



WHITE PAPER

Becoming a Digital Native:
A Look at DevOps, Cloud, and What's Around
the Corner for 2019

Contents

DEVOPS IN 2019 AND BEYOND	3
WHAT DEVOPS WILL TRULY BECOME.....	3
THE TOP 5 DEVOPS TRENDS FOR 2019.....	4
CLOUD IN 2019 AND BEYOND	6
A CLOSER LOOK AT 5 CLOUD CONCEPTS.....	6
THE GOOD NEWS: THERE ARE PARTNERS CAPABLE OF DELIVERING	9
A LOOK AT WHAT'S AROUND THE CORNER	9

DevOps in 2019 and Beyond

When it comes to 2019 DevOps concepts, it's extremely important for organizations to keep in mind that **DevOps is NOT just for developers**. Too often, a person not directly involved with DevOps envisions a bunch of coders doing some kind of development operation without really understanding what that means.

There is so much more to the story and the process in DevOps. In fact, business leaders and even 'traditional' IT organizations need to understand DevOps and what it can do for a company. The market is shifting toward more custom application development and even integration with advanced software development kits (SDKs) and APIs.

Before moving forward, it's imperative to touch on the concept of legacy. At a high level, this includes any process or operation that requires quite a bit of manual intervention and a lot of complex reactive support. This can be code, business or IT processes, and even IT infrastructure. As we all evolve into a data-driven society, digital transformation will require agility and velocity that outstrips classical architectures and practices.

WHAT DEVOPS WILL TRULY BECOME

As we look to the future, DevOps will become all of the following:

- A **cultural shift** in how processes, code and technology is delivered
- A **philosophy** around continuous development and integration with users, businesses and even market dynamics
- A **practice** that continuously evolves at the base of business
- A **tool** to help deliver services and applications at market-ready speeds
- A **process** to help companies innovate at a much faster pace than what traditional (or legacy) software tools and even infrastructure could offer

In today's world, DevOps is a technological and cultural shift that enables *continuous integration*, *continuous development* and *continuous innovation*.



DevOps in 2019 and Beyond (cont.)

THE TOP 5 DEVOPS TRENDS FOR 2019

1 | *DevOps will be much more tightly integrated with business.* Already, there has been an incredible amount of adoption around DevOps, as the acceptance of DevOps principles reached critical mass in the hearts and minds of many in IT.

According to a study by cloud-management provider RightScale, the ratio of enterprises that have adopted some aspect of DevOps principles reached 84% in 2017.¹ However, there's a difference between accepting principles and putting them into action. That same study showed that just 30% of enterprises have been able to adopt DevOps company-wide.

The truth is that while DevOps adoption has gone wide, it hasn't necessarily gone deep. Looking ahead, this coming year will really be when large organizations start integrating DevOps at true levels of scale.

2 | *DevOps will evolve even further with greater application of sub-DevOps processes, such as Security and Testing.* Just like with broader enterprise adoption around DevOps, the integration of solutions, such as security, will be critical. There will be an increase of acceptance that security and compliance must be completely folded into DevOps transformation if organizations are to achieve success.

But, just like the adoption of DevOps culture, security must become a part of that culture as well.

Enterprises recognize that to truly make the development ecosystem and software secure, they must instill the principles these security engineers have been preaching for years directly into the habits of the entire team.

3 | *DevOps will become the foundational engine to design digitally native organizations.* Organizations have become increasingly concerned around the legacy solutions they have in place. These are monolithic systems and immobile applications with poor data utilization, and the overall inability to scale within a digital market. It's become more frightening for enterprises because legacy architecture will stifle both innovation and competitive advantages. This is a big reason why enterprises are looking to move massive application and data sets into the cloud. Additionally, more projects around application refactoring and better utilization around data are beginning to emerge. Most of all, companies are becoming less fearful of moving bigger platforms, like ERP systems, into the cloud. To that extent, DevOps is helping create a digital native organization.

¹ <https://www.rightscale.com/press-releases/rightscale-2017-state-of-the-cloud-report-uncovers-cloud-adoption-trends>

DevOps in 2019 and Beyond (cont.)

4 | *DevOps culture will become even more deeply ingrained in both technology and business, and it'll be up to you to empower people to really embrace this change. In reality, without the support of people across various business units, DevOps can't succeed. According to Gartner, "through 2023, 90% of DevOps initiatives will fail to fully meet expectations due to the limitations of leadership approaches, not technical reasons. The value in adopting DevOps practices is vast, but if initiatives are to be successful, organizations must approach them in the right way. 'People, not process, are the most common cause of DevOps failures,' George Spafford, Research Director at Gartner, says. 'Many organizations invest in DevOps tools without addressing organizational change and the value they will provide to the larger enterprise.'"*²

This culture will help drive innovation and new solution capabilities for growing enterprises. However, you can't fix culture with tools alone. "Implementing tools and some level of automation is the easy part," says Adam Auerbach, VP and Co-Head of the DevTestSecOps Practice at EPAM Systems. "Getting the company culture changed to support a new way of working, blending of roles and having time for innovation, on the other hand, is going to take a lot of time and effort. But, it's worth it. It's key to figure out what those issues are and how to solve them; this needs to be fleshed out first. This way, you unify culture to use your DevOps tools properly."³

5 | DevOps will deeply impact cloud capabilities, as well as embolden exploration and innovation. Let me give you a specific example: serverless solutions. Platforms like Cloud Functions within Google Cloud Platform (GCP) are going to be used even more for powerful, event-driven architectures. According to analysts at Research and Markets, serverless computing and this abstraction are driving the function-as-a-service market at a phenomenal rate. In 2018 and the following years, the company expects this market to grow by almost 33% annually, reaching \$7.72 billion by 2021.⁴

According to George Spafford, research director at Gartner:

"DevOps challenges conventional IT thinking with its lack of a standard definition and approach, its constant evolution, and its requirement for acceptance and management of risk."

"For example, instead of focusing on release rates and doing things faster, start with the business value by asking what that will enable," explains Spafford. "The justification could be something like 'by increasing our release rate, we will be able to innovate faster and thus support sales and marketing's push for ordering with a mobile app.' **The most successful organizations know the business benefits they hope to realize from DevOps.**"⁵

For leaders in this space, it's absolutely critical to communicate the power of DevOps from a truly holistic perspective, as well as how a good DevOps culture can fundamentally shift an organization's stance in the market.

² Gartner, Smarter with Gartner, 8 Steps to Get DevOps Right, March 15, 2018, <https://www.gartner.com/smarterwithgartner/the-secret-to-devops-success/>

³ <https://www.informationweek.com/devops/getting-devops-wrong-top-5-mistakes-organizations-make/a/d-id/1333173>

⁴ <https://www.marketsandmarkets.com/PressReleases/function-as-a-service.asp>

⁵ Gartner, Smarter with Gartner, 8 Steps to Get DevOps Right, March 15, 2018, <https://www.gartner.com/smarterwithgartner/8-steps-to-get-devops-right/>

Cloud in 2019 and Beyond

It goes without saying that cloud computing has become a powerful technology and business engine. When it comes to public cloud solutions, there's really no slowdown in growth and use-cases.

According to Gartner, the worldwide public cloud services market is projected to grow 17.3% in 2019 to total \$206.2 billion, up from \$175.8 billion in 2018. By 2022, Gartner expects that 90% of organizations purchasing public cloud infrastructure as a service (IaaS) will do so from an integrated IaaS and platform-as-a-service (PaaS) provider, and will use both the IaaS and PaaS capabilities from that provider.⁶

According to an IDC report predicting trends for 2019, software as a service (SaaS) will be the largest cloud computing category, capturing nearly two thirds of all public cloud spending in 2018. SaaS spending, which is comprised of applications and system infrastructure software (SIS), will be dominated by applications purchases, which will make up more than half of all public cloud services spending through 2019. Enterprise resource management (ERM) applications and customer relationship management (CRM) applications will see the most spending in 2018, followed by collaborative applications and content applications.

“The industries that are spending the most – discrete manufacturing, professional services, and banking – are the ones that have come to recognize the tremendous benefits that can be gained from public cloud services. Organizations within these industries are leveraging public cloud services to quickly develop and launch 3rd Platform solutions, such as big data and analytics and the Internet of Things (IoT), that will enhance and optimize the customer’s journey and lower operational costs,” said Eileen Smith, program director, Customer Insights & Analysis.⁷

Enterprises across almost every industry are looking at ways they can leverage cloud for the removal of legacy processes, the enhancement of business operations and the creation of real-world competitive advantages.

A CLOSER LOOK AT 5 CLOUD CONCEPTS

1 |

Cloud services and solutions will only continue to grow. The ‘as-a-Service’ market is continuing to expand and provide even more services within the cloud. Take this perspective into account:

- SaaS will grow at an 18% CAGR by 2020, according to Bain & Company.⁸
- Investment in PaaS will grow from 32% in 2016 to 56% in 2019, making it the fastest-growing sector of cloud platforms, according to KPMG.⁹
- SaaS remains the largest segment of the cloud market, with revenue expected to grow 17.8% to reach \$85.1 billion in 2019.¹⁰

⁶ Gartner Press Release, Gartner Forecasts Worldwide Public Cloud Revenue to Grow 17.3 Percent in 2019, September 2018, <https://www.gartner.com/en/newsroom/press-releases/2018-09-12-gartner-forecasts-worldwide-public-cloud-revenue-to-grow-17-percent-in-2019>

⁷ <https://www.idc.com/getdoc.jsp?containerId=prUS43511618>

⁸ http://www.bain.com/Images/BAIN_BRIEF_The_Changing_Faces_of_the_Cloud.pdf

⁹ <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/02/the-creative-cios-agenda-journey-to-cloud.PDF>

¹⁰ Gartner Press Release, Gartner Forecasts Worldwide Public Cloud Revenue to Grow 17.3 Percent in 2019, September 2018, <https://www.gartner.com/en/newsroom/press-releases/2018-09-12-gartner-forecasts-worldwide-public-cloud-revenue-to-grow-17-percent-in-2019>

Cloud in 2019 and Beyond (cont.)

“SaaS has not killed the software market, but is growing rapidly and pressuring legacy providers to include SaaS options or risk losing market traction,” explains [Laurie Wurster](#), research director at Gartner.

Gartner predicts that by 2020, all new entrants and 80% of historical vendors will offer subscription-based business models, regardless of where the software resides. “What began as a trickle a few years ago has become a stampede of vendors wanting to make a move to a subscription business model,” Wurster says.¹¹

2 | *Hybrid and multi-cloud will become the new normal.* There’s a rise in both colocation utilization alongside public cloud deployments.

So, what’s driving all of this? Data. Various industries are creating a lot of information and require better and more effective ways to manage this influx of data. In fact, IDC predicts that the data services for hybrid (DSH) cloud market is expected to grow at a five-year CAGR of 20.5%.¹² “There are three significant shifts happening in the DSH cloud market that are reflected in this forecast: first, the rapid growth of data location optimization services employing cognitive/machine learning; second, the growth of integration and orchestration software with ongoing shift to hybrid/multicloud; and third, growth in security and compliance data services with heightened emphasis on regulatory compliance and ongoing increase in security breaches,” says Ritu Jyoti, Research Director, Storage at IDC.

In many situations, moving to a public, cloud-only scenario just doesn’t make sense. This is where hybrid and multi-cloud come in. Looking ahead, these models will provide the most flexibility and agility when creating new and innovative solutions.

3 | *Cognitive systems will be critical cloud differentiators.* This is where smart technologies like AI and even machine learning come into play. Cumulatively known as ‘cognitive systems,’ these solutions can greatly improve the frequency, flexibility and immediacy of data analysis across a range of industries, circumstances and applications. IDC estimates that the amount of the global datasphere subject to data analysis will grow by a factor of 50 to 5.2ZB in 2025. The amount of analyzed data that is “touched” by cognitive systems will grow by a factor of 100 to 1.4ZB in 2025.¹³

Let me give you an example; one component of a cognitive system is natural language processing (NLP). Basically, NLP allows organizations to create intelligent interactions between machines and humans. To fill the gap between people and machines, NLP leverages code, computational linguistics, and even computer science to help understand and even manipulate human language. This type of technology allows computers to comprehend the structure, meaning and composition of various human languages. From there, it allows users (and machines) to interact with other computers and systems using natural sentences.

It’s no wonder that we’re seeing a vast boom in NLP solutions. NLP allows us to understand meaning behind various speech and human interaction processes.

Using this example, it’s clear that cognitive systems will play a major role in how we utilize data and impact the business world.

¹¹ Gartner, Smarter with Gartner, Moving to a Software Subscription Model, May 30 2018, <https://www.gartner.com/smarterwithgartner/moving-to-a-software-subscription-model/>

¹² <https://www.idc.com/getdoc.jsp?containerId=US43004417>

¹³ <https://seagate.com/www-content/our-story/trends/files/Seagate-WP-DataAge2025-March-2017.pdf>

Cloud in 2019 and Beyond (cont.)

4 | *Security will become even more critical and sometimes confusing.* When it comes to cloud, applications and new advanced systems, security will only complicate and oftentimes confuse the matter. Furthermore, things like GDPR certainly don't make it any easier. This is a major reason why the governance, risk and compliance (GRC) side of the business continues to grow. Consider this, results from a recent survey by Commvault showed that only a small number (12% of the 177 global IT organizations surveyed) understand how GDPR will affect their cloud services.¹⁴ These results raise the assumption that companies using cloud services will be more vulnerable.

This is a major reason why cybersecurity and DevSecTestOps practices will become absolutely critical. In the DevSecTestOps world, we inject security directly into the development and testing process. This means that before code even goes into production, there has been extensive vulnerability and code security checks. It's these types of services that'll reduce risk and help with compliance.

5 | *Advanced cloud systems will act as a bridge between humans, machines and connected devices.* IDC recently reported that by 2025, an average connected person anywhere in the world will interact with connected devices nearly 4,800 times per day, which basically equates to one interaction every 18 seconds.

Here's a specific example. NLP allows us to understand meaning behind various speech and human interaction processes. The resulting capabilities can include **sentiment analysis**, or the voice of the customer, speech inference and relations, as well as patterns between people and entire social groups, and even variations in market trends. This also allows us to see how they interact with services, resources and physical devices.

In using data and cognitive systems, you can begin to understand and even visualize market, customer and even specific service sentiment. This solution leverages data, NLP and a host of other techniques to better understand what makes the consumer happy (or sad). By leveraging a combination of NLP, text analysis, computational linguistics and biometrics, we're able to understand the voice of the customer. And that's not all – you can also understand the sentiment around your competition.

It's these future solutions that'll provide deeper understanding of the market, and how consumers interact with evolving cloud and digital systems.

Cloud isn't going anywhere. In fact, deep conversations around infrastructure, application and development cloud migrations have already garnered the attention of some of the world's largest enterprise organizations. Why? They don't want to be left behind as more solutions and services are moved into the cloud. Their fear is that they'll miss major market opportunities that can only be afforded by the power of cloud. And they're right. From ERP migration and integration into the cloud, to designing AI engines and chatbots, all of these solutions involve unique cloud architectures and sometimes groundbreaking innovation.

¹⁴ <http://www.businesscomputingworld.co.uk/news-post/global-survey-shows-that-89-of-organisations-are-still-confused-by-gdpr/>

The Good News: There are Partners Capable of Delivering

If you take a scroll through some of the most successful digital and cloud migration stories, you'll quickly realize that a good partner must have the ability to create the foundations for some of the most advanced cloud use-cases in the industry. It's this type of head start that allows leading digital engineering partners to focus on new emerging business solutions, and it helps customers remove legacy barriers to digital adoption.

To effectively execute your strategy, you'll need a partner and system integrator that helps integrate, for example, Google-built machine learning API. A partner working with cloud services like application development, backend integration, model training, project planning, advanced data analysis planogram design (for things such TensorFlow and automated image processing) will help you design and build the foundation for your organization's digital future, and next-generation cloud ecosystem.

Furthermore, leading digital engineering partners are those that invest heavily in their cloud and digital partnerships. For example, did you know that Google has an **Advanced Solutions** Lab and that only a small number of hand-picked partners are a part of that team? As a differentiator, it's this type of digital partner that can work with some of the industry's most advanced AI, machine learning, and data solutions to help impact customers' evolving projects.

A LOOK AT WHAT'S AROUND THE CORNER

Innovation happens in hours and minutes; not in days or months. It's a big reason why it's important to collaborate with a partner that drives true digital innovation in today's data-driven world and guides customers with comprehensive roadmaps to successfully navigate their digital journey.

Looking to the near future, we'll see even more systems integrate with both DevOps and the cloud.¹⁵ In fact, we'll see entire DevOps processes migrated into the cloud.¹⁵ Once DevOps practices and the cloud are truly unified, you open the door for so many other opportunities. For example, you can start new initiatives around data ingestion into a data lake to process various data types. Or, you can quickly integrate with other cloud services to spin up a new business segment. The point is that you are now agile and can deploy at the speed of a digital market. And for those exploring their own digital futures, it's important to explore the cloud landscape to ensure you're always working with the right type of model.

The biggest piece of advice for 2019 and beyond is to not be afraid to go on this journey. However, you do need to get started. Stagnation and turning a blind eye to innovation will only slow down business processes. This is a major reason why leading organizations are taking advantage of cloud services to revolutionize their cloud and DevOps practices. Most of all, it helps develop a digitally native organization.

¹⁵ <https://www.informationweek.com/cloud/platform-as-a-service/should-you-migrate-your-devops-architecture-to-the-cloud/a/d-id/1332989>



ABOUT EPAM SYSTEMS

Since 1993, EPAM Systems, Inc. (NYSE: EPAM) has leveraged its software engineering expertise to become a leading global product development, digital platform engineering, and top digital and product design agency. Through its 'Engineering DNA' and innovative strategy, consulting, and design capabilities, EPAM works in collaboration with its customers to deliver next-gen solutions that turn complex business challenges into real business outcomes. EPAM's global teams serve customers in over 25 countries across North America, Europe, Asia and Australia. EPAM is a recognized market leader in multiple categories among top global independent research agencies, and was one of only four technology companies to appear on each of the Forbes 25 Fastest Growing Public Tech Companies lists between 2013 and 2017.

Learn more at <http://www.epam.com/> and follow us on **Twitter** @EPAMSYSTEMS and **LinkedIn**.

NEWTOWN

*41 University Drive,
Suite 202
Newtown, PA 18940*

P: +1-267-759-9000

E: sales@epam.com