

## WHITE PAPER

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# Managing the Costs of Complex Sourcing: Driving Business Adaptability with Quality

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December 2009

## IDC OPINION

IDC sees growing demand for complex sourcing of applications in a difficult economy as reliance on adaptive software has increased to enable corporate success. Businesses depend on quality and security for critical software that drives business agility; the costs of failed applications are prohibitive even as fewer financial and human resources are available to help deliver quality software. Managing the overall costs due to inadequate requirements, poor quality, and ineffectual security management of applications is both more challenging and more critical for successful businesses as they seek to emerge from the most challenging economy in recent memory.

The push for complex sourcing — which encompasses distributed, outsourced, and offshore development as well as the use of open source components — has increased significantly over the past 12–18 months as businesses seek to augment limited internal staff in the wake of layoffs and constrained financial resources. Although open source licenses are "free," costs exist on a variety of levels. Management issues must be addressed that encompass quality, security, licensing, and visibility into which and how much open source is actually being used. (IDC research indicates that companies tend to significantly underestimate use of open source code overall.)

The benefits to quality automation, along with emerging support for innovative software as a service (SaaS) licensing models to speed adoption, are leading to increased testing automation. The benefits of SaaS testing include deployment with minimal need for resources, immediate access to testing capabilities (without implementation delays), as well as the ability to decapitalize expenditures in a difficult economy. Moving forward, IDC also sees SaaS testing adoption as an on-ramp for testing "in the cloud" and leverage of virtual infrastructure both for test labs and ultimately for deployment purposes as well as part of a managed, architected software release cycle. The potential economic and performance benefits for testing and deployment in these environments — which IDC expects to be a key emerging trend from 2010 to 2013 and beyond — are engaging.

## IN THIS WHITE PAPER

This paper addresses the benefits and challenges driving increased adoption of testing automation along with coordination of requirements and security. It also analyzes the adoption of complex sourcing approaches to development and the need for effective quality management in that context. In addition, this document discusses how organizations should perform a gap analysis, understand organizational and process maturity, and evaluate and adopt appropriate automated software quality tools as part of an effective overall approach to managing the costs of complex applications. This paper also briefly considers HP Software's on-premise and SaaS quality solutions.

## SITUATION OVERVIEW

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### **Market Trends and Evolution: Driving Competitive Value with Quality**

In a fiercely competitive financial environment with constrained resources and thin margins, the business drivers for software agility are stronger than ever. Global competitive pressures emerging from the recession and resulting economic uncertainty demand greater business adaptability, enabled by quality software.

At the same time, utilization of broadly distributed resources to create and to customize purchased applications increases the complexity of the software supply chain. Increasingly, code comes from a variety of dispersed and often disparate sources — including distributed internal staff who are augmented (or supplanted) by contractors, outsourcers, and offshore providers as well as the usage of open source components. These circumstances lead to greater complexity for code creation, increased risk, and the likelihood of software problems both early and late in the development process. Yet the costs of software defects late in the life cycle, along with the costs of performance and security issues, are exorbitant.

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### **Timeliness and Management Issues for Use of Manual Rather than Automated Solutions: SaaS Benefits**

In the rush to cut costs over the past 18 months, a number of organizations also cut back on their testing and quality staff and are already beginning to experience the consequences of the lack of testing personnel in the form of defective, poorly performing applications. In this context, the delays and management issues involved with manual rather than automated testing solutions also become more obvious and more onerous. Manual testing costs, errors, and inefficiencies can be prohibitive where time to market is a driver for business survival. With fewer resources in the wake of layoffs over the past 12–18 months, test automation provides a key alternative.

Coordination with requirements, change management–effective processes, and resource prioritization and deployment facilitates quality management across the life cycle. Performance issues, software defects, and security challenges must be addressed in conjunction with one another for both business consistency and compliance purposes.

In that context, the speed to improve quality adoption enabled by innovative SaaS licensing models and emerging cloud solutions includes immediate access to testing capabilities to enable faster process change and adoption, the ability to deploy without the cost of additional resources, the flexibility to shift vendors (because "sunk" costs aren't a factor) and a commensurate focus on customer responsiveness, and decapitalization benefits. For organizations that have chosen to retain significant staff and have strong investments in on-premise automated solutions, the costs of a SaaS solution are outweighed by their commitment and existing quality resources. So it is key for organizations to consider their quality maturity level and quality needs in determining an appropriate deployment model.

We also see testing as an excellent fit for testing as a service (TaaS) and emerging cloud testing solutions, which provide the benefit of flexible access to infrastructure for deployment and provisioning benefits in a world where infrastructure costs and management challenges are overwhelming. Adaptive use of infrastructure with virtualization also provides a context for virtual test lab management, which facilitates creation and configuration management of shadow production environments, for improved resource allocation earlier in the life cycle. (Many organizations are constrained by limited infrastructure test lab resources and have tended to use them inefficiently, hoarding them when not needed and allocating access inappropriately, which acts as a bottleneck to the testing process.)

Overall, the benefits of immediate testing access, agility, and decapitalization enabled by SaaS deployment models, coupled with the emergence of agile process approaches to support adaptive development, are driving increased adoption of these combined solutions. Over time, we expect cloud computing and TaaS to augment and supplant traditional approaches, where performance demands and the need for flexible deployment will drive user adoption as broad solutions become available.

The emergence of agile, iterative testing process approaches supports improved collaboration for requirements and change management and increased responsiveness between the business and IT. (Coordination with business process testing is also an emerging trend.)

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## **Costs of Software Defects, Performance Issues, Security Challenges**

Organizations tend to be overly optimistic in their assessments of the breadth and depth of their existing quality coverage. As a result, they do not fully comprehend either the frequency or the financial consequences of repairing defects across the software life cycle. According to IDC custom survey research (*Costs of Debugging Survey*, April 2008), despite significant increases in complexity, the majority of respondents believed that the amount of time required to find and fix defects has been decreasing over the past two years (and will decrease further over the next three years). And while three-quarters of respondents said they are confident their manual code review processes identify all potentially serious bugs, on the other hand, 31% found 26 or more critical defects in the field and 65% had 1–25 critical bugs. The later these problems are found in the software production life cycle, the costlier they are to repair given code and other dependencies. And these costs don't take into consideration the costs to an organization's reputation and to the business of software downtime.

IDC research also indicates excessive application change and churn for key software, which contributes to risk and costs to organizations. Security ranks as a significant issue for organizations and needs to be tied to quality approaches by incorporating up-front practices to improve security from requirements forward and ongoing assessment of vulnerabilities coordinated with quality through the life cycle of a software project.

As discussed earlier, companies continue to struggle with resource allocation; they don't have sufficient staffing to do quality work for software creation, and they are trying to find ways to get the job done. The costs of letting those resources go are now becoming apparent and supporting the drive to automate.

The increased complexity of software development environments and the cost of fixing defects in the field (rather than early in the software life cycle) are exorbitant ways to drain income and to hamstring businesses as a result of critical software downtime. The costs of debugging field defects are significant, taking into consideration multiple developers who need to be involved and the multiple days and cycles required to find and repair the original problem as well as other code dependencies. The monetary impact is significant and doesn't take into consideration the additional business costs for downtime of critical applications (in the case of field defects). Repairing field defects is effortful. According to IDC's 2008 research, a majority of respondents (67%) said that repairing field defects takes 2 to 10 workdays, and 11% said that it takes 11 to 30 workdays. The overall commitment of staff to the task of repairing code more generally is also significant, with IDC research indicating that 37% of developer time is spent debugging. Testing automation that enables developer time to be focused on code creation rather than error remediation obviously cuts costs in a variety of ways throughout the life cycle. It makes financial and business sense to invest in early, iterative approaches to testing from requirements to deployment.

## **Gap Analysis and Evolving a Comprehensive Quality Approach**

To move toward effective quality approaches, organizations must understand their pressing pain points, challenges, costs, and organizational and process maturity levels to lay the groundwork for quality adoption and strategy. It is key for organizations to step back and candidly assess their current development and testing environment (including current and future staffing levels, existing tools adoption, sourcing approaches, etc.) to establish and then focus on the most critical priorities. Areas on which to focus include baselining existing defects and system downtime as a result. Understanding current organizational structure and effectiveness for testing is also key. (Do you have a distinct QA organization? Do developers test their own code at system and system integration time?) How are you doing your development? Does your organization use internal staff, contractors, onshore, offshore, open source, and/or all of the above for sourcing your code? What about automated tools adoption? Is your organization using current commercial products and/or open source testing tools? How well managed are those environments? Would on-premise or SaaS delivery models be most appropriate as you evaluate and adopt automated testing tools? It is also key to understand the overall application context for system and performance (ERP, infrastructure, virtualization for test lab and deployment, etc.). Assessing these areas and others related to them provides a context for the current situation (including cultural, process, and organizational issues).

Based on that initial gap analysis of your company's current state and future direction, you should engage in an evaluation of automated testing solutions that incorporates a testing process and organizational approach and adoption of quality tools. At this point, it also makes sense to consider the appropriate licensing model, coordination with requirements, security, change, and complexity for performance testing needs to be addressed.

All too frequently, organizations neglect coordination with the front end of the quality life cycle (requirements) and the transitional handoff for quality on the back end to provisioning, release management, and deployment. As organizations go through their quality evaluation, they must address these areas to proactively plan for an end-to-end approach to the quality life cycle. Because IDC research indicates that 70–80% of project failures result from poor requirements gathering, analysis, and management, and because organizations tend to spend 70–80% of their overall budget on operations, lights-on, and infrastructure, investing in improving both the initial end of the software quality process and its long-term "back end" for operations and deployment can result in significant savings over time.

## **HP'S QUALITY SOLUTION PORTFOLIO**

As the long-standing revenue market leader for automated software quality solutions, HP is the dominant player overall for testing automation. HP's broad portfolio of quality solutions includes HP Quality Center for test management, HP LoadRunner for performance testing, HP QuickTest Professional for functional and regression testing, and HP WebInspect for security defects and vulnerabilities testing. G2000 organizations increasingly face business-critical threats with security issues. Incorporating static and dynamic analysis as part of an effective quality approach can help to mitigate related security concerns. These solutions reside in the context of an extremely broad product portfolio, encompassing service and asset management, IT project portfolio management (ITPPM), information and data management, and other areas. HP's quality products encompass a range of testing environments, including SOA-specific testing, composite applications, as well as Web 2.0.

The HP Quality Management ecosystem offers a range of solutions for quality, performance, and security testing platforms. HP has a broad community of third-party solution providers to augment HP Quality Center software. The solutions from these providers are complemented by testing service offerings specific to the testing environment.

Given the breadth of the HP portfolio of solutions, existing integration between key areas is also an opportunity for users. Integration between HP's quality and ITPPM solutions enables users to prioritize scarce resources potentially to coordinate with the IT project portfolio. And integration between HP's quality and service management solutions provides synchronization of defects with production environments. (HP Quality Center offers HP Service Manager integration.) This enables users to have context for coordination between quality management predeployment on the one hand and incorporation of service requests and positioning software for provisioning, release, and deployment on the other.

HP has been evolving requirements capabilities in conjunction with quality, security, and quality updates announced earlier this year (2Q09) and recently announced business process testing as well (4Q09). HP's third-party partnership and reseller relationship with SAP positions it well for ERP testing and coordination with related SAP solutions for quality and change management.

In addition, HP has a broad portfolio of SaaS offerings that provide users with the alternative of deploying multiple products off-premise (from testing to service management to ITPPM). These SaaS offerings enable the benefits discussed earlier: a faster on-ramp, flexibility, and decapitalization.

## **CHALLENGES AND OPPORTUNITIES**

HP's opportunities include appropriate leverage across its portfolio of internal and partner products. Given economic, organizational, and security challenges, user demand for the combined capabilities is a strong opportunity. The emergence of the "cloud" also demands a response from quality solution providers to support management and effective cloud deployments over time. Wireless and VoIP environments carry their own complexities and issues from a quality perspective. HP challenges include helping to evolve user maturity levels to be able to take advantage of the broad combined HP portfolio. Gaining adoption for expensive automated tools in an environment where organizations see open source alternatives and ease-of-use barriers exist is also challenging — and shelfware remains an issue. Testing tools from open source providers appear to be "free." HP solutions are not "free," and while they are improving in terms of ease of use, they carry a learning curve. However, open source carries with it integration costs, management issues, and potential security and licensing issues as well as highly constrained functional capabilities that are inadequate for enterprise use.

In this context, it is key for users to evaluate their pain points and to adopt products that are sufficiently capable of addressing quality needs in a broader business and life-cycle context. Automated tools adoption will fail without effective process and organizational change, which HP is well-positioned to provide. Quality processes, mentoring, and guidance, as well as support from technical account managers assigned to each customer, help to provide a broader context.

HP is seeking to address these challenges by assigning a technical account manager to each customer, coordinating processes with tools adoption, providing mentoring for adoption, and offering easier-to-use solutions.

SaaS provides another opportunity for faster adoption at lower initial price points to seed adoption and provide longer-term options for users seeking off-premise quality solutions. Benefits include being an on-ramp ultimately to "cloud" testing solutions as well.

## **CONCLUSION**

Organizations should assess their current quality approaches in this difficult economic climate where business value is tightly linked to adaptive, high-quality software. In that context, they should evaluate and adopt appropriate automated quality solutions along with effective organizational and process strategies. To create an effective testing strategy, businesses should leverage a testing strategy from software project inception with requirements to development to provisioning and service management, including a coherent approach to security.

Management of and visibility into the quality life cycle are not luxuries for organizations that are dependent on business-critical software to enable corporate agility and business survival in a difficult economy.

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