Next

RESEARCH REPORT

May 2019 \$499



2019 State of DevOps

DevOps is needed in today's business environment, where improved application security is essential and users demand more applications, services, and features — fast.





Next

TABLE of CONTENTS

- 3 About the Author
- **4** Executive Summary
- 5 Research Synopsis
- 6 Reasons for Adopting DevOps
- 20 Appendix

Figures

- Figure 1: Behind the Need for DevOps
- Figure 2: Applications Managed by IT Team
- Figure 3: Applications Moved into Production
- Figure 4: Average Time to Move Application into Production
- Figure 5: Application Upgrades Moved into Production
- Figure 6: Application Failures
- Figure 7: Recovery Time
- Figure 8: Major Challenges to Implementing DevOps

- Figure 9: Cultural Changes as a Result of DevOps
- Figure 10: Reasons for Not Adopting DevOps Methodology
- Figure 11: DevOps Approach to Software Development
- Figure 12: Purchase Plans for DevOps Technologies and Tools
- Figure 13: Expected Timeline to Adopt DevOps
- Figure 14: Investments for DevOps Implementation
- Figure 15: Critical Tools to Enable DevOps
- Figure 16: Benefits of DevOps
- Figure 17: DevOps' Impact on IT Infrastructure, Application Deployment Speed, and Security
- Figure 18: Improvements Resulting from DevOps Adoption
- Figure 19: Familiarity with DevOps Concept
- Figure 20: Alerting IT to Application Failures

- Figure 21: Time Necessary for Infrastructure Change
- Figure 22: In-House Developers
- Figure 23: Methodologies Used by In-House Developers
- Figure 24: Organizations' Use of Agile
- Figure 25: Enabling Integration with APIs
- Figure 26: Measuring Success of DevOps Initiatives
- Figure 27: DevOps Expertise for New Hires
- Figure 28: Primary Background Area
- Figure 29: Respondent Job Title
- Figure 30: Respondent Company Size
- Figure 31: Respondent Company Revenue
- Figure 32: Respondent Industry

RESEARCH REPORT

2019 State of DevOps

Previous

Table of Contents

Next

AUTHOR



Salavatore Salamone Interop Reports

Salvatore Salamone is the managing editor of Network Computing. After working as a research physicist, he became a writer and editor covering business, technology, and science. He has written three business technology books and served as an editor at IT industry publications including Network World, Byte, Bio-IT World, Data Communications, LAN Times, and InternetWeek.

RESEARCH REPORT

Interop | NETWORKComputing
InformationWeek | DARKReading

interop.com



Table of Contents

EXECUTIVE SUMMARY

DevOps continues to make its mark in enterprise IT as a set of software development practices that combines software development (Dev) and information technology operations (Ops). Together, they are designed to shorten the systems development life cycle while delivering features, fixes, and updates frequently in close alignment with business objectives.

Most IT professionals and developers are familiar with the concept. And the conventional wisdom is that many organizations seek to use DevOps strategies to improve the way they develop, deploy, and maintain applications and services.

Interop and InformationWeek sought to see where DevOps adoption and deployment stand. This report summarizes the findings of their survey of 150 IT and application development professionals at companies of all sizes, across many industries. The survey found the following:

- Most companies are familiar with DevOps and are using the strategy now or plan to do so within the year.
- Drivers for adoption include the need to develop, deploy, and support more applications in faster times.
- A plethora of tools and technologies are being used, evaluated, and purchased to support DevOps efforts.
- Expected benefits include greater speed-to-market, improved application performance, reduced downtime, and quicker fixes and updates.



Table of Contents

ABOUT US

Interop

Interop is the industry's most trusted independent conference focused on Full Stack IT education for technology leaders. The event continues the 30 years Interop has dedicated to providing IT professionals with a trusted environment to learn, collaborate, and uncover new strategies and solutions they need to lead their businesses through constant change and disruption. Interop offers both breadth and depth of content to a broad IT audience across core areas: Cloud, Data & Analytics, DevOps, Government, Infrastructure, Leadership & Professional Development, and Security. For more information, visit interop.com.

RESEARCH REPORT

Interop | NETWORKComputing
InformationWeek | DARKReading

RESEARCH SYNOPSIS

Survey Name: Interop and InformationWeek State of DevOps Survey

Survey Date: April 2019

Primary Region: North America

Number of Respondents: 150 IT professionals at companies of all sizes. The margin of error for the total respondent base (N=150) is +/-7.9 percentage points.

Purpose: To understand the current state of IT in light of emerging technology and changing business models.

Methodology: Interop and InformationWeek conducted an online survey of 150 IT and application development professionals and asked about priorities and challenges regarding their companies' plans and use of DevOps. The survey was conducted online. Respondents were recruited via an email invitation containing an embedded link to the survey. The email was sent to a select group of Informa's qualified database; Informa is the parent company of Interop and InformationWeek. Informa was responsible for all programming and data analysis. These procedures were carried out in strict accordance with standard market research practices.

Respondents' job titles included all levels of IT, such as CIO, IT management and staff, security management and staff, and corporate management. All respondents were screened as involved in the purchase, planning, implementation, operations, or administration of technology within their organization. Respondents worked at companies of all sizes (about one-quarter small, one-quarter midsize, and half large), and hailed from a variety of industries, including financial, banking, education, consulting, construction, government, and healthcare.

Table of Contents

Next

Reasons for Adopting DevOps

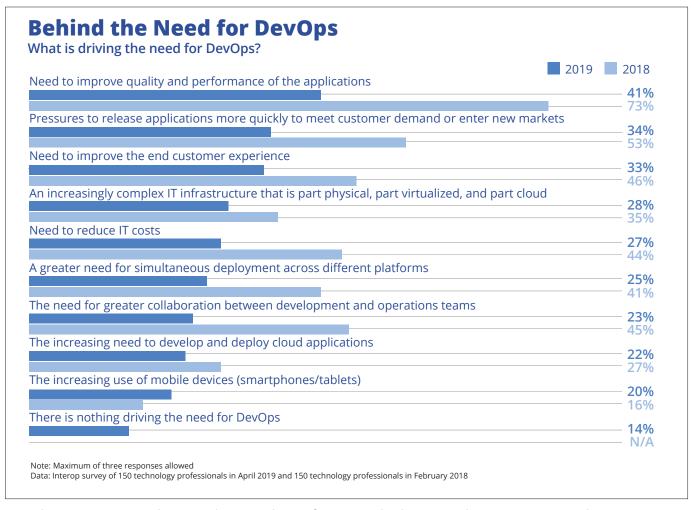
The digitalization of business is placing new demands on companies today. Customers expect applications and services to be available all the time, quickly deliver requested information, and provide fast access to account data. They also continually demand more functionality and assume their suggestions for new features will be swiftly implemented.

As a result, development and operations teams today must be able to quickly deploy new applications and services, as well as make updates to existing software and services. In most companies, there is a need to support more applications and services, all requiring short go-to-market strategies. Interestingly, between 2018 and 2019 there is a significant drop in urgency to adopt DevOps. This could be due to either a maturity in the marketplace or diminished expectations as organizations begin DevOps initiatives and reset their goals.

DevOps Drivers

The top drivers for DevOps include the demands or to enter new markets (34%),

Figure 1



mance of applications (41%), pressures to release code more quickly to meet customer

need to improve the quality and perfor- and the need to improve the customer mance of applications (41%), pressures to experience (33%) (**Figure 1**).

Other factors cited by slightly more than a quarter of the respondents are the need

RESEARCH REPORT

Next

Table of Contents



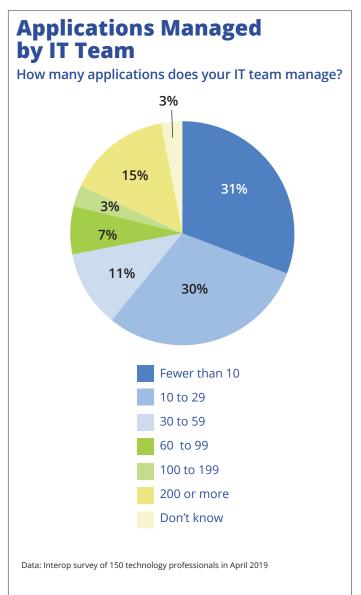
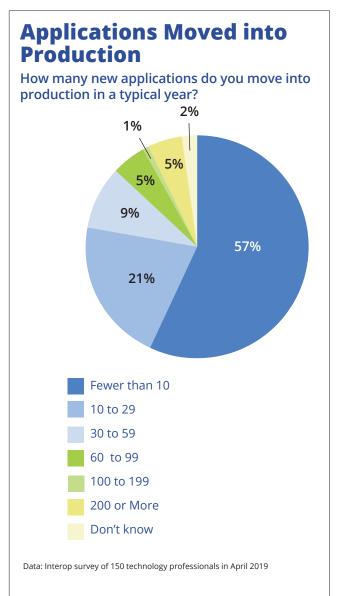


Figure 3



to reduce IT costs and the need to address the increased complexity of today's IT infrastructures, which often have physical, virtual, and cloud elements that are hard to manage seamlessly. At the same time, for 25% of respondents one of the drivers for implementing DevOps is the great need to simultaneously deploy applications and services across different platforms.

Application Proliferation

Customer demand for more applications and services is driving up the number of applications IT must support. Teams at quarter of the respondents manage 60 or more applications (**Figure 2**). Fifteen percent manage 200 or more applications. Only 31% manage fewer than 10 applications.

The situation is not static. Forty-one percent of respondents will move 10 or more applications into production this year (**Figure 3**). Eleven percent will move 60 or more applications into production; 5% will move 200 or more.

Supporting the large numbers of existing applications and accommodating the

RESEARCH REPORT

Table of Contents

Next

explosion of new applications will strain conventional approaches where development and operations are run as separate entities. Companies eye DevOps as a way to efficiently manage the expected volume of applications needed to conduct business today.

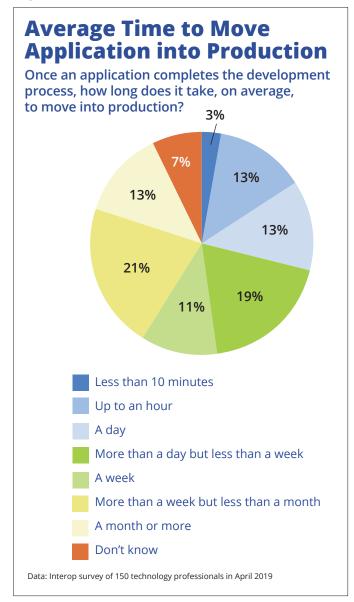
Faster Deployment Required

The need to react to changing market conditions and meet constantly evolving customer expectations requires a fast time to market. Applications and services routinely must be pushed out in shorter time frames than have been the norm.

Just how fast are companies moving today? The average time to move an application into production after it has been developed is a day or less at 29% of survey respondents (**Figure 4**). The average time is 10 minutes to an hour at 13% and less than 10 minutes at 3%.

Another 19% accomplish the move to production in a week or less. Overall, 80% move applications into production in a month or faster.

Figure 4



Don't Forget Application Upgrades

DevOps can help speed development and deployment of new applications and services. But another area where help is needed is in maintaining existing applications. A majority of respondents (53%) move 10 or more application upgrades into production in a typical year (**Figure 5**). Of those, 9% upgrade 200 or more applications a year, another 5% manage 100 to 199, and 7% deal with 60 to 99 application upgrades per year.

Application Failure Rates

Be it employees accessing applications to conduct their daily business or customers interacting with an organization through applications or services, user expectations for availability are high. People want access on their own terms 24/7/365.

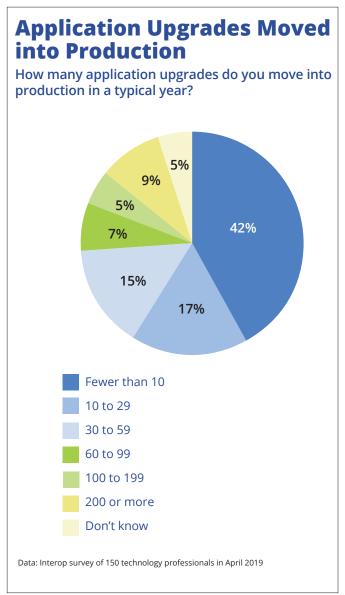
This makes avoiding application failures due to outages and disruptions all the more critical. Studies peg the average cost of downtime to be \$300,000 per hour (\$5,000 per minute) and as high as \$540,000 per hour for some industries. A single outage in a year can have devastating financial consequences.

RESEARCH REPORT

Next

Table of Contents





Unfortunately, most organizations experience application failures on a regular basis. Seventy-seven percent of IT professionals have, on average, at least one failure per month (**Figure 6**). At the high end, roughly a quarter (22%) average 11 or more application failures per month.

Recovery Times

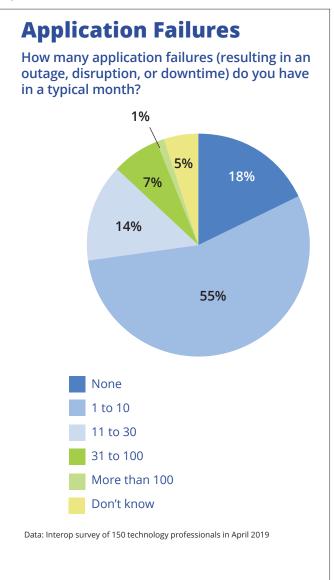
Application failures inevitably will occur. The time to restore an application becomes a business-critical parameter against which IT is measured. With an average cost of downtime being \$5,000 per minute, even seconds count. Still, it takes 10 minutes or less, on average, to recover from an application failure for only 10% of survey respondents.

It takes, on average, an hour or less to recover for close to two-thirds (62%) of respondents (**Figure 7**). It takes a matter of hours for 20%, a full day for 7%, and more than a day for 2%.

What's Holding Up DevOps Adoption?

Given such strong reasons to adopt DevOps,

Figure 6

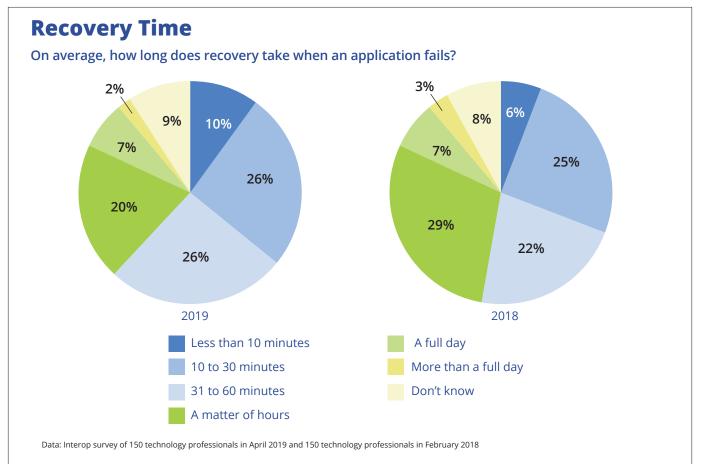


RESEARCH REPORT

Table of Contents

Next





the natural question to ask is: What, if anything, is preventing more expansive use of the strategy? Respondents provide some insight into the matter, noting some of the obstacles they encounter.

the natural question to ask is: What, if Challenges to Implementing DevOps

The top issues inhibiting the adoption and wider use of DevOps mimic those found in any IT undertaking. Security and compliance concerns are the top issue, cited by 34% of

the respondents (**Figure 8**). This is followed by lack of skills within development and operations (32% of respondents); organization complexity, in that too many people or departments must be involved (where there are too many interdependencies) (31%); and difficulty justifying a DevOps project from an ROI perspective (30%).

There are some notable differences in this study's results when compared with the Interop and InformationWeek survey conducted last year. Security jumps to the top from the sixth most important concern in 2018 (with 21% of respondents saying it was important). Also, lack of skills and difficulty justifying ROI both have had significant gains in the percentage of respondents who feel these are critical concerns. This reflects changes from 2018 to 2019 in what IT managers consider to be challenges to DevOps deployment and might indicate the progress made in the past year. As DevOps deployments grew and became more mainstream in organizations, practical issues such as security, staff skills, and ROI would naturally become more important.

Next

Table of Contents

RESEARCH REPORT

Interop | NETWORKComputing
InformationWeek | DARKReading

2019 State of DevOps

Figure 8

Major Challenges to Implementing DevOps What have been the major challenges to implementing DevOps strategy in your organization? 2019 2018 Security or compliance concerns Lack of the right skills within development and operations 32% 26% Organizational complexity — too many people or departments involved, too many interdependencies 31% 36% Difficult to justify from an ROI standpoint 30% 17% Roles and responsibilities across development and operations are not aligned 25% No time/resources available to develop a strategy or plan for DevOps 19% Identifying the right consulting firm with a DevOps practice 18% 6% No budget or a lack of clarity over whose budget is responsible for what A lack of understanding of the phases of the entire development life cycle and who is responsible for which step 11% 22% Finding the proper collaborative tools to enable the different teams to work together 10% No support from leadership Note: Multiple responses allowed Base: 110 respondents in 2019 and 128 respondents in 2018 who have adopted or plan to adopt DevOps principles Data: Interop survey of 150 technology professionals in April 2019, and 150 technology professionals in February 2018

Cultural Changes Required for DevOps

The traditional approach to rolling out new services and applications rarely saw much collaboration between the development and operational sides of the house. The teams worked independently. DevOps changes that relationship. As the name implies, the teams work together for a common goal. This point is confirmed in that 50% of the respondents say DevOps requires that operations be involved in new product and feature development (**Figure 9**). About a quarter of the respondents note that to enable this collaboration, operations and development are co-located.

Other notable cultural differences needed for DevOps to succeed include the fact that development is now required to take part in application deployments (37%); development, quality assurance, and operations share responsibilities and release sign-offs (30%); and operations is included in daily stand-ups (27%). Not surprisingly, there is a growing need to get security involved in all aspects of development and operations.

Next

Table of Contents

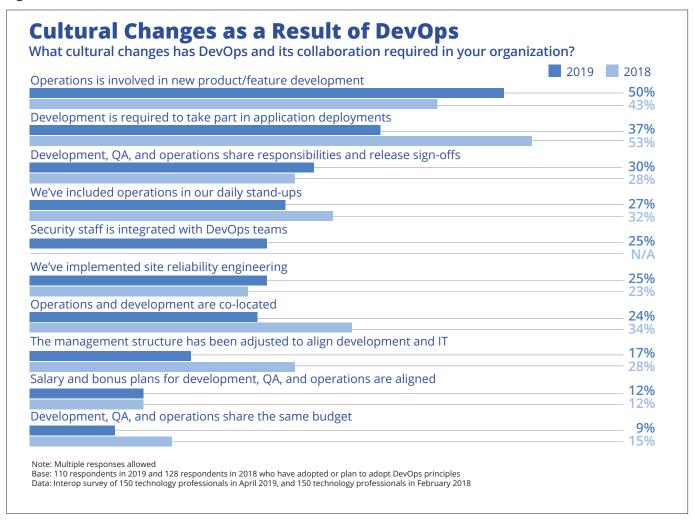
A quarter of the respondents say security staff is now integrated with DevOps. Some refer to this as DevSecOps.

Why DevOps Might Not Happen

Many organizations are willing to address these challenges and cultural issues to reap the benefits of a DevOps deployment. However, there can be other reasons why an organization might not embrace DevOps. For some, it is a matter of priorities. For 34% of respondents, a top reason for not adopting DevOps is that other technologies or business priorities take precedence (Figure 10). There may not be a demand from the business for the benefits DevOps could potentially deliver. That was the case for 24% of respondents. Additionally, as 28% of the respondents note, a company may simply lack the resources to undertake a DevOps effort. Lack of resources and other priorities being considered more important also were at the top of the list in 2018.

A couple of factors are viewed as less of an impediment this year compared with last. Fewer IT managers cite confusion and lack obstacle, while in 2019, the figure is 22%. immaturity of tools and methodologies. of definition around the overall concept. Another issue with a statistically signifi-. Twenty-two percent rated this as a top

Figure 9



of DevOps. In 2018, 34% felt this was an cant change (for the positive) concerns the

RESEARCH REPORT

Next

Table of Contents

issue in 2018, while 16% did so in 2019. Figure 10 Such changes from year to year should be expected in any maturing market.

Implementing a DevOps Strategy

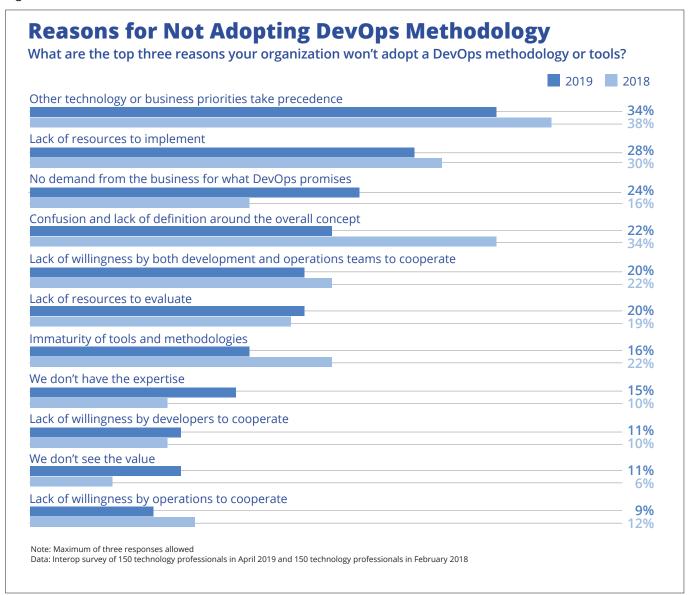
Companies are taking different paths to DevOps deployments deployment, and they have different time scales.

Thirty percent of the survey respondents say none of their development efforts today use DevOps, but they are planning to undertake such efforts (Figure 11). In contrast, last year only 20% of the companies that had not adopted a DevOps strategy said they were planning to do so in the next year.

Which Tools and Technologies?

Once committed to implementing a DevOps strategy, development and production teams need solutions to turn the strategy into a day-to-day reality. Fortunately, there are many tools and technologies available to carry this out.

Many organizations already use or are now purchasing some essential tools and technologies. About a third of respondents



RESEARCH REPORT

Next

Table of Contents

are using or buying tools for collaboration and group chat (35%), issue tracking (35%), source control (33%), project management (33%), continuous integration (30%), and configuration management (29%) (Figure 12). Twenty to 25% are evaluating these tools, and about 10% (on average across these tool sets) plan to purchase such tools in the next year. Other solutions being used, evaluated, and planned for purchase in the next year include automated test tools, release automation software, and application development platforms.

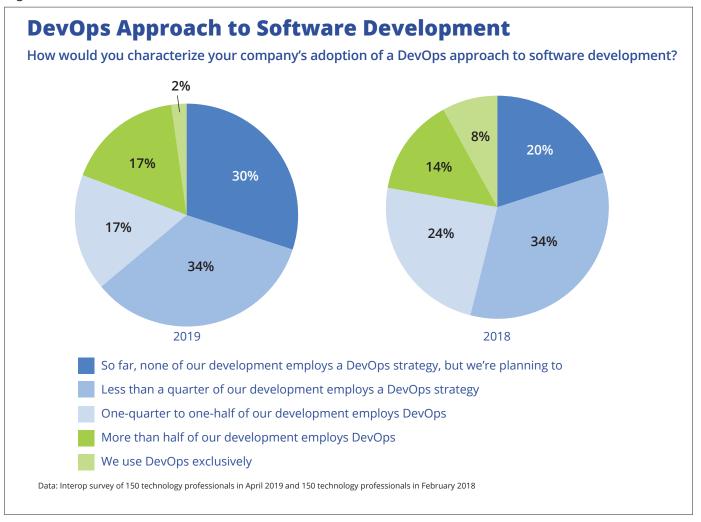
Timeline to Deployment

Most companies responding to the survey are committed to DevOps. Altogether, 59% of their companies have already adopted DevOps or will do so within a year. Breaking that number down: 20% have already adopted a DevOps strategy; 39% will do so within a year; and, of that, 17% in less than six months (Figure 13).

This Year's DevOps Investment **Priorities**

Companies will need to invest in technology

Figure 11



and people to support the growing adop- new tools (50%), hiring new staff with the tion and deployment of DevOps. Top areas necessary skills (40%), and investing in new for the upcoming year include investing in training for development and operations

RESEARCH REPORT **Interop** | **NETWORK**Computing

InformationWeek | DARKReading

Next

Table of Contents

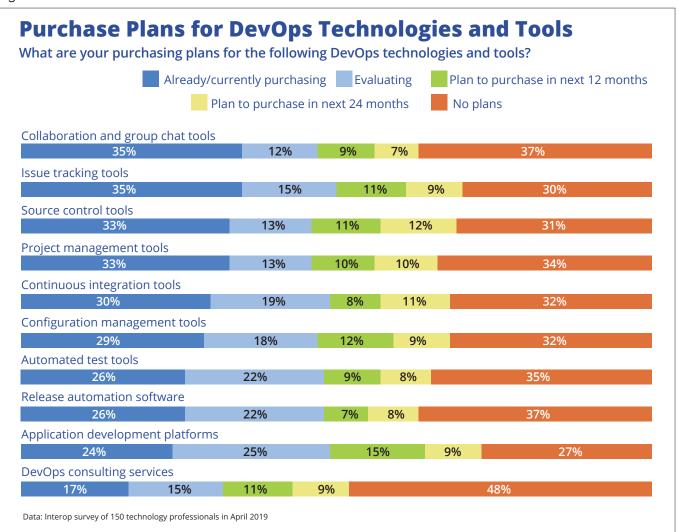
personnel (36%) (**Figure 14**). Redesigning processes to drive the DevOps approach is an additional area of needed investment (48% of respondents).

Critical Tools to Enable DevOps

Focusing on technology, there are a variety of tools that can help DevOps efforts achieve their goals. Essential solutions include application performance monitoring (30%), performance testing (24%), release automation (23%), and functional testing (22%) (**Figure 15**). All of these tools help quantify how well a new or updated application or service is performing. This information is required to ensure applications and services are delivering value to the organization and to measure the value of DevOps.

Complementing these performance metric tools, there also is a need for help managing processes. Nineteen percent of the respondents need change/configuration management tools, 15% want application development life cycle tools, and, in a nod to the operations side, 10% need infrastructure management tools for their

Figure 12



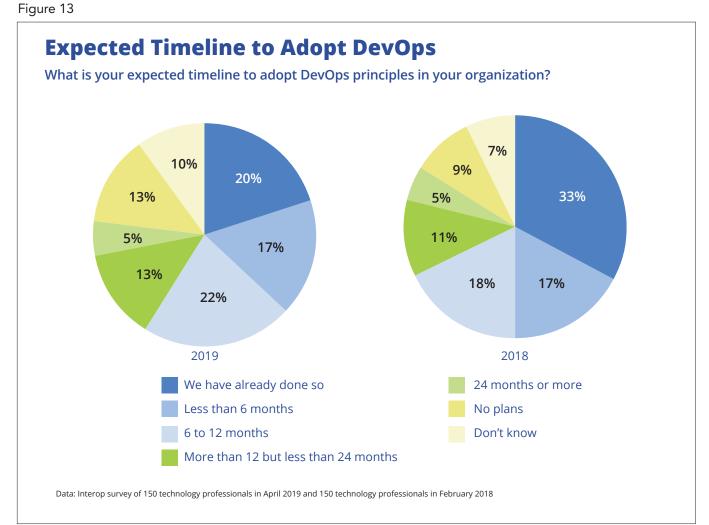
RESEARCH REPORT

2019 State of DevOps

Previous

Next

Table of Contents



servers and storage.

the development and operations processes. As noted throughout this report, some To that end, 24% of the respondents believe organizations are integrating security into enterprise security tools are needed for a

successful DevOps deployment.

Benefits of DevOps Adoption

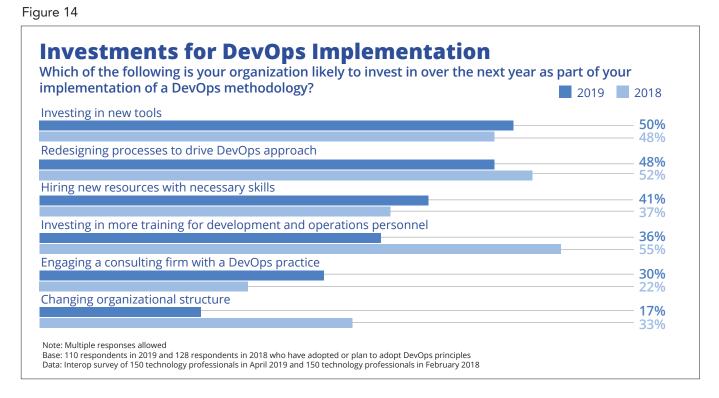
If these tools are used and cultural changes take place, companies expect major benefits when implementing a DevOps strategy.

Half of the survey respondents believe DevOps will help to address the increase in the deployment frequency of their software and services. DevOps enables or will enable increased collaboration between departments according to 44% (Figure 16). Other top benefits either already realized or expected include a reduction in time spent fixing or maintaining applications (39%), faster time to market with software and services (37%), and improved quality and performance of deployed applications (35%).

Interestingly, last year's survey found respondents expected much more from DevOps deployments. While 50% this year believe that DevOps will increase the frequency of software and services deployments in 2019, 69% felt that way last year. Similarly, 58% were looking for a reduction in the time to fix and maintain applications last year, and this year, that

Next

Table of Contents



number falls to 39%. Last year, 48% said they would reduce time to market; this year, that falls to 37% of respondents.

The change in benefits expectations in these areas might be due to the growing number of deployments. With any project, projected benefits can be inflated due to the hype surrounding the implementation of a new strategy. Realized benefits could

be lower as efforts go from the planning stage to deployment.

DevOps' Impact

The move to DevOps is driven by the need for improvements in several major functional areas. That's about the only way organizations will be able to keep pace with the demands of maintaining existing and deploying new applications and services every year.

Application deployment speed is one of the main reasons cited for moving to DevOps. This aligns with the survey respondent expectations or realizations with moving to a DevOps strategy. Almost three-quarters (72%) expect or have realized improvements in application deployment times with DevOps (**Figure 17**). Thirty-four percent expect or have realized a significant improvement; 38% see some improvement.

Seventy percent of IT technology professionals expect or have realized improvement in IT infrastructure stability with DevOps. Fifty percent see some improvement, and 20% find that DevOps provided significant improvement in infrastructure stability.

Security also benefits with DevOps. As noted, some organizations see the embrace of DevOps as an opportunity to get security involved from the beginning in a so-called DevSecOps approach. The reason why is apparent, based on survey results. Sixty-one percent of respondents believe that secu-

RESEARCH REPORT

Next

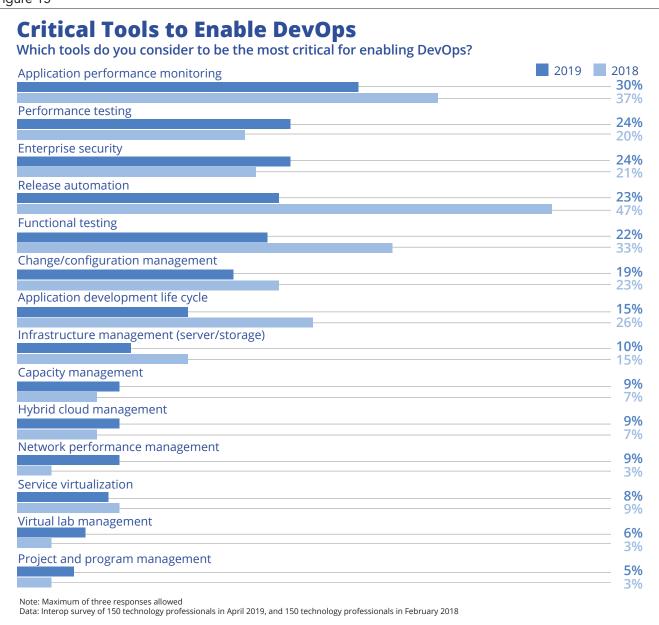
Table of Contents

RESEARCH REPORT

Interop | NETWORKComputing
InformationWeek | DARKReading

2019 State of DevOps

Figure 15



rity is improved with a DevOps approach; a quarter of IT professionals see a significant improvement in security.

Conclusion

Most survey respondents are familiar with DevOps, are aware of its potential benefits, and have a desire to move to a DevOps strategy. The reasons for adopting DevOps include a need to deploy more applications and upgrades faster, and IT needs a way to fix problems faster. While there is great interest in DevOps, there are challenges to adoption/deployment. To overcome these challenges, organizations plan to use a variety of technologies and will implement cultural changes.

Those using DevOps are realizing benefits in several areas. Improvements include:

- 74% reduced the time spent fixing and maintaining applications; 27% have seen a significant reduction.
- 67% have increased collaboration between departments; 23% say this increase was significant.
- 66% have improved the quality and performance of deployed applications;

Next

Table of Contents

2019 State of DevOps

Figure 16

Benefits of DevOps What benefits have you seen or do you anticipate seeing from implementing DevOps in your organization? 2019 2018 Increased frequency of deployments of our software/services 50% 69% Increased collaboration between departments 44% 45% A reduction in time spent fixing and maintaining applications 39% 58% Reduced time-to-market for our software/services 37% Improved quality and performance of our deployed applications 35% Our software/services made available across more platforms 28% 23% An increase in revenue 24% 26% New software/services that would otherwise not be possible/explored 24% A reduction in spend on development, testing, or operations 19% 34% Increased numbers of customers using our software/services 16% Fewer employees working on developing and deploying our software/services 14% Base: 110 respondents in 2019 and 128 respondents in 2018 who have adopted or plan to adopt DevOps principles Data: Interop survey of 150 technology professionals in April 2019, and 150 technology professionals in February 2018

19% say this improvement was significant.

- 62% reduced the time-to-market for their software/services; 20% say the time reduction was significant.
- 61% increased the frequency of software/service deployments; 27% realized a significant improvement.

Other improvements reported due to using a DevOps strategy include the ability to deploy new software and services that would otherwise not be possible; a reduction in the amount spent on development, testing, and operations; software and services are available across more platforms, and fewer people are needed to develop and deploy software (Figure 18).

The bottom line is that DevOps is a needed strategy in today's business environment, where improved application security is essential and users demand more applica-

RESEARCH REPORT

Next

Table of Contents

2019 State of DevOps

tions, services, and features in faster time

Figure 1

frames than traditional development and

operations teams can support.

RESEARCH REPORT

InformationWeek | DARKReading

Interop | NETWORKComputing

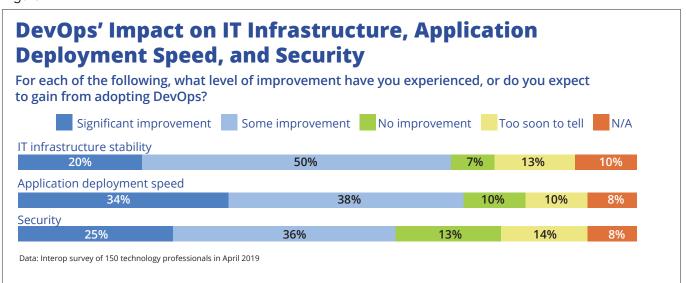




Table of Contents

APPENDIX

Figure 17



RESEARCH REPORT





Table of Contents

Figure 18

Improvements Resulting from DevOps Adoption

How would you quantify the change for each of the following as a result of your DevOps adoption?

	Significant improvement	Moderate improvement	Insignificant improvement	No change
A reduction in time spent fixing and maintaining applications	27%	47%	10%	16%
Increased frequency of deployments of our software/services	27%	34%	19%	20%
Increased collaboration between departments	23%	44%	14%	19%
Reduced time-to-market for our software/services	20%	42%	14%	24%
Improved quality and performance of our deployed applications	19%	47%	16%	18%
An increase in revenue	15%	29%	27%	29%
New software/services that would otherwise not be possible/explored	14%	43%	23%	20%
A reduction in spend on development, testing, or operations	12%	46%	18%	24%
Fewer employees working on developing and deploying our software/services	11%	41%	18%	30%
Our software/services made available across more platforms	11%	39%	16%	34%
Increased numbers of customers using our software/services Data: Interop survey of 150 technology professionals in April 2019	10%	37%	23%	30%

RESEARCH REPORT Interop | NETWORK Computing

InformationWeek DARKReading

2019 State of DevOps

Previous

Next

Table of Contents

Figure 19

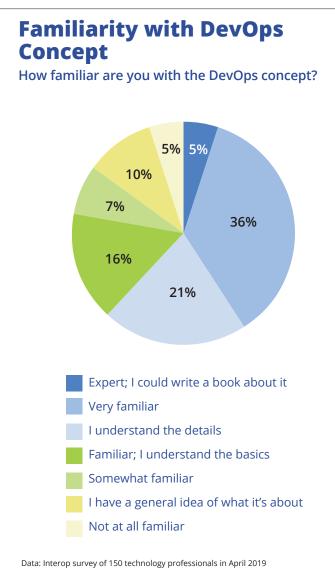
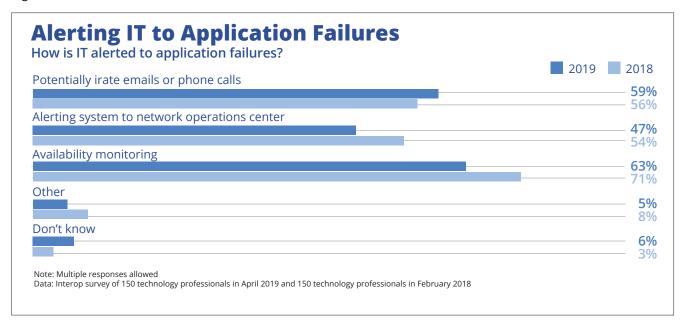


Figure 20



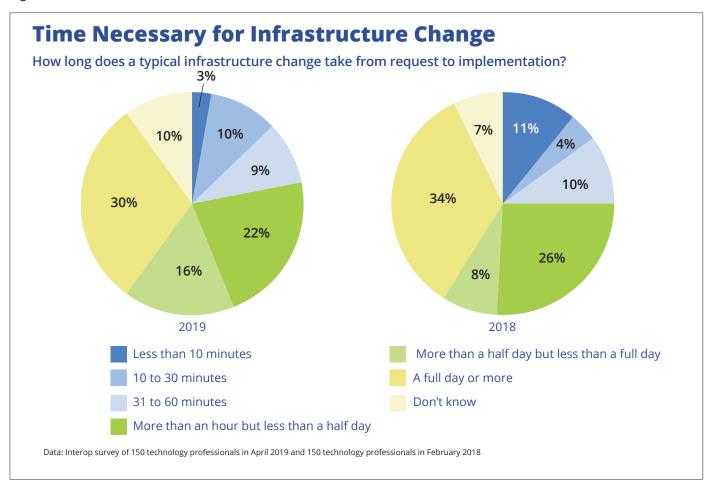
RESEARCH REPORT

Next

Table of Contents

2019 State of DevOps

Figure 21



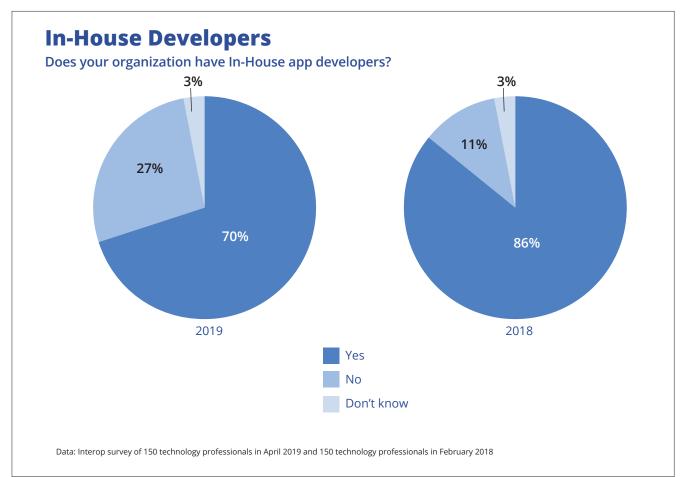
RESEARCH REPORT

Next

Table of Contents

2019 State of DevOps

Figure 22



RESEARCH REPORT

Next

Table of Contents

2019 State of DevOps

Figure 23

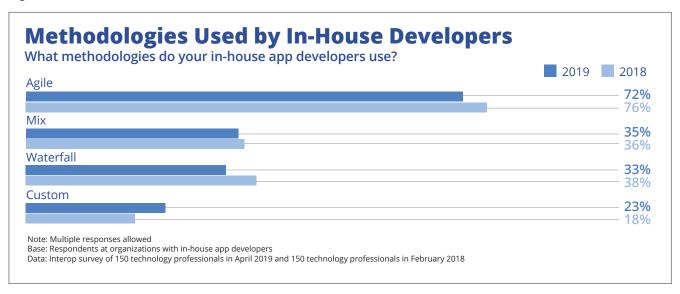
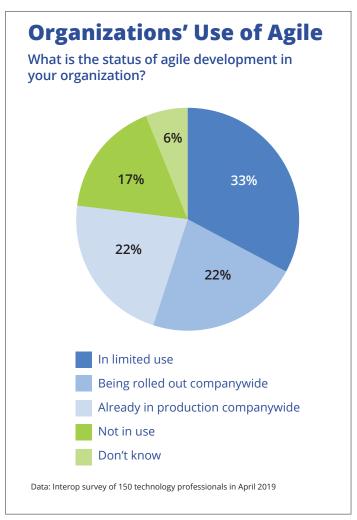


Figure 24

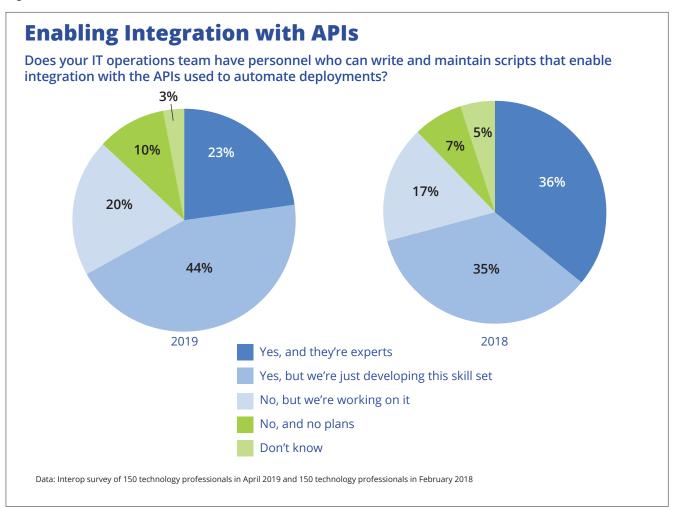


RESEARCH REPORT



Table of Contents

Figure 25



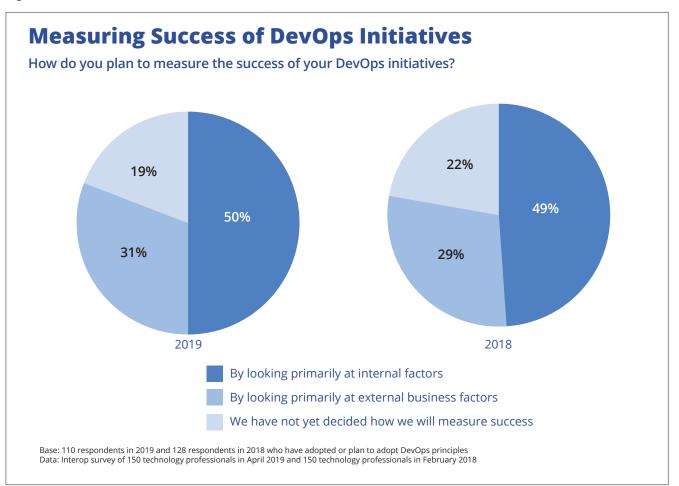
RESEARCH REPORT



Table of Contents

2019 State of DevOps

Figure 26



RESEARCH REPORT





Table of Contents

Figure 27



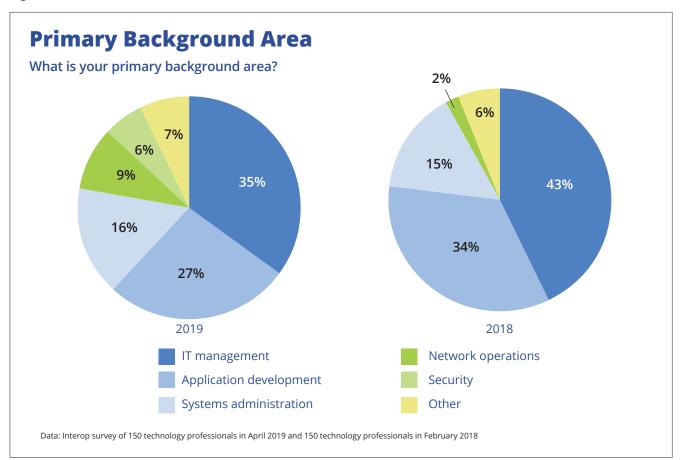
RESEARCH REPORT

Next

Table of Contents

2019 State of DevOps

Figure 28



RESEARCH REPORT

ous Next

Table of Contents

Figure 29

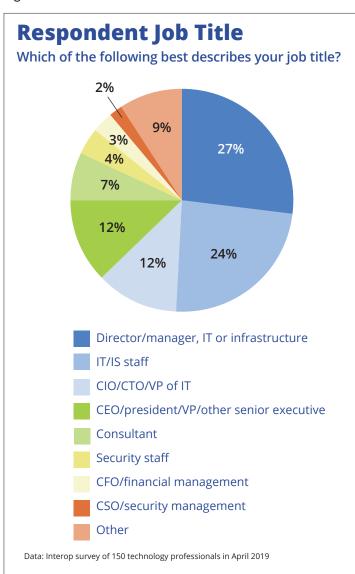
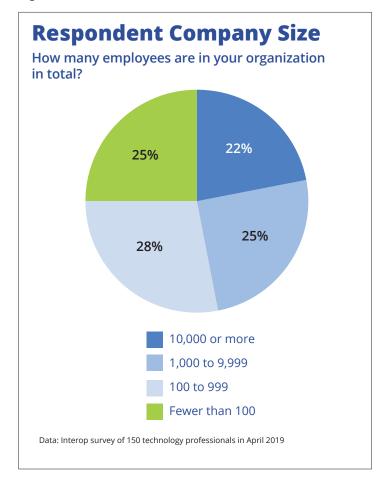


Figure 30



RESEARCH REPORT

Table of Contents

Figure 31

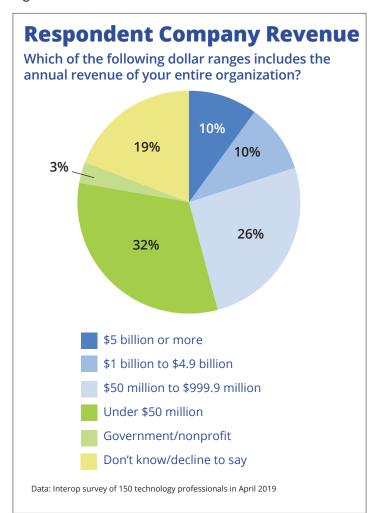


Figure 32

inancial services/banking/securities and investments	1
T vendor	1
Consulting and business services	
Government (federal, state, or local, including military)	
Healthcare/medical	
Telecommunications/ISPs	
Education	
_ogistics/transportation	
Biotech/biomedical/pharmaceutical	
Manufacturing/industrial, non-computer	
Retail/e-commerce	
Consumer goods	
Distributor	
Electronics	
Nonprofit	
Hospitality/travel	
Media/entertainment	
Other	

RESEARCH REPORT