

The Impact Of Agile Development Processes on Quality Assurance

Early involvement and the flexibility to adjust to frequent changes are the keys to successful quality assurance (QA) in an Agile development environment.

Data sheet

Businesses that are under pressure to deliver higher-quality applications in response to competitive demands are turning to Agile development practices. In fact, Agile and other iterative methods are becoming the de facto standard for application development.

Agile software development is about delivering high-quality applications and making sure they are aligned with business needs. The Agile methodology is usually perceived as mainly applicable to development teams, but actually requires the entire organization to adjust. To retain a relevant role in the development process, QA organizations need to go beyond their traditional techniques and tailor their processes to adapt to the requirements of an Agile development methodology. HP offers an approach and solutions that help QA teams embrace the Agile methodology and make a significant contribution to its successful outcome.

QA challenges in an Agile environment

Agile development presents QA organizations with two over-arching challenges: bringing quality and stability to applications much earlier in the development process in order to align with the business, and becoming flexible enough to keep pace with the iterative nature of the Agile methodology.

The focus shift: aligning with the business

In the traditional “waterfall” development process, quality and stability are usually addressed in the later phases of the release, when changes are more costly to fix. In Agile development, smaller builds that provide incremental functionality are presented to customers early and often in a fast-paced, iterative process. For this process to be effective, QA has to bring quality and stability to each of these iterations, so reviewers can give early feedback on whether

the functionality meets business requirements. QA teams don’t have the luxury of testing against a single, unchanging set of requirements across the development lifecycle, and planning time may shrink from a year to just a week.

It takes real collaboration between development and QA teams to bring quality and stability earlier in the development process. The degree of collaboration required for a successful Agile development process also demands early QA involvement. QA teams have to be engaged at the outset so that they can share tools and best practices with other teams, develop a common language, foster cross-team communication, and align test plans and tests with business requirements.

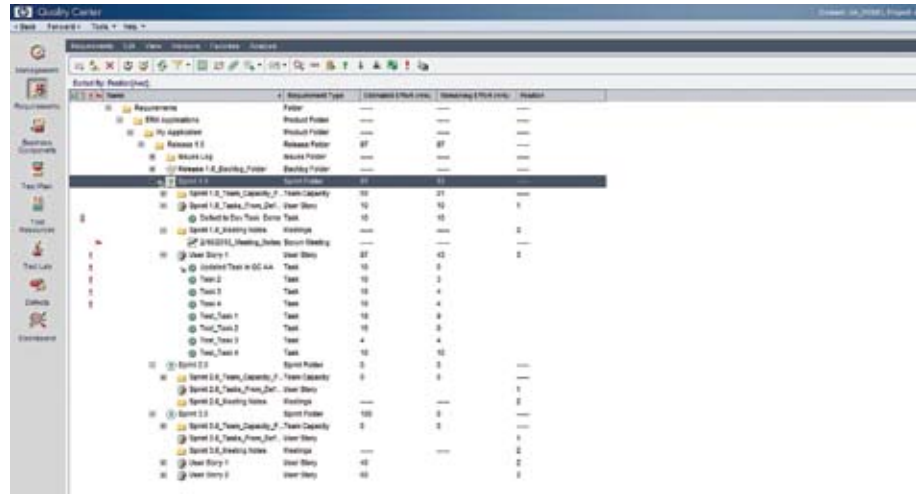
And because Agile development is an iterative process with multiple “sprints,” QA must have end-to-end involvement, reinforcing quality and stability at every build.

To cope with these challenges, organizations need to:

- Make sure that QA representatives as well as business analysts attend scrum meetings
- Include QA in the user story review and approval process upfront to validate the testability of user stories
- Implement a common repository for development plans, user stories, tests, and defects
- Establish traceability across user stories, test types, generic tasks, and defects
- Test iteratively to keep quality efforts aligned with the needs of the business
- Notify stakeholders of changes in real time
- Introduce QA activities during design, coding, and stabilization processes, as described below



Figure 1
HP Quality Center and the Agile Accelerator to manage product, release, and sprint backlogs.



HP supports the Agile methodology for QA using an accelerated software development lifecycle that includes design, coding, and stabilization activities. Our approach makes it possible to review the application at every iteration to make sure it is aligned with business needs, to involve QA earlier in order to test the application as it evolves from iteration to iteration, and to add quality into user stories at the definition and authoring stage to verify testability, avoid ambiguity, and keep testing aligned with business needs. Our approach keeps QA involved in every sprint, and at each phase of development.

During the design phase, the HP methodology helps QA representatives decide which automated regression tests should be run on every build, determine whether performance and security testing should be conducted during a given build, and make sure backlog items are well-defined and testable.

While the application is being coded, the HP approach promotes frequent compilations to help identify breaks in the code, as well as smoke tests and exploratory testing to identify defects before the development team hands its build to QA. A subset of the regression suite defined during the design phase is run on each nightly build, and development provides QA with multiple builds during each sprint so that QA can test them outside of the development environment.

Finally, each iteration ends with a period during which Development teams and QA are focused on stabilization of the build.

The cultural shift: embracing change

Compared with a traditional waterfall development process, Agile development requires more flexibility in adopting changes to plans, user stories, and priorities on the part of both QA and development. Adopting changes throughout the release introduces major challenges for the QA organization such as:

- User stories need to be validated multiple times after each change

- Tests have to be updated frequently, which increases cost and effort
- What to test first becomes an important question, as constantly changing priorities and plans make it more difficult to know who is doing what, and when

To cope with these challenges, QA can implement the following best practices:

- Establish full traceability, from user stories and tasks all the way to tests, to give QA immediate visibility into the impact of any change to user stories, priorities, or the plan
- Use tools and tactics such as email change alerts, change approval boards, and a central repository for user stories
- Build a component framework for testing (a change-friendly framework that helps reduce the cost of functionality changes and promotes flexibility in adopting them)
- Increase automation wherever possible, freeing manual resources to focus on frequent functionality changes
 - Maintain a fully, or almost fully automated regression test suite
 - Identify stable new functionality during development and automate tests
 - Implement automated testing for multi-layered applications that span environments, application layers, and business processes to enhance stability and reduce maintenance

The tools: HP Quality Center

HP Quality Center is a suite of solutions that facilitate collaboration and visibility across the software development lifecycle with features such as traceability, asset sharing, and cross-project reporting.

Figure 2
HP Quality Center and the Agile Accelerator to produce Sprint burndown charts to monitor progress real-time.



Customers wishing to move to Agile development can leverage the HP Quality Center Agile Accelerator—a complete solution that gives Agile teams, and in particular QA, the tools they need to deliver high-quality applications quickly and effectively:

- Custom requirement types for user stories and tasks
- Modular data storage
- Release and cycle management for sprint and backlog support
- Role configuration, to support Agile roles such as Scrum Master
- Custom workflow and field transition rules
- Custom reports for workflow tracking, velocity, burn-up, and burn-down
- Built-in risk management for user story prioritization
- Lifecycle traceability to keep Agile stakeholders informed of any changes

With these and other features, the Agile Accelerator gives QA organizations real-time visibility into requirements coverage and associated defects. It enables QA to manage the release process, make more informed release decisions, and better measure the progress and effectiveness of QA activities. It gives business analysts, QA, and developers a single global platform for collaboration and a central facility for managing manual, automated, and service-oriented architecture (SOA)-based testing assets. And, using workflows and alerts, it facilitates standardized testing and boosts productivity.

The HP Quality Center management module can be used to manage sprints and product backlogs, track progress of iterations, and report on outstanding defects that need to be addressed in upcoming sprints. A requirements module helps teams define and prioritize user stories, define the tasks that represent work items associated with a user story, and align business with IT regarding which tests need

to be developed. And a built-in, risk-based quality management methodology helps users make an objective assessment of testing priorities based on business risk, and lets them assign development and testing times to various developer and QA activities.

The Quality Center dashboard has built-in customizable reports that support real-time decision-making. Versioning functionality helps distributed teams collaborate and manage multiple versions of user stories in parallel, maintaining an audit history of changes throughout the project lifecycle. HP Quality Center also helps QA fully document and collaborate on defects with the developments team.

HP Services

Get the most from your software investment

HP provides high-quality software services that address all aspects of your software application lifecycle needs. With HP, you have access to standards-based, modular, multi-platform software coupled with global services and support. The wide range of HP service offerings—from online self-solve support to proactive mission-critical services—enables you to choose the services that best match your business needs. For an overview of HP software services, visit:

www.managementsoftware.hp.com/service

To access technical interactive support, visit Software Support Online at:

www.hp.com/managementsoftware/services

To learn more about HP Software Customer Connection, a one-stop information and learning portal for software products and services, visit:

www.hp.com/go/swcustomerconnection

HP Business Process Testing software complements the Agile development process by establishing a change-friendly testing framework with modular components that enable accurate risk calculation and informed choices. It also helps organizations start their testing processes earlier, reducing both test creation time and ongoing test maintenance costs for manual and automated testing. And it allows QA teams to collaborate with business analysts as subject-matter experts, create more accurate test scenarios, and streamline testing efforts by combining test automation and documentation into a single, integrated process. Finally, it allows Business Analysts to participate in and contribute to testing by quickly assembling business process tests using a pre-defined set of components.

HP Unified Functional Testing supports integration testing, component testing, and end-to-end user acceptance testing when interactions take place across all layers of the application, from the Graphical User Interface to the business layer. It enables QA teams on Agile development projects to:

- Create more sophisticated test suites and increase coverage by creating multi-layered tests
- Validate functionality across all environments, application layers, and business processes
- Conduct regression testing of frequently changing applications—easily, with better stability, and with less maintenance
- Share and reuse automated testing assets across teams
- Increase code stability earlier in the development cycle

HP Financial Services

HP Financial Services provides innovative financing and financial asset management programs to help you cost-effectively acquire, manage, and ultimately retire your HP solutions. For more information on these services, contact your HP sales representative or visit: www.hp.com/go/hpfinancialservices

Contact information

To find an HP Software & Solutions sales office or reseller near you, visit:

www.managementsoftware.hp.com/buy

HP Quality Center Agile Accelerator downloads:

<http://www.hp.com/go/agileaccelerator>

To understand how your QA team can embrace the Agile methodology with the help of HP approach and make a significant contribution to its successful outcome please visit: www.hp.com/go/Agile

Share with colleagues



Get connected

www.hp.com/go/getconnected

Current HP driver, support, and security alerts delivered directly to your desktop

