

# Assuring Software Quality in a Fast-Moving DevOps World

TCS Research

## Abstract

Consumers have become used to living in an 'always-on' app-centric world, where apps 'just work', and are automatically updated as our needs evolve. This experience has extended to the workplace, and people want accounting systems, HR systems and CRM systems to be 'appified', available on the smart phones, and continuously updated with useful new functionalities.

Mired in slow, old-fashioned processes, traditional companies are being disrupted by super-agile digital entrants. To survive, they need to adopt the same approach to software development and delivery as the disruptors—the 'DevOps' way—where software development, Quality Assurance (QA), and IT operations teams work together to continuously develop, test, deliver, deploy, monitor, and update digital services in line with users' needs. DevOps represents a major change in the way software is delivered. In an environment where speed is of the essence and quality must be top-notch, it is becoming the only way forward.

## Four Factors Driving the Rise of DevOps

DevOps is a modern solution to a set of four, very modern business needs and challenges:

### 1. Surging Customer Expectations

In the consumer world, digital innovators have made it super-easy to buy, consume, and return products. As consumers get used to this kind of service delivery experience, they expect it everywhere, shunning any service that is slow or difficult, or requires effort. Businesses must evolve to meet customer expectations, and maintain competitive advantage, or eventually perish.

### 2. The Faster Pace of Innovation

Successful disruptors don't just revolutionize things once; they keep on revolutionizing, often at an incredible pace, and simultaneously increasing quality, rather than compromising it. Innovation has become a relentless race, with no time to spend on perfecting a new system that will be obsolete before it's even deployed.

### 3. Ubiquity of Digital Devices

Digital is now the default, so today's services must work seamlessly on a huge range of devices. Developers must also keep a continuous eye on emerging devices and platforms, which are rapidly proliferating beyond smart phones and tablets into wearable tech, virtual and augmented reality, and machine-to-machine (M2M) communications.

### 4. Need to Reduce Cost and Eliminate Waste and Error

DevOps is driven by a need to reduce cost and eliminate waste and error across the entire development cycle. It builds on concepts, such as Lean and Six Sigma for manufacturing and Agile and Continuous Integration for software development, to create a culture in which continuous software updates can be deployed extremely quickly, with any defects ironed out early in the cycle.

4/10 top-ranked companies in 12 industry sectors will disappear by 2020, plunged into irrelevance by fast-moving competitors with new, digital business models.<sup>1</sup>

## Five Key Assurance Challenges Created by DevOps

For DevOps to be effective, assurance organizations must look beyond defect detection and conformance to requirements, to become the guardians of customer experience. They must bridge the gaps between development and operations teams and enable IT teams to deliver on business needs. Embedding testing and QA into a DevOps culture requires a considerable reorganization of the way software delivery is managed, and presents five inter-related challenges around the classical pillars of People, Process and Technology:

### 1. Changing the Organizational Structure

DevOps requires a significant change in the way IT functions are organized. The function must move away from silos, linear processes, and top-down decision making. Development, QA, and operations teams must be fully integrated, empowered, and often self-organizing.

### 2. Changing the Mindset

DevOps requires a major mindset shift, in which development, QA, and operations teams commit to working together on a continuous stream of small software deployments, rather than one monolithic application that may take months or years to 'complete'. This means accepting and embracing new and initially unfamiliar ways of working, and committing to learning new skills.

### 3. Changing the Process

One of the biggest challenges of DevOps is to implement the operational shift from a linear process to one that emphasizes continuous iteration in short stages, with development, QA, and operations teams collaborating throughout. Such a transformation also demands change in other established processes across the organization, which have to be tackled with the same amount of attention and rigor.

### 4. Applying the Right Metrics

The metrics that were applied to testing in a traditional development world almost certainly no longer apply in a DevOps culture, and trying to bring them over to the new environment may be counterproductive. Establishing a

“DevOps is not one-size-fits-all. You have to find the way that works for you. Every organization is different, so we have tried to pick the pieces that work best for Woolworths. We have vastly less quality issues. We don't find nearly as many problems as we did before. They are picked up early, when they should be—back in the actual development phase.”<sup>2</sup>

*Richard Lewis,*  
Quality Assurance Manager at  
Australian retail group  
Woolworths

shared vision and goals, and finding the right metrics to measure performance against them is essential to ensuring the team as a whole delivers high-quality software that meets the objectives of the organization.

## 5. Learning New Skills, Tools, and Technologies

DevOps requires QA professionals to learn a raft of new skills. Since they must work alongside their dev and ops colleagues, they must develop knowledge and expertise in these two functions. And they must also learn to use new tools for everything from test automation to service virtualization and cloud configuration management.

“For us, DevOps is more of a journey than a destination. It's about making sure we communicate and collaborate a lot more efficiently than in the past. That's been our journey, all the while keeping in mind the end goal: to provide a better quality customer experience.”<sup>2</sup>

*Anant Subramanian,*  
Senior Director eBusiness  
Services at Comcast

## The Future is DevOps

DevOps isn't merely an implementation; it is an evolution. In some organizations, perhaps even a revolution! Thus, of all the questions that CIOs must ask before they steer their organizations towards the DevOps journey, perhaps the ones that are most critical are, “Have we enlisted the right partner?” and “What are the essential attributes of a right DevOps partner?”

When facing a challenge of these proportions, it's prudent to seek help, advice and inspiration from organizations that have already navigated it successfully. Read this TCS research to understand how digitization is turning industries upside down; how the smartest companies are adopting DevOps to retain their competitive edge; and the challenges these companies faced in making the transition to a world where it's common to deploy top-quality new services multiple times per day. Learn from software testing and QA leaders at organizations from two distinct parts of the globe who have embarked on the DevOps journey: Comcast in the US, and Woolworths in Australia.

## Conclusion

The digital marketplace is forcing organizations to completely rethink the way they deliver services. For companies that want to survive the digital revolution and thrive in a new world where the default is digital, the only solution is to bring development, QA, and operations together to form a single community dedicated to continuously delivering high-quality digital services.

DevOps is critical to an organization's success today, where traditional approaches are falling short in a fast-moving, multi-channel, multi-platform, multi-device world. It requires a different organizational structure, an open and collaborative mindset, new ways of working, new metrics, new skills, and new tools.

## References

[1] IMD, The Digital Vortex, June 2015

[2] Winning in the Digital Marketplace: Assuring Software Quality in a Fast-Moving DevOps World, 2016

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