Techstrong Research

The Role of Testing in a DevOps Environment

COMMISSIONED BY Tricentis

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Executive Summary

FOR DECADES, testing of applications has been viewed as a necessary bottleneck to getting software completed. The situation is changing dramatically. In a survey of more than 500 managers and DevOps professionals conducted by Techstrong Research, more than 78% see testing as a benefit rather than a bottleneck.

We're on the cusp of a transition. DevOps has become the foundation for software development and deployment, being embraced by companies across industries regardless of company size. Organizations are at different points in their DevOps maturity — some businesses have well-designed best practices while others are struggling.

The role of testing is a requirement for achieving the goal of delivering high-quality software into the hands of customers and employees. More than 50% of survey respondents agreed that the greatest value of testing is that it enables teams to release updates and applications faster with confidence. In addition, nearly 60% of respondents experienced a reduction in issues once applications were in production.

Expectations for software quality are high — customers have zero tolerance for poorly performing software. It has never been easier for customers to investigate offerings from competitors because of better mobile and application experiences. At the same time, both employees and business leadership expect consumer-like experiences and application quality when working with business applications.

Of the more than 500 managers and DevOps professionals who responded ... more than 50% agreed that the greatest value of testing is that it enables teams to release updates and applications faster with confidence.

It is increasingly clear that both management and development teams see software testing as essential to creating high-quality software. The reasons are clear: Software is growing more complex with the movement to the cloud and the increased use of SaaS applications and containerized applications based on microservices. In addition, the need to ensure security and compliance is making DevOps testing an imperative. Success begins with direction and support from top management.

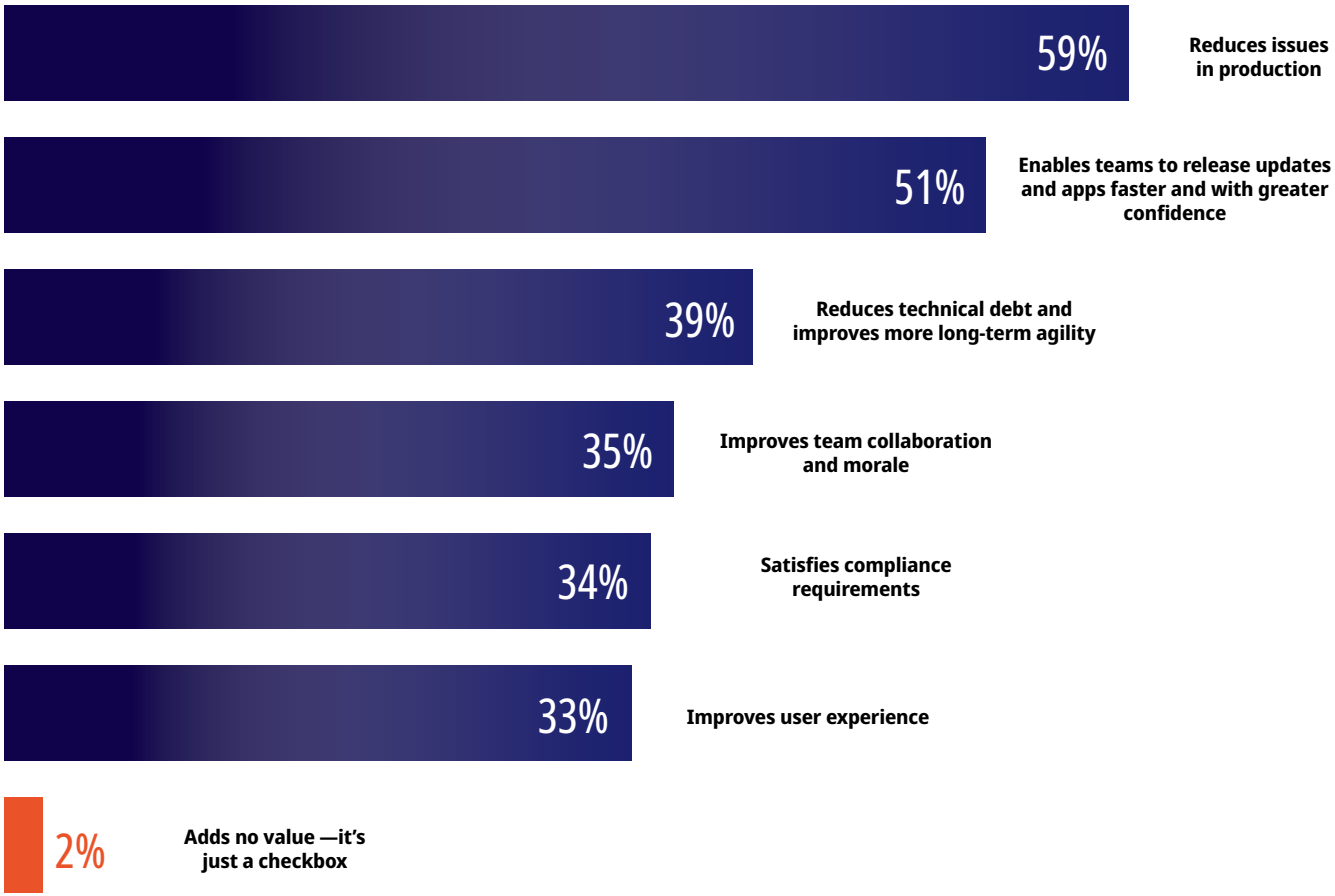
Successful businesses are creating frameworks to execute testing without dictating which testing tools DevOps professionals are using. It is imperative for organizations to create a positive collaborative environment between software development and testing teams. Having consistent processes across software environments is critical to business success. Well-managed businesses create an environment where developers and testers have a common understanding of software requirements and implement processes to support changing business requirements.

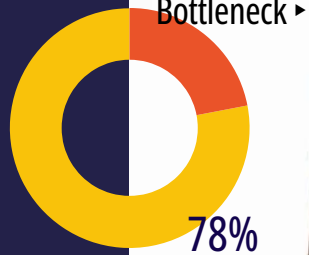
The movement to the new generation of DevOps testing will not be simple. There are challenges that organizations making this transition must overcome. For example, development organizations are more frequently implementing containerization and microservices as they move away from monolithic software development. This transition to modern software development practices can sometimes complicate the testing environment. One of the biggest challenges is that testing simply cannot keep up with new application features. According to the survey, a combined 82% of respondents experienced either frequent or some slowdown in testing new software releases. Successful organizations are those that implemented collaboration across teams. In 42% of cases, organizations will sometimes hold back on releasing new features until software and related dependencies are adequately tested.

How does testing contribute to DevOps success?

It is clear from our research that testing is a critical element of a successful DevOps strategy.

What's the value of testing to your DevOps efforts?

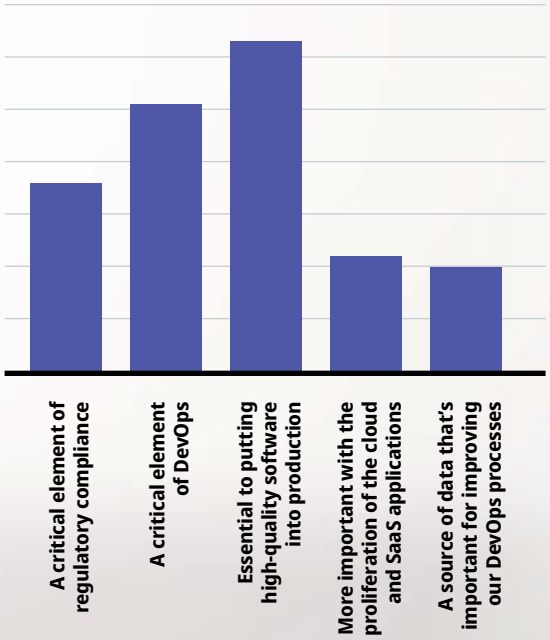




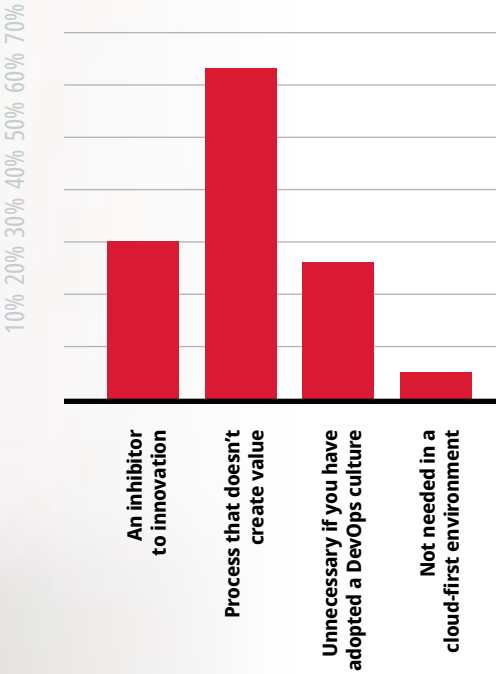
Testing is both a benefit and a bottleneck

Businesses must constantly release new software to meet changing customer requirements. One of the priorities with DevOps is to identify and remove inefficiencies in the software development process. While almost 80% of respondents recognize that testing helps to ensure quality, even they acknowledge that it becomes a chokepoint for releasing software. Surprisingly, one in five respondents view testing as purely a bottleneck.

For those who see it as a benefit, testing is:



For those who see it as a bottleneck, testing is:



Is testing slowing your team's ability to release new software?

Testing is a critical part of the DevOps process to ensure that applications perform as expected. Although development teams are pushed to release updates on a continual basis, poor software releases that create negative user experiences can be disastrous. **That's why we're seeing that most organizations defer releases until testing is done: Quality trumps speed.**

HOW OFTEN DOES TESTING SLOW DOWN YOUR ABILITY TO RELEASE NEW SOFTWARE?

Always/Frequently	Sometimes	Rarely	Never
38%	44%	14%	4%

Why is testing slowing teams down?

42%

Testing can't keep up with new features and bug fixes

50%

Testing can't keep up with changes forced upon us by other teams, third-party applications and platforms

36%

There's a growing list of testing expectations (regulatory compliance and others) that make in-sprint testing impossible

How do 4% of businesses <u>not</u> slow down due to testing?

96%

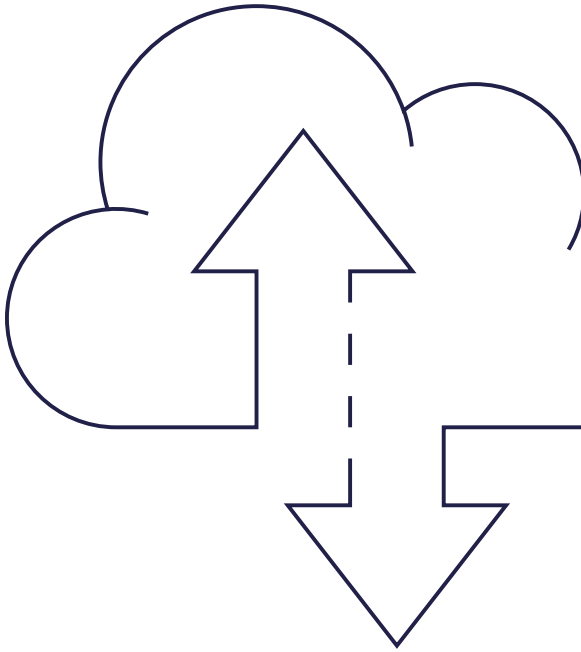
Have internal testing capabilities to meet demand

12%

Use third parties when needed to meet demand

4%

Release without the desired level of testing

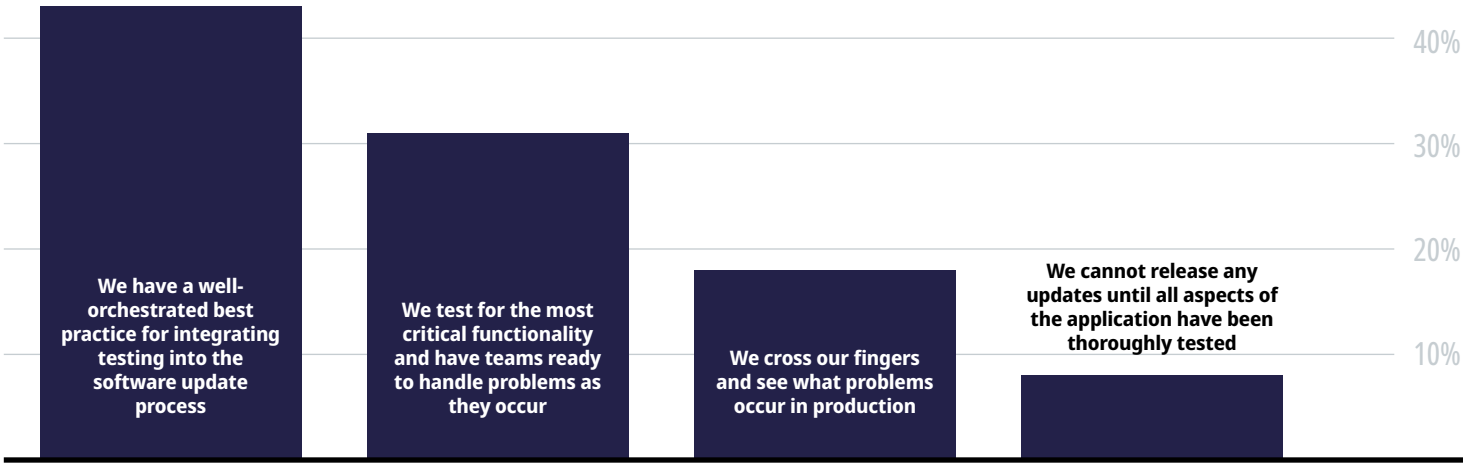


The cloud means you don't control updates

Businesses have lost control of when critical software is performed by third-party partners. With the proliferation of SaaS-based offerings, organizations must quickly react when cloud-based platforms receive updates. Testing needs to be done "on the fly" to make sure custom offerings stay relevant when vendors release new software.

Cloud vendors decide when updates are performed. However, customers and employees expect your software to always work. For example, if APIs and other pre-built connectors are no longer working with a cloud-based office productivity suite, employees don't want to hear "It's not our fault, our cloud vendor had a major update." It's up to internal IT teams to make sure applications work as expected.

When a SaaS provider or other third-party software vendor updates its software, how do you approach it from a testing perspective?



Containerization has broken down massive applications into reusable services

Increasingly, development organizations are shifting away from monolithic applications to reusable microservices that are housed in containers. Cloud-native applications are software offerings designed with microservices, containers and dynamic orchestration as well as continuous delivery of software. Every part of the cloud-native application is housed within its own container and dynamically orchestrated with other containers to optimize the way resources are utilized.

One of the biggest benefits of containerization is that applications can be updated more quickly than large monolithic applications. This transition has a significant impact on software testing.

Respondents are still divided on the impact of microservices and the ability to continually test

43%

say dependencies between services make it challenging to test as each microservice is updated

38%

say it's easier to test because you have smaller, more discrete services

26%

say it's becoming more complex because applications can be made up of dozens of services

14%

lack the internal skills to test cloud-native and containerized applications

9%

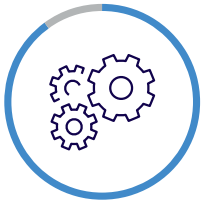
depend on developers to test cloud-native applications

With the continuous release of new software, automation is a key to enabling innovation

Nearly all of the survey respondents are using automation. However, levels of adoption vary in organizations. We wanted to better understand specific areas where automation is helping to improve the continuous release of high quality software.

The key benefits of automation on testing are:

90%



More complete testing

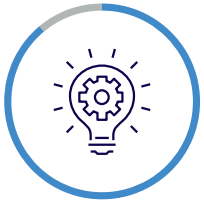
95%

Increased speed

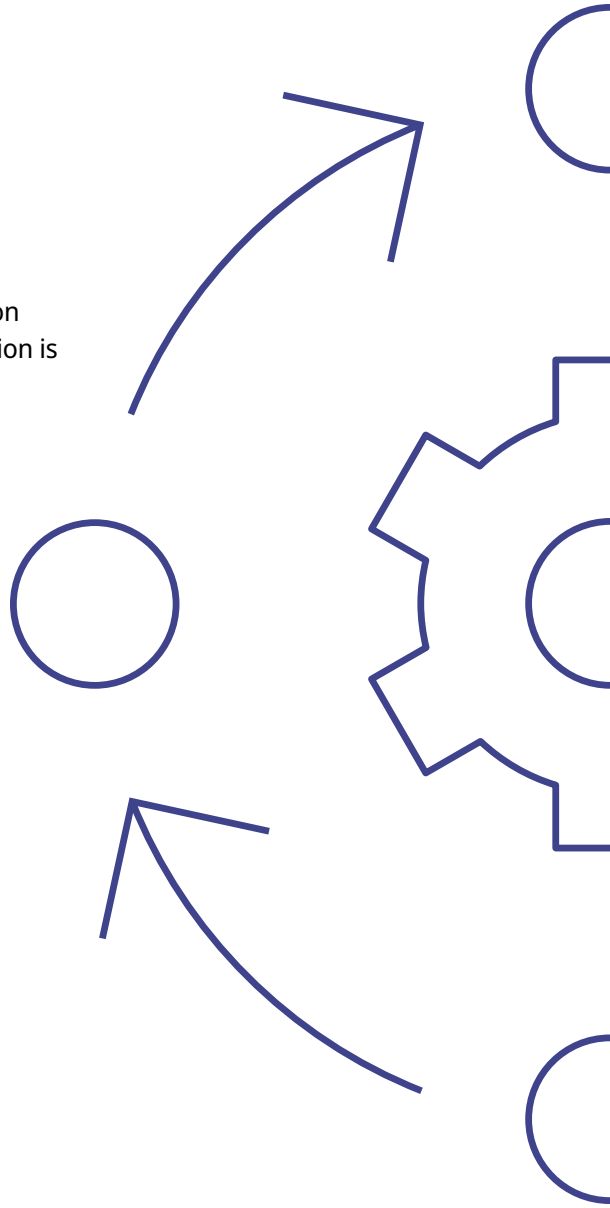
92%

Find hidden issues

89%



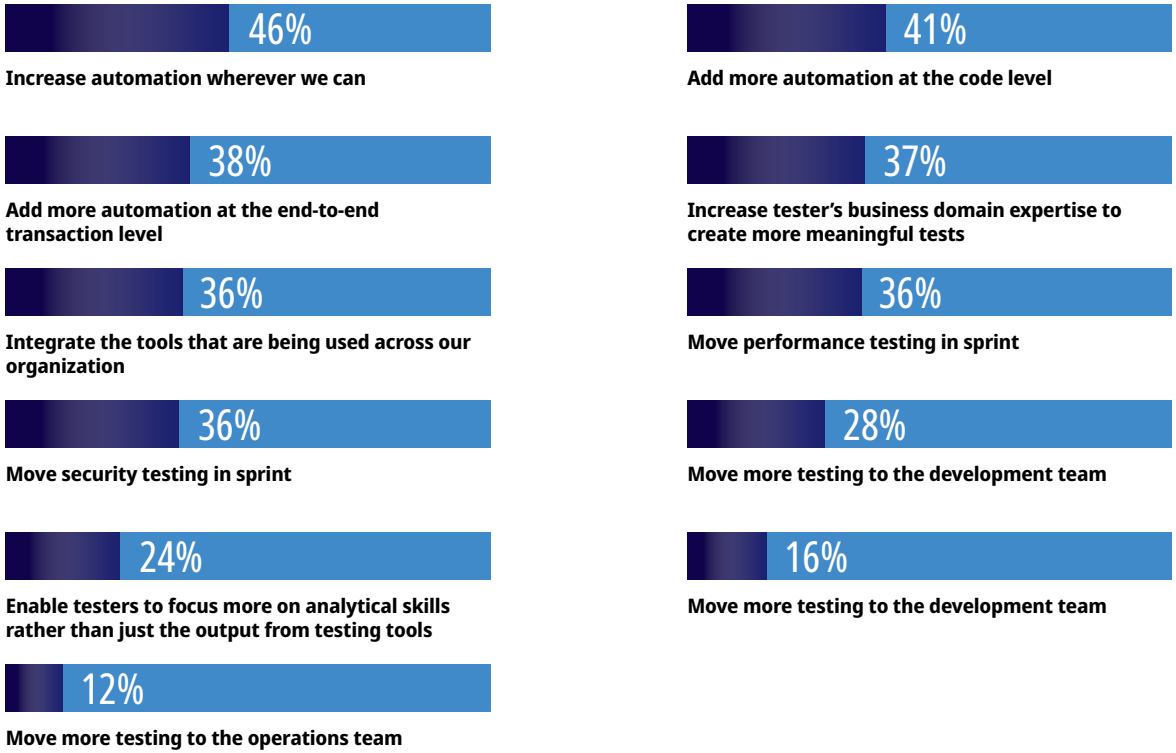
Find resources to create innovation



Starting testing early in the software development process is the path to success

Respondents believe that shifting left helps release better software faster. To enable this change, automation needs to be integrated into the entire DevOps process — from code creation to testing and deployment. In addition, there is a strong desire to connect testers' results with actual business domain expertise. Rather than reporting on the results of tests, respondents want testers to be able to help deliver those results in a business context.

How would you improve the testing process?



The Techstrong Research View

DEVOPS IS NO LONGER a theoretical approach to building new software, it is the new reality. Gone are the days when developers assumed that testing was an afterthought. Simply put, software quality is an imperative for businesses. Without well-designed software, organizations cannot provide quality service to their constituents. Therefore, software testing has become essential in delivering high-quality software. Achieving excellence in DevOps requires that teams learn to collaborate effectively through strong management leadership.

Techstrong Research decided to investigate how businesses are transforming their software environment by making testing a priority. One of the most interesting results from the study is that almost 80% of respondents do not see testing as a bottleneck. This is a significant change from only a few years ago when organizations would focus primarily on development rather than on the integration of testing into the overall software quality environment.

There is a dramatic change in the way companies view the importance of software as the driver for business excellence. Across all industries, software is defining the way companies interact with their customers, suppliers, partners, and employees. Therefore, there is little room for error. This imperative for software quality is taking on even greater importance with the movement to cloud computing that requires a more modular approach to software development and deployment. Increasingly, organizations are building applications by creating microservices that are integrated into containers. These microservices must be thoroughly tested since they will be used in many different applications, both internal and external. At the same time, services must be tested to ensure that dependencies are well-managed and understood. Just as important is the ability to test applications and services for regulatory compliance and security.

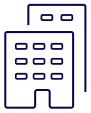
Survey Demographics

Techstrong Research conducted research on the importance of testing in high-paced DevOps environments. The survey was conducted during July and August of 2021. Over 550 individuals that are familiar with application testing and DevOps completed the survey.

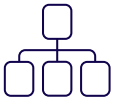
Respondents hold a variety of roles and come from a broad range of organizational sizes:

of respondents came from small organizations (<500 employees)

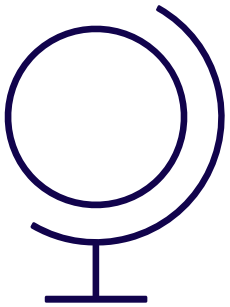
of respondents represent medium-sized organizations (>10,000 employees)



of respondents represent large enterprises (>10,000 employees)



self-identified as manager or leadership (manger/senior manager to CEO)



Survey responses came from a global cross-section of 28 countries and regions including **North America (58%), Latin America (6%), EMEA (12%)** and **APAC (24%).**

About the authors

DAN KIRSCH, managing director and co-founder of Techstrong Research is a consultant, IT industry analyst and thought leader focused on how emerging technologies such as AI, machine learning and advanced analytics are impacting businesses. Dan is focused on how businesses use these emerging technologies to alter their approaches to information security, governance, risk and ethics. Dan provides advisory services directly to leadership at technology vendors that design and deliver security solutions to the market. Dan is a co-author of *Augmented Intelligence: The Business Power of Human-Machine Collaboration* (CRC Press, 2020), *Cloud for Dummies* (John Wiley & Sons 2020) and *Hybrid Cloud for Dummies* (John Wiley & Sons, 2012).

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Techstrong Research is relentlessly focused on the business outcomes of disruptive technologies.

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