IDC PERSPECTIVE

Addressing the Challenge of Adopting and Scaling DevOps

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EXECUTIVE SNAPSHOT

FIGURE 1

Executive Snapshot: Addressing the Challenge of Adopting and Scaling DevOps

In today's expanding digital business climate, it is imperative that organizations adopt DevOps as a means for moving faster and with more agility, making it easier to adapt to changing market demands and exploiting emerging opportunities. This research examines the current state of DevOps adoption and offers guidance on how organizations can scale DevOps across their application portfolio. This discussion includes building the right foundation, velocity, adoption, and leveraging 3rd Platform technologies.

Key Takeaways

- The digital economy is experiencing exponential growth with no signs of slowing down, forcing organizations to consider how they can remain competitive in this new economic paradigm.

- It is essential for organizations to be able to move faster and with more agility to adapt to ensure a delightful customer experience (CX).

- Organizations need to consider how they can modernize to a DevOps application delivery approach to keep pace with the changing digital ecosystem.

- Although DevOps adoption is increasing, organizations are challenged to increase adoption internally.

Recommended Actions

- Do not overlook the foundational aspects of DevOps adoption such as agile methodologies, culture, executive sponsorship, and alignment between IT and the business.

- Look at your processes holistically using tools such as a value stream map to remove friction, rework, and stalled DevOps teams. Automation is the key to improving velocity.

- Expand DevOps adoption by fostering a culture of trust, building communities of practices using approaches such a center of excellence (CoE) for DevOps.

- Ensure your DevOps teams are taking advantage of adjacent 3rd Platform technologies such as cloud computing and containers.

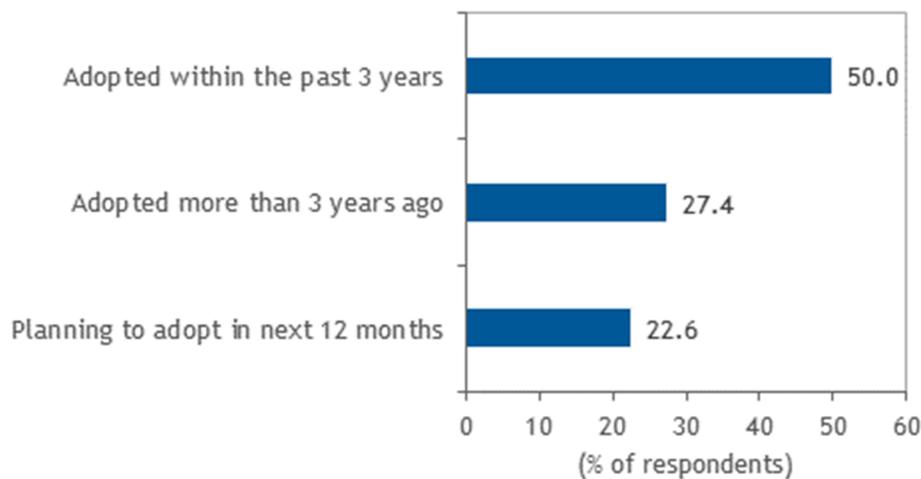Source: IDC, 2020

SITUATION OVERVIEW

IDC predicts that by 2022, 60%+ of global GDP will be digitized, with growth in every industry driven by digitally enhanced offerings, operations, and relationships and almost $7 trillion in IT-related spending in 2019-2022 (see *IDC FutureScape: Worldwide IT Industry 2019 Predictions,* IDC #US44403818, October 2018). Organizations that adapt quickly and provide a delightful customer experience (CX) will have the opportunity to thrive in this new digital economy, while those that continue to rely upon long application release cycles and legacy waterfall software development life cycle (SDLC) processes will likely not be able to survive, or at least won't thrive as they might otherwise, given the right technology decisions.

DevOps represents the integration of application development and IT operations at many levels, including culture, process workflows, infrastructure management, and application creation, deployment, and delivery. Fundamentally, using DevOps principles leads to a faster, more agile approach to conceptualizing business innovation and converting those ideas or processes into user accessible code – whether delivered as packaged software, SaaS, mobile and web applications, or online business services. Ultimately, organizations need to examine their current waterfall SDLC processes and consider how they can modernize to a DevOps approach to keep pace with the changing digital ecosystem and ensure a positive CX.

While there has been a great deal of interest in DevOps over the past few years, the reality is that many organizations are still in the early stages of rolling out DevOps practices and DevOps-enabling tools across their application landscape and it is still a future state scenario for many organizations. In a recent IDC survey of U.S. enterprise organizations, respondents were asked if their organization has adopted or is planning to adopt DevOps practices. More than 77% of respondents indicated that they have already adopted DevOps in some capacity for a portion of their applications (see Figure 2).

FIGURE 2
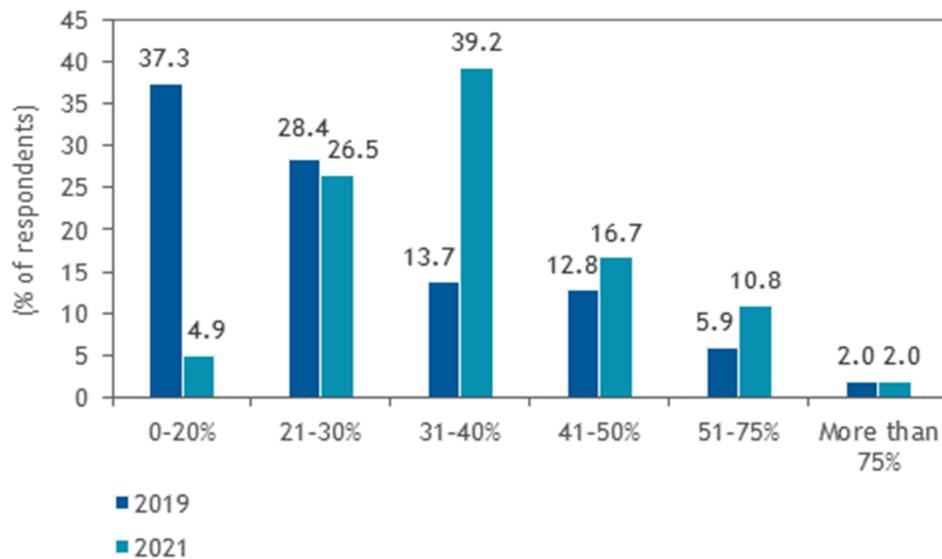
DevOps Adoption

n = 102

Source: IDC's *U.S. DevOps Survey,* July 2019

However, when those same respondents were asked what the actual percentage of their application landscape were currently using DevOps – we found that most of these enterprise organizations are using DevOps for less than 20% of their application estate (see Figure 3). The adoption rate nearly doubles in 2021, with most organizations planning to have nearly 31-40% of their application estate using DevOps.

In contrasting DevOps adoption data with the growth of the digital economy, it becomes clear that time is of the essence for organizations that have not managed to broadly adopt DevOps as well as those that have adopted but are failing to scale DevOps across their application landscape.

FIGURE 3

Percentage of Applications Using DevOps, 2019 and 2021

n = 102

Source: IDC's *U.S. DevOps Survey,* July 2019

ADVICE FOR THE TECHNOLOGY BUYER

To achieve a successful DevOps implantation, it helps begin with a foundation consisting of the following practices and technologies:

- Agile adoption
- Executive sponsorship
- Cultural transformation
- Business alignment
- Process and test automation
- Address drain of legacy applications

- Creating communities of practice
- Measure progress with metrics
- Leverage 3rd Platform technologies

Create a Foundation for DevOps Success

Agile Adoption

Often organizations move to adopt DevOps, but the existing IT teams are still engaged in waterfall development processes and procedures and have not gone through an agile transformation. Current IDC survey data suggests that 67% of application development approaches are now driven by agile methodologies (see *PaaSView and the Developer 2019: Key Worldwide Trends in Contemporary Application Development,* IDC #US45367319, July 2019). Like DevOps adoption, agile development practices encompass both cultural transformation and enabling software tools. It is important that organizations adopting DevOps let IT teams get acclimated to agile software development methodologies.

Organizations should ensure that the groundwork of agile application development is already in place. Agile is foundational to DevOps and much of the agile manifesto applies to DevOps, including:

- Working software
- Customer collaboration and feedback
- Responding to changing requirements

For strong agile teams, the seeds of DevOps will have already been planted and broad adoption is the next logical step in the evolution of improving the speed in which they can deliver value to their customers. Expecting your teams to rapidly adopt DevOps and agile simultaneously is unrealistic.

Executive Sponsorship

Although many DevOps initiatives have been started as grassroots efforts, the most successful organizations have support from the company's executive leadership team. Often it is the success of the early "rogue" projects that helps the team build a business plan to acquire support for larger DevOps adoption. Regardless, to get executive sponsorship, IT leaders will likely have to present a business plan that demonstrates an ROI for the business. Many of these business plans will focus on the cost savings of avoiding expensive outages due to improved quality or the opportunity to get features into customer's hands faster.

Recent IDC survey data reveals that 25% of organizations that are going through a DevOps transformation are still trying to get buy-in from senior management (see *U.S. DevOps Survey of Large Enterprise Organizations, 2019,* IDC #US45688619, December 2019). Teams that need to invest in new DevOps tools and make organizational changes such as getting development and operations working together will need the support of leadership to fund these new initiatives. Consequently, it is nearly impossible to transform and scale DevOps without the backing of executive leadership.

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Cultural Transformation

Changing an organization's culture is one of the most difficult challenges a leader will face, but it is vitally important for a successful DevOps transformation. As Peter

Drucker famously said, "Culture eats strategy for breakfast." Uniting development, testing, and IT operations to be on the same page and share a common focus is the key to removing organizational friction, accelerating DevOps adoption, and improving your ability to reliably deliver value to your customers.

Establishing a new culture is leadership in action, meaning that leaders set the tone for their organization's culture change through their own behavior. It is important for leaders to emphasize the importance of the transformation, sell the benefits of DevOps adoption, and treat the transformation as a priority by personifying the right behavior. It is essential that there is engagement with teams at all levels and functions and individuals are given a chance to raise objections and help come up solutions to challenging problems.

This kind of engagement can change the game and incent the teams to "own the transformation" rather than it being seen as the latest edict from management. This leadership by example spawns grassroots adoption, allowing the cultural transformation to permeate the organization at all levels. Make sure you look for opportunities to publicly celebrate success as teams mature in their transformation. Further, leaders need to exercise patience as it takes time for transformation to take hold and there will likely be some need for upskilling your IT teams.

Skills

According to a recent IDC *DevOps Survey* (see *Addressing the DevOps Skills Gap,* IDC #US44899019, March 2019), the market for DevOps talent is tight, and many organizations are taking multiple approaches toward addressing the skills gap. This includes investing in training for existing resources to provide opportunities for upskilling as well as hiring some outside DevOps talent for select roles – particularly where this external talent can provide expertise and influence that can help accelerate the cultural transformation.

Business Alignment

Often overlooked is the value the business can get from DevOps adoption. It remains critically important that DevOps teams are aligned with the business and understand how they contribute to the bottom line. That is, successful DevOps implementations make the business run better, be more efficient, and most importantly, generate incremental revenue.

Gene Kim, author of *The Phoenix Project* and *The Unicorn Project,* stated, "The obstacles to DevOps are beyond the classic technology value streams of architecture, development, operations, QA, and security – and increasingly it's to what degree do you have a trusting relationship with your business partner." In today's digital economy, IT should not be treated as a cost center but regarded as a critical organizational asset and a strategic part of the business.

Most recently, people are starting to refer to this partnership with the business as BizDevOps. The objective for the organization is to facilitate this collaboration and direct DevOps teams toward not just a speedy and efficient outcome but a successful conclusion from a business value perspective. A specific new feature may be interesting to a development team because they get to work with something new, but if that feature does not expand the business or protect the user base, what value is it providing to the business?

When IDC asked teams that have adopted or are adopting DevOps, what is the most pressing thing they need to do, the top answer (35%) was working more closely with the business (see *U.S. DevOps Survey of Large Enterprise Organizations, 2019,* IDC #US45688619, December 2019). A fantastic way

to get the business engaged with your DevOps effort early on is to include them in a value stream mapping (VSM) exercise.

Value Stream Mapping

A VSM exercise will provide insights into how work moves through the delivery pipeline. The VSM should include all the participating parties along the value stream, including the business stakeholders. The VSM tracks the flow of work from the initial customer request until it is made available for the customer to use in production. Using the full breadth of knowledge from the cross-functional team, including business stakeholders, the organization should look to identify areas where things are done manually, where there is poor communication, where redundant effort causes rework, and where handoffs cause work to queue up and affect another team, forcing them to wait before they can make progress.

Since this is a group exercise, the process itself helps rally the cross-functional team around improving the flow of work. This helps get all the different areas speaking a common language with an enhanced understanding of how they can contribute toward improving the flow of work.

Understanding your value stream is critical and something that should be done before starting a comprehensive process automation effort, because clearly automating an inefficient process may not provide you with the best possible outcome.

Accelerating DevOps Velocity

Automate

Automation is the fuel that accelerates the velocity of the DevOps delivery pipeline and frees team members up to perform more higher-value work. In contrast, manual and arduous waterfall processes are the antithesis of automation, adding friction to the DevOps delivery pipeline and causing time-consuming procedures, meetings (i.e., change advisory board [CAB]), rework, and handoffs. There are many areas where DevOps teams can improve velocity with automation, including configuration and infrastructure management and provisioning, change approvals, release delivery, and deployment and testing automation.

In a recent IDC study, large enterprise organizations were asked for their top process bottleneck and the top response (61%) was manual processes management (see *U.S. DevOps Survey of Large Enterprise Organizations, 2019,* IDC #US45688619, December 2019). Clearly, enterprise DevOps organizations are still grappling with legacy manual processes. When these organizations were asked what manual processes were holding them back, the highest response (40%) was the lack of test automation.

Test Automation

DevOps teams are frequently encumbered by too many manual tests that need to be run for each iteration of an application release. Automating manual tests is normally where DevOps teams can realize early improvements in velocity and quality. Automated software testing reduces friction between development and QA and enables developers to easily test their own code changes using a consistent and repeatable approach. DevOps teams should handle their automation scripts with same due diligence as the application code itself. Test automation must be designed with reusable common components (i.e., application authentication and access), extensible and saved in source control management (SCM) system.

Just like the application source code, changes to the automation scripts ought to go through a peer code review process to ensure quality. Further, the automated tests need to be written such that they perform consistently and reliably. A test that will unpredictably pass or fail when run against the exact same software only wastes valuable time, leads to frustration, and could be masking a real software defect. An unreliable automated test is worse than running a test manually – make sure your test automation is dependable.

Another test automation challenge is making sure automated test suites do not get bogged down with superfluous or outdated tests. Automated tests tend to accumulate as new functionality is added, extending the time it takes to run the test suites and creating maintenance challenges. Since these tests are not run manually, teams lose track of them because they don't feel the pain of repeatedly running the test manually. So DevOps teams should regularly review the test automation scripts to merge duplicate functionality tests together and remove tests that may have become obsolete, treating this test maintenance as recurring technical debt.

A key point to remember is that automation is extremely valuable for improving velocity and quality, but don't let the automation itself become the problem.

As an aside, the test automation market is changing rapidly; software vendors such as Tricentis are beginning to offer scriptless test automation tools as well as AI capabilities that may prove helpful in addressing challenges with creating and maintaining test automation.

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Accelerate DevOps Adoption

Legacy Applications

Many organizations are already struggling with resource constraints and are hard-pressed to make transformational changes such as adopting DevOps across their application landscape, building new cloud-native applications, and integrating these new applications to existing systems of records (SOR). The drain of keeping critical business applications running with flat or shrinking budgets is an ongoing dilemma.

When we surveyed enterprises that have adopted or are actively adopting DevOps and asked what the top technology blockers in the DevOps pipeline are, the top answer (70%) was integration into legacy application environments (see *U.S. DevOps Survey of Large Enterprise Organizations, 2019,* IDC #US45688619, December 2019). These enterprises are saddled with technology debt, and IT departments do not have time to focus on innovative solutions while maintaining legacy applications.

In today's digital economy, sticking with the status quo is not going to keep you in business over the long term. Organizations need to garner support for DevOps transformation from their leadership and be creative in how they create independent teams that are free from legacy support responsibilities to adopt DevOps and build innovative solutions using next-generation technology. An EMEA IDC document found that aptly named *DevOps determined* organizations that are taking bold steps to go through a DevOps transformation consistently rated higher than their *DevOps distracted* peers in areas such as agile adoption, collaboration, automation, and continuous delivery (see *DevOps Deadlock: Getting to DevOps-Determined,* IDC #EMEA44456718, November 2018).

Expanding DevOps Practices

Organizations need to exercise some patience and realize that DevOps is not a destination; it is an ongoing approach to delivering software that stresses a faster flow of releasing business value to your customers and ongoing continuous improvement. The DevOps adoption process is iterative, and it will take time to expand DevOps usage within your organization. You need to foster a culture of trust that is not afraid of failure, rather one that actively uses failure to better refine ideas and nurture new innovations.

As you start to make progress, this approach will instill confidence in the value of the DevOps effort, and it can serve as a framework for other teams to follow as they start down their own path toward embracing DevOps. These early adopters of DevOps can become evangelists and mentors within your organization to help and encourage other teams on their DevOps journeys.

DevOps Center of Excellence

These new evangelists can serve as the foundation for building a DevOps center of excellence (CoE) within your organization. A DevOps CoE is a community of DevOps specialist and champions who are focused on easing adoption and providing direction for teams who are just starting their adoption journey. There may be several communities of practice within the CoE allowing teams to collaborate around domain topics such as testing, release engineering, and operations.

A CoE can help new teams adopt DevOps faster by providing consulting services and best practices. The CoE will often get involved with defining a common DevOps tools stack, working with the security team on universal security and governance processes, establishing dashboards for reporting, offering centralized support for automation, or providing other reusable DevOps artifacts. An effective CoE model requires a significant amount of alignment, communication, and distribution of work between participating groups.

As more teams mature in their DevOps journey, it behooves organizations to rotate CoE members and leaders regularly to enable them gain experience, broaden ownership, and allow for new innovative ideas and approaches. The rotation of members enables the CoE to constantly improve over time by leveraging the collective knowledge of the organization.

Straightforward Metrics

Getting started with DevOps presents multiple challenges that must be overcome. One of the biggest challenges classically is how are you going to measure success? The temptation is to be thorough in your approach and identify as many metrics as possible to ensure nothing is being missed. This might include searching the internet or seeing what types of metrics your suite of DevOps tools can provide. While the intent is good, this type of approach makes it hard to focus on key areas of improvement. It can overwhelm your DevOps teams with data as they work to collect the most meaningful metrics and figure out how to apply them as part of a continuous improvement effort.

Make sure the metrics you collect help you measure and drive the changes and behaviors you are looking for. Some sample metrics are deployment frequency, cycle time, availability, MTTR, CSAT/NPS, and so forth. To start, keep it simple, begin with collecting just three or four metrics.

A terrific way to measure progress is to align with your business partners' core objectives. What effect will the DevOps effort have on business outcomes? For example, how does improved availability and speed to market equate to sales? What tangible cost benefits can be shown back to the business (i.e.,

availability, quality, retention) in a dialect they understand? Determine how a feature enhancement created or was additive to business value, like increasing lead pools, enhancing customer experiences, driving conversion rates, and establishing new businesses.

Exploit 3rd Platform Technologies

Cloud

Cloud platforms are part of what IDC refers to as the 3rd Platform – the post-distributed computing era of deployment environment (2nd Platform) – which embraces cloud technology and services. While DevOps is focused on process flow and continuous improvement, a suitable cloud platform provides the lubricant to help make this happen easily and naturally.

IDC survey results show that 50-74% of DevOps teams claim that 25% of their applications are already running in the cloud (see *U.S. DevOps Survey of Large Enterprise Organizations, 2019,* IDC #US45688619, December 2019). It is much easier and faster to drive a DevOps effort on a cloud platform than trying to setup an environment on a typical on-premises environment. A cloud platform can provide critical services such as:

- Self-service provisioning that gives developers more control over their own infrastructure leveraging infrastructure defined as code (IaC) (This facilitates automated and repeatable processes that are not as practical without a robust cloud platform.)
- Creating ephemeral production-like environments that developers can clone to test changes and easily liquidate deployments that have served their purpose (This empowers application developers to quickly try new innovative ideas leveraging IaC to build and then destroy the environments when they are through.)
- Access to DevOps tools such as CI/CD solutions to drive build automation and frequent commits
- Many clouds that provide integrated access to SCM solutions such as Git

Public cloud environments will normally provide significant cost savings as workloads are shifted off on-premises infrastructure by allowing rightsizing of resources paid for in alignment with the resources required. No longer is over-provisioning required to meet peak demand.

Containers

Although you do not have to use containers to embrace DevOps practices, containers can help teams work more efficiently. A recent IDC survey showed that 68% of DevOps teams are using containers as a key technology for modernizing their application efforts. While another 40% indicated that containers are actually helping them accelerate their DevOps adoption (see *U.S. DevOps Survey of Large Enterprise Organizations, 2019,* IDC #US45688619, December 2019).

Containers provide the agility to easily change between different programming frameworks or deployment platforms. This is because containers are shielded from the underlying deployment environment, making it possible to run almost any type of application inside a container on virtually any platform. IDC predicts by 2024, 80% of all new applications will be deployed in containers to gain the benefits of deployment speed, application consistency, and portability (see *IDC FutureScape: Worldwide Developer and DevOps 2020 Predictions,* IDC #US44636519, October 2019).

Once again, this approach allows DevOps teams to focus more on adding business value via new functionality rather being concerned with deployment issues. Containers help make production software deployments more automatable and reliable. Further, containers ease the management of

multicloud and hybrid cloud scenarios because you can move containers from on premises or between cloud platforms without changing the application software, barring other external dependencies.

LEARN MORE

Related Research

- *DevOps Application Delivery Bottlenecks* (IDC #US45814020, January 2020)
- *Developers: Driving the Future of Digital Innovation* (IDC #US45723719, January 2020)
- *U.S. DevOps Survey of Large Enterprise Organizations*, 2019 (IDC #US45688619, December 2019)
- *IDC FutureScape: Worldwide Developer and DevOps 2020 Predictions* (IDC #US44636519, October 2019)
- *PaaSView and the Developer 2019: Key Worldwide Trends in Contemporary Application Development* (IDC #US45367319, July 2019)
- *IDC PeerScape: Practices for Using Metrics to Measure DevOps Progress* (IDC #US45026419, May 2019)
- *Addressing the DevOps Skills Gap* (IDC #US44899019, March 2019)
- *DevOps Deadlock: Getting to DevOps-Determined* (IDC #EMEA44456718, November 2018)
- *IDC FutureScape: Worldwide IT Industry 2019 Predictions* (IDC #US44403818, October 2018)

Synopsis

This IDC Perspective addresses the challenge of adopting and scaling DevOps. The new digital economy is moving at breakneck speed, and organizations that do not modernize their application delivery practices will be left behind and ultimately irrelevant. DevOps application development methodologies provide the framework organizations need to modernize by improving quality, velocity, and agility. Using IDC market data, this IDC Perspective provides the current state of DevOps adoption and insights that can be used to not only adopt DevOps but scale it across their application landscape.

According to Jim Mercer, research director, DevOps at IDC, "Most enterprise organizations have already adopted DevOps as part of pilot or greenfield projects. As enterprise organization mature, they are hitting a ceiling of scalability and they struggle to expand the use of DevOps across their application portfolio. These organizations will not reap the benefits without a comprehensive approach to DevOps adoption. Scaling DevOps across your application landscape requires the due diligence of gaining support from executive leadership, building the proper agile foundation, using automation to drive velocity, leveraging 3rd Platform technologies, and fostering a cross-functional culture of trust and transparency."

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