

Business white paper

Better apps faster

Transforming application development and deployment



An introduction to DevOps

DevOps is becoming an increasingly common approach to accelerate application development, test delivery to production. Following this brief introduction about DevOps, you will learn about three case studies, where HP Software Research & Development teams adopted DevOps practices to accelerate delivery and increase quality. The case studies specifically discuss the transformation of the development and delivery processes of HP Business Service Management (BSM), HP Application Lifecycle Management (ALM) and HP Service Anywhere (SAW). The case studies will help you understand the business potential of DevOps and a few of the various ways teams can approach DevOps in larger global enterprises.

Changing environments

Historically, businesses have managed their software development lifecycle with long-established waterfall models where siloed teams take responsibility for different tasks in the software development lifecycle. This approach to software delivery often requires long lead times and extensive planning but frequently failed to deliver the correct business solution on time. In response to business demand for more reactive IT delivery and the challenges of waterfall models, more iterative and responsive approaches have emerged. Specifically, the introduction of Agile development processes has enabled organisations to eliminate development silos and embrace changing requirements and business priorities.

“HP DevOps is what takes agile over the finish line.”

– Kurt Bittner, Forrester Research.



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DevOps Definition

While there is no universally accepted definition of DevOps, here we define DevOps as an approach that emphasises rapid, small and iterative steps to application development, deployment and feedback loops to react more positively to and meet customer needs. It is characterised by a cultural shift where the development and operations teams function as one team, focused on delivering business value.

Essentially, there are many approaches to “DevOps” and they continue to evolve based on shared best practices. Established on collaboration between delivery teams (development, testing, operations, security, etc.), the DevOps approach emphasises communication, cooperation and integration of the teams that build and manage software, as well as the tools they leverage to deliver the software. Many enterprises, including HP, have adopted DevOps. This helps them build and deploy high-quality software releases faster and more frequently, while safeguarding the reliability, resilience and security of their production systems.

Moving toward DevOps faces three major challenges; building the correct culture, implementing the right processes and adopting suitable technologies.

A cultural change

DevOps requires a cultural transformation. The approach encourages all parties to collaborate, communicate and share responsibilities, customer-orientated goals and business objectives. Repairing the historical adversarial relationship between Development and Operations is essential and a culture of trust must emerge. A key characteristic of a DevOps team is shared responsibility for the production system. The team handles incidents and outages, focusing on how to improve the system and eliminate repeat incidents.

Changing processes

The development, quality assurance or operations teams often adopt [agile project management](#) and two-way flows between the teams. Development plans and delivers software versions rapidly to satisfy customer expectations while operations experiences stable, reliable process automation and robust ITIL processes.

The right technology

The benefits of DevOps are realised when the correct processes and culture meets the right technology. Typically, automation is a key enabler of DevOps initiatives. Developers often automate build and integration activities in Continuous Integration. They automate all forms of testing to verify quality while the automation of deployment/ installation tasks accelerates delivery of application changes to test systems and ultimately production. In most DevOps scenarios, aligning a variety of technology solutions accelerates delivery and improves consistency.

In summary:

Highly competitive markets require businesses to innovate. The value of a DevOps approach accelerates time-to-market, boosts the end-user experience and reduces costs. It simultaneously increases application quality and maximises the production environment's reliability, delivering business value and a competitive edge.

95%
 successful build
 rate, up from
 25% pre-DevOps



“We no longer constantly apologise to quality control about build quality and the teams pull together rather than operate within their own environments. With trust in place, quality control is now happy to receive continuous BSM updates. Since introducing continuous integration builds, the development team works more effectively. They spend 60 per cent less time dealing with source control.”

– Aviva Levin, development services group manager, HP Research & Development

Process change improves build quality rates

HP released version 9.0 of Business Service Management (BSM) in 2010 as a suite of solutions to help manage traditional IT service and emerging cloud computing delivery models. Like many commercial software suppliers, fixing bugs is an ongoing job for HP BSM developers.

Continuously delivering revised builds proved challenging. Breaks affected the entire product due to inadequate component separation, leading to inaccurate builds. An absence of automated testing led to long build stabilisation times and the success rate of nightly builds stood at an unacceptably low 25 per cent.

HP decided to accelerate the fix and build process team by adopting a DevOps approach.

The first step involved providing developers with the Apache Subversion (SVN) source control tool to manage content for current and future developments. This means developers can create higher quality builds and accelerate the time-to-delivery. The tool also provides quality assurance, with details of all build changes, allowing personnel to only focus on changed areas, saving time and money.

HP recognised the importance of improved granularity within the BSM product’s components. Having more independent components means the verification of component changes is quicker, developers usually receive feedback about their specific changes within one hour.

Developers are now committed to continuous integration builds. The nightly build success rate has climbed to 95 per cent and the team is able to release builds to meet quality control, daily.

The HP BSM development team currently employs the DevOps methodology for general software development and to resolve customer and internal end-user problems. The time to verify and deliver a build has fallen from seven to two days, increasing user satisfaction.



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Tackling cultural differences to resolve slow development times

HP was concerned its Application Lifecycle Management deployment had become too slow, with developers frequently missing delivery deadlines, frustrating customers. Developers were having to build a module with a specific change during the day, before handing to night-shift personnel to integrate the changes with other modules.

A lack of integration, no automation, and the constant back and forth meant change failure rates of 30%. Equally worrying the tension was causing a breakdown in relations between the development and operations teams.

“With the DevOps process and automated testing, we deploy an HP ALM release every three months while previously we’d be lucky to deploy a release in 18 months. That’s an 83 per cent improvement.”

– Liran Levy, R&D Lifecycle DevOps Manager, Hewlett Packard Enterprise

In response, the HP ALM development and operations teams quickly adopted the DevOps approach.

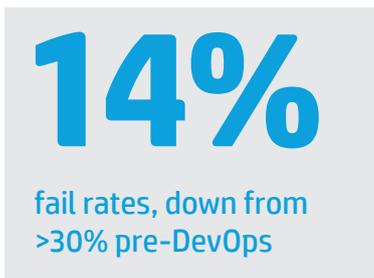
To remedy the relationship predicament, the teams established a more collaborative style by letting each team experience the other team’s working environment. The development team now works in a laboratory-type environment while the operations team takes part in application design, helping appreciate any dependencies and associated architecture.

Within the HP ALM development process, the introduction of a comprehensive automation capability, especially test automation, was the most important initiative. Test automation eliminates time-consuming manual testing processes, speeding the build and delivery processes.

HP ALM incorporates a common platform, several important applications and a dashboard to manage the application lifecycle. The software includes unified functional testing tools and automated testing solutions, helping developers and testers to deliver quality software more rapidly.

Today, the software deployment uses continuous integration and continuous delivery processes together with fully automated test procedures. With the DevOps process, the developer, tester and DevOps engineer work together to deliver and deploy code changes in an automated manner. The developer codes the change and the tester writes the automated test while the DevOps engineer controls the continuous integration process to automate the test.

Following the adoption of DevOps, the ALM development team typically meets a quality coverage rate of 85 per cent with a maximum change feedback time of two hours. The average mean time to recover stands at 114 minutes while only 14 per cent of the developers’ committed changes fail.



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Technology change powers shift to cloud service model

HP adopted a strategy to deliver services from the cloud several years ago. At the time it wanted customers to receive HP Service Anywhere (SAW) updates in high-quality packets with new functionality every two weeks. In addition, HP would assess three or four main releases every year within a customers' production environment to ensure zero downtime before releasing any upgrades.

The SAW team wanted to embrace a DevOps methodology from day one, but were aware there were unique challenges.

“The DevOps culture brought developers together and helped deliver services to customers, eliminating siloed groups. One common process with no inconsistencies exists from development to production, creating a highly customer-orientated product.”

— Adam Spektor, DevOps manager, HP Research and Development

“Transitioning the development of a legacy product from a traditional ‘waterfall’ software design process to an agile DevOps methodology is quite different from developing a new product,” explains Adam Spektor, DevOps manager, HP Research and Development. “Although we started with a clean slate we couldn’t afford the long stabilisation period associated with legacy product upgrades. Customers expect to see change immediately with high availability.”

Employing the DevOps approach to deliver HP SAW involved changing the culture between different IT teams, he explains: “We didn’t create a DevOps team as this would have simply produced another siloed IT group. The DevOps approach requires collaboration across all parties. A high degree of automation was also imperative to remove much of the repetitive work and keep the developers motivated - which leads to a highly productive working environment.”

When developers finish a code update, they check the code into source control and then the automated build, integration and testing tools evaluate the code and give the developers rapid feedback. This allows any product changes to be validated before entering production. The SAW team effectively generates a single, consistent process for whoever employed the application, regardless of location. In addition, there are weekly sanity tests for quality assurance.

After establishing the SAW development team and producing the first code, HP took less than a year to build a beta-version and produce the first release using a DevOps approach. Deployment of the HP SAW SaaS solution is fully automated and reproducible at three data centres. It benefits from a centralised dashboard to visualise quality. Developers cannot push code forward if coverage is less than 75 per cent.

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