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Attaining Continuous Quality in Software Development and Testing

PeerSpot

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Introduction

Software developers may want to present themselves to the world as "chill," but in reality, the process of developing, testing, and releasing software can be a tense business. There's an endless conflict between quality, cost, and time. Money and time are always finite. Quality should not be negotiable, but sometimes is. It's a balancing act between the quantitative (e.g., money and time) vs. qualitative (value delivered to the customer or business). When there's a conflict, it's tempting to abandon quality.

Aiming for a more optimal outcome, DevOps teams are moving towards a mode of working known as continuous quality – the ability to move quickly with fewer resources, but still producing quality software. Establishing perva-sive, continuous quality requires a combination of processes and tooling. It also means focusing and optimizing each stage of the development and test-ing workflows. The goal is to ensure that everyone has enough resources, along with the right people and tools to complete the work and keep the flow of work steady. One of the main benefits of continuous quality is to have fewer starts and stops in the process.

This paper looks at the elements of continuous quality in software develop-ment and testing. It's based on real user experiences with OpenText ALM Octane, as described on PeerSpot. Users discuss the importance of a quality management platform serving as an end-to-end solution that spans traceabili-ty, acceptance, security, and more. Integration capabilities are critical, as is the ability to function across multiple development methodologies.

The Need for Continuous Quality

One word captures the essence of software development today. That word is "continuous." While building software had long been an episodic, project-based form of work, today virtually all aspects of the process unfold on a continuous basis. It never stops. New features are continually being developed, tested, and deployed. The workflow takes place at a pace that would have been difficult to imagine a decade ago.

With continuous development, testing, and release comes a compelling need for continuous quality. Software does not exist in a vacuum. It's typically part of a competitive business strategy. Companies want to deploy new features as quickly as possible to improve customer experience and achieve market differentiation. However, they cannot afford a lapse in quality despite all the fast moves. Continuous quality addresses these interlocking needs. It strives to improve the overall processes and practices that achieve better outcomes.
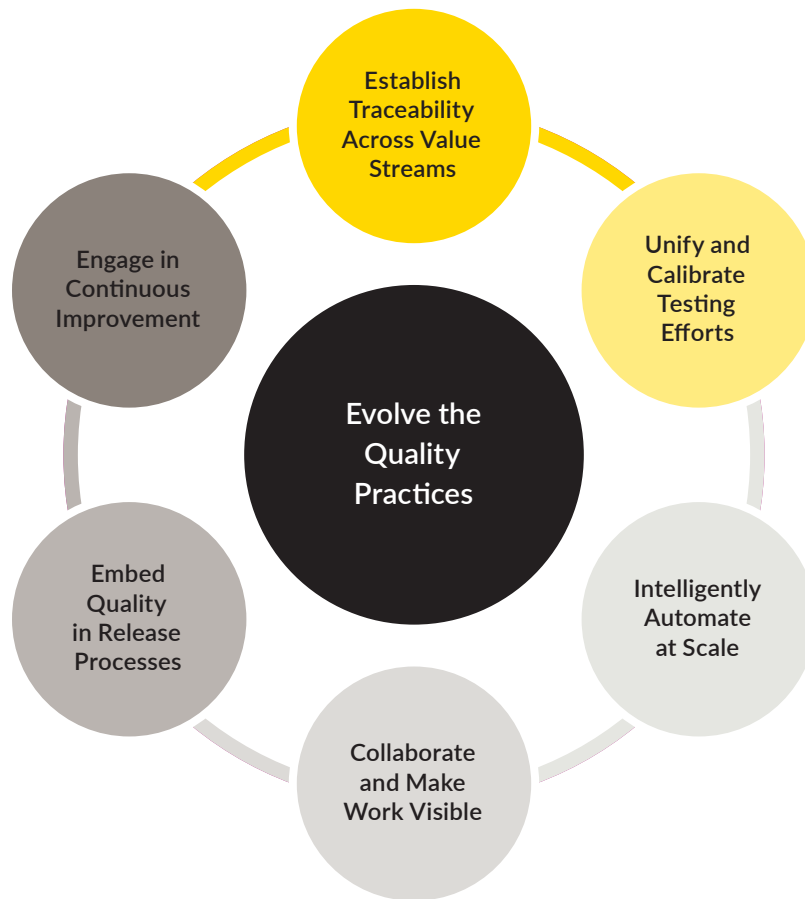
Figure 1 – The elements of continuous quality in software development, testing, and releasing.

Continuous quality affects each stage of software development. During planning, continuous quality means incorporating quality requirements early in the cycle. During the build phase, continuous quality comprises "shift left" strategies, along with managing commit quality and dependencies. In testing, continuous quality means governing both manual and automated tests – replacing inefficient practices with capabilities based on Artificial Intelligence (AI) and Machine Learning (ML). It's a never-ending evolution of all quality practices in the software domain. Throughout, there is a need for a tool to track quality. This way, all stakeholders can be aware of quality issues as software moves through the software development lifecycle (SDLC). Figure 1 shows some of the key elements of continuous quality.

Continuous Quality Use Cases

PeerSpot members are implementing continuous quality across a variety of use cases. For example, a Release Management and Testing Manager at a comms service provider with over 1,000 employees uses ALM Octane for test management, defect management, and release management. They also do quality management with the toolset. For a Process Owner E/E Test Management at a transportation company with over 10,000 employees, the main focus is on efficient planning of tests. As he explained, "We cannot run all the tests we have every single week, because lots of the stuff has different variants for Europe and the U.S. and China. So, we have to have very sophisticated test planning."

A Release Manager at a comms service provider with over 1,000 employees uses ALM Octane to manage software delivery. They work in a hybrid mode that mixes traditional waterfall delivery and agile methodologies. An Assistant General Manager (AGM) for Delivery Excellence at a comms service provider with over 1,000 employees uses ALM Octane for agile projects. Their use case spans project milestone progress, project environment, project development, project execution, software development, and software execution.

Key Success Factors for Continuous Quality

Operationalizing continuous quality involves a mix of processes and tools. As PeerSpot members explained, it is essential to start with an end-to-end platform. A unified solution provides for traceability and acceptance criteria, among other elements of the testing process. The platform has to be able to integrate easily with a wide variety of systems, such as development environments and code repositories. It should also support multiple modes of development and testing. As these success factors come together, the people and teams involved in software development and testing can make progress towards implementing continuous quality.

An End–to–End Platform for Traceability, Acceptance Criteria, and Beyond

ALM Octane users get on the path to continuous quality because the platform offers them a complete, unified solution. As a QA Specialist at SITA, a comms service provider with more than 5,000 employees, put it, "Backlog is like a library of our tests. It contains the features linked to the tests, so you can see which project or feature that you are working on. It is all in one place and everyone who needs it has access to it."

"ALM Octane provides us with a single platform for all automated testing," said a Managing Partner at Georg Nauerz Consulting, a small consultancy. He added, "Our test manage-

> "The single platform … has 100 percent affected collaboration between development and testing teams because everything is all in one place."
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ment is a lot more transparent and successful because it includes the team (the non-IT user and the developers). We are more streamlined and running a lot faster. The single platform for all automated testing has 100 percent affected collaboration between development and testing teams because everything is all in one place." He switched from JIRA to ALM Octane because ALM Octane provides a single tool.

A Founder, Managing Director at a small tech services company remarked that ALM Octane provides a single platform for all automated testing. In his view, "That definitely helped facilitate the testing, the test scenarios, and collaboration between the test team and the development team. Having both together on a single platform allows us to ease the integration between the different teams. In addition, it gives you a single, global ALM platform that supports all your agile and waterfall needs."

The comms provider's Release Management and Testing Manager shared that ALM Octane functions as a single platform for their automated testing. They have used ALM Octane to integrate their automation testing with Jenkins to parts of their pipeline module through the API. In addition to making test execution visible, it enables them to centralize. He offered detail, noting, "When we report on a project basis, we're able to do it in one click for a given project. The graphs are standard for all the projects. You just click and you always have the same set of reports, tailored to that project. It fetches the data from that project. I don't need to click five times to find my report. That's what my release manager also loves about it. He doesn't have to click 10 links or 10 drop-downs to get a report."

End-to-end traceability is what stood out to the AGM, Delivery Excellence. He revealed, "Most of our agile projects work in a closed team structure. We are seeing what the flow is, where we are, and project milestones. So, it provides end-to-end traceability and good visibility of project milestones. We also wanted to have a tool where my team could write scenarios for user stories and those user stories would be available in a single tool. So, ALM Octane is a better tool for the future."

Integration Capabilities

An effective platform for continuous quality has to be easy to integrate with other tools. ALM Octane meets this criterion, as the comms service Release Manager described. He said, "It is very much integratable. This was a piece that was critical for us because ALM Quality Center was used by our company for more than 10 years, and it was very easy to integrate. Before we could migrate to ALM Octane, we needed the integration to be in place for a new tool. There are different ways to integrate, through the REST API, plugins, or the MF Connect tool, which also comes with ALM Octane."

The transportation Process Owner E/E Test Management echoed this sentiment, saying, "In terms of integrations to proprietary, third-party, and open-source tools out-of-the-box, it has a very powerful REST interface. We can interact with other tools. Micro Focus also offers synchronization tools, OpenText Connect Core, which has out-of-the-box interfaces to industry standards tools." Figure 2 shows some basic integrations needed for continuous quality.
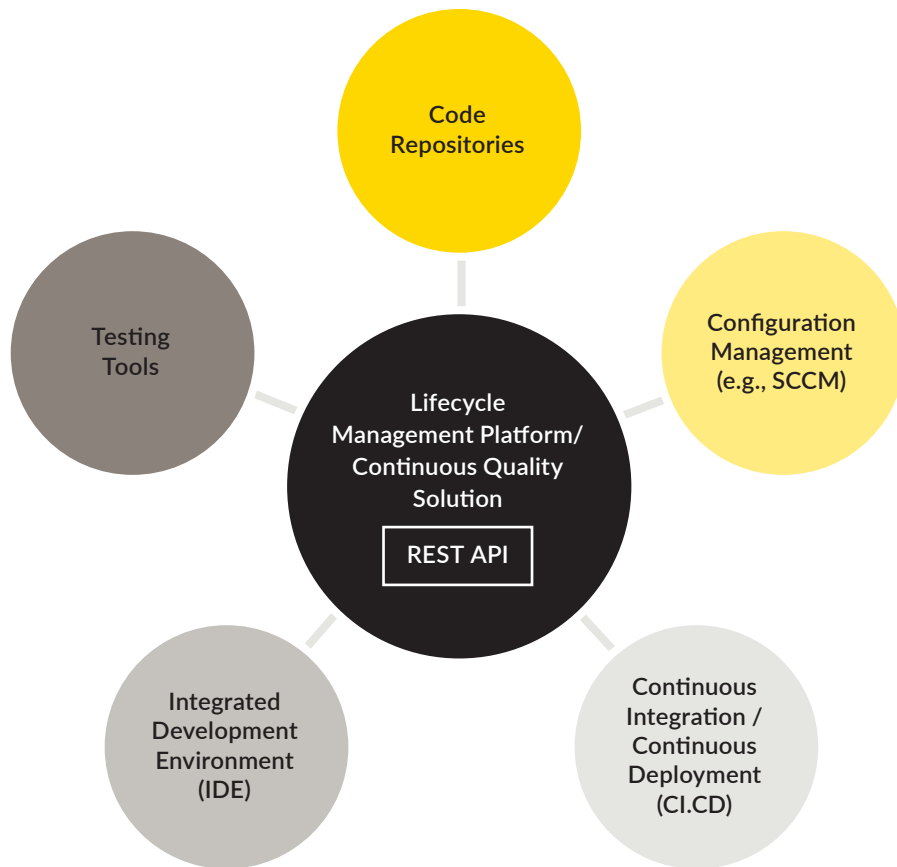
Figure 2 – Typical integrations required for continuous quality.

"One of the benefits is the <u>integration with different platforms</u>," said the tech services Founder, Managing Director. He observed, "Having the defect management, and being able to relate defects and testing to the initial user requirements – having this complete life cycle – is one of the major advantages with ALM Octane. It's the 'life cycle' way of thinking that the solution provides. That is a very important component of agile and DevOps. ALM Octane integrates with your CI server for continuous integration and delivery. This 'life cycle' approach gives us end-to-end visibility."

For this user, integration led to an estimated 20% reduction in testing costs. The platform also cut his integration costs by building a streamlined application delivery pipeline connecting to all IDE, CI, and SCCM tools. This translated

into integrations savings of between 20 and 30 percent. It further helped by speeding up releasing by a factor of about 20 percent.

Other notable comments about integration included:

- "The most valuable feature is <u>CI/CD integration</u>, and it is a good fit into the agile lifecycle."- Principal Consultant at SACS Inc.

- "ALM Octane <u>integrates</u> with your CI server for continuous integration and delivery. This makes us go faster, providing overall transparency during stages or phases. It has reduced integration costs by building a streamlined application delivery pipeline connecting to all IDE, CI, and SCCM tools." – Managing Partner at Georg Nauerz Consulting, a small consultancy

- "It has the potential to <u>reduce integration costs</u> by building a streamlined application delivery pipeline that is connected to all IDE, CI, and SCCM tools." – Release Management and Testing Manager at a comms service provider with over 1,000 employees

Adaptability for any Methodology

The software development field is diverse enough that continuous quality must encompass multiple methodologies. Most, if not all organizations – except perhaps startups or "digital native" firms – employ a mix of development styles. The platform must accommodate these requirements. For instance, the QA Specialist at SITA selected ALM

"...the solution natively supports agile–waterfall hybrid software development at an enterprise scale."

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Octane because "the solution <u>natively supports</u> agile-waterfall hybrid software development at an enterprise scale." She noted, "This is very important to us. Because even though the company wishes to go agile, we still have projects which follow a waterfall methodology. In order for us to accommodate both, we needed some sort of hybrid system."

"ALM Octane natively supports <u>waterfall, hybrid, and agile</u> software development at an enterprise scale," said the Managing Partner of Georg Nauerz Consulting. "There is no difference based on whatever path that you are trying to follow. You have work, and if you do it in cycles and iterations, that's fine. If you don't, that is fine too." The tech services Founder, Managing Director similarly stated,

"The solution natively supports waterfall, hybrid, and agile software development at enterprise scale. That's very important because there is a big shift going on from the waterfall environment into agile in DevOps. Having a tool that can give us both practices was important."

The native support for waterfall and agile software development was important in the comms provider Release Management and Testing Manager's decision to go with ALM Octane. He shared, "We knew that waterfall and agile will co-exist for quite some time, and the tool had to be able to manage both in parallel. Also, for the future, it will still support what we want. If the shift goes more to agile and less to waterfall, the tool still has to support both of the methodologies." In his case, they had looked at Jira, but had some concerns about its reporting capabilities and its task management capabilities, as well as managing waterfall and agile in parallel.

> **"...it reduces complexity and the need to manage multiple tools."**
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The comms service Release Manager is overseeing a hybrid delivery model, of which waterfall is still is a big part. From her perspective, "ALM Octane natively supports waterfall, hybrid, and agile software development perfectly at an enterprise scale. By supporting agile, it reduces complexity and the need to manage multiple tools."

The native support for waterfall, hybrid, and agile software development at enterprise scale was one of the reasons why the transportation Process Owner E/E Test Management changed to ALM Octane. This matters for his team because they are supporting critical use cases. As he explained, "In the development process, we're creating the requirement specifications which are then handed out to a supplier, including Bosch, Continental, Alpine, etc. They then develop control units with software and we have to link our tests against those requirements to check if everything is implemented. This is a very important task. It's required by law."

He offered the example of autonomous driving, revealing, "We have to prove that the car is not, by default, running into trees. We are proving that by test cases that are passed. While that is still waterfall, it's not agile, we are using the agile methodologies more and more to control our workload. For example, we are using a user story in test management to order teams to test a certain number of test cases."

Conclusion

Quality is a paramount issue in the rapidly changing world of software development, testing, and releasing. While teams in these workstreams face constant pressure to be lean and cost effective, the expectation of quality never lets up. In the long run, investing in quality reveals itself to be a cost-effective strategy. A commitment to continuous quality offers a solution – a way to code, test and release on a rapid basis, but without sacrificing quality. To work, continuous quality must operate across the entire dev-test-release cycle. As PeerSpot members have found, the right lifecycle management platform can make all the difference when it comes to implementing a continuous quality approach.

As they expressed in their reviews, the right solution for continuous quality will be one that offers end-to-end functionality. It provides a single point of control and awareness for all the various processes that must come together to achieve continuous quality. Integration is important, too, as continuous quality necessarily touches numerous other systems. The solution needs to work well in a variety of development methodologies, including the traditional "waterfall" approach and newer agile modes of development. Combined with well-thought-through processes, the right solution will enable continuous quality to adapt as an organization's software methodologies and requirements inevitably evolve over time.

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