TRANSFORMING QUALITY ASSURANCE ORGANIZATIONS BY ENABLING DEV"T"OPS

Abstract

Despite the rising popularity of DevOps in enabling agile development, its potential to transform the testing lifecycle is largely untapped. This paper examines the importance of DevOps in today's business landscape and explains why it should play a greater role in testing/QA organizations (Dev"T"Ops). It also focuses on implementation view of DevOps along with its measurable benefits.

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DevOps – The 'agile' catalyst

The rapid pace of change in the present economy requires organizations to find new ways to quickly overcome business and technology challenges. The winning organizations are those that possess the will to transform and discover smarter ways of working. Today, there is an ever-increasing demand for quality software, which places greater focus on optimizing all stages of the software delivery lifecycle (SDLC). Thus, many players are adopting agile methodologies to stay relevant and achieve reliable and predictable business outcomes.

In such a competitive landscape, DevOps has already become a vital catalyst as the preferred solution to address technical challenges such as:

- Digital Transformation : Omni Channel Experience, End to End business process workflow implementation, IOT devices integrations

- Cloud Deployment:

  - Rapid applications development - code publishing, security keys container/stack/queue creations, full / half / partial deployments

  - On demand virtual machines - auto scaling, machine images

  - Tracking of real time usage – data, volume, and transactions

- Data : Data Replications, Data Provisioning, Data Deployment

- APIs: Micro Services Integrations, Service Virtualizations

More importantly, DevOps is expanding beyond technology and is significantly impacting people as well as processes.

DevTOps – Implementing DevOps in testing

DevOps is a set of practices and processes that foster better collaboration and communication between developers and other professionals involved in operations. Despite its importance in enabling agility in development lifecycles, DevOps is often considered as an add-on capability. Many organizations are unable to tap its full potential to transform testing lifecycles that typically consume nearly 30% of their budgets or schedules.

Principally, DevOps is about building a collaborative culture, adopting agile methodologies, exploiting automation to accelerate innovation, and providing rapid feedback to achieve common goals. As such, DevOps mandates a close involvement with the QA organization. DevOps in QA is essential for many reasons, the key among which are Enabling rapid testing cycles, Ensuring reliable finished products, Providing predictable business outcomes, Reducing cost or Improving SLAs.

The time has come for enterprises to introduce DevOps in testing. Enabling DevTOps will help QA organizations promote DevOps across the SDLC for superior benefits. To tap the objectives such as speed & agility, many choices of tool sets and point solutions (Open Source / COTS) are available.
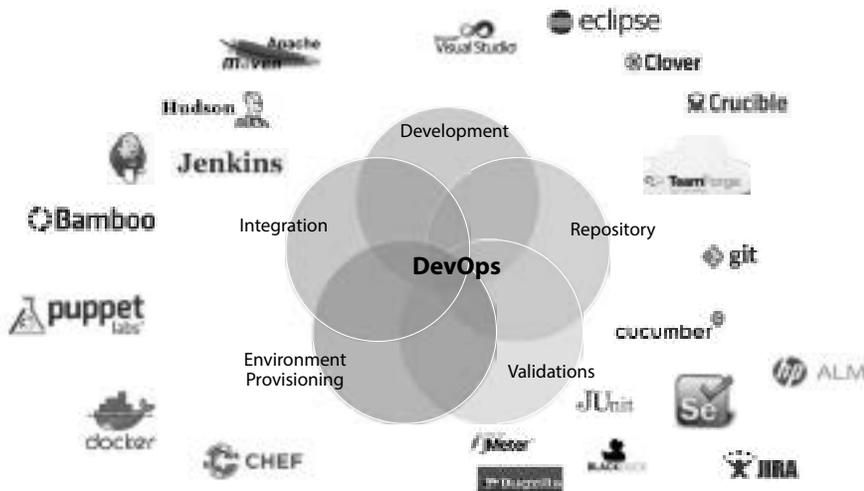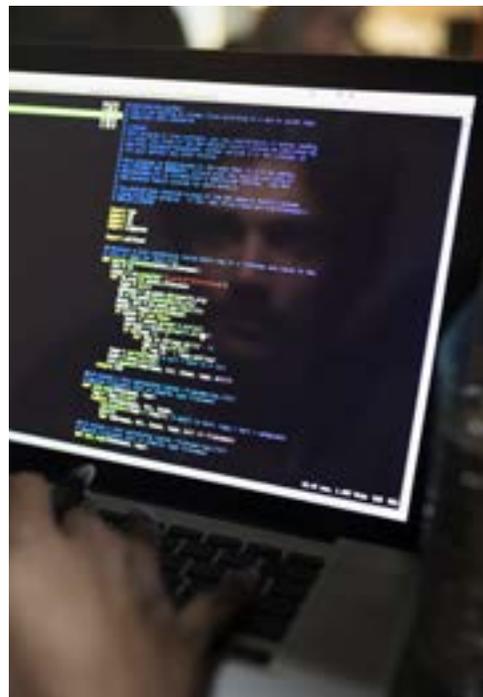
Over the past 15 years, test automation has come a long way. Techniques such as behavior-driven development (BDD) and acceptance test-driven development (ATDD) are enabling the much-needed shift-left in QA. Further, automation tools are being deployed intelligently across the software test lifecycle (STLC), thereby improving automation coverage

beyond user interfaces (UIs), irrespective of disparate technologies. This increased automation coverage provides a great platform to practice DevTOps.

In a continuous integration (CI) and continuous delivery (CD) pipeline end to end automation is a key. Pipe line consists of build automation, continuous

integration; test automation; and deployment automation. The pipeline starts by building the binaries by cloning & caching of the repository, hooking / polling the changes, merging the code branches to create the deliverables. This ensures that newly developed features are continuously integrated with the central code base.
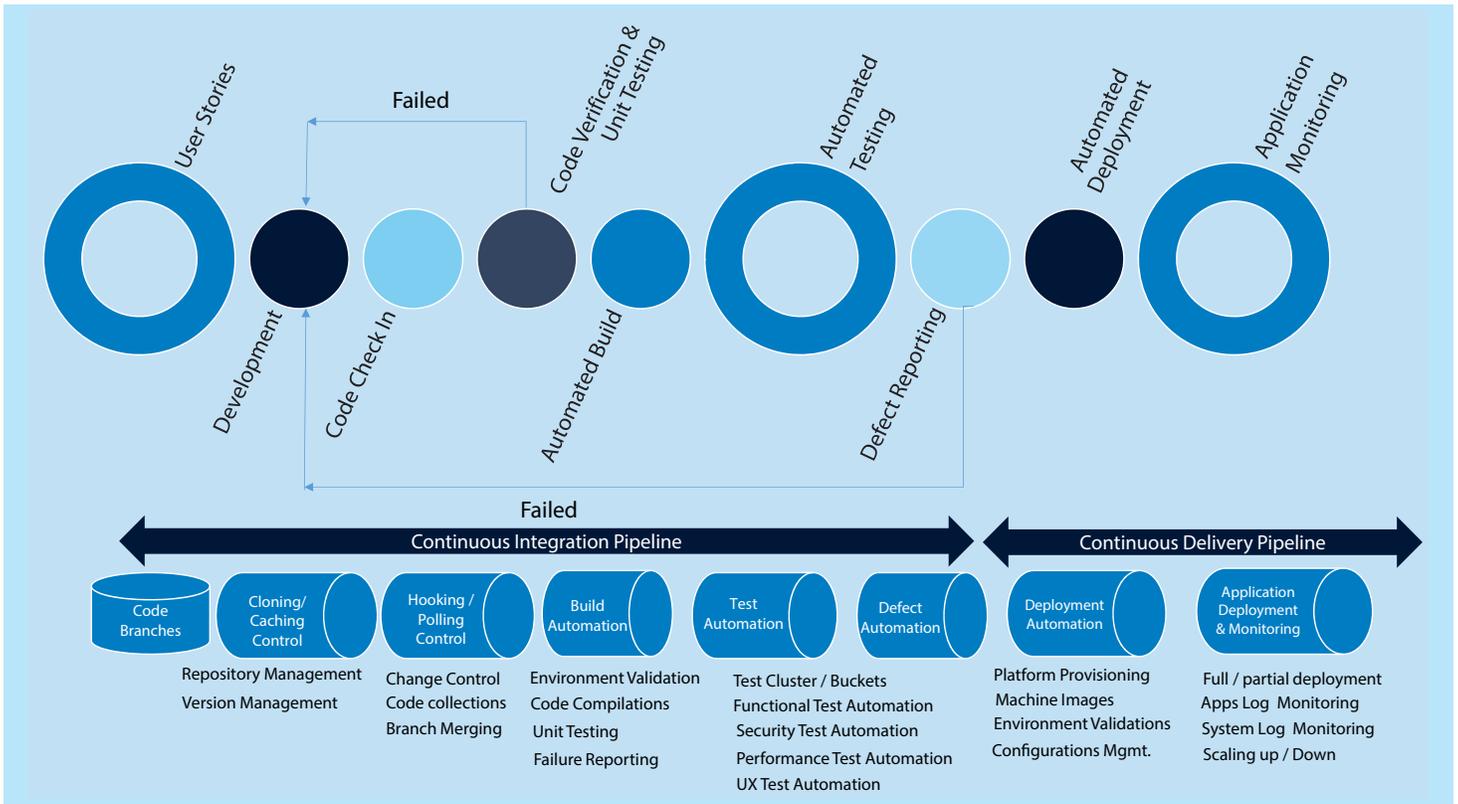
Each time build is done and code is unit tested. The health of checked-in codes are informed to the developer's real time basis and in case of failure checked-ins are prohibited. Once the build is successful it is automatically deployed for the testing to ensure that it meets all desired exit criteria. The test automation are extended beyond the functional to several non-functional such as security, performance, user experience or compliance etc. The defects are automatically reported in the defect management tools.

Once the application is verified for the quality gates it moves for deployment pipeline. The deployment pipeline is supported by platform provisioning, environment validations and system configuration management & verifications.

The deployment on premise or a hosted environment such as Amazon Web Services (AWS) are automated and allows provisioning or tearing down environments automatically. The deployment in staged / production environment happens in controlled manners where changes get deployed partial or full. The deployment is fully automated and executes just in few minutes Deployment automation ensures the applications quality and reliability as well as its future scalability. The deployed applications are continuously monitored preventive basis such as applications / system logs are scanned regularly and alerts are sent in case of issues. The infrastructure such as memory / space are controlled automatically and scaling ups / downs happens real time.

Benefits of DevTOps

Mature IT services organizations are already reaping the benefits of DevTOps investments across people, processes and technologies. In these organizations, developers and testers collaborate better to achieve common goals and deliver top-quality products. DevTOps helps QA organizations prevent defects rather than detect them later. In doing so, DevTOps delivers measurable success and tangible benefits such as shorter timeframes to verify and implement changes, reduced average time taken to recover from production incidents, reduced failure rates during production changes and greater bandwidth for innovation.

Further, the return on investment in DevTOps is faster and more significant compared to other investments made by QA organizations. The key areas of improved ROI include lower cost due to reduced downtime/wait-time, faster time-to-market when launching new features, improved customer satisfaction and more opportunities to innovate.

Conclusion

Top quality and greater speed in development and operations are the main drivers for adopting DevOps. DevOps helps organizations accurately track changes to source code, manage development, testing and operational complexities and ensure self-healing. As new tools and techniques enable higher testing automation coverage, there is a need to enable DevOps in testing as well. However, this can be challenging for traditional testers as they must shift to the center of development and operations activities and contribute to overall product vision and strategy. Such a change is critical to improving the cadence of production releases. QA organizations must focus on making strategic investments in their own operations by implementing DevTOps to enable software development engineers in test (SDETs) and focus on defect prevention rather than detection. By adopting DevTOps, QA teams can reduce production failures, recover quickly from production incidents, launch new features faster, and improve customer satisfaction – all of which improve ROI. Investing in DevTOps in QA drives innovation in testing that will continue to generate returns for the organization.

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