



# The Rise of Continuous Testing

Accelerating Application Delivery and Quality

# An Unlikely Ally

As the application economy drives companies to roll out applications more quickly, companies are seeing testing in a new light. Once considered a speed bump on the DevOps fast track, new tools and testing methodologies are emerging to bring testing up to speed.

In this ebook, we'll explore some of the challenges on the road to continuous testing, along with new approaches that will help you adopt next-gen testing practices that offer the ability to test early, often and automatically.



A recent poll showed that more than

**75% said they wanted to “shift left”**

and move testing from downstream back into development.<sup>1</sup>



# Want to Find the Source of Many Significant Challenges? Look to the Left.

It's clear that traditional testing models just don't work in a DevOps setting—your world moves too fast, and there's too much at stake to rely on the slow, mostly manual status quo. The initial problems start all the way to the left of your software development lifecycle in the requirements phase. In fact, 64 percent of total defect cost can be traced to poorly defined or incomplete requirements.<sup>2</sup>

## **Ambiguous requirements mean poor outcomes and big risks**

When your requirements aren't clear, you usher in an array of problems—defective software, delays and clashes between the business and IT, to name just a few. Today, most testing is still done manually, but these methods are a remnant of the past and don't provide enough coverage, covering just 10 to 20 percent of functionality.

2 Hyderabad Business School, GITAM University, "Quality Flaws: Issues and Challenges in Software Development," November 2012



**This disconnect between requirements and the final output can have costly consequences. If you can't get your requirements right—and do it quickly—then you risk:**

### **Costly rework**

Don't send your teams "back to the drawing board" late in the software development lifecycle.

### **Defective applications**

User expectations are skyrocketing—they'll close and delete your app in seconds if they sense performance issues.



### **Damage to your brand**

If users detect a pattern of poor design or execution, negative reviews and high abandonment rates could harm your company's position in the marketplace.

# Use Modeling and Automation for Clear, Unambiguous Requirements

Everyone wants lower testing costs, better quality and faster application delivery—the question is “How?”

**To bring these benefits to your own organization, you need to adopt a new approach that:**

- Allows you to design requirements with extreme clarity so potential defects can be eliminated or addressed in fewer hours instead of days or weeks
- Helps you test more efficiently, so you can run the smallest number of tests possible to cover 100 percent of your testing criteria
- Fosters automation in test case design, test generation and change implementation

Right now, you probably have too many manual steps that slow you down. Defining requirements, designing test cases and other manual testing activities are keeping you from moving faster and ramping up your applications' quality.

## **Implementing advanced requirements engineering and test design automation capabilities**

At CA, this is the approach that guides the continual refinement of our CA Agile Requirements Designer solution.

With CA Agile Requirements Designer, you'll automatically generate the optimal set of tests right from your requirements modeled as complete and unambiguous flowcharts. Then when requirements change, these tests will update automatically so you can deliver software that reflects changing user needs.

Improve Quality

**80%**

increase in test coverage

Boost Productivity

**30%**

reduction in test cycles

Save Time

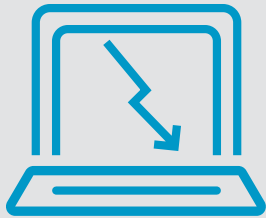
**99%+**

reduction in time to reflect changes in tests

[Learn more about CA Agile Requirements Designer](#)

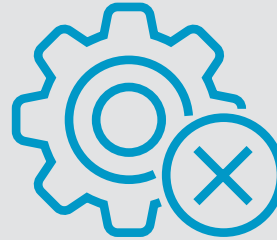
# How Much Time Do Testers Spend Looking for Test Data?

If you work in testing, you already know that time wasted looking for the right test data is a pervasive problem. But looking for test data is only one part of the issue—finding the right data or creating it manually consumes about 50 percent of a tester's time.<sup>3</sup> And a staggering **70 percent of all test data is still being developed manually.**<sup>4</sup>



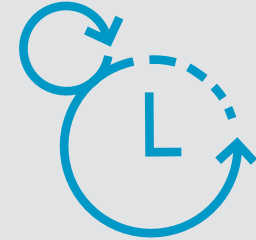
In addition to wasted time, there are other consequences that stem from these challenges.

**Decline in software quality**



Don't let defects remain unresolved until late in the development cycle, where they require far more time and expense to fix.

**Increased exposure to compliance and data privacy issues**



Improper handling and formatting of test data gathered from production databases can expose you to breaches, fines and reputational damage.

**Delayed agile implementation**

Lengthy searches for test data and manual provisioning not only hinders the testing process, it also slows down the entire supposedly agile organization.

<sup>3</sup> CA Technologies implementation field experience with actual customers

<sup>4</sup> Bloor Research, "A Bloor Market Update Report: Test Data Management," March 2017

# Accelerate the Rate of Test Data Creation to the Speed of Agile

You've seen your teams wait days or weeks for the right test data, or spend long hours manually developing it themselves. How can you get away from this tired process that relies only on production data and start testing at the speed of agile?

## By exploring new technologies that:

- Support more data sources, including unstructured data, along with information in NoSQL environments and mainframes.
- Mass produce test data automatically and quickly, using sophisticated synthetic data generation that simulates the variability and formats of production data.
- Mask data the right way so you can get the most out of production data when needed (without sacrificing security or violating compliance protocols).

## Mitigating problems and achieving real cost savings

- Extensive and flexible synthetic data creation
- Access to their own copy of test data via virtual test data creation
- Ability to ramp up their data creation speed to match the pace of your agile environment

Finding, improving, protecting and delivering test data is made easier, and subsetting and masking is more efficient, giving your testing teams greater ROI from your tools during this phase of your software development lifecycle.

[Learn more about CA Test Manager](#)



# Have You Hit the “QA Wall”?

To compete in the application economy, software developers like you are looking for ways to ramp up speed, boost quality and deliver a quality experience to your customers. And you're not alone—nearly 75 percent of companies have adopted DevOps processes to help them accelerate the software delivery lifecycle. But regardless of the benefits by DevOps, you're still running into the “QA wall.” In one survey, 63 percent of respondents cited test/QA as the main hold-up in the software production process.<sup>5</sup>

It's easy to see why this is a headache for your testers, and the testing phase also slows down and undermines your overall approach to rapid application development. Failing to break through this bottleneck can result in:

## Longer cycles

29% of DevOps practitioners say that **quality was being sacrificed** due to QA challenges.<sup>6</sup>



## Higher costs

Testing a wide variety of **devices and environments** can mean allocating funds to hire additional testers.



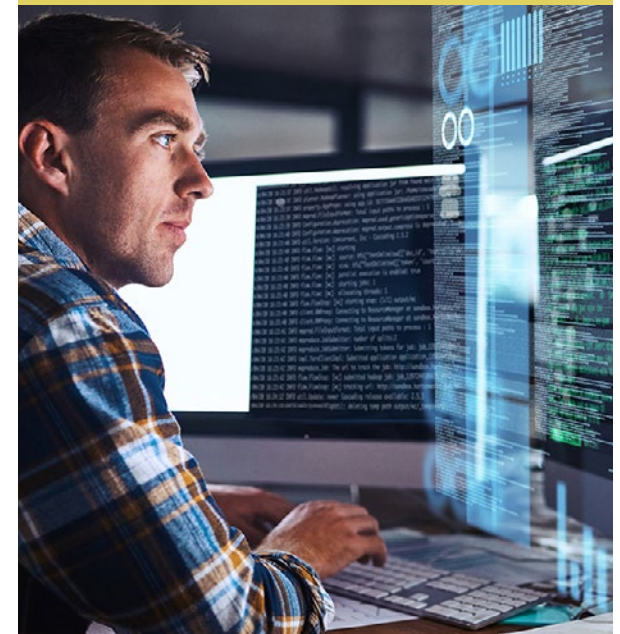
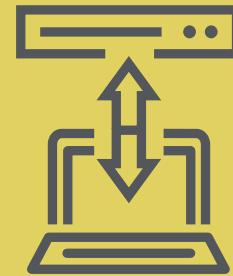
## Diminished quality

**Inefficient testing practices** can increase the pressure on your entire DevOps team.



How can you help your testers contribute to the overall speed of the DevOps team?

**By adopting a way to simulate unavailable systems.**



<sup>5</sup> Computing Research, “DevOps Review 2017,” March 2017

<sup>6</sup> Computing Research, “DevOps Review 2017,” March 2017

# Get Exactly What You Need (When You Need It)

Continually releasing software requires collaboration across each phase of the software development lifecycle. Testers are typically at a disadvantage because they can't access the incomplete or unavailable services required to complete their tasks.

However, by creating virtualized services across the entire software supply chain, testers can contribute more value to the overall development process. With this approach, you can:

- **Capture** and record traffic or messages flowing between any two systems.
- **Model** captured data and correlate it into a virtual service, which is a "conversation" of appropriate requests and responses that is plausible enough for use in development and testing.
- **Simulate** to respond to requests with appropriate data just as the real thing would, except with more predictable behaviors and much lower setup and teardown cost.

## Creating virtual services for the test environment

Developers, integration testers and performance testers can all move more quickly with CA Service Virtualization. You can now simulate systems that aren't available, regardless of where they are across the software development lifecycle.

Teams can now collaborate more efficiently, allowing you to accelerate release cycles and reduce testing environment infrastructure costs.

[Learn more about CA Service Virtualization](#)

CA Service Virtualization customers have seen:



faster time  
to market



**more defects found**  
(at least one stage  
earlier in the software  
delivery lifecycle.)<sup>7</sup>



# Do You Have Difficulties Scaling Test Coverage for Your Agile Teams?

To bring apps to market quickly in the age of digital transformation, companies have adopted the use of agile development and DevOps delivery. However, testing as a discipline has fallen behind, relying on legacy tools and methods that are poorly suited for rapid, quality application development.

Infrequent testing leads to bad applications. If your testing practices haven't "shifted left," where we test for application performance early and often in the software development lifecycle, you're preventing your developers from contributing to the continuous delivery culture needed for success in the application economy.

The reality is that performance testing of applications is often an afterthought given today's heavily manual test processes and limited availability of test resources for development teams.

## For the Test Center of Excellence (CoE) in the DevOps practice, this holds specific challenges:



### Tool incompatibility resulting in management complexity

Agile teams forced to switch out of their preferred open-source tools in their local IDEs today results in QA as the bottleneck with larger operating pains and longer development cycles.



### Inability to scale up and out efficiently for performance

Load testing to over 2 million virtual users at enterprise scale (for projects across multiple distributed teams in the same instance) is a challenge for Test CoEs today.



### Under delivering on test runs for continuous testing

Overwhelmed by proliferation and complexity in application delivery, the VP of Applications are limited in their ability to accelerate test automation for test runs across the (CI/CD) pipeline.

# Democratize Your Performance Testing

“Test early, test often” should be the motto of any organization seeking to stay competitive in the application economy. In the modern software factory, testing should be democratized, offering teams the ability to run tests to ensure application quality, regardless of their place in the development cycle. As you bridge and broker enterprise coverage at scale from the Test Center of Excellence, performance engineer your applications in the cloud for continuous quality.

## By cultivating this approach, you can:

- **Offer self-service capabilities in the cloud** so that developers can easily run open-source-based performance tests that matters from their local IDE of choice. This lets them test early and often regardless where they are around the world and at any time of the day.
- **Scale load testing** to over 2 million virtual users hitting the application simultaneously across multiple application projects. Bridge and broker for enterprise test coverage at scale in the Test Center of Excellence, to performance and function test over a single platform.
- **Seamlessly test and integrate** continuously with a wide variety of tools, such as Jenkins, Bamboo and TeamCity, for continuous delivery. DevOps practices can performance engineer applications in the cloud continuously for quality, as they leverage on OOTB DevOps integrations that help accelerate test automation across Dev/QA and ops frictionlessly.

## Run open-source-based load-performance and API tests continuously anytime, anywhere at enterprise scale from your DevOps practice

With a next-generation, browser-based SaaS testing solution like **CA BlazeMeter®** for the modern SDLC, align your current testing platform in the Test Center of Excellence to open-source-based tools and best practices that agile development teams use. Stay ahead of the market by democratizing performance and function testing of Web/mobile/microservices/API over a single integrated toolchain.

Bridge and broker enterprise test coverage at scale across the tens/hundreds of application projects in the business.

Remember to leverage the extensiveness of DevOps integrations out of the box for the benefits of a CI/CD pipeline, as you accelerate test automation continuously for quality applications in the cloud.

Request your CA BlazeMeter demo now.

[www.blazemeter.com/shiftright](http://www.blazemeter.com/shiftright)

[Learn more about CA BlazeMeter](#)

# How Risky Are Your Releases?

Unfortunately, much of your testing still relies on manual methods with only 16 percent of test activities automated on average.<sup>8</sup> What's more, testing often is siloed across the organization—disconnected people and tools—leading to inconsistent visibility into testing progress and testing results.

Only **16%** of test activities automated on average<sup>8</sup>

The lack of collaboration, visibility and feedback across the release process can create unnecessary release delays and risk with business-impacting consequences:



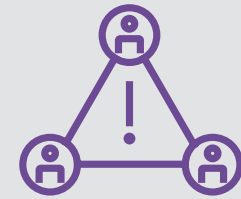
## Missed deadlines

For every day a release is late, that's unrecoverable revenue lost. Your competitors are out in market before you. Your customers are missing key functionality enhancements.



## Lost time

Too much manual work, rework, unplanned work, wait time and technical debt creates inefficiency in your pipeline—hours that could be spent on innovation and your competitive edge.



## Disappointing quality

Consumers abandon loyalty fast with all the choice in the market. If your applications don't perform as expected or have too many issues, consumers find another solution. Focusing on producing the highest quality apps is critical.

In the modern software factory, testing can't be an isolated workflow disconnected from your application release process. Quality must become everyone's concern—a shared responsibility across development, testing, release and operations teams. And these teams need to be able to work together effectively and efficiently to deliver high quality work, on time.

<sup>8</sup> Capgemini and Sogeti, "World Quality Report 2017-18"

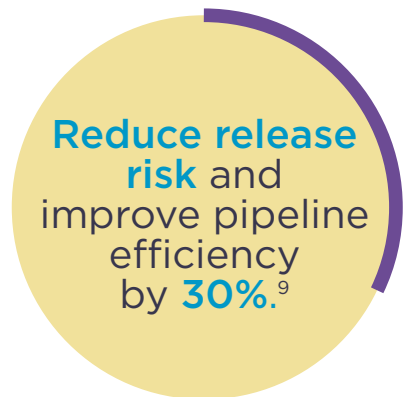
# Orchestrate the Delivery of Quality

Testing is still stuck in legacy mode, relying on manual processes. But it doesn't have to be this way—with the right approach, you can “shift left,” bring in more automation, and start intelligently testing apps.

## Building more efficient continuous testing frameworks for quality delivery

CA Continuous Delivery Director helps your testing strategy come to life by orchestrating the delivery of quality. It provides testing transparency, automation and intelligence for the modern software factory by managing testing stages, change validation and delivery risk across your organization.

You can now connect the testing toolchain from planning into production, supporting intelligent, automated testing cycles, fast testing feedback, complete visibility of all testing activities, and testing insights that inform release health. You'll be in complete control of your testing workflows ensuring the right tests are run in the right environments at the right time.



## With this new way of thinking, you can:



**Go faster** by implementing a mission control that reduces cycle time.



**Adapt quickly** to the code change committed to the pipeline, which means you find and fix issues earlier and more efficiently.



**Improve customer experience** by gaining more insight into levels of quality and release readiness.

[Learn more about CA Continuous Delivery Director](#)

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