Microservices: Fast Path to Digital Modernization

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Microservices

Fast path to digital modernization

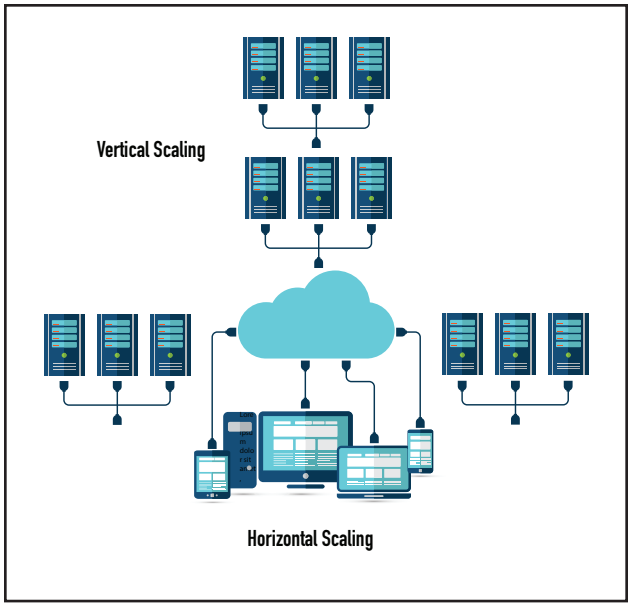
When every business is a digital business, top executives look to IT organizations to automate the hyper-responsive operations customers expect. IT leaders need to create a new mindset for their teams, and execute an organization-wide cultural shift before most companies can harness the power of the Cloud to respond to constantly-changing customer demands.

This white paper explains why IT operations are replacing their "fail-safe" mindset with a new "safe-to- fail" culture built for continuous innovation. As leading IT organizations scale up Agile, they're replacing development initiatives that spanned quarters and, in some cases, years with microservices. By breaking massive functionality into smaller units called a microservice, IT can now combine and recombine capabilities in record time, delivering quality applications that can be updated on the fly – while preserving system stability and optimal performance.

Automated tests, continuous integration and deployment, feature flags, re-routing small percentages of traffic, and small teams working in parallel, make microservices attractive to IT organizations in digitally transformed businesses. Microservices enable companies to quickly adopt the latest techniques and tools for software development, often allowing them to become "employers of choice" – a destination for digital talent.

One of the microservices' most significant advantages centers around scaling, both vertically and horizontally. Having these scalable options allow IT organizations to associate smaller microservices under a heavy and shared processing load. Not only does this load sharing avoid having to dedicate an entire application to a specified set of resources, it can often eliminate the need to add hardware.

Placing applications in the Cloud enables continuous innovation, but simply moving existing applications to the Cloud sends competitive advantage into the wind. Monolithic architectures and sequential, step-driven application testing and development can work in the Cloud, but they don't leverage the Cloud's advantages, such as distributing processing across a shared computing capacity. These types of architectures and testing and development processes also miss out on one of the Cloud's most significant features: the opportunity to "right size" computing power vertically and horizontally. The Cloud can scale, vertically and horizontally, to offer IT organizations close-to-infinite capacity that can "scale up and down" as needed – a flexibility not available with traditional computing environments.



The cloud's flexibility to scale vertically and horizontally finetunes processing efficiency – even as loads fluctuate.

Innovative IT organizations are "containerizing" functionality development and getting to quality faster as they continuously deliver single-function microservices. To ensure that response time and overall system performance remain high, IT groups are bundling microservices, allowing a single API call to trigger the necessary functionality. In addition,

employing a service mesh (which bundles features in a single package) enables fast retries, load balancing, tracing, and health monitoring. A service mesh offers a pervasive layer that connects containerized applications and microservices without the need for additional hardware. Not only does using a service mesh help assure optimal performance, it eliminates the need for developers to manually manage the repetitive develop/deploy cycle with individual tools – an extremely time-consuming effort.

> "Breaking up huge applications into smaller self-contained functionality makes that functionality easier to maintain and allows IT to combine and recombine microservices as needed."
>
> Jackson Stakeman, Rural Sourcing

How microservices work

Simply put, microservices streamline the rebuilding process required to move apps to the Cloud. IT organizations that take a microservices approach break down monolithic applications into small, independent components, each of which executes a specific function or business process. APIs then manage all the communications between these functional components. This modular approach slashes development time by creating microservices that can be deployed quickly and reused by other apps. This streamlined development and deployment approach enables digital adaption's nirvana of 50 or more deployments per day.

However positive microservices-driven development and deployment is, the process isn't challenge-free. For example, high-demand microservices increase API calls, which can lead to increased latency and slower response times. When multiple applications share common microservices, their interdependence escalates, making it more difficult for IT professionals to identify the underlying causes of degraded performance.

One way to minimize latency and efficiency challenges is through containerization, a virtualization method that bundles frequently-accessed microservices with their associated files, environment variables, and libraries.

Ideal way to modernize, optimize apps

How microservices support digital

Continuous innovation and an ongoing delivery of updated and expanded functionality demands a dynamic environment capable of lightning-fast adaptation. This makes the microservices architecture ideal for the digital age. Not only does this approach maximize deployment's velocity, it also leverages Agile to accommodate the ever-shifting demands of the digital customer. Developers' automated tools enable faster build-to-develop-and-deploy cycles, and higher quality applications as a result.

In the digital environment, speed is critical and quality-related expectations mandate that every upgrade and enhancement works correctly – the first time. High-quality functionality produced quickly, keeps costs down even as everything changes. Microservices also offers IT organizations a recruiting and retention advantage over competitors' workplaces that take a more traditional approach to application development and deployment.

Small teams working in parallel use automated tests, continuous integration and deployment, and feature flags make microservices attractive to IT organizations in digitally transformed businesses.

One of microservices' most significant advantages centers around scaling, both vertically and horizontally. Having these scalable options allows IT organizations to associate smaller microservices under a heavy shared processing load. Not only does this load sharing avoid having to dedicate an entire application to a specified set of resources, it can often eliminate the need to add hardware.

One of the most significant challenges facing today's businesses is finding well-rounded digital talent. And digital's "hard" skills aren't enough. In this collaborative, team-driven environment, "soft" skills, such as communication and problem solving, are equally critical. Because companies will never be able to find all the digital talent they need in the marketplace, partnering with third parties that can supply the needed skillsets takes on a new importance. The rapid build-and-deploy environment also requires digital talent that understands the company's mission, culture, and vision.

Partnering with Intent™, a purposeful approach to digital talent sourcing, takes all of these requirements into account. As a result of these complex, multi-dimensional needs, IT organizations are narrowing their list of sourcing partners in favor of a handful of strategically selected partners. These partners are able to deliver "employee-like" individuals who are culturally additive while also possessing the required digital skills. Partnering with Intent also allows IT organizations to quickly and easily "restack the deck" with different combinations of digital assets as needs change. (For more information about how Partnering with Intent can transform digital talent building and retention, download our white paper)

If finding digital talent wasn't hard enough, there are management challenges once those valuable digital assets are secured. For example, sometimes even large companies with sky-high budgets struggle to meaningfully engage their digital talent. Putting them into an "accelerator" operation far away from the core business is a common mistake. This separation makes it difficult for people to see how their work is advancing the business, a key indicator of assignment satisfaction. IT leaders with a clear vision of how to use digital capabilities to move their companies forward should mainstream digital talent into the core business, positioning digital adoption as the preferred way of doing business.

Digital talent, which will continue to be in short supply for years to come, wants to work in IT organizations that encourage risk-taking, constantly strive for innovation, and have a "safe-to-fail" culture. The majority of digitally skilled employees (72%) prefer entrepreneurial cultures with agility and flexibility. Because competition for this talent is so high and few IT organizations can afford, from a productivity standpoint, to have this precious commodity walk out the door, many organizations are adopting a more flexible approach to work responsibilities – a collaborative approach that

empowers IT professionals to push the boundaries of what can be accomplished with technology. These types of entrepreneurial organizations often become "destinations of choice" for digital talent, which can leave competitors struggling to find the right employees.

Finally, the constant measurement built into the microservices' repetitive approach enables IT organizations to see how their work is changing the customer experience and make adjustments on the fly. As a result of valuable analytics-driven "report cards," IT can see what's working and what's not, tweaking application components for better results without disrupting the business.

However beneficial microservices are to the IT organization and, ultimately, to the business, its success depends on operational efficiency as well. The C-suite and LOB executives must step up to remove non-technological barriers that stand in the way of microservices' ability to speed revenue to the bottom line.

Orchestrating the move to microservices

IT organizations should not simply move monolithic architectures and applications as they currently exist to the Cloud. As they stand, most applications are wrapped into a single executable file. Even the smallest change requires that a new version of the application be built and deployed. Tapping into the Cloud means being able to rapidly build, deploy, reiterate and update applications – which is extremely difficult to accomplish with a monolithic approach. That's why existing applications need to be completely rewritten and broken into Cloud-native forms, such as microservices, event-driven architectures, and serverless technologies.

By following these five principles as they rebuild their applications, IT organizations will leverage the Cloud's advantages while maximizing their productivity:

1. Use domain-driven design
2. Create guidelines for code libraries
3. Resist the urge to share databases between microservices
4. Handle security concerns
5. Measure performance when scaling

Select first microservices carefully

All enthusiasm for microservices aside, it's crucial that IT organizations stepping into this new development and deployment architecture proceed with caution. Expecting IT professionals to learn how to develop and deploy in the microservices environment as they build containers from scratch is simply too steep a mountain to climb. Choose one or the other as a microservices starting point, but not both. In addition, select a low-value application as the place to start. Too often, eager IT leaders select a customer-facing or mission-critical application as a first project, which simply places too much visibility onto the project and raises the stakes exponentially.

> Remember that proficiency with automated tools that are part of microservices is a table-stakes requirement. Be sure to consistently measure the applications' performances. and keep a vigilant eye out if the microservices function seems to be "thickening" over time.

MICROSERVICE DELIVERS RESULTS

Moving to a microservices architecture is not an effort that most IT organizations attempt alone. Some organizations choose to take a "we lead" approach: they design the architecture they want, and delegate the actual build and deploy phases to a third party, or secure the digital talent they need from a trusted partner to do that work. Other IT groups that lack the digital architects but have strong digital talent in-house at the build and deploy phases, follow the "they lead" model, where architectural expertise comes from a trusted partner.

Rural Sourcing's flexible approach to the digital development allows it to work equally well with the "we lead/you build and deploy" organizations as it does for those that take a "you lead/we build and deploy" approach. The following use cases describe two clients' challenges and how Rural Sourcing helped advance their microservices-based initiatives:

• A client with an existing platform that was having scalability issues called on Rural Sourcing to lead a 2.0 build focused on modularity and scalability, which would utilize the Cloud. Rural Sourcing tapped into the power of open source tools and frameworks to deliver a 2.0 microservices-based architecture that preserved a full menu of technical options for the client. The result, a fully containerized architecture using Kubernetes, was written in Java. Because time was short, Rural Sourcing deployed three full teams to build out different parts of the application simultaneously. The teams established CI/CD pipelines to keep the code flowing as they rapidly pushed out new features. The deployed application, which was built to accommodate modular, scalable extensions, can easily digest new features and meet increasing market demand.

• When another client wanted to rollout a Minimum Viable Product as a greenfield application, they decided to take a microservices approach. This decision made sense because greenfield projects typically require several updates as market demand and functionality requirements become clear. Microservices would also allow the product to scale quickly as market demand grew. Rural Sourcing separated different areas of the application into different databases and microservices to allow maximum flexibility and scalability at the architectural level. The client's business units then worked with the internal IT group to sift through emerging functional needs and direct subsequent buildouts.

In addition to the two use cases from Rural Sourcing's experience, executives from the C-suite and lines of business are reporting impressive results from their IT organizations' use of microservices, including:

1. A retailer that can scale 5x on inventory lookups for Black Friday.
2. A financial services and telecom company with high throughput requirements that can keep response times under 50 milliseconds.
3. A railway transporter can reroute trains in seconds – not hours.
4. 100 million digital subscribers have the same optimal experience as they stream an average of 140 million hours of content.

Companies in all types of markets are leveraging microservices to compete more effectively in the ever-changing digital marketplace. To learn more about how Rural Sourcing can accelerate your responsiveness, visit ruralsourcing.com.

CONCLUSIONS

Fast-tracking into all-digital future

Competing and winning in digital business requires immediate reaction to customer demands and the ability to turn on a dime. Agile gave developers a way to pick up the pace, but microservices offer an unparalleled opportunity to scale innovation, rapidly and cost-effectively.

With the global talent wars comes a need for every business to offer a "safe-to-fail" culture that not only accepts, but encourages innovation. Microservices' component- based approach to functionality development and deployment will not only appeal to digital talent, but will allow teams to respond to shifting customer demand at a record pace.

Only the largest and most well-known IT organizations will be able to attract and retain the digital talent they need. For the majority of companies, working with forward-thinking partners that can deliver digital projects with teams schooled in a collaborative culture and "safe-to-fail" principles is the answer.

Partnering with Intent, the purposeful approach that integrates "outside" talent into the organizations via a shared mission, will prevail as leading IT organizations seek out the digital talent they need now. In addition, Partnering with Intent offers IT leaders a way to "restack" their digital staff at will, scaling up on in-demand skillsets without having to hire these expensive resources directly.

ABOUT RURAL SOURCING

Rural Sourcing is changing the IT outsourcing experience with a cost-effective, agile approach to software development, support and maintenance of critical business and cloud applications. By providing an alternative to offshore outsourcing, Rural Sourcing eliminates the obstacles of time zones, distance, language, and geopolitical risks. With development centers strategically located throughout the United States, Rural Sourcing leverages untapped, highly skilled IT resources in smaller cities to provide world-class solutions for Fortune 1000 clients across various industries including consumer & retail goods, financial services, healthcare, hi-tech, and pharmaceutical.

To learn more, or if you have any questions about Partnering with Intent, contact us at inquiries@ruralsourcing.com or 877-887-4774. Additional information may also be found at www.ruralsourcing.com.

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