Interop ITX

RESEARCH REPORTS

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2017 State of DevOps

- Although DevOps is maturing, organizations still face barriers to adoption. But eight out of 10 are planning DevOps investments, and those diving in have realized significant operational and financial benefits.

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About the Author

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Eric Bruno is a contributing editor to multiple publications with more than 20 years of experience in the information technology community. He is a highly requested moderator and speaker for a variety of conferences and other events on topics spanning the technology spectrum from the desktop to the data center. He has written articles, blogs, white papers, and books on software architecture and development topics for more than a decade. He is also an enterprise architect, developer, and industry analyst with expertise in full lifecycle, large-scale software architecture, design, and development for companies all over the globe. His accomplishments span highly distributed system development, multi-tiered web development, real-time development, and transactional software development.

See his editorial work online at www.ericbruno.com.

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Research Summary

- **Survey Name:** Interop ITX and InformationWeek 2017 State of DevOps
- **Survey Date:** January 2017
- **Region:** North America
- **Respondent base:** 300 technology professionals involved in applications (such as applications development, deployment or management). The margin of error for the total respondent base (N=300) is +/- 5.6 percentage points.
- **Methodology:** Interop ITX and InformationWeek surveyed business technology decision-makers at North American companies about applications usage and strategies. The survey was conducted online, and respondents were recruited via an email invitation containing an embedded link to the survey. The email invitation was sent to a select group of UBM's audience. Just over one-third of the resulting respondents work in an IT management role, and nearly three in ten work in applications development. Four out of 10 respondents were from large companies with 1,000 or more employees. UBM was responsible for all programming and data analysis. These procedures were carried out in strict accordance with standard market research practices.

Introduction

The practice of DevOps aims to remove bottlenecks in software release and deployment processes, increase automation, reduce mistakes and system failures, while allowing faster recovery from errors and outages. DevOps is also about getting development and IT operations staff to collaborate more effectively and share in the responsibilities of application definition, development, deployment, and support.

Our survey of over 300 IT professionals involved in DevOps explored the state of DevOps practices as implemented in 2016. How and why are IT organizations making use of DevOps? Among other insights, our survey revealed:

- Adoption is on the rise: 18% of respondents have already implemented DevOps, and an additional 32% plan to within 12 months. Only 20% reported no plans to adopt DevOps.
- Top drivers for DevOps adoption included the need to increase quality, improve the customer experience, reduce complexity, and reduce overall IT costs.
- Top barriers to DevOps were a lack of demand from the business, a lack of expertise, or a lack of time and resources.
- Organizations are achieving bottom-line success with DevOps: 25% of survey respondents said DevOps practices led to reduced costs at their organization, while 20% correlated DevOps to increased revenue.
- Other benefits included increased collaboration, higher frequency of software deployments, a reduction in time spent maintaining applications, and improved quality and performance of applications.
- Top areas for DevOps investment included tools for project management, issue tracking, collaboration, and automation.

What is DevOps?

The agile development methodology has now been widely adopted, making developers more iterative, releases more frequent, and causing bottlenecks to appear in the rest of the application deployment and support processes. Identifying these bottlenecks is a good thing if you can eliminate them, which is precisely what a DevOps practice aims to do. In fact, DevOps can be considered the extension of agile practices to all post-development activity at a fundamental level. In our survey of IT professionals, 60% claimed to be using an agile development methodology, while 38% said they're using a mix of agile and another methodology. Only 4% of those surveyed indicated they're not using agile whatsoever. (See Figure 1 at right.)

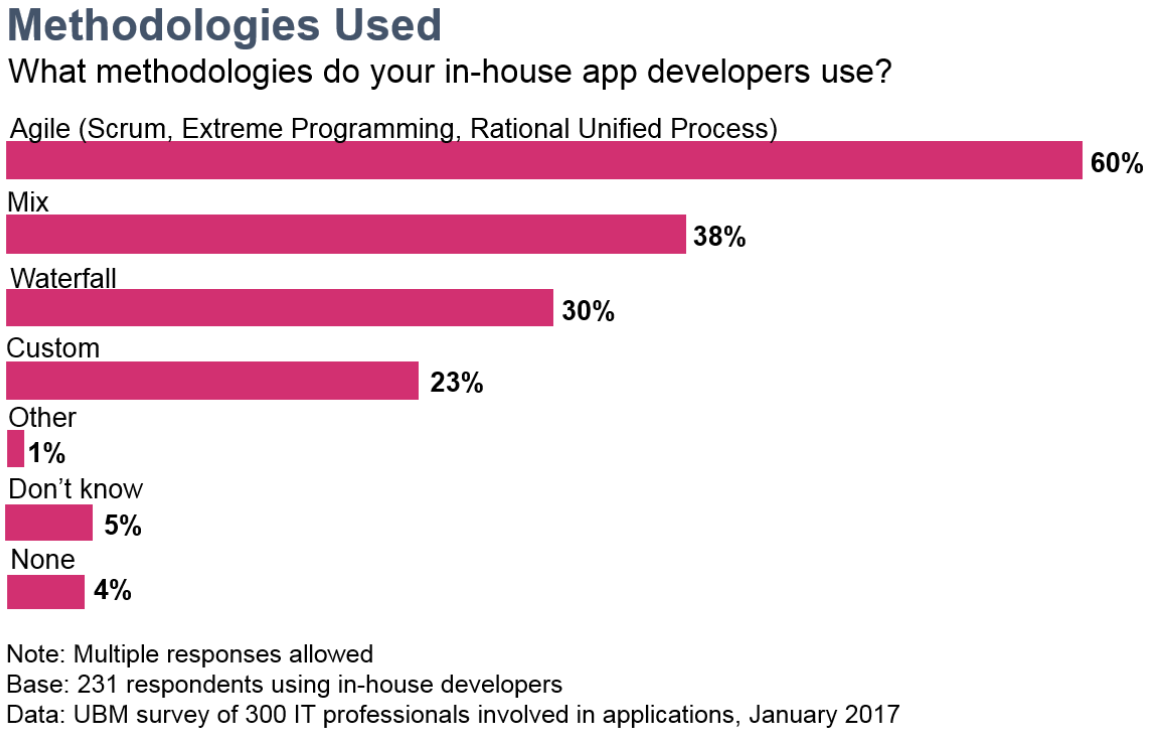


Figure 1

However, while agile is clear and concrete for software development planning, with steps to follow and expected goals and benefits, implementing a DevOps practice has proven to be more elusive. This can be seen in some of the results of this year's survey compared with those from our DevOps survey results published in 2014. For instance, while 100% of IT professionals polled in 2014 claimed some level of familiarity with DevOps, 15% are now admitting they're not at all

familiar with DevOps. Also, 4% fewer claimed to be very familiar with DevOps than in 2014. (See Figure 2 at right.)

These statistics may not be as troublesome as they appear. Instead, it's likely the result of the natural growth and adoption of DevOps. For example, one reason for lessened familiarity may be partly due to misconceptions in the early days of DevOps (where IT *thought* they understood it more than they really did), and partly due to changing roles of DevOps participants over the years. Let's take a closer look at those roles and the people in them, as well as the types of applications involved.

Familiarity with DevOps

How familiar are you with the DevOps concept?

Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 2

DevOps Roles and Results

According to those who took our survey, around 80% indicated that they have developers in house, and they were split almost evenly between IT, development, and system administrative roles. (See Figure 3, page 7.) As for specific roles, 64% of the survey respondents were either IT management or IT/IS staff, and 23% were in an executive or other corporate leadership role. (See figure 37, page 42.)

As for the number of existing applications managed by IT teams in our survey, 62% said they manage from 1 to 20 applications, 22% manage between 20 to 40, and a relatively large 16% claimed to manage 40 to 60 or more applications. (see Figure 17, page 22.) Of these applications, 46% of the respondents reported that 10 or fewer upgrades are made to production each year, 24% reported between 10 to 20, and almost 10% claimed 60 or more

updates to existing applications per year. (see Figure 18, page 23.) As for new applications, 63% indicated fewer than 10 new applications were deployed each year, 21% indicated between 10 to 19, and the remaining 16% indicated 20 or more new applications. (See Figure 19, page 24.)

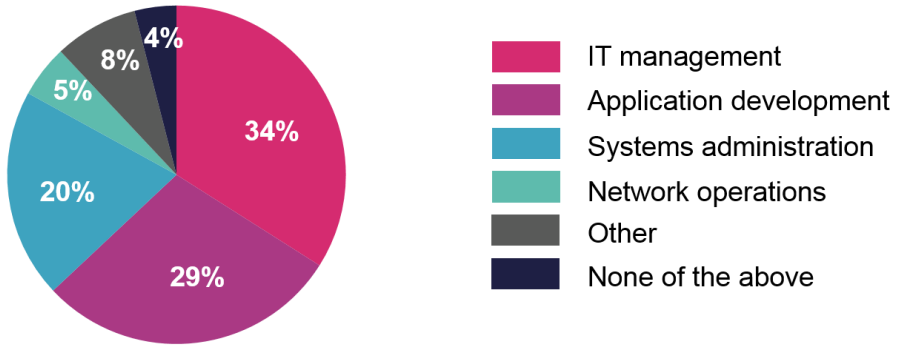
DevOps Adoption

Compared to past DevOps survey results, those with plans to adopt DevOps have increased. For example, whereas close to 30% of respondents reported they had no plans to adopt DevOps in 2014, this number was reduced to 20% in 2016. (See Figure 4 at right.) Those who planned to adopt DevOps within 12 months increased as well.

With so many applications to manage, these results come as no surprise. According to our survey, the top DevOps adoption drivers include the need to increase quality, improve the customer experience, reduce complexity, and reduce overall IT costs. (See Figure 5, page 8.) Nearly half of the IT professionals who took our survey indicated that mobile and cloud development efforts also drove their need to adopt DevOps.

Functional Background

What is your primary background area?



Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 3

Expect to Adopt DevOps

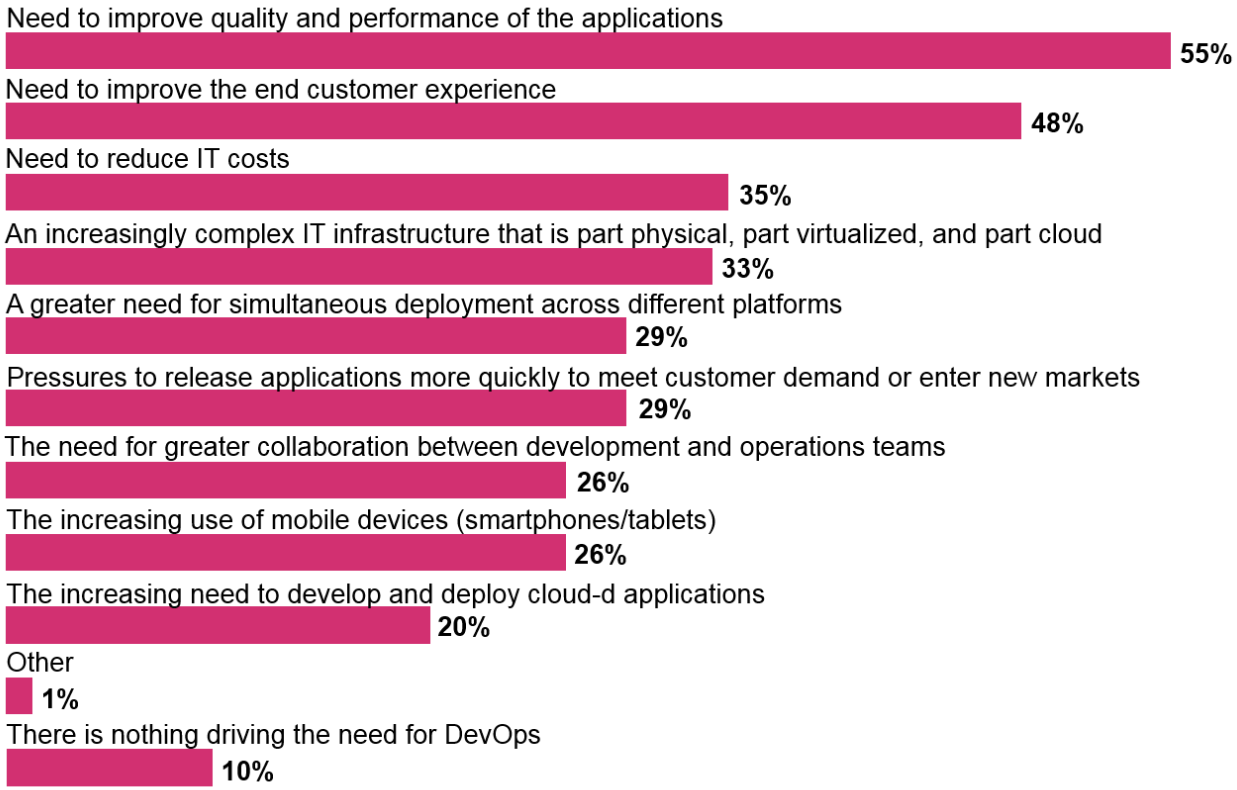
What is your expected timeline to adopt DevOps principles in your organization?

Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 4

DevOps Drivers

What is driving the need for DevOps?



Note: Multiple responses allowed
Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 5

That's likely due to the rapid release rates expected by mobile users and the nature of cloud deployments and management – something discussed in later in this report.

Now that we've examined *why* today's IT professionals are adopting DevOps, let's take a look at *how* they're going about it. According to our survey, it's rare that every development group within a single organization has a DevOps practice. In fact, less than 5% said they use DevOps exclusively, and just over 50% said that between a quarter to half of their development groups have adopted DevOps. And although 35% claimed that none of their development groups were currently using DevOps,

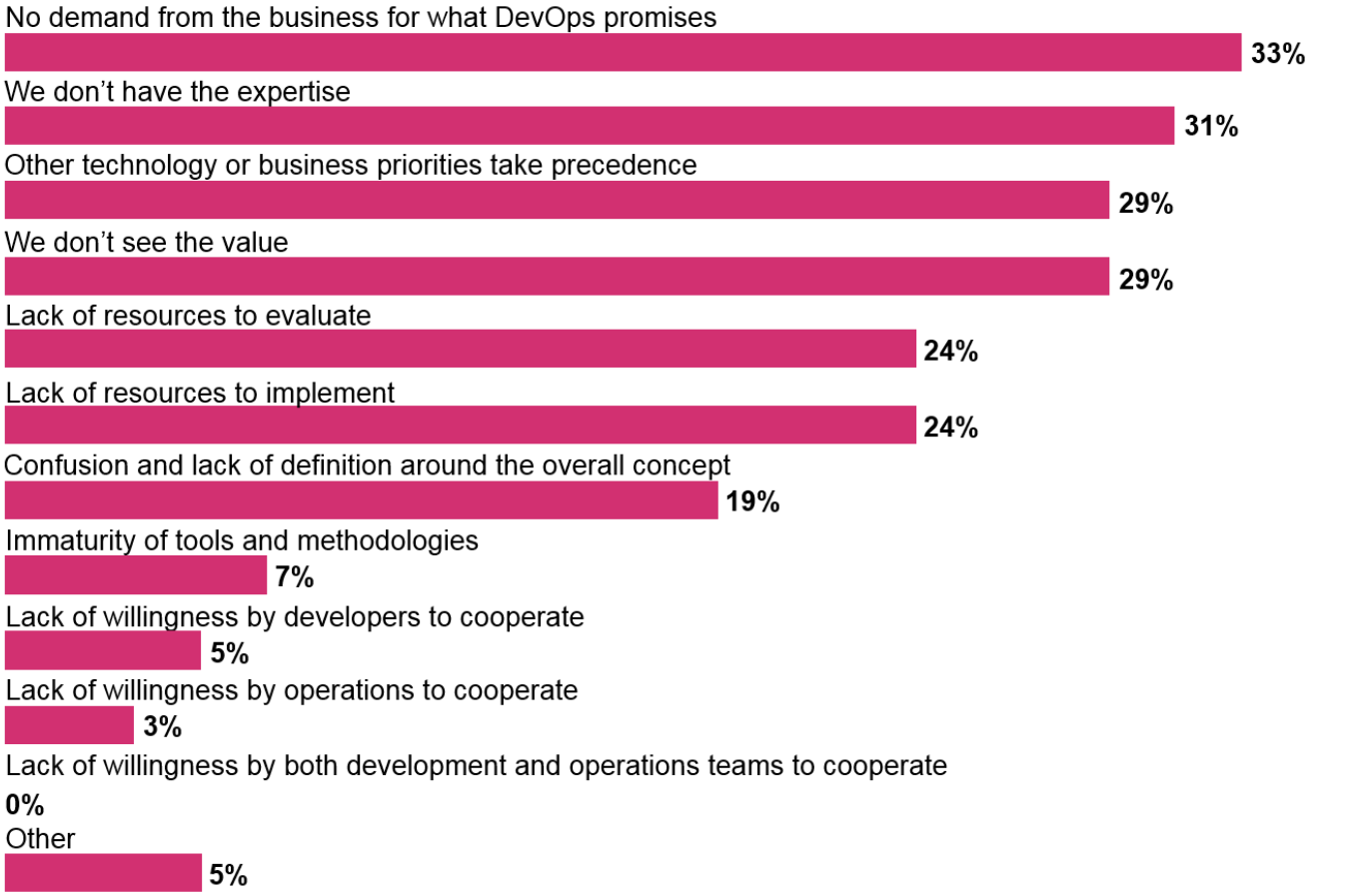
they did indicate that adoption plans were in place. (See Figure 25, page 30.)

In terms of barriers to DevOps adoption, the top reasons included lack of demand from the business, a lack of expertise, or a lack of time and resources. (See Figure 6 at right.)

Additionally, a lack of willingness of development or operations staff to cooperate was cited by very few in the survey. Clearly, these results indicate that without support from the business or top leadership – and without adequate training – IT doesn't feel comfortable trying DevOps on their own.

Top Barriers to DevOps Adoption

What are the top reasons your organization won't adopt a DevOps methodology or tools?



Note: Maximum of three responses allowed
Base: 58 respondents who have no plans to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 6

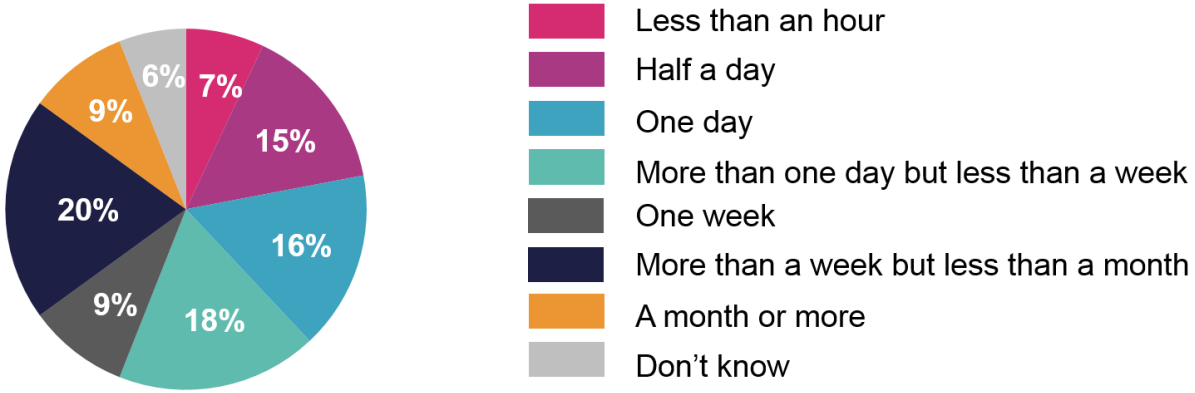
DevOps in Action

What kind of results are organizations deploying DevOps experiencing? According to consultant Dan North, speaking at the 2016 DevOps Virtual Summit, a good measurement of success is shortening the length of time development work remains in the queue. When asked how long it takes to go from request to implementation, less than 25% of those who responded to our survey said it was an hour or less. Just over 30% claimed it was somewhere between an hour and a full day, while the remaining 45% indicated it was more than a day or they simply don't know (likely because they haven't measured it).

To be specific, 20% of those who responded to our survey said it takes more than a week to get an application into production after a development cycle completes, while only 7% said they can do it in less than an hour. Worse yet, nearly 10% reported the process could take more than a month. (See Figure 7 below).

Time to Production

Once an application completes the development process, how long does it take to move into production?



Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 7

The goal of DevOps is not only to reduce this time, but also to measure all changes and results, create a feedback loop, and continuously increase operational efficiency. This includes improvement in the relationship between development and IT staff and overall corporate culture. In our survey, 43% of respondents indicated that operations staff had become involved in future product feature enhancements, and 41% said that development had become more involved in application deployments. Other cultural changes included an increase in operations staff taking part in development's agile "stand up" meetings and the co-location of staff to improve communication. More importantly, 25% of the respondents reported that corporate management structure had been changed to better align development and IT staff and goals. (See Figure 26, page 31.)

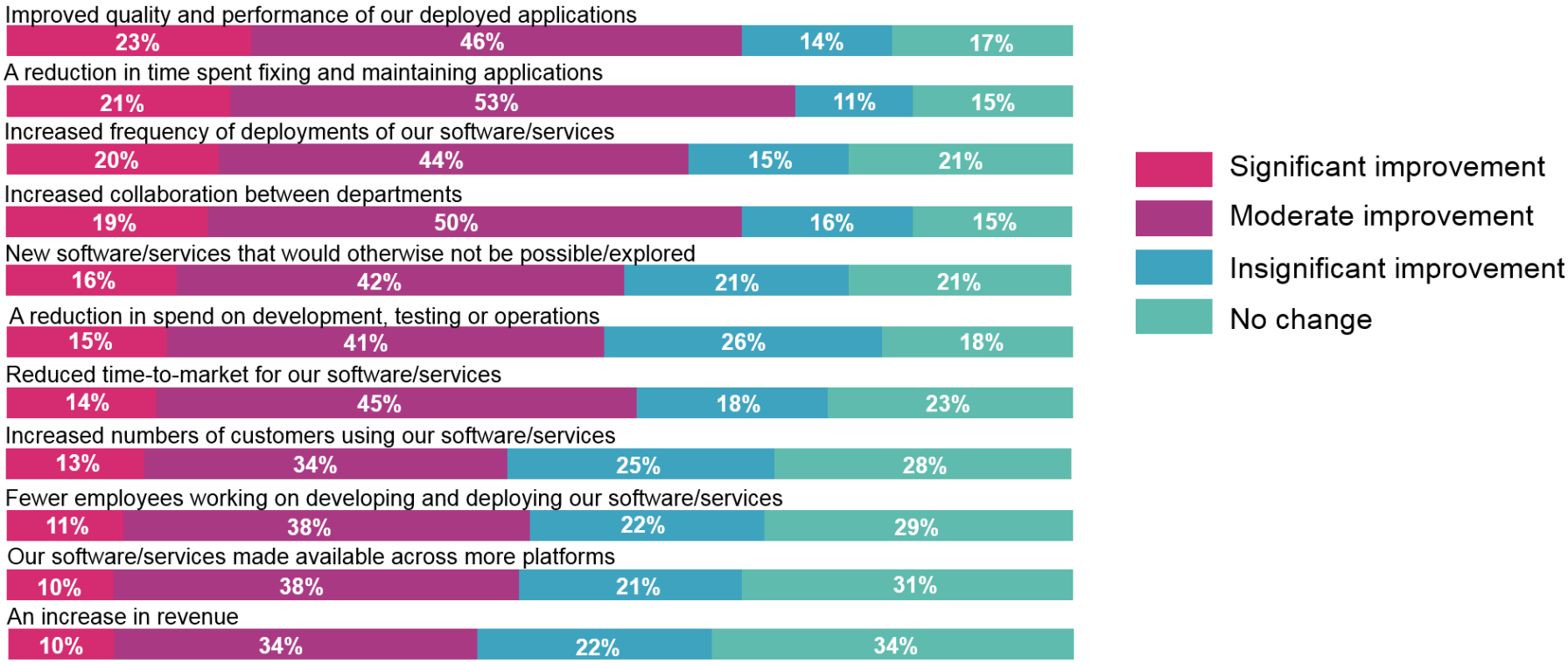
▷ Tangible Benefits

In terms of real money, 25% of survey respondents said DevOps practices led to reduced costs at their organization, while 20% went so far as to correlate DevOps to increased revenue. Other benefits of DevOps rated highly included increased collaboration (46%), higher frequency of software deployments (39%), a reduction in time spent maintaining applications (also 39%), and improved quality and performance of applications (38%). (See Figure 27, page 32.)

Drilling deeper into the benefits of DevOps, we asked IT professionals to rate a set of possible benefits on a scale, based on real experience. These ratings correlated to the findings above, with the caveat that most had seen moderate improvement as opposed to something more significant. (See Figure 8, page 12.) However, for the benefits considered important to the business (i.e. increased quality, increased revenue, reduced time to market, and so on), the amount of improvement due to DevOps overall was rated high.

Changes Resulting from DevOps Adoption

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



Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

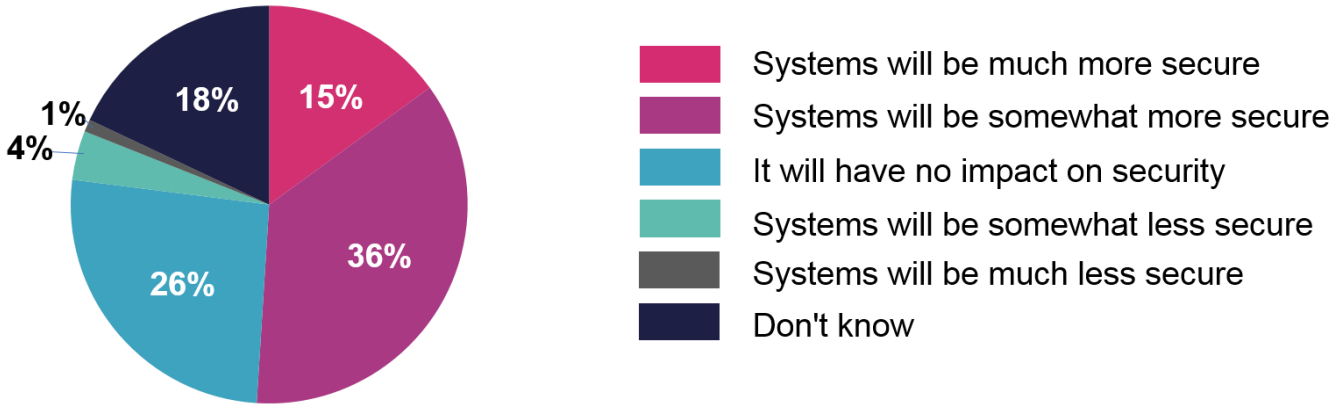
Figure 8

Continuing the good news, nearly 80% of those who took our survey indicated they had seen or expect to see improvement in production stability (with 15% saying it's too soon to tell), and 78% had seen or expect to see improvement in application performance. (See Figure 28, page 33.) These results match those in a similar study on DevOps from Puppet Labs in 2016, the 2016 State of DevOps Report.

However, in terms of security, while few respondents reported a decrease in production security, this is an area where DevOps has not yet contributed significant improvement. (See Figure 9 below.) This may not be the fault of DevOps practices themselves – increasing security requires a deliberate effort – but it could point to an opportunity for tools vendors.

Impact on Security

What impact will DevOps have on the security of production systems?



Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 9

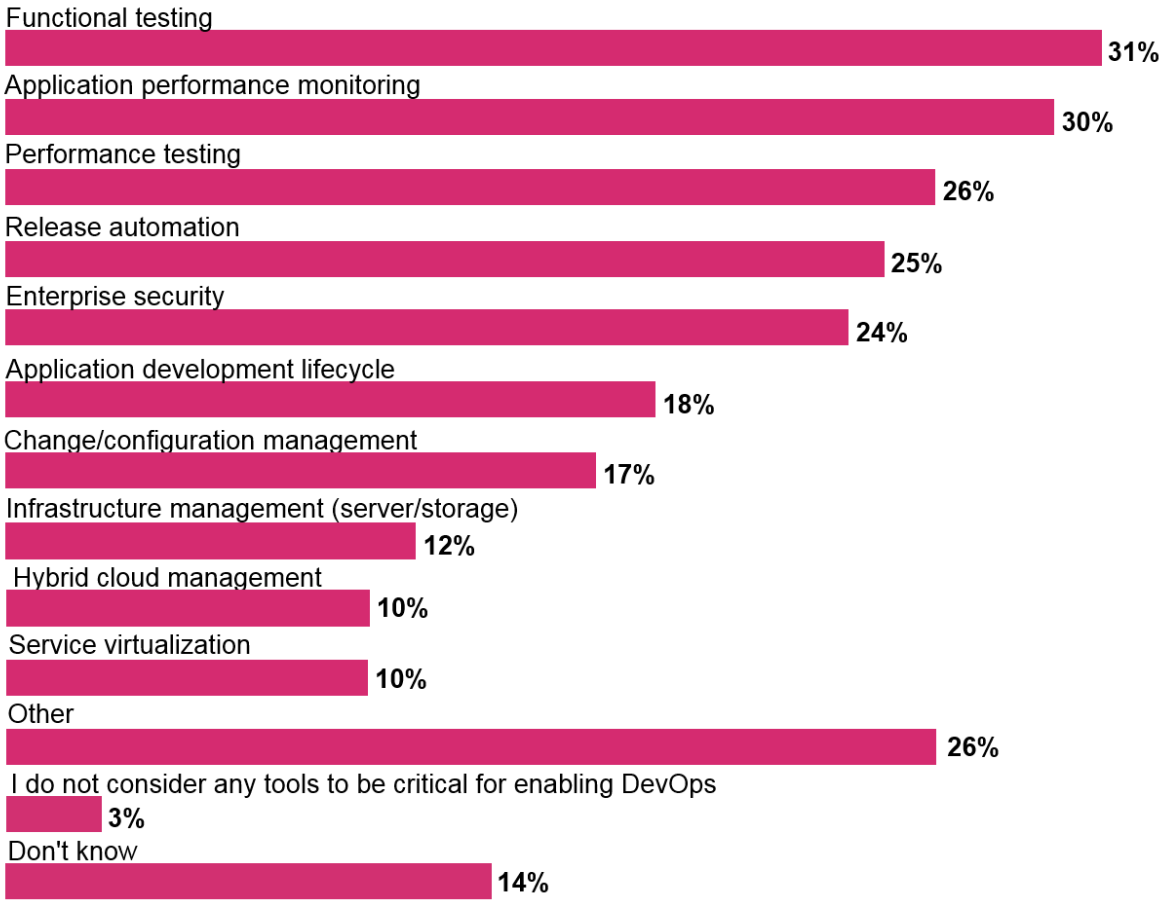
Tools and Automation

To be clear, DevOps is less about tools than it is about processes, philosophy (where developers play a greater role in operations, and IT is more involved in product definition), and the automation of otherwise error-prone manual activity. It happens that this drive toward automation is best achieved through tools. When asked which tools are most critical for enabling DevOps, respondents rated functional testing, performance testing, and release automation tools as their top three choices. (See Figure 10 at right.)

For collaboration, 36% of respondents said they use GitHub, 35% use Microsoft Teams, 24% use Slack, and 24% use Confluence, among others. (See Figure 33, page 38.) In terms of DevOps management, it's no surprise that PowerShell, Docker, Puppet, and Chef remained the top four tools choices, with Ansible coming in a close fifth place. (See Figure 34, page 39.)

Critical Tools for DevOps

Which tools do you consider to be the most critical for enabling DevOps?



Note: Maximum of three responses allowed
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 10

What *is* surprising and rather unfortunate is that 26% of the respondents admitted to not using any DevOps management tools whatsoever.

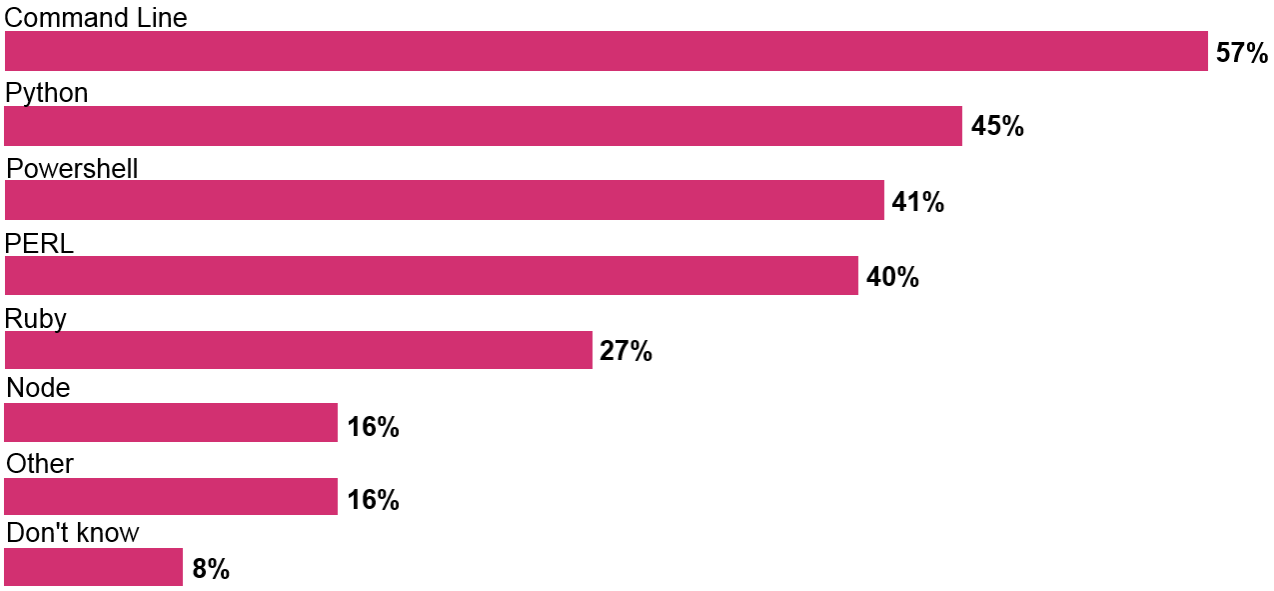
Similar results were seen with release automation tools. For instance, while tools from Microsoft, IBM, CA Technologies, and BMC topped the list in terms of purchases or planned purchases, a large percentage of respondents have no current purchase plans. (See Figure 32, page 37.) One reason for this may be the availability of open-source tools, where a commercial license or support agreement isn't a requirement. Another reason may be a move towards do-it-yourself automation tools.

For example, one approach to enabling release automation is explicitly building this capability into production software through APIs and scripting.
In fact, scripting languages such as the command line, Python, PowerShell, and PERL were ranked at the top in terms of usage. (See Figure 11 at right.)

Further, 70% of respondents indicated that IT personnel currently write scripts for API integration to enable automated deployments, while only 11% indicated they had no plans to do so themselves. (See Figure 24, page 29.)

Scripting Languages

What scripting languages do in-house developers use?



Note: Multiple responses allowed
Base: 231 respondents using in-house developers
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 11

This DIY movement in DevOps may be the result of a lack of maturity in automation tools, or it may simply be the culture of IT staff overall. Regardless, any DIY effort runs the risk of proprietary, error-prone solutions, and this may be an area for DevOps growth in the future.

When Things Go Wrong

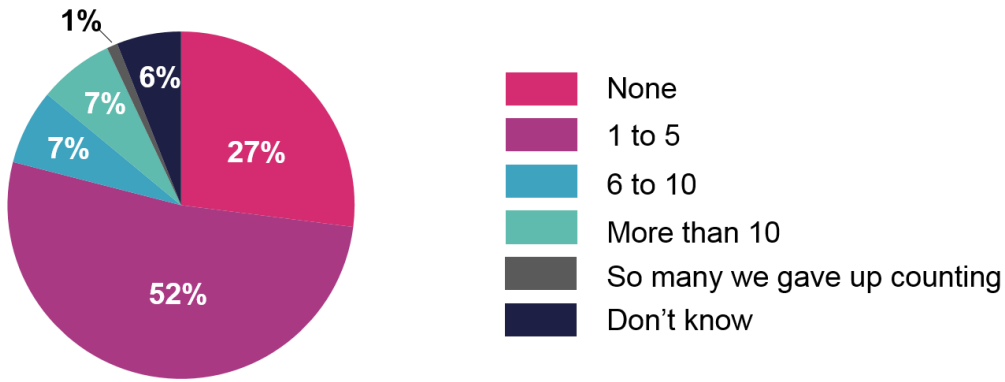
In an effort to learn from them, it can be useful to examine how DevOps and overall IT activities have gone awry for others.

For instance, more than half of the IT professionals we surveyed experience between 1 and 5 application failures per month, and an additional 14% experience 6 or more. (See Figure 12 at right.)

While a large percentage of respondents said they are first alerted to failures via monitoring and alerting systems already in place, a whopping 59% discover them via irate customers. (See Figure 20, page 25.) A successful DevOps practice should not only help eliminate failures, but enable IT to discover and remedy failures before users do, whenever possible.

Application Failures

How many application failures (e.g., outages, disruptions, or downtime) do you have in a typical month?



Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 12

Indeed, it's an imperfect world. Therefore, when things do go wrong, it's important to quickly recover and restore system stability. For the vast majority of those who took our survey, recovery from failure usually takes less than half a day. (See Figure 13 below.) However, only 34% can do so in under 30 minutes, and some take a day or more. These are all long timeframes to have users suffer through an application outage or failure of any kind.

Recovery Time

On average, how long does recovery take when an application fails?

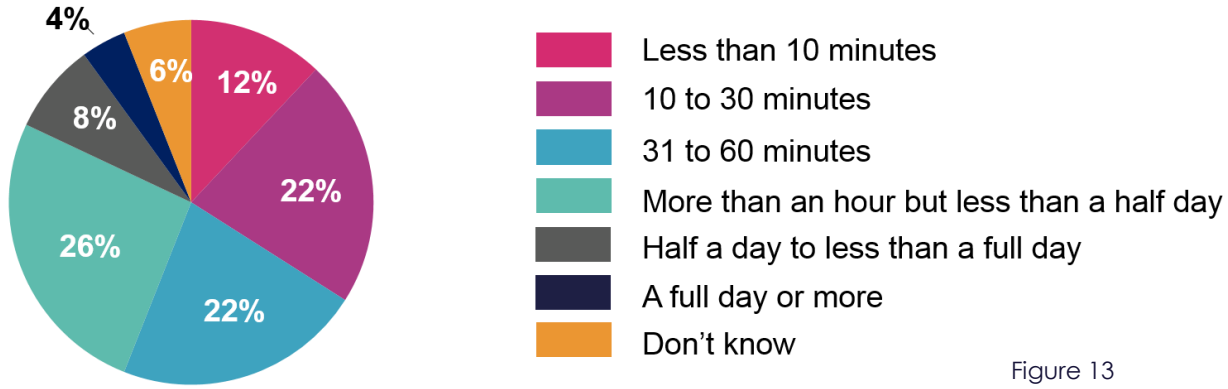


Figure 13

Data: UBM survey of 300 IT professionals involved in applications, January 2017

One way to avoid this problem is through adequate testing of both deployment processes and failure recovery processes. In our survey, only 69% of respondents admitted to testing their recovery processes. (See Figure 21, page 26.) Clearly some work needs to be done here.

Our survey on DevOps is intended to give you a view into the current state of DevOps practices in the industry. However, some of the results also give insight into the direction DevOps is headed within other organizations.

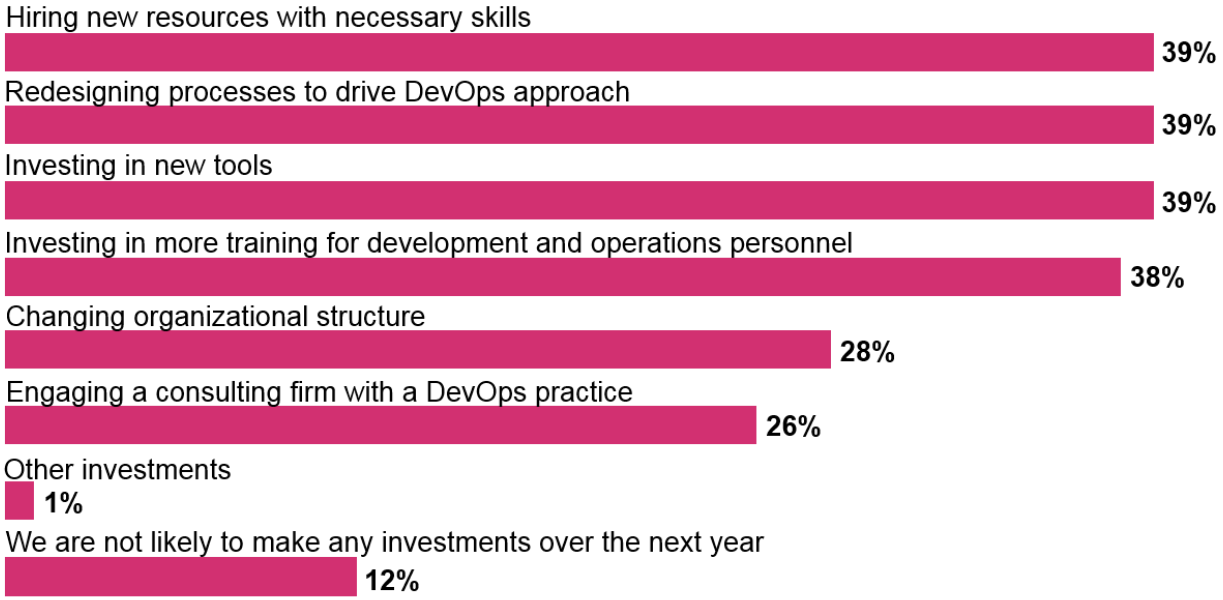
For example, most who took our survey indicated plans to invest in DevOps growth within the next year, with only 12% indicating no plans for future investment. (See Figure 14 at right.)

Specifically, our survey showed that tools for project management, issue tracking, collaboration, and automation top the list for future DevOps investment. (See Figure 31, page 36.)

Additionally, 62% of those surveyed indicated they plan to look for DevOps expertise when hiring new members of their development and operations teams. (See Figure 36, page 41.)

Investments for DevOps

Which of the following is your organization likely to invest in over the next year as part of your implementation of a DevOps methodology?



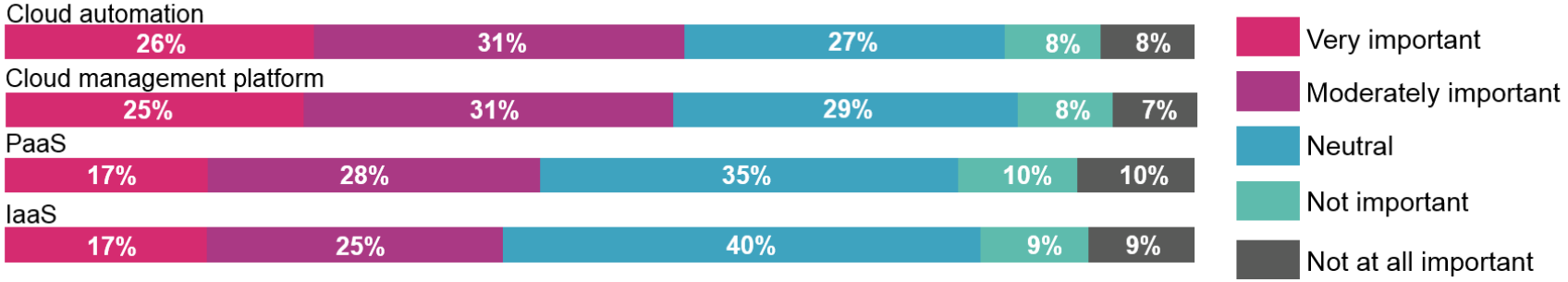
Note: Multiple responses allowed
Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 14

It's important to point out that both public cloud and DevOps adoption have many things in common, such as the need for deployment automation, increased management and monitoring tools, careful planning for outages and recovery, and the increased need for security. In fact, more than half of those who responded to our survey said they currently deploy or plan to deploy production applications using platform or infrastructure public cloud services. Additionally, a majority indicated that cloud automation and cloud management technologies are important parts of their DevOps initiative. (See Figure 15 below.)

Importance of Cloud to DevOps

How important are the following cloud technologies to your DevOps initiative?



Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 15

DevOps Growing Pains

Despite continued maturity, IT organizations are still facing challenges in terms of DevOps adoption. Security, cost, lack of organizational alignment and support, and lack of skills were listed among the top challenges. (See Figure 16, page 20.) Fortunately, the plans for growth and future investment in DevOps will help organizations overcome these challenges. Additionally, new trends in IT – such as the move to the public cloud – may help with DevOps adoption. If you take only two key points away from this report, remember: the potential benefits that a successful DevOps initiative promises is worth the investment, but it's still wise to be cautious and deliberate in your DevOps implementation.

DevOps Challenges

What have been the major challenges to implementing DevOps strategy in your organization?

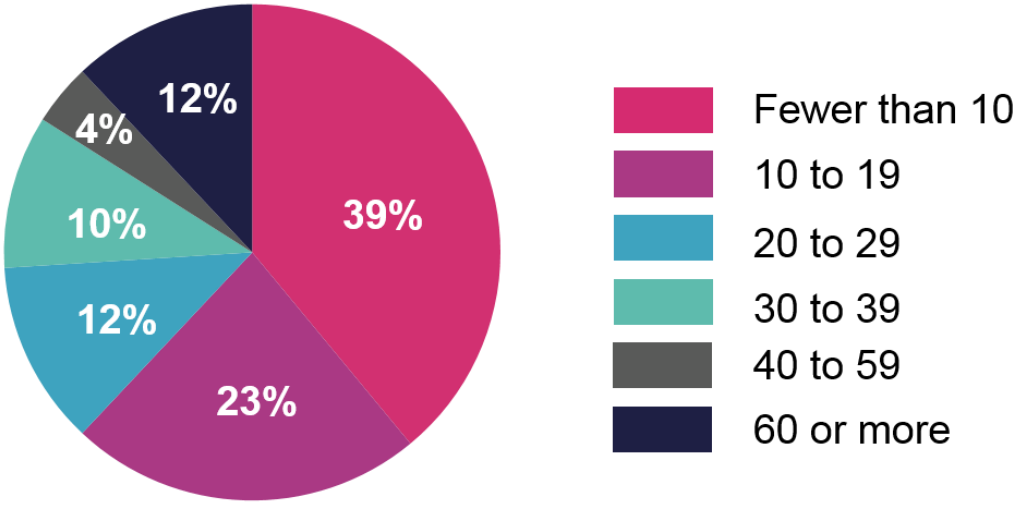
Note: Maximum of three responses allowed
Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 16

Appendix

Number of Applications Managed

How many applications does your IT team manage?

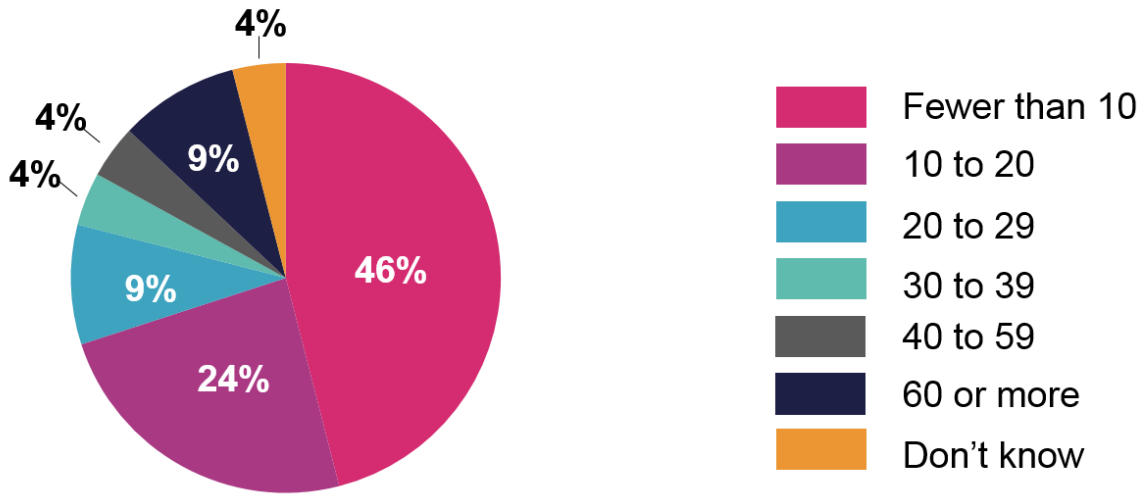


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 17

Application Upgrades

How many application upgrades are moved into production in a typical year?

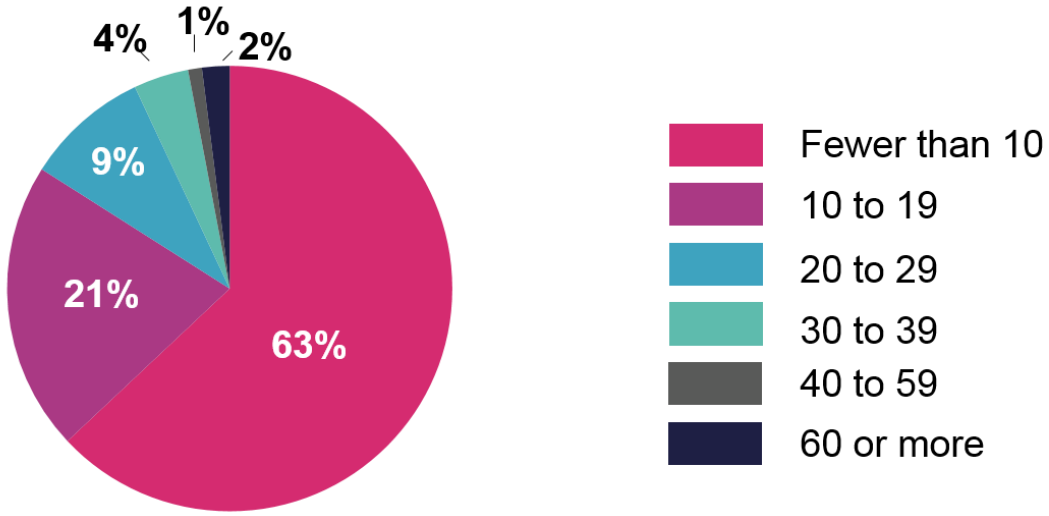


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 18

Number of Applications in Production

How many new applications are moved into production in a typical year?



Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 19

Alerting IT

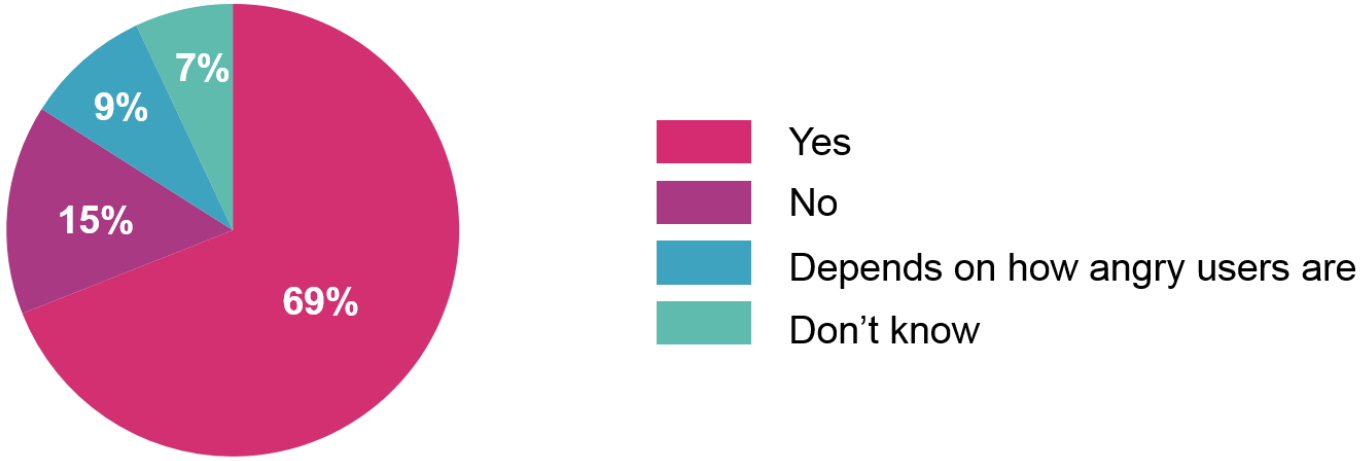
How is IT alerted to application failures?

Note: Multiple responses allowed
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 20

Testing Recovery Processes

Are recovery processes tested before being pushed live?

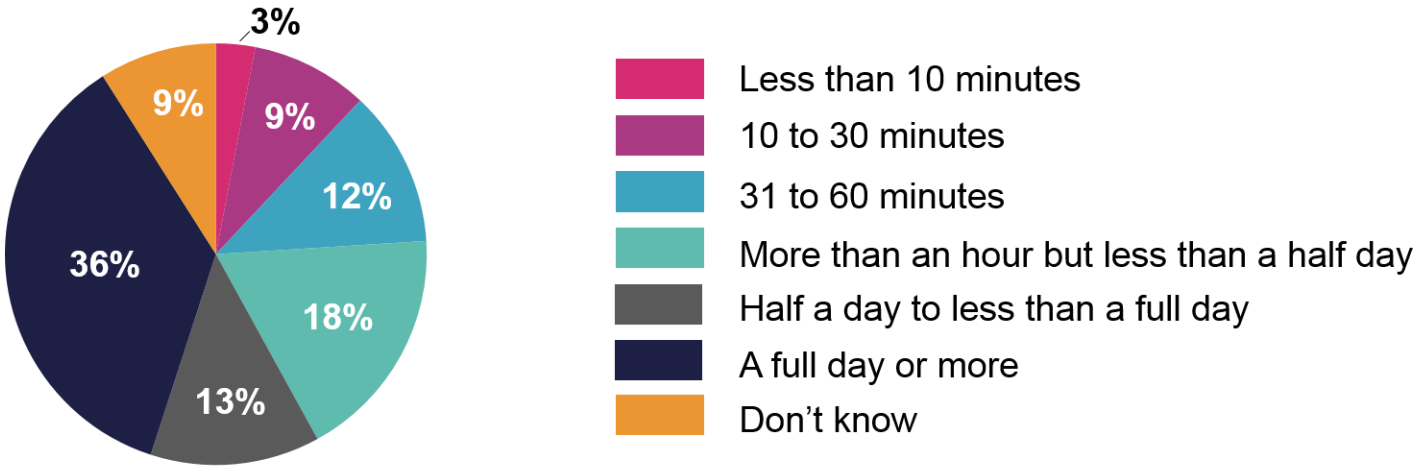


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 21

Time From Request to Implementation

How long does a typical infrastructure change take from request to implementation?

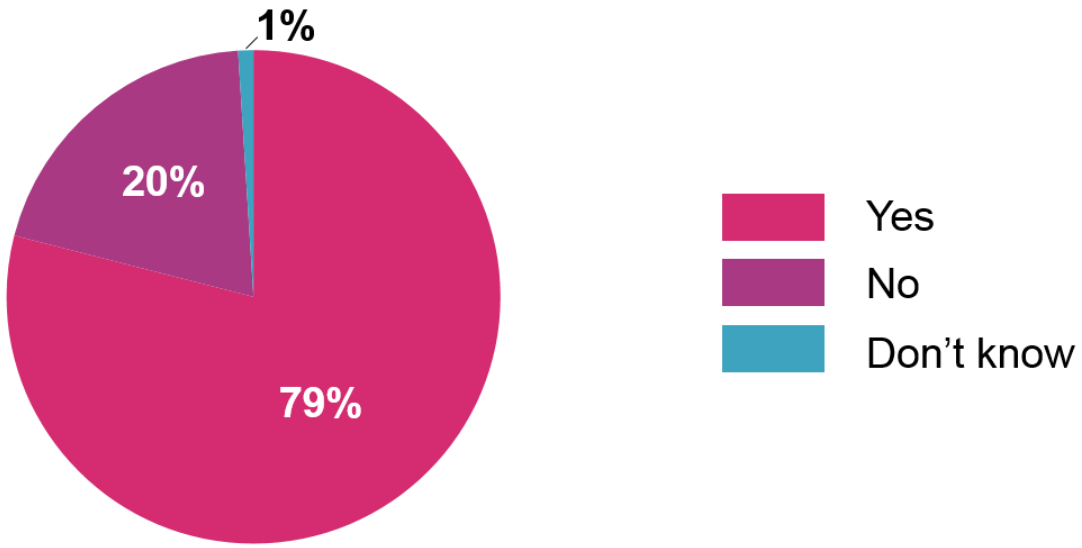


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 22

In-House Developers

Does your organization have in-house app developers?

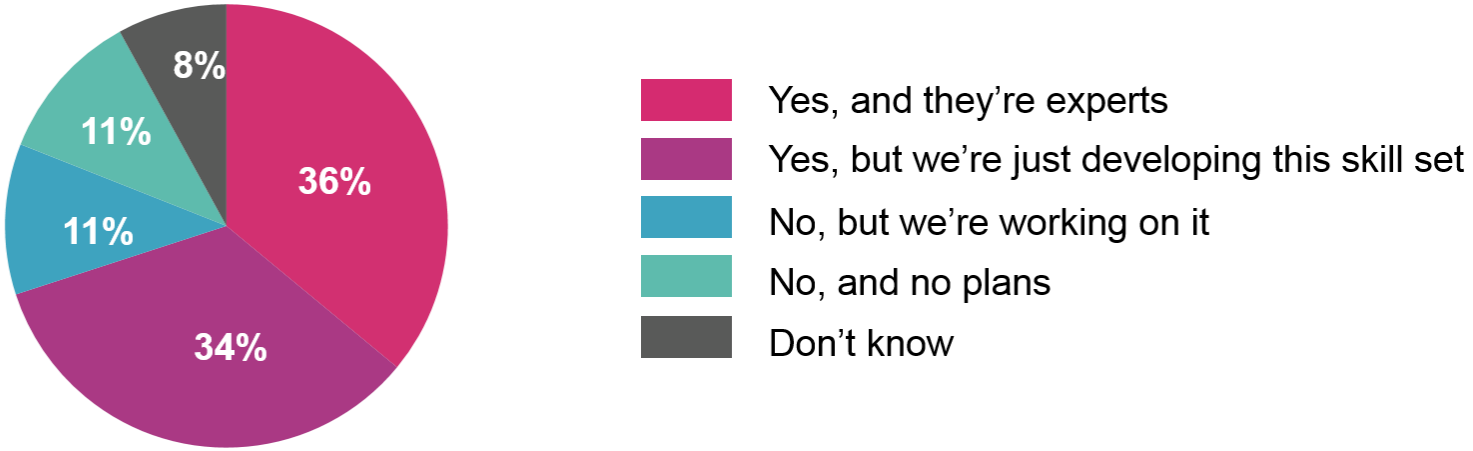


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 23

Integration with APIs

Does your IT operations team have personnel who can write and maintain scripts that enable integration with the APIs used to automate deployments?



Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 24

Adoption of DevOps

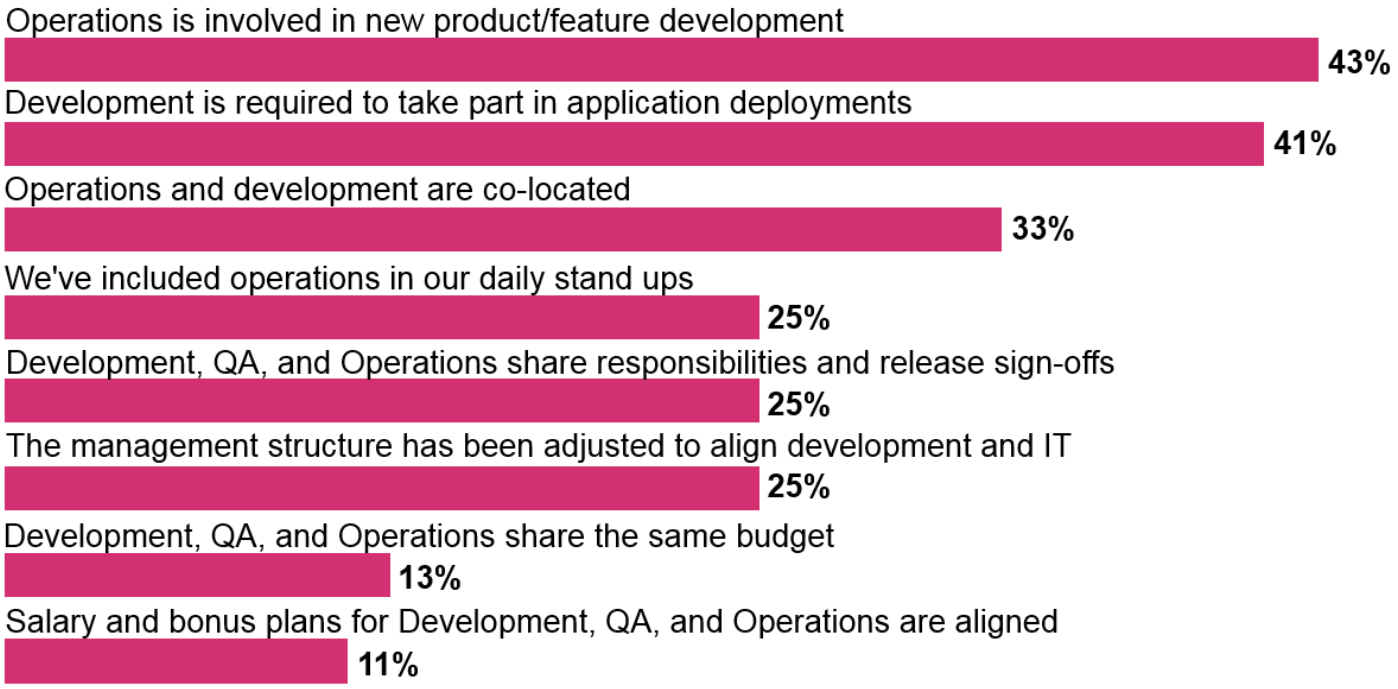
How would you characterize your company's adoption of a DevOps approach to software development?

Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 25

Cultural Changes Resulting from DevOps

What cultural changes has DevOps and its collaboration required in your organization?

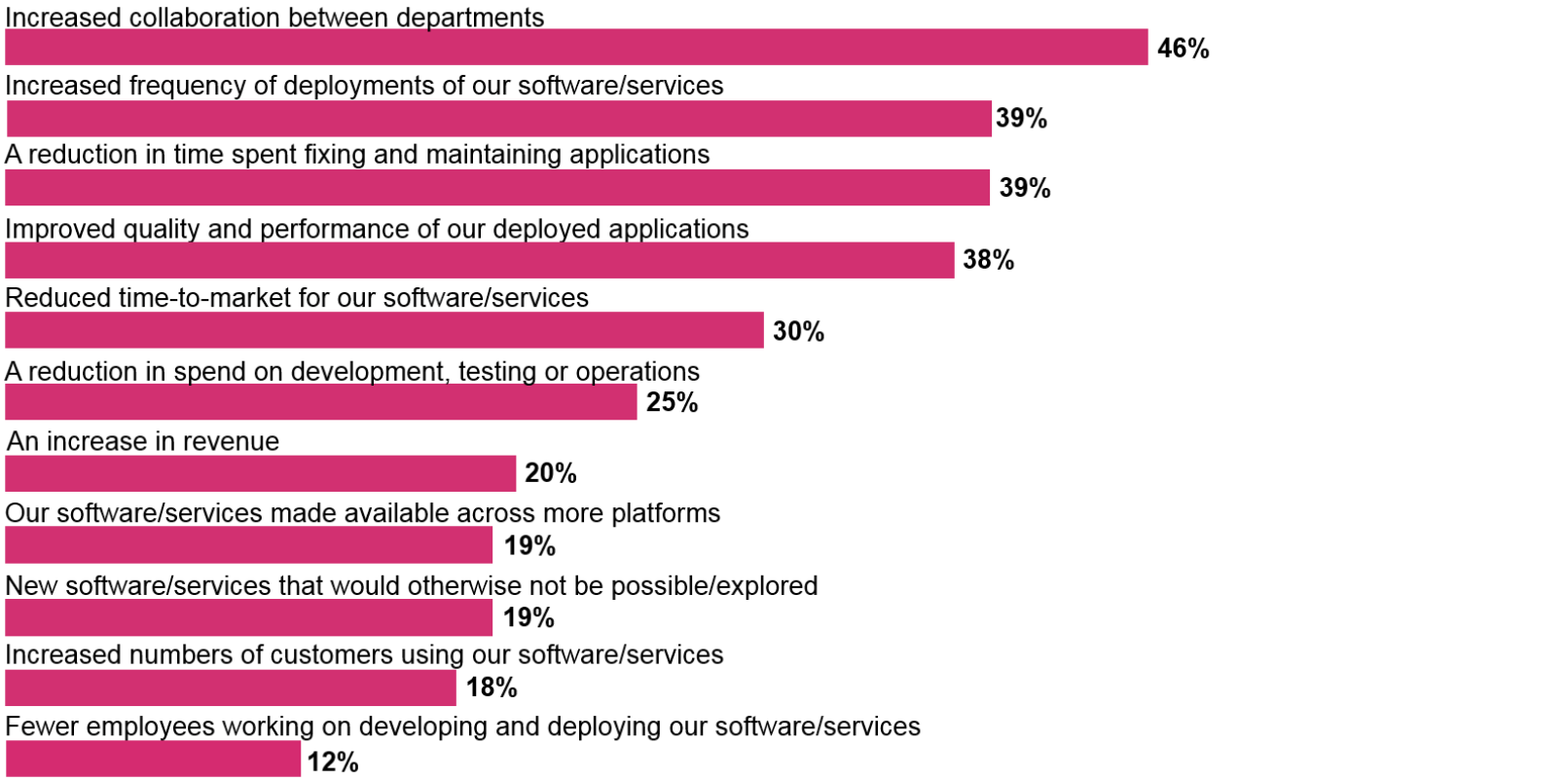


Note: Multiple responses allowed
Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 26

DevOps Benefits

What benefits have you seen or do you anticipate seeing from implementing DevOps in your organization?

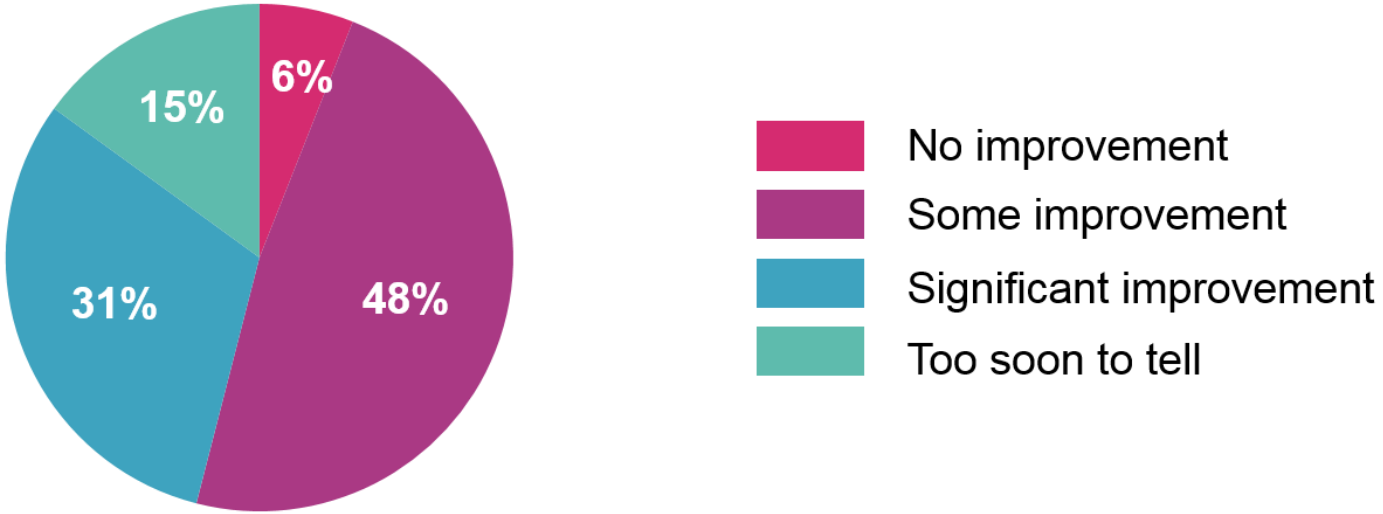


Note: Multiple responses allowed
Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 27

Improvement in IT Infrastructure Stability

What level of improvement in IT infrastructure stability have you had or do you expect to gain from adopting DevOps?

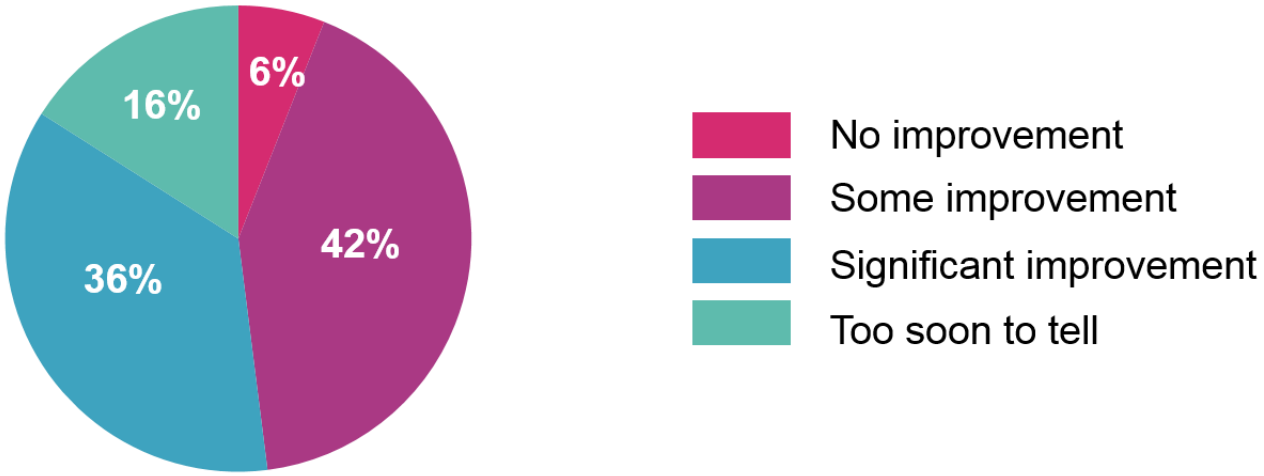


Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 28

Improvement in App Dev Speed

What level of improvement in application deployment speed have you gained or do you expect to gain from adopting DevOps?

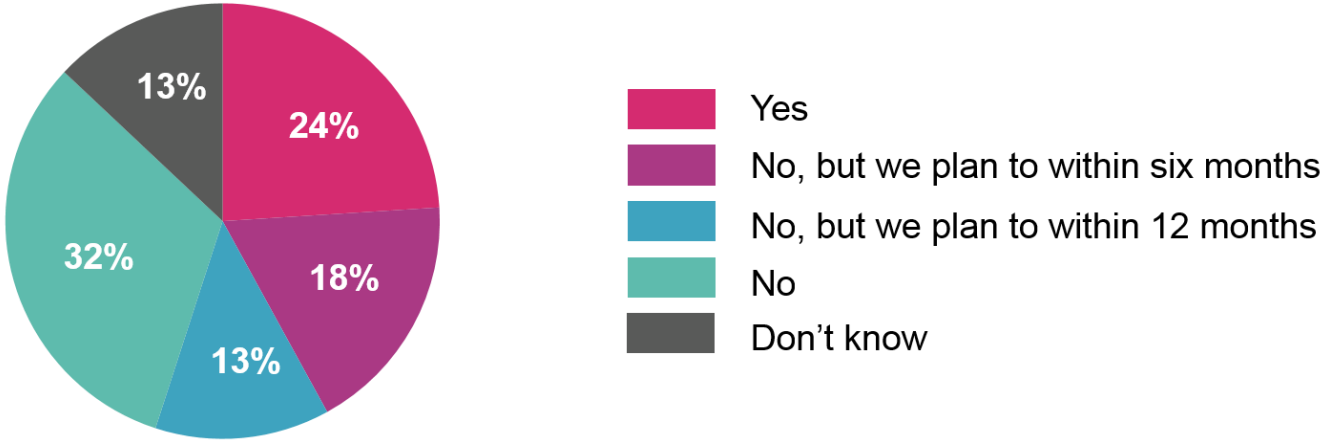


Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 29

Public Cloud Use

Does your organization run any production systems on a public PaaS/IaaS service?

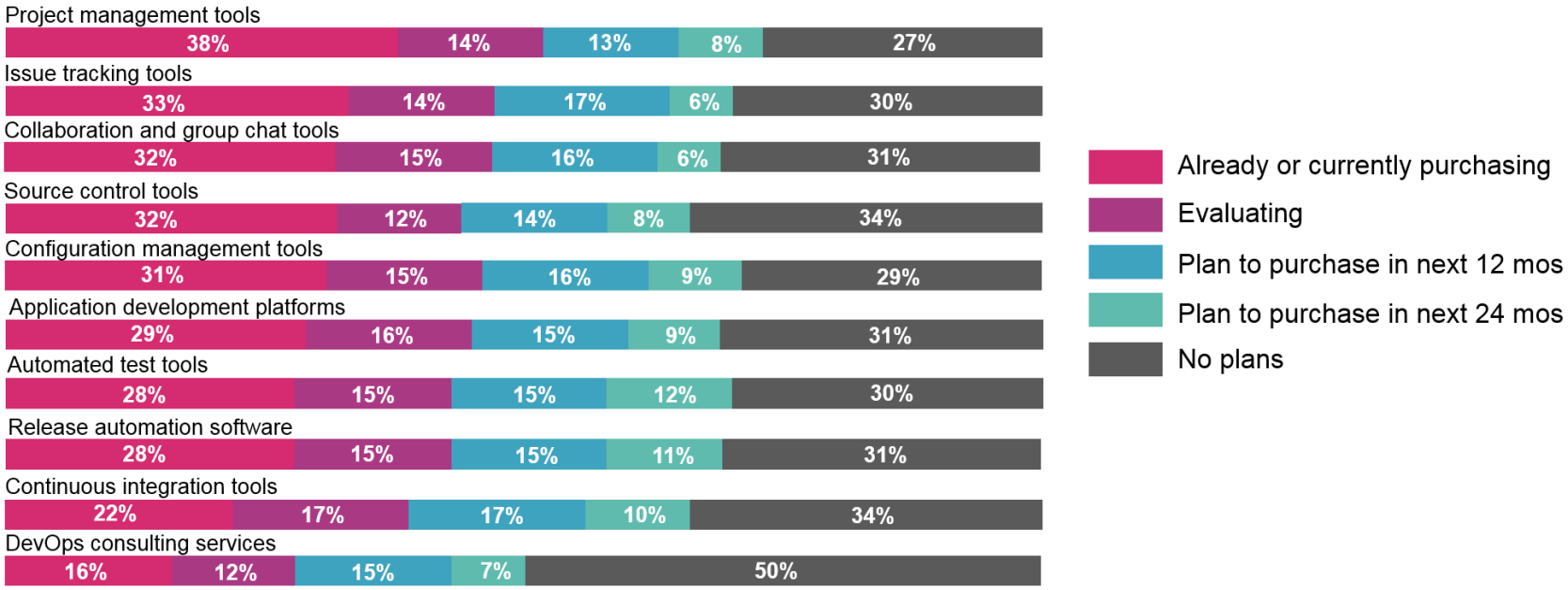


Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 30

DevOps Technology Purchase Plans

What are your purchasing plans for the following DevOps technologies and tools?

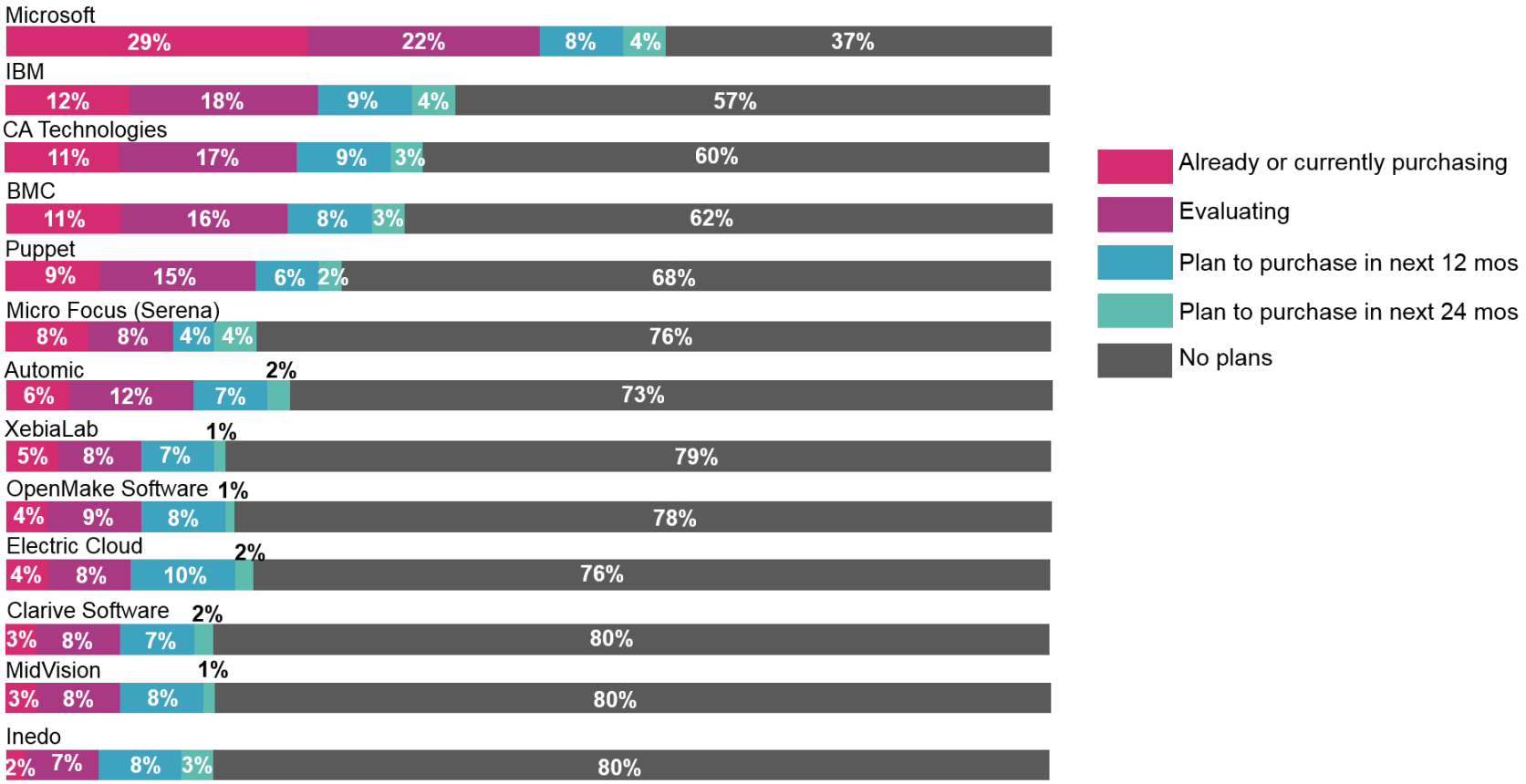


Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 31

Purchase Plans

What are your purchasing plans for the following vendors' application release automation frameworks?

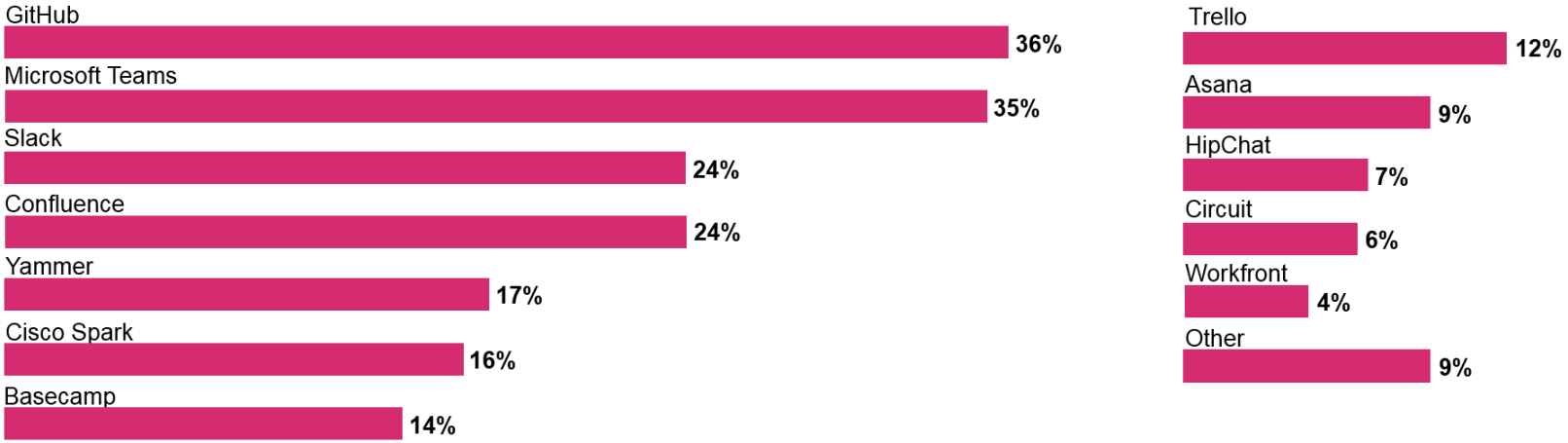


Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 32

Use of Collaboration Tools

Which of the following collaboration tools are you currently using or planning to implement in the next 12 months?

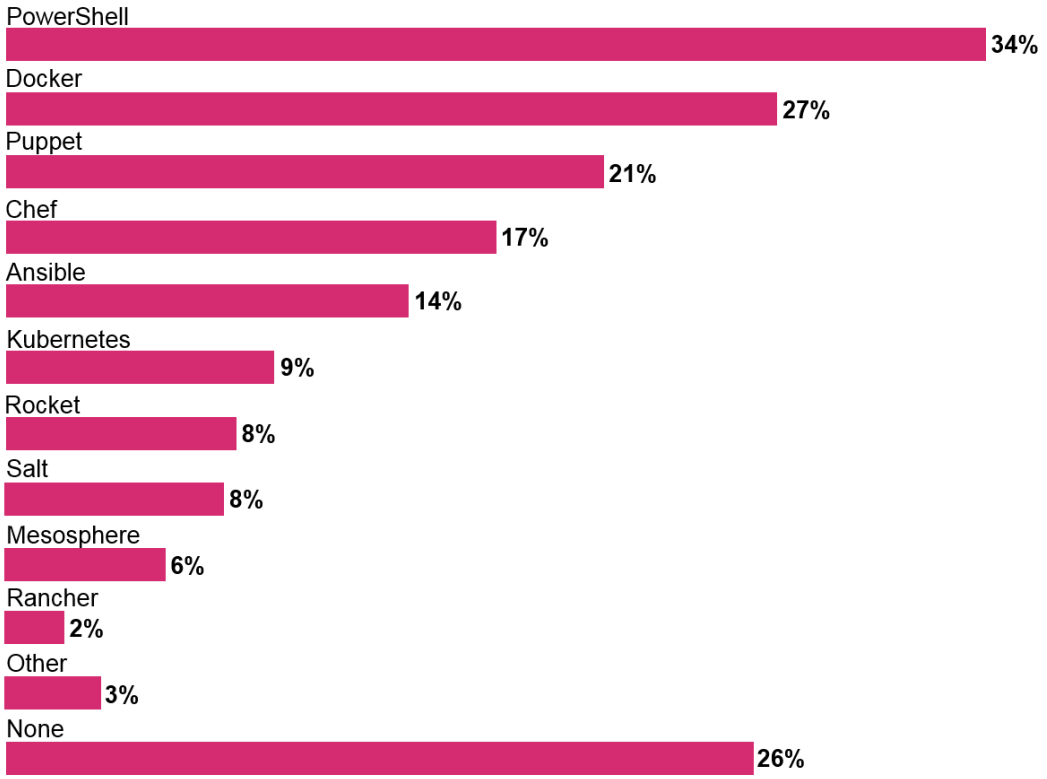


Note: Multiple responses allowed
Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 33

Use of Configuration Management Tools

Which of the following configuration management tools are you currently using, or plan to implement in the next 12 months?



Note: Multiple responses allowed
Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 34

Measuring Success

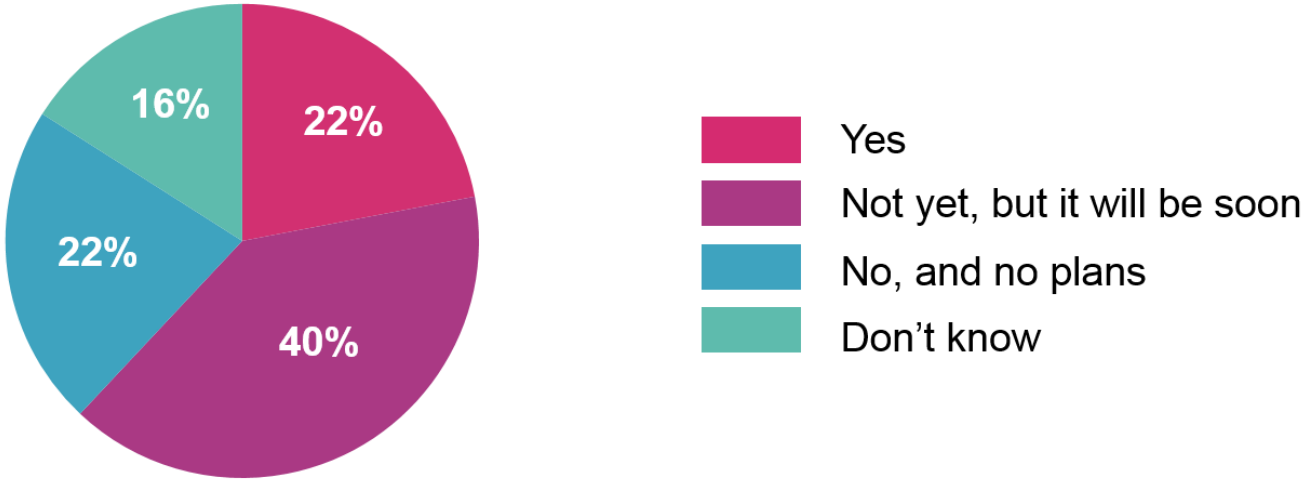
How do you plan to measure the success of your DevOps initiatives?

Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 35

DevOps Expertise

Is DevOps expertise on your list of must-haves for new hires in development and admin roles?

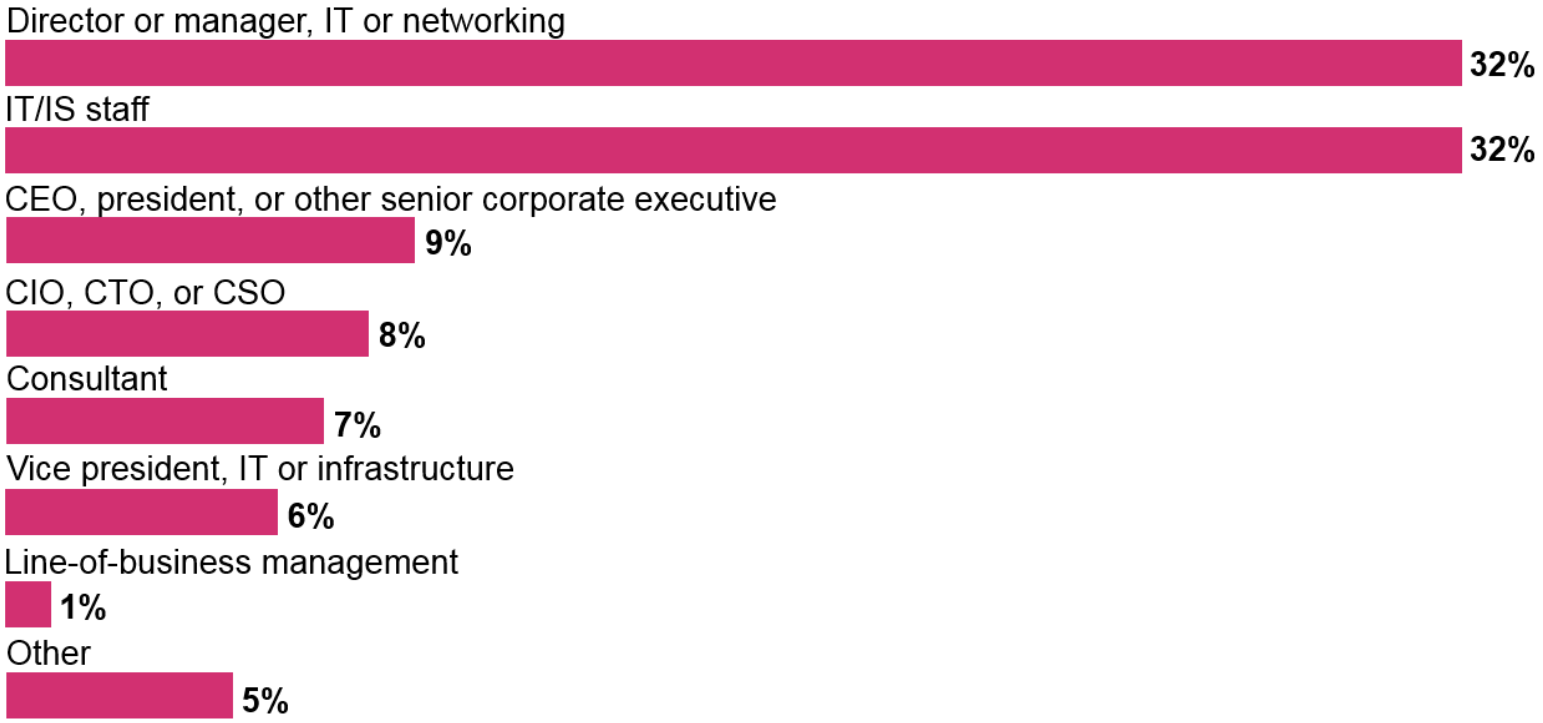


Base: 237 respondents who have adopted or plan to adopt DevOps
Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 36

Job Title

Which of the following best describes your job title?

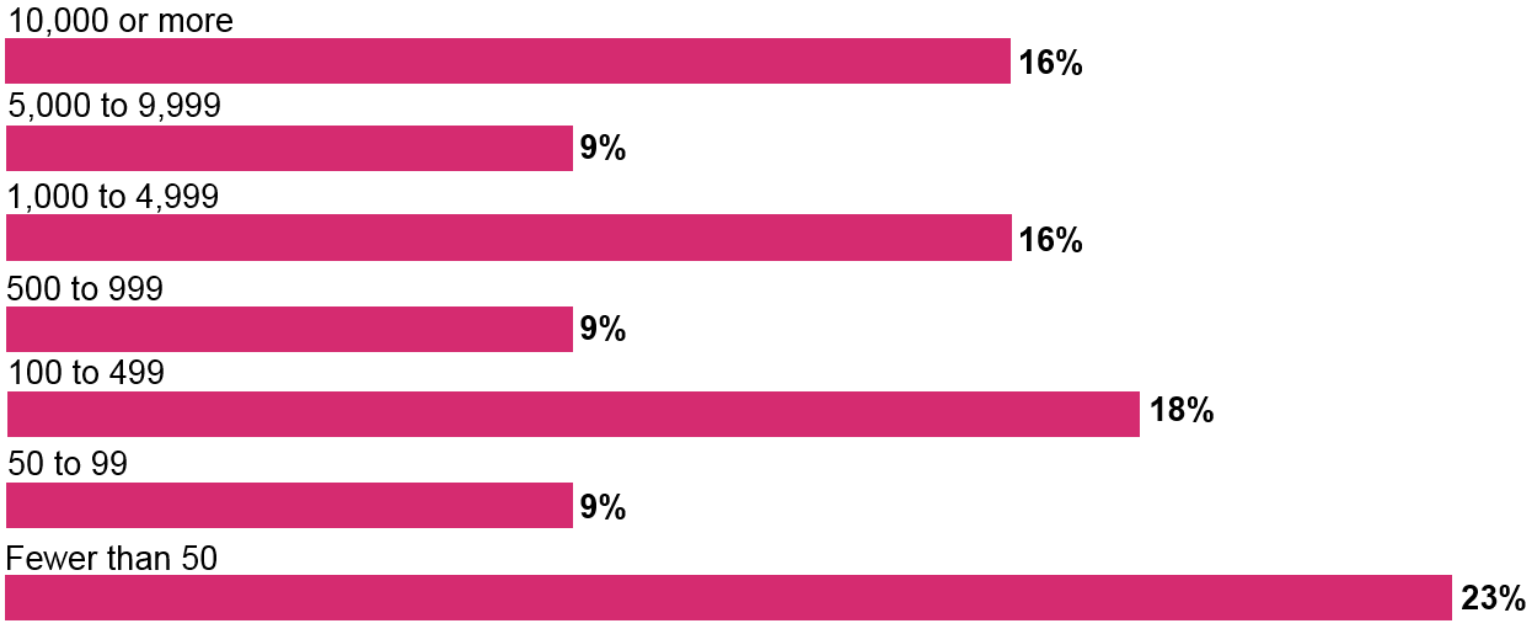


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 37

Company Size

How many employees are in your organization in total?

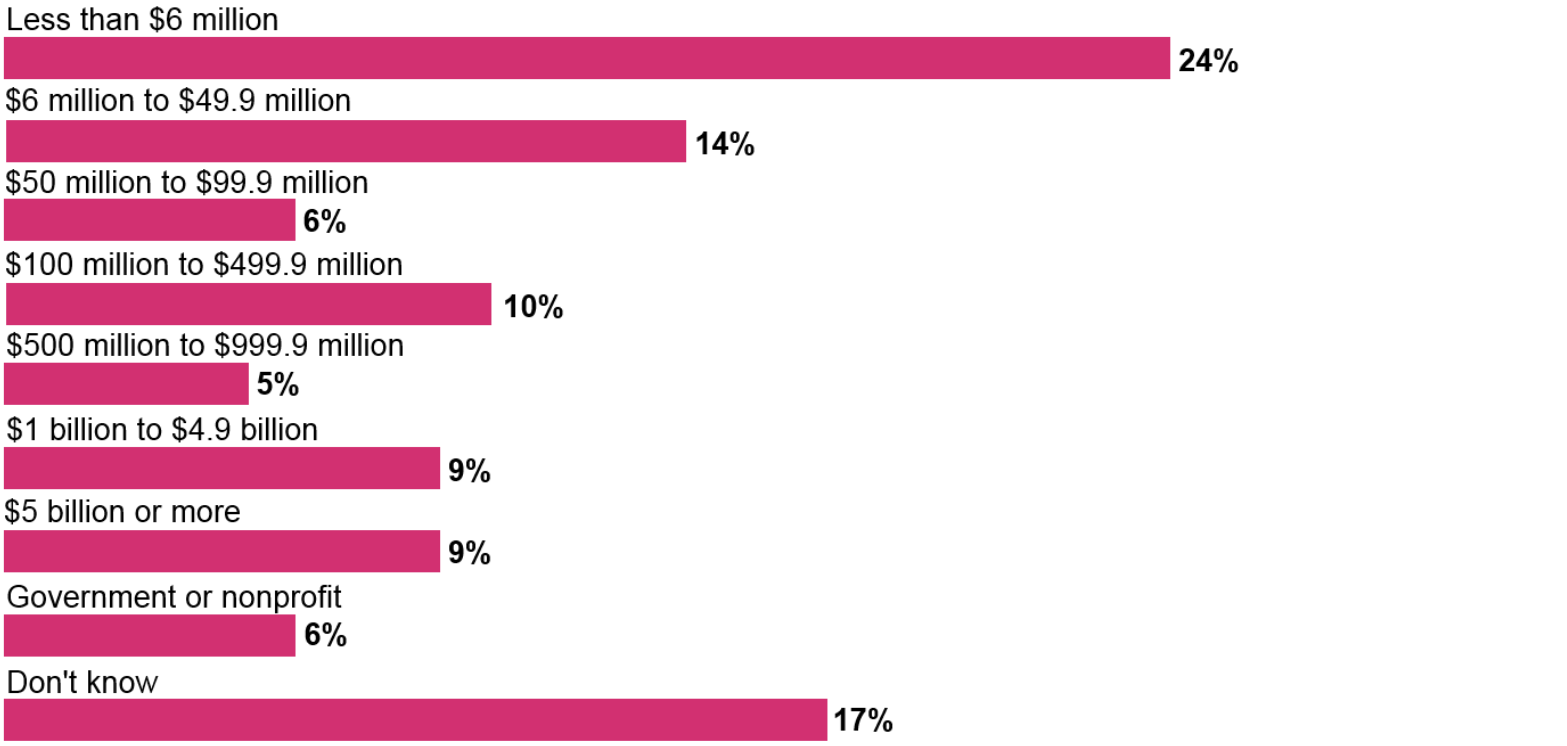


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 38

Company Revenue

Which of the following dollar ranges includes the annual revenue of your entire organization?

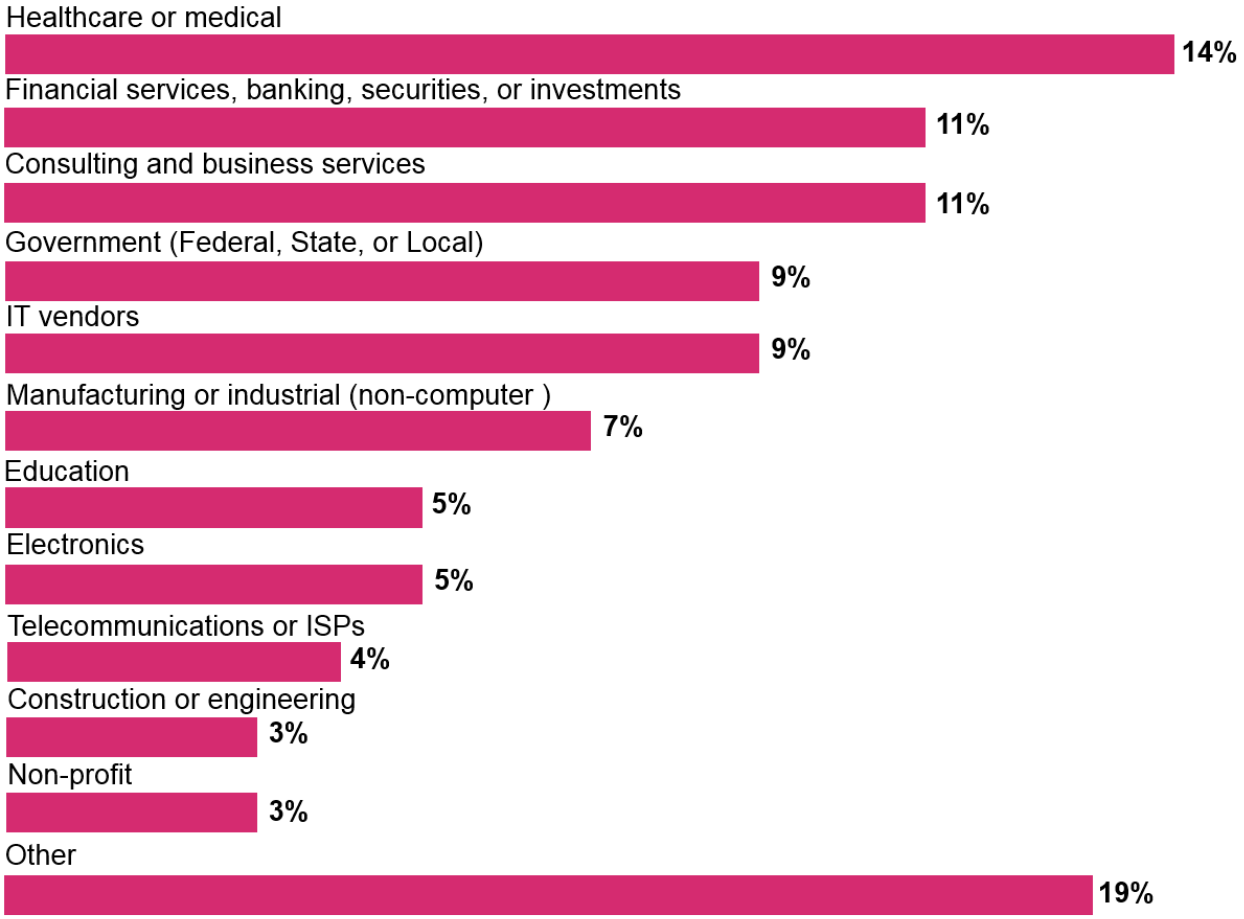


Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 39

Industry

What is your organization's primary industry?



Data: UBM survey of 300 IT professionals involved in applications, January 2017

Figure 40