps gaining traction

The challenge for organizations is understanding how they will build and leverage their microservice architecture. Do individuals build the exact services they need every time they need them (e.g., Netflix)? Do organizations form small teams around bits of code that operate independently (e.g., Spotify)? Or some other variation that mixes-and-matches microservices with other architectures?

Microservices are great at early-stage implementation. However, as teams build microservices that could be beneficial if leveraged by a broader set of people, those microservices should graduate into APIs, which have interfaces and are discoverable. A microservice is not meant to have an interface but rather serves a piece of functionality in an application. If teams open that microservice up to a broader audience internally or externally, they should put an API on top of it and start managing that as a reusable capability. I believe more companies will start to bridge the gap between microservices and traditional systems with APIs to promote development speed and agility.

5. Chatbots for customer service

We will see a lot of experiments focused on figuring out how best to fuse automation and human control to provide better customer service and support. How much can organizations actually automate without driving the customer away? What's the right balance between automating something through software versus getting humans involved? How do organizations change the interaction model between their customers and partners to help them find information quicker without pointing to a representative?

In the near term, chatbots need to quickly understand intonation to determine if the caller should go to a representative or stay on the line to answer a few more questions. If the caller gets frustrated because too many questions are being asked by the chatbot, the system should recognize the frustrated tone and push the caller through to a representative. The representative should then be equipped with all the caller's information so the caller doesn't get more frustrated at having to repeat everything (we've all been through this). Balancing chatbot automation with human interaction won't be successful if the two worlds don't hand off well to each other, and APIs are at the core of accomplishing this.

What do you think? Are these five trends impacting your organization? And what other trends should we watch out for?[1]

1 This article first appeared on InfoWorld.

Thinking outside the microservices box

BY PAUL CRERAND

Microservices are on the rise, with almost half (44%) of IT professionals now deploying applications as a set of independent, modular assets that support individual business processes. There's plenty of reasons why there's so much buzz around this approach right now.

Microservices are essentially a way of breaking large, monolithic applications down into a set of loosely coupled functions that are clearly defined to support a specific business process. This enables organizations to roll-out new digital capabilities much faster and reduce the risk of disruption during updates, making them well-suited for customer-facing processes.

Searching for a microservices blueprint

While there's widespread acceptance of these benefits, many IT teams are still in the dark as to how best to make

the shift to microservices. All too often, organizations will simply look to others that have pioneered a successful approach; especially the trendy digital natives such as Netflix or Spotify. Given some organizations, particularly in highly regulated industries, have different security and compliance needs, trying to emulate a singular approach might not be feasible.

For example, larger organizations with more legacy systems and siloed applications will have different needs than younger, smaller firms. Every organization is unique, so what works for one won't necessarily work for another. 130-year-old Unilever, for example, created over 80 microservices to support its continued growth, allowing the company to connect its eCommerce applications to the various legacy systems that support its core operations across a global portfolio of brands. Unilever is pairing its microservices architecture with API-led connectivity to drastically reduce development time for new eCommerce applications.

As a result, Unilever is able to deploy three to four times faster, proving that organizations with aging legacy IT and established cultures can gain major advantages from reengineering their applications around a microservices architecture if they use the right approach.

Creating a pragmatic tailor-made architecture

Organizations with diverse circumstances and requirements can all benefit from microservices. So, what should organizations consider when looking to build out their own pragmatic blueprint for a microservices architecture?

- **Identifying the right tool for the job:** It's important to remember that a microservices architecture might not be the best fit for every application. If an organization, for

instance, relies heavily on a legacy ERP application that has supported critical business processes for decades, then it should make sure the rewards of switching to a microservices approach outweigh the risks of keeping the legacy application in place.

Just as organizations get the most from the cloud by identifying which workloads will benefit most from moving out of an internal data center, they must ask the right questions to determine whether the benefits outweigh the risks of reengineering established applications.

- **Managing microservices with APIs:** By their nature, microservices proliferate. So at a large scale, organizations could find them just as, or even more, unwieldy as the monolithic applications they're designed to replace. As a result, it's vital to consider how microservices will be managed as large numbers of small teams build apps and access business critical systems and data on a regular basis.

One way to manage microservices effectively is through well-managed APIs, given each microservice exposes a managed API endpoint. The end result: Developers and lines of business users can innovate quickly while central IT maintains the right SLA, governance and security.

- **Connecting to legacy and SaaS apps:** For larger organizations with more legacy systems and SaaS applications in place, it's also critical to identify how these systems can be integrated with microservices. Again, API-led connectivity provides an ideal solution to avoiding the astronomical costs that would result from building point-to-point integrations. Unilever took this approach to create an eCommerce platform that unified its portfolio

of more than 400 brands on a common operating model.

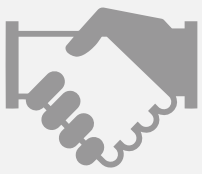
Using API-led connectivity, Unilever created an application network to connect the platform's multiple tools–including NetSuite, Demandware and Google Analytics, among others–and provide access to key on-premises systems such as SAP, which holds its product and customer master data.

Seeing the bigger picture

Ultimately, microservices will be an essential tool in meeting an accelerated pace of customer demand. Yet, organizations should be careful not to get caught up in the hype and embark on a microservices deployment without first understanding what the right approach is.

'One-size-fits-all' is rarely true in IT, and microservices are no different. By taking their own unique circumstances into account, organizations will find it much easier to understand how to get the most from a microservices architecture.[2]

2 This article first appeared on Information Age.



Why DevOps and APIs are a match made in heaven

BY PAUL CRERAND

In our technology-driven world, organizations cannot afford to stand still. They need to deliver software at high velocity without sacrificing stability, which is why DevOps has become such a popular approach.

As the name suggests, DevOps is an attempt to combine software development and IT operations in order to effectively get the best of both worlds: the rapid iteration favored by the former and the stability, reliability and security favored by the latter. Ultimately, DevOps helps to ensure that IT can more effectively support the needs of the business.

But it isn't just DevOps practices that improve the bottom line for companies. Alongside the move to DevOps, companies are also recognizing the need for API strategies to accelerate innovation.

According to MuleSoft's 2017 Connectivity Benchmark Report, 94 percent of IT leaders say they can deliver new products and services to market faster with APIs. Together, DevOps and APIs deliver greater business value than what they can deliver individually.

When Dev met Ops

The DevOps movement has exploded over the past few years. Gartner pegged 2016 as the year when it finally broke through into the mainstream, employed by 25 percent of Global 2000 organizations. Furthermore, of the 50 enterprises ECS Digital surveyed, only 11 percent said they aren't planning to adopt DevOps.

Modern, "fail fast", cloud-centric organizations powered by automated and agile development processes like Amazon are leading the DevOps charge. For those more reliant on legacy technology and operating in highly regulated industries, such as financial services, adoption o this relatively new approach has been slower.

After all, DevOps requires a significant cultural change. However, many are starting the journey by adopting new tools to strip out inefficiencies from the development lifecycle. It's all about accelerating time-to-market to meet customer demand, while reducing failure rates and inefficiency.

An unexpected bump

There are challenges associated with this new approach to software development and delivery. For example, if organizations become too focused on the production model, it can become all-too-easy to keep on pushing out software

assets without thinking about whether they offer real value to the business.

Or worse, those assets live in a silo and aren't discoverable and reusable by the rest of the business. Just because it is much easier to produce in this environment, it doesn't mean the code production treadmill should keep on turning unfettered.

Organizations therefore need to balance the highly efficient DevOps production model with an efficient consumption and reuse model via APIs. Consider a DevOps project designed to expose customer data from a legacy platform onto a mobile app.

With a well-designed API, that legacy data can be discovered inside the organization by other teams so that they too can use the information for other projects. The approach is faster, more efficient and cost-effective. Additionally, the more discoverable the assets, the faster they become ready for reuse, potentially to audiences that might otherwise not have known about them, thus driving greater agility and innovation.

DevOps and APIs—the perfect partners

With this API-led connectivity approach, every asset becomes a managed API, discoverable through self-service with no loss of control. Organizations as diverse as Spotify and Siemens are already embracing this approach to become more agile, efficient and innovative.

Like Amazon, Spotify has been at the vanguard of the DevOps movement, benefitting from a slick, seamless pipeline of software production. However, it also found that multiple departments were producing duplicate assets and

that these assets were difficult or those outside their specific silo to take advantage of.

Using APIs to build an application network, Spotify has been able to expose the capabilities being moved through the pipeline to third-party partners and internally to speed up time-to-market and create new business opportunities.

Siemens, meanwhile, has been able to expose assets managed by its data management team via APIs, eliminating bottlenecks and ensuring partners and internal teams can self-serve to drive greater business agility.

It did so in part thanks to a cross-functional team spanning central IT, line of business and mobile teams that ensures all assets created through the DevOps pipeline are broadly consumed and fully utilized. The results speak for themselves: Siemens has halved the time taken to get a first release of a new capability out to other teams in the business working on related projects.

The marriage of API-led connectivity with DevOps will not necessarily be easy, requiring a change in mind-set to one where assets are produced with the intent that they will be consumed by others in the business. As such, central IT needs to change culturally to become an enabler of reusable, self-service consumption. However, as the likes of Spotify and Siemens can attest, the rewards speak for themselves.[3]

3 This article first appeared on the Computer Business Review.

API-driven microservices will become the norm

BY PAUL CRERAND

Despite being an obsolete term a few years ago, “microservices architecture” is fast becoming one of the most popular ways to design software applications. Widely regarded for the agility it affords organizations in today’s fast-changing world, microservices allow organizations to break down large, monolithic applications into a set of loosely coupled services.

Yet, amid microservices’ growing popularity, organizations should not do it for fashion. One size doesn’t fit all and trying to follow in the footsteps of pioneers like Spotify and Netflix might not be feasible.

For example, one of the major challenges for established companies when adopting microservices is learning how to mix this architecture pattern with the many other architectural patterns already deployed in the enterprise. Additionally, companies need to learn how to manage the

speed and flexibility that microservices fuel, as well as the complexity it creates.

To gain true value from microservices, business and IT leaders need to start by assessing business objectives and evaluating if the architecture can coexist with traditional applications, as well as current systems, business processes and operational and compliance imperatives, combined with their DevOps capability and maturity. For most organizations, it will mean complementing microservices with an API strategy.

Why microservices?

The microservices approach is in many ways a modern reincarnation of the decades-old idea of component-based development (CBD, and it also draws upon the principles of Service-oriented Architecture (SOA. Thanks to standardized containers, highly flexible cloud infrastructure and APIs—which tie apps, systems and devices together—microservices allow developers to break down monolithic apps into loosely coupled functions focused on supporting specific business processes. In so doing, organizations can be much more agile in responding to new market requirements, rolling out robust digital capabilities quickly and easily to customers, employees, and partners alike.

From an IT perspective, the benefits are even clearer. Aside from the fact that microservices are faster to build, test and deploy, they also add reliability to the mix. If a fault occurs, for example, it will only affect users of that specific service rather than the entire IT stack.

Microservices are also easy to scale and can be changed, updated and deployed in a simple, automated manner. For developers, microservices mean greater flexibility and productivity, allowing them to independently develop and

deploy services in smaller teams, and code in the languages and frameworks they're most comfortable with.

The importance of an API strategy

However, organizations must also be aware that microservices aren't a silver bullet. For one thing, this architectural approach creates an increasing number of services that can result in information barriers and service sprawl.

Additionally, it usually brings additional complexity for developers, who now have to mitigate fault tolerance and network latency, while dealing with a variety of message formats as well as load balancing. There's also a danger of duplication of effort; teams must put extra resources into transparency and communication, especially in use cases spanning more than one service.

To help tame microservices complexity, organizations should implement an API strategy. APIs not only bridge the gap between microservices and traditional systems, they also make microservices easier to build and manage. With an API strategy, organizations can expose the functionality of microservices as products, which can lead to the creation of both internal and external business value.

APIs can also overcome the significant costs associated with building point-to-point integrations between legacy systems and SaaS apps, enabling organizations to quickly plug and unplug microservices into their application networks, which connect digital assets and capabilities across the entire IT stack.

Firms like Spotify are taking this approach, using APIs to manage and connect microservices as part of a DevOps push to streamline business processes and create a more agile and responsive company. For example, SKY has adopted a microservices architecture approach for which it uses

Replaceability, Operability, Accessibility & Maintainability (ROAM as its guiding principles.

It's not all about those at the vanguard of technology innovation either; 130-year-old Unilever has built over 80 microservices to connect eCommerce applications with legacy systems around the world.

Thanks to an API-led connectivity approach, the global giant has been able to reduce development time and deploy 3-4 times faster to drive success. Other more traditional companies, including high street lending giant Barclays, and airline flydubai, are reaping similar benefits from microservices by taking the same approach.

Looking ahead

It's important not to rush into microservices just because it's what others are doing. Organizations that are heavily reliant on monolithic legacy deployments must do their research first to make sure that switching will be worth the disruption caused by re-engineering these applications. However, if they do, API-led connectivity is the only choice to manage the crucial integration piece effectively and minimize the risk of uncontrollable microservices sprawl.

In today's uncompromising business climate, organizations need to take calculated risks to stand out from the crowd, get closer to customers and work more productively. More and more organizations around the world will look to a combination of microservices and API-led connectivity to do just that.[4]

4 This article first appeared on Information Age.

Splunk's CIO on DevOps, APIs, and the evolving role of IT

BY ROSS MASON

The role of IT has evolved from a centralized delivery model to IT as a service, where IT-owned capabilities are being offered as a service throughout the business to drive new levels of agility. One CIO embracing the changing role is Declan Morris of Splunk, which enables organizations to turn massive streams of data into operational intelligence. (Disclosure: Splunk is a customer of my employer, MuleSoft.)

In this Q&A, Declan explains how Splunk's IT team is driving value across the organization and partnering with the business to deliver on unified vision focused on customers and growth. Recalling his experiences at Splunk and Adobe—where he was on the original team that helped launch Adobe Creative Cloud—Declan shares best practices around how CIOs can take advantage of the technology

trends impacting every industry and how CIOs can help pivot to new business models when needed.

The role of the CIO is getting harder. Why on earth do you do it?

Declan Morris: It's a great time to be in IT. I love the rate of innovation that we're seeing in our industry. When I started my career, the typical product rollout was approximately 12 to 18 months. However, the consumerization of IT has accelerated everything. Now, the companies making serious change and thriving are the folks that are excited about what's going on in IT. They realize the power of IT and harness it to drive customer adoption and business growth.

How is Splunk's IT team armed for this fast-paced era?

DM: The typical IT shop will hire business system analysts (BSAs) as a means to engage with their internal clients. However, I believe that the traditional IT model is done and dusted. At Splunk, we strive to hire product managers and product owners. We want people to have a passion for what they own and to really think about IT as a product. That means creating a companywide vision, aligning the rest of the organization around that vision and executing against it. This is the way I truly believe IT is going. It's inevitable.

I'd love to unpack the shift from IT to product more. What role do APIs play in this shift at Splunk?

DM: We are now an API-driven economy. There's no question. APIs allow us to bring disparate sets of services together to create something new, where the whole is greater than the sum of the parts. And, we can do it in record time. For example, when challenged to launch Splunk Cloud trial in 90 days, traditionally that would have been handled exclusively by the product organization. However, our IT team

was able to deliver 95 percent of the functionality using an API-based strategy, where our team could easily orchestrate behind the scenes with other SaaS providers like AWS, Ping, Stripe, and Salesforce. We delivered the trial in less than 90 days, contributing to accelerated adoption of our Splunk Cloud solution across the industry. I shudder to think what it would have taken if we attempted this initiative five to seven years ago.

With the right API strategy, IT can truly deliver business value. In return, the value raises the executive leadership team's confidence in the IT organization's ability to deliver, which in turn leads to further investment opportunities. At Splunk, we're in the early stages of truly creating an API marketplace, where we can extract value from reuse and consistency across the board. The building blocks are there. That is absolutely the way we're heading. As noted in a recent McKinsey article, the IT department is "radically reframing." In conjunction with this reframe is the need for CIOs to evolve and partner closer with business leaders.

How do you communicate the value your team is building to your CEO and CFO?

DM: If the executive leadership team doesn't know where they're going, then IT has no way of knowing where it's going. Splunk's CEO Doug Merritt has been crystal clear and consistent in his messaging for what our vision is to get to $2 billion in revenue in the next three years. It makes my job, frankly, a lot easier. As a team, IT can reverse engineer from that viewpoint and can critically look at what the business needs are to drive greater value rather than becoming a choke point—the worst outcome for any CIO.

From one month to the next, our business is never static. CIOs have to be adaptable in this environment and

comfortable with ambiguity. If priorities have changed for the right reasons and it's tied to business value, change is good.

However, many CIOs will encounter an executive leadership team that's less open to change or lacks a crystal-clear vision. In these situations, one effective strategy is to gut check your idea with all the major influencers before engaging the CEO. When the CEO seriously questions what is being put forward, the rest of the executive leadership team can jump to your support because they have their fingerprints on the strategy.

How do you approach the adoption and management of SaaS applications in your IT landscape?

DM: This behavior is induced by what the business drivers are. It's not about cherry-picking a SaaS solution. The SaaS solutions we consider have to blend in with our overall corporate strategy, and we hinge our IT strategy off where our CEO is taking the company. Earlier this year, he put down the challenge to the organization to double revenue in the next three years that could double our employee base. That's been a rally call for the company. Our responsibility within IT is to ensure that the additional SaaS applications we introduce on top of our platform actually complement and contribute towards that goal. We take a very critical approach to evaluating what SaaS vendors play well within our ecosystem and to ensuring that they're expansible.

Additionally, I think the SaaS providers have done an amazing job circumventing IT to a certain extent and going straight to the business to sell their technology. While a couple years ago this created a sea of shadow IT within companies, today we're having more constructive and healthy conversations with the wider business on what

problems they are trying to solve. At Splunk, we have a Portfolio Working Group with representation from every major part of the business. We meet as a group to come up with ways to solve the business needs.

Furthermore, it's imperative that IT teams understand how to diagnose their SaaS environments. If an error occurs and the CEO asks what happened, you can't simply say, "Well that was SaaS, so we don't have the ability to do an inquiry." There's an expectation. My advice is to pay close attention to the SaaS providers you work with to ensure that you can really tap into their environment and have access to what you need to run your business.

A slightly different topic: How are you implementing DevOps?

DM: If you have a DevOps team, it's probably a red flag. DevOps is a framework, not a team. One way to know you have DevOps is when you look around the table, you are unable to separate the ops people from the engineers because they're working closely together. Also, when you have the inevitable P1, who takes the call? If DevOps is done right, there is truly a joint sense of ownership. It shouldn't be about the ops person restoring service. It's "we" need to restore the service. In today's DevOps world, the mission team should be able to sit around a physical table and collaborate. At Splunk, we're absolutely all in. It's invigorating and exciting. We have a lot of folks to thank, including Spotify and Amazon Web Services (AWS), for being pioneers in the space.

Finally, what advice would you give to CIOs going through major transitions?

DM: When companies go through major transitions as they scale, more often than not CIOs will encounter the corporate antibodies—the naysayers that question why they need

to change when they've always done it a certain way. The advice I give to every CIO is as follows: If you're going through a major transition, especially one where there will be corporate antibodies, peel off an energized and motivated team to execute the transition and set them up for success. The team doesn't have to be very large—in my previous job at Adobe, I left behind a product team of 350 to start a team of 12. For me, it was inevitable our industry would go through a seismic shift, and if we didn't embrace it, we were going to be left on the wayside.[5]

5 This article first appeared on CIO.com.

How the API Economy is igniting a cultural shift in businesses

BY ROSS MASON

We are in the middle of a generational shift in technology. The convergence of digital forces—namely mobile, SaaS, cloud, big data, Internet of Things (IoT), and social—is creating a massive disruption in the market and altering consumer expectations. Today, everything needs to be personalized, dynamic, always on, and always mobile.

As a result, there's no shortage of organizations hoping to reinvent themselves for the digital age. Success in today's fast-paced economy relies on continuous innovation and adaptation, leaving no room for disjointed technologies and stagnant processes.

However, most organizations are struggling to adapt to this new, rapid way, which may be one of the reasons why 52 percent of the Fortune 500 have fallen off the list since

2000. It also explains a key reason why the likes of Amazon, which is manically focused on moving faster than competitors, has climbed the ranks in under eight years.

For Amazon, winning is about speed, agility, inventiveness and an ability to try many experiments rapidly and fail fast. Recent experiments by the once-exclusively internet company include opening its first brick-and-mortar retail store and soon opening its first convenience stores.

It's clear the big no longer eat the small; the fast eat the slow. Speed is one of the single most important characteristics that determine a company's success today. It's critical for bringing new products to market, establishing new global presences, changing existing processes, and onboarding new partners—all faster than competition.

However, speed is proving to be a struggle across industries as new digital forces converge. So, how can companies speed up to win in the API economy, which is simply the sum of digital exchanges between two or more parties?

The IT delivery gap

A big barrier for companies looking to achieve speed is the IT delivery gap. IT has a relatively fixed set of resources and a constrained capacity to deliver on new projects. Yet, as new digital forces enter the workplace, the business wants to move faster and continuously evolve to meet new market and consumer needs. All of a sudden, project backlogs build up and overwhelm central IT teams, who then hold back the business.

In this frazzled state, IT teams often resort to creating shortcuts to complete projects on tighter timelines and smaller budgets. These shortcuts often mean creating point-to-point connections between systems, usually with an outsourced workforce. However, each point-to-point

connection creates tight dependencies between applications so any future changes require extensive and costly downstream work.

The resulting technical debt compounds the problem with little thought given to long term manageability or reuse. Eventually, business users don't feel a strong partnership with the IT team, leading them to take matters into their own hands and purchase their own technology tools. This is known as shadow IT, and it puts mission critical customer and product data at risk, putting more pressure on central IT.

The reality for established enterprises is that the centralized IT model is no longer working. IT teams can't keep running faster on the project hamster wheel. With today's digital forces knocking down the door, central IT needs to evolve and operate under a new model that caters to ever-changing business needs.

The new IT operating model

To close the IT delivery gap, IT needs to shift away from the traditional project-based approach—where they try to deliver all IT projects themselves—and toward an approach that allows IT to build reusable assets that are consumable by the broader development community within the organization.

The modern API is the core enabler behind this approach. Modern APIs adhere to standards (e.g., HTTP, REST, JSON) that are developer-friendly, language agnostic, and easily accessible and understood broadly by developers. These modern APIs are more than code. They are products; they live beyond any one project; they have a strong discipline for security and governance; and they have their own software development lifecycles (SDLC) of designing, testing, building,

managing, and versioning. These new API characteristics completely change the disrupt-or-be-disrupted game.

Now with API-led connectivity, rather than connecting everything point-to-point, key assets become managed APIs that can be discovered by developers in an environment still tightly secured by central IT. Central IT essentially "Lego-ifies" the business, as teams compose, recompose and adapt these building blocks to address changing needs. Then, the speed with which every subsequent project is delivered begins to accelerate because the new operating model eliminates the work needed to build future projects and processes from scratch.

The internal API economy

The web has proven how effective APIs can be in driving speed and innovation on top of self-service capabilities. With approximately 16,000 open APIs on the web, developers can build an idea in days and scale it or kill it just as quickly. Almost all of us use these services every day. Almost every popular mobile app we use leverages building blocks on the web, so app developers don't need to build their own maps, communication services, data services, and more. Developers can focus on building value and innovation on top of these APIs.

To participate in the external API economy, businesses need to drive an internal API economy first. Innovation at the edges doesn't work unless a business can unlock its core, which is often made up of big, monolithic infrastructure. By opening up APIs internally, businesses can free themselves from the limitations of their legacy systems, changing the way they deliver digital products and services to customers, partners and employees.

To drive this innovation, organizations are shifting to an IT-as-a-Service operating model, where IT-owned capabilities are being offered as a service to the business. With this strategy, businesses are creating internal API economies, where assets are consumed and built upon to drive new value internally and externally.

A successful internal API economy requires IT to decentralize and democratize application development and data access to the business as a whole. In addition, central IT needs to invest in enabling a broader set of developers internally to discover, use and self-serve these assets, so the business can deliver more of their own projects. This changes the relationship between IT and the business.

To win in the digital era, companies need to play a larger role in the API economy. We're all used to the instant connectivity that puts the world at our fingertips. Today, it's difficult to imagine standing in a long line at the bank to cash a check, or waiting more than 10 minutes for our taxi to arrive. Whereas a mere five years ago that would have been a normal part of our daily lives.

The unsung hero of our connected world is the modern API. It's what makes possible all the interactivity that we've come to expect and rely upon. It helps drive the speed with which new technology products can be brought to market faster than the competition, establish new market presences quickly, and change processes and workflows to fit evolving consumer tastes.[6]

6 This article first appeared on CIO.com.

Physical, virtual, social: Is the application network next?

BY ROSS MASON

Networks have always been at the heart of our society, defining our relationships, creating our experiences and ultimately shaping our lives. From the steam railways that enabled commerce between cities and towns, to the cables that paved the way for global communication over telephones and then the internet, networks have a history of redefining our way of life.

More recently, the internet has given rise to virtual networks that allow us to connect to vast computing resources, and social networks that allow us to cultivate our own global communities. Recent estimates suggest that by next year, 2.44 billion people will be connected via social networks, illustrating the scale of influence these platforms have on our society. Facebook alone already boasts 1.86 billion

active users, with 1.26 billion people signing in every day to connect with their network.

The dawn of a new network

In the new digital era these networks have collectively ushered in, connectivity has become the foundation of every consumer experience, business model, process, product and service. In this world, the more connections that organizations make, the more value they will be able to get out of their digital assets.

Connectivity is critical to new technology advances in areas like the Internet of Things (IoT), artificial intelligence (AI) and augmented reality (AR). None of these technologies work if you can't connect to data and assets. However, given the number of applications, data sources, and devices that companies now rely on, the old way of connecting these assets has broken down; it is too heavy, costly and resource in-tensive. Gluing everything together into one big, monolithic thing is a recipe for disaster in a world where digital change happens so quickly. So much so that recent research found that half of IT departments now fail to complete digital projects on time.

Ultimately, this has brought us to a tipping point where a new type of network, an application network, is needed to connect everything together to open up new possibilities. This new type of network fundamentally changes the way that organizations think about IT delivery and connectivity.

By allowing IT to connect the business to a catalogue of digital assets and capabilities that enable them to self-serve their own innovation projects, an application network ignites a complete cultural and functional shift. Following the principles of Metcalfe's law, every new asset that is connected

to the application network increases its overall value by making its data and capabilities available for others to discover and consume. In this way, IT ceases to be a bottleneck through which innovation must flow and instead becomes an enabler to the rest of the business. Where the current IT model involves having to deliver every project from start to finish, IT's task is to provide just enough enablement to encourage the application network to grow, whilst championing best practices and providing governance to create a trusted ecosystem.

The building blocks of software

The nodes of an application network are APIs, which turn digital capabilities into reusable building blocks. The application network provides the 'digital glue' that enables these building blocks to be composed and recomposed for greater agility, flexibility and speed. Businesses can rapidly compose new services and make them pluggable and reusable for anyone who has access. Additionally, discovery becomes inherent and part of the engagement layer of application networks. Business teams will by default look to see if a capability they need already exists, in the same way that consumers head to the Apple App Store to see if there is 'an app for that'.

With an API-led approach to connectivity, business innovation accelerates rapidly, as new applications, data sources and devices can simply be 'plugged' into the application network, as easily as you might plug in a printer. As such, innovation can be led by anyone who has the potential to add value to the organization's digital ecosystem–from internal development teams to external partners.

Ultimately, this is the beginning of the next era of the web, where APIs and application networks can make any

capability available to people and machines. We are already starting to see major global organizations beginning to realize the benefits of this approach. For example, Spotify has created an application network by deploying reusable APIs to improve information sharing across its entire business and to develop applications much faster than others in the market. Unilever has similarly used an application network to remove the barriers to business innovation, by shifting the focus away from individual assignments and towards reusable platform capabilities.

In the same way that physical, virtual, and social networks have shaped society, defined relationships and created new experiences, application networks promise to usher in a new wave of business and technology innovation. Take the automotive industry for example, where software companies and car manufacturers are already vying to own the in-vehicle experience.

In the future, people could be paying for experiences powered by many API-connected services, rather than the car itself. More broadly, industry is fast approaching a point where sponsored adverts are replaced with targeted APIs based on their search criteria that allow consumers to directly buy products and services from a web page.

These examples are just the tip of the iceberg of possibilities being created by API-led connectivity. Like the many connectivity revolutions that have come before, application networks will be the cornerstone upon which the next digital revolution is founded, organizing API economies and shaping the course that our society charts into the future.[7]

7 This article first appeared on ITProportal.

ABOUT MULESOFT

MuleSoft makes it easy to connect the world's applications, data and devices. With our market-leading Anypoint Platform™, companies are building application networks to fundamentally change the pace of innovation. MuleSoft's API-led approach to connectivity gives companies new ways to reach their customers, employees and partners. Organizations in more than 60 countries, from emerging companies to Global 500 corporations, use MuleSoft to transform their businesses.

To find out how, visit www.mulesoft.com.