Redefining the application lifecycle

Looking beyond the application to align with business goals

White paper

Table of contents

Successful companies recognize that the applications are the business. The quality, performance, security, and integrity of the organization are reflected in its applications.

Executive summary

A new generation of applications and architectures has changed the rules for IT—again. Composite applications and service-oriented architecture (SOA) are catalysts for a massive application refresh movement—and IT is under pressure to ensure that quality keeps pace with rapid changes in technology. At the same time, IT outcomes are no longer the litmus test for success; instead, IT must move to the front lines and take responsibility for producing business results.

All of this has created a need to re-think traditional application quality management practices and establish new disciplines addressing the application lifecycle. Not just the traditional software development lifecycle (SDLC) phases, but the entire lifecycle, including both earlier phases for understanding and prioritizing demand and establishing policies, as well as later phases that stretch into production.

HP Software asserts that the true application lifecycle is broader than most perceive; that the linkages and hand offs between phases must be clearly defined and enabled in a fundamentally different way; and that proper management of the connection between business and IT through each phase can mean the difference between success and failure.

HP has developed an innovative approach to quality management based on optimizing the entire application lifecycle. The HP approach focuses on the three attributes that determine success or failure of application delivery: functionality, performance, and security, and takes into account all of the key roles across IT that interact with the application lifecycle.

This paper describes the HP approach and highlights the key opportunities to reduce the risks, costs, and time required to develop, deliver, and maintain high-quality applications.

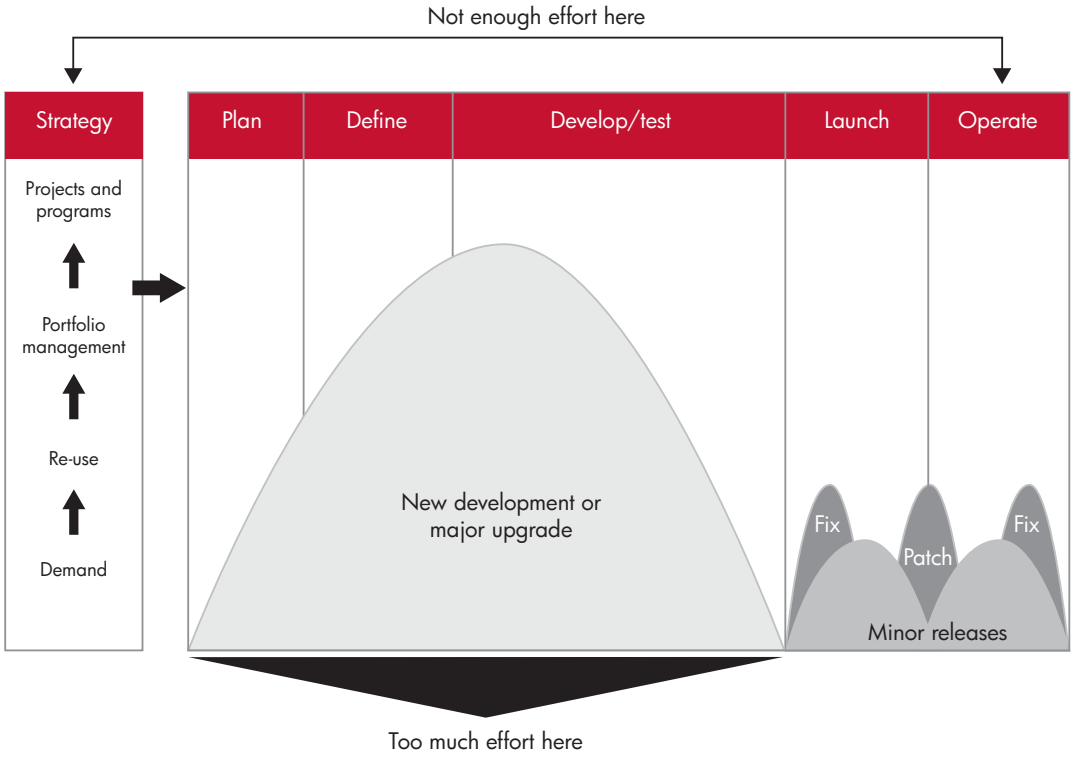
The changing nature of applications

New technologies, architectures, business trends, and end-user expectations are changing the very nature of applications—and the definition of application quality.

As a result, applications themselves are changing. New tools and architectures have emerged that make it faster and simpler to develop and deliver composite applications, rich Internet applications, and interactive Web 2.0 services. Technologies such as AJAX and Adobe® Flex are enabling companies to refresh their Web applications and update their back-end systems. And new processes such as agile development are being implemented with the hopes of making it easier to create adaptable applications quickly.

From a business perspective, trends such as off-shoring, outsourcing, and the globalization of quality assurance (QA) and development teams have increased the pressure on IT for faster development time frames and more consistent quality practices. In addition, new compliance and governance requirements make security and other attributes of application quality even more important. With compliance mandates in a constant state of flux and security threats constantly morphing and expanding, IT must establish effective change management processes and find new ways to keep applications agile, adaptable, and secure. This in turn requires common quality processes, practices, and solutions that enable globally distributed teams and activities.

Figure 1. The traditional application lifecycle often neglects earlier and later phases that are vital to long-term application quality and operational success.



New realities, new opportunities

All of these new advancements and trends will enable companies to innovate and integrate their business processes and services like never before. But risk is higher than ever in these composite application environments. Failure in a single application can impact multiple business processes and bring things to a standstill.

The approach of focusing on functionality, performance, and security throughout the application lifecycle concentrates on these new trends. With the right processes, the right technologies and management disciplines, companies can realize the promise of agility and innovation—with higher quality today and minimal risk down the road.

Together, these trends have created the perfect storm for quality management—and the perfect opportunity to do things right from a quality perspective.

The goal is to learn from the mistakes of the past. If you want to take full advantage of the new technologies, you'll need to adopt a modern approach. You'll need to focus on optimizing the application lifecycle, not just developing or customizing the application.

The HP approach to the application lifecycle

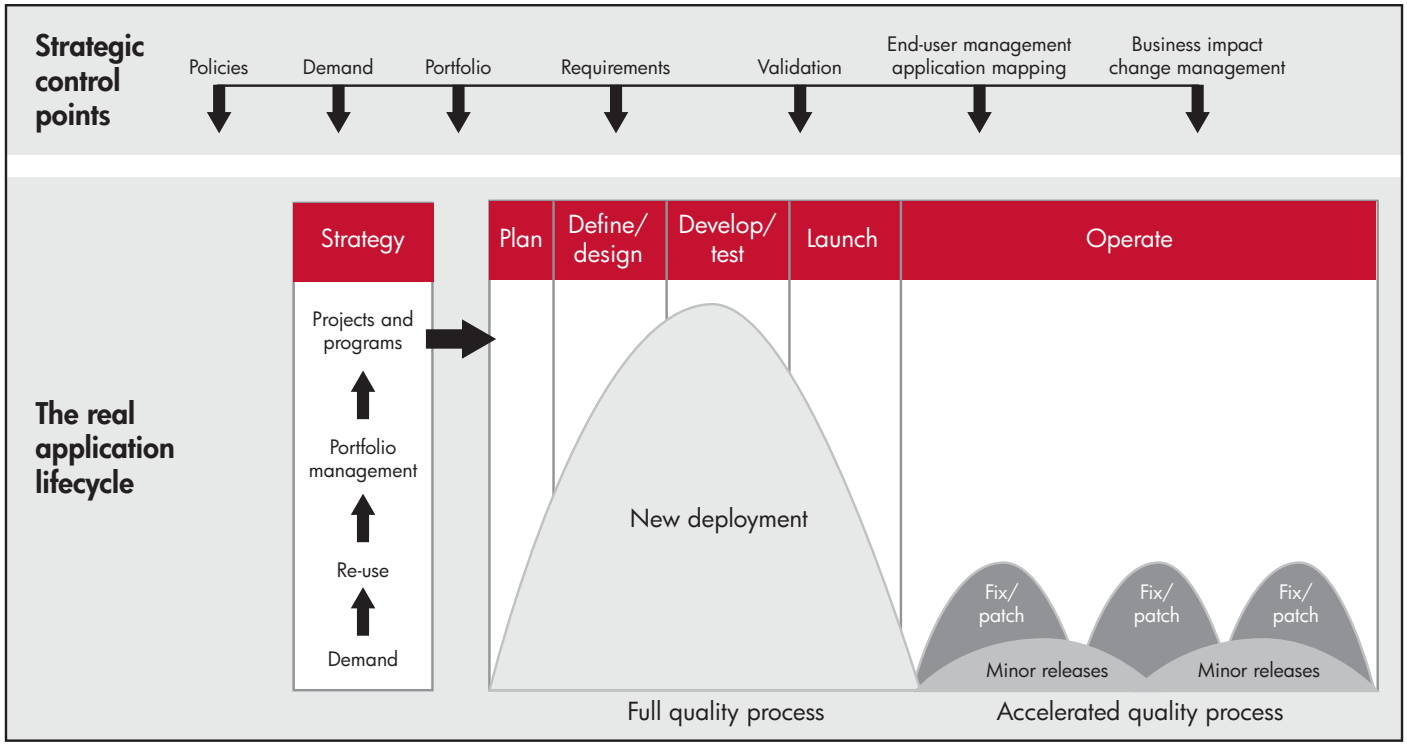
Few executives would dispute that business success depends on application quality. Yet few IT organizations manage the quality of their applications with a business perspective in mind. They deliver applications as they always have in the past: Developers create the code and with minimal ad hoc testing the application is tossed over to operations; there is little focus on what happens after that.

HP takes a business-centric approach to application lifecycle management—a unique way of managing application quality assurance, addressing the three pillars of quality:

- Does the application provide the functionality needed to meet business requirements?
- Does the application function with sufficient performance to meet business requirements?
- Does the application deliver adequate security to meet business requirements?

The HP approach is guided by an overarching principle: Application teams must view the true application lifecycle—from portfolio prioritization, architecture, service, and security policies to concept, delivery, ongoing management, and change in operations.

Figure 2. The HP approach focuses more attention on strategic control points at all phases of the lifecycle.



Advantages of the HP approach: a closer look

The traditional view of application projects has two major issues. The first is that it is developer-centric. It is focused primarily on the construction of the application, not the business requirements or strategic value of the application. This leads to the second issue, where the operations phase is looked at as the "happily ever after" phase—beyond the scope of the development project, running the application is someone else's concern.

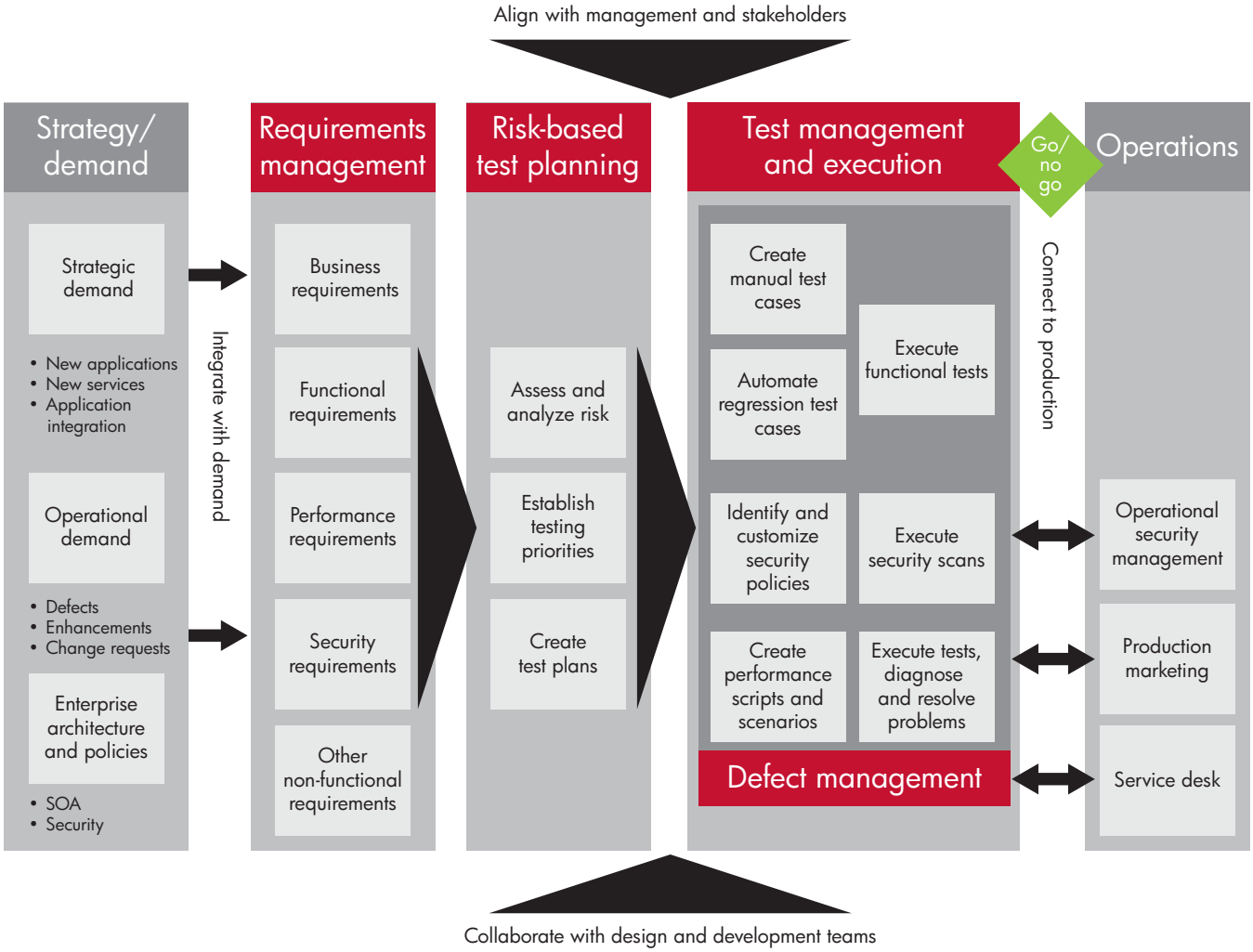
The key to getting business results is to focus on the elements that drive the greatest business value. Therefore it is critical to start very early, understanding that the overall demand from a business perspective—and the portfolio investment decisions that drive application priorities—all are a part of the application lifecycle. For example, how do application owners prioritize key application functionality among hundreds of business requirements? Take a global order management application: Would it be more important for the application to handle vendor invoices in 20 currencies or to create compliance audit reports with a single click? The right choices in the strategy phase of the application lifecycle yield better business outcomes in the end.

This greater focus on the front end has the added benefit of helping catch potential problems earlier in the lifecycle, where they are significantly cheaper and easier to fix, rather than later when the application has already been built. New software design paradigms aim to catch the vast majority of potential errors in the software in the requirements phase, before a single line of code has been written.

Strategic control points in the application lifecycle

HP Software has pioneered the concept of strategic control points. These are critical gates or hand offs where the business and IT must work together to get aligned and stay aligned. It is the successful management of these strategic control points that determines, more than anything else, whether the application effort will be successful or not. For example, it makes little difference in the end if the application is written in Java™ or .NET; however, it is critical that the business requirements are established properly, that the application is validated against those requirements, and that there is traceability to ensure that the functionality, performance, and security the business requested is what the business got from the delivered application. That is why steps such as requirements management and validation are called out as strategic control points.

Figure 3. The HP Quality Management Process aligns the roles and responsibilities of all stakeholders throughout the lifecycle.



Alignment without execution isn't sufficient. The key consideration is to use alignment to drive all the critical application delivery, stakeholders, and activities. Another advantage of the HP approach is that it addresses the complete quality process and the vital roles and stakeholders involved, including:

- Building strategy through requirements management
- Assessing and associating risk with specific requirements and functionality
- Driving functional, performance, and security tests
- Continuously improving the functionality, performance, and security during the operations phase

The HP approach supports all these key activities, and HP Software solutions allow customers to pull all this information together in real time, driving vastly improved decision making and significantly reducing the risk of failure.

How the HP quality approach helps you align with business objectives

The HP approach to optimizing the application lifecycle offers some significant new capabilities that enable companies to master change and profit from it rather than simply react to it. For example, using this approach customers can:

- Align IT objectives with business priorities and keep them aligned throughout the application lifecycle
- Reduce application development, delivery, and maintenance costs
- Constantly improve operational efficiencies by measuring and reporting key performance indicators (KPIs)
- Quantify and manage application quality, performance, and availability issues from a business and end-user perspective
- Share knowledge and best practices across departments and lines of business (LOBs), raising the value of existing intellectual capital

Flawed assumptions, suboptimal outcomes

HP Software has had the opportunity to help many companies optimize the application lifecycle. In the process of working with these customers, HP consultants have noticed a few common misconceptions that can lead to suboptimal results:

Flawed assumption #1: Quality is achieved through a series of specialized tasks.

With most companies today, the application quality process is still a series of discrete tasks performed by specialists—requirements generation, coding, unit and functional testing, performance tuning, and so on. The assumption is that if each team performs its specific task correctly, the end result will be a high-quality application that meets end-user requirements and business objectives. All too often, that assumption proves wrong. Here's why:

- **Business objectives are frequently lost in translation.** The requirements defined in the initial phase are not always properly communicated from one team to the next. The result: The application delivered into production does not always address current business goals or match end-user expectations.
- **Expertise goes untapped.** There is a huge volume of knowledge and experience within the various application quality and management teams—but when these teams don't share best practices, much of this intellectual capital is wasted and operational efficiencies across the organization are lost.
- **Data isn't collected or shared.** There is often no measurement, collection, or centralization of standardized KPIs that could be useful throughout the application lifecycle.
- **Finger-pointing runs rampant.** No one is eager to take responsibility for problems that do occur. Management blames IT. IT blames application quality project teams. Project teams blame R&D or product vendors. More often than not, these teams simply don't know the source of the issue. Getting to the root cause of application problems becomes a long and expensive process, and often the problem goes unresolved while finger-pointing continues.

The fact is, quality must be built in throughout the entire application lifecycle, not bolted on to discrete tasks within the lifecycle.

Flawed assumption #2: Security and quality are separate initiatives.

Historically, quality assurance processes haven't focused on security. And those that do consider security are covering only the basics: authentication, authorization, access control, and encryption. The job for QA teams has been to ensure that the application functions as intended and scales effectively under load. Management typically has not expected QA to perform any kind of security testing; in fact, security initiatives are often perceived as working in opposition to QA goals because they can extend development and testing cycles. The result is that security is often treated as an afterthought, which means developers leave many security defects in their source code.

There are fundamental problems with this course of action. According to industry analysts, 75 percent of attacks by hackers now occur at the application layer, not the network layer. Attackers are targeting IT's soft underbelly: Web-based applications. And the old paradigm of assigning a security team to test applications after development or just before deployment no longer works. Security teams must go back to developers—who have not been trained in security best practices—and try to get a fix for vulnerabilities. That means more delays and more expense, and in many cases the same security vulnerabilities are embedded within applications over and over again.

The fact is, security and quality are not and cannot be separate. Development and QA must engage to fix the root causes of security issues, accelerate secure applications, and reduce security costs and risks.

Flawed assumption #3: The launch date is the all-important milestone.

When a new application or a major upgrade is needed, it is usually needed now. Therefore the tendency is to rush through this phase and begin coding because that is believed to be the fasted way from A to B—making sure the application does what it is supposed to do. The launch date is all-important. Development and testing efforts are typically cycles of finding and fixing bugs, adding patches, etc.

But often this approach neglects key strategic considerations:

- How will this application contribute to specific business goals?
- What is its priority relative to other projects and why? How will it be managed within the IT portfolio?
- How will its evolving requirements be kept in alignment with business objectives?
- How will functionality, performance, and security be validated pre-launch and maintained post-launch?
- What is the change-management strategy for this application?

The fact is, you can be successful developing applications in any language: Java, AJAX, Ruby, PHP, etc. But if you don't carefully map out the strategy, execute the requirements correctly, validate, and consider the operations phase—your project will fail.

The overall average cost of a security breach is $6 million, according to the Ponemon Institute's 2007 Annual Study.

Implementing a business-centric quality model: next steps

No two organizations have the same requirements, resources, or starting point for transitioning to the new model of optimizing a business-centric application lifecycle. But all competitive organizations can benefit by getting started immediately.

HP Software is committed to helping you be the agent of change. With industry-leading business technology optimization (BTO) solutions, HP Software offers a comprehensive array of products and services to help customers make the move to the right application lifecycle model quickly, correctly, and successfully. Among the core product suites that can help you implement the application lifecycle model described in this paper:

- **HP Quality Center** software provides automated software testing and quality assurance across a wide range of IT and application environments. It includes an integrated suite of role-based applications, a business dashboard, and an open, scalable, and extensible foundation—all designed to optimize and automate key quality activities, including test management, requirements, and defects tracking; functional testing and regression testing; and business-process design validation. HP Quality Center includes HP Quality Center software, HP QuickTest Professional software, and HP Business Process Testing software.
- **HP Performance Center** software provides the first lifecycle approach to optimizing application performance, helping provide your applications will scale to support the right number of users, transaction volumes, and performance levels. HP Performance Center includes integrated applications and a business dashboard for key performance optimization activities, including load-testing, and J2EE diagnostics across complex, heterogeneous computing environments. HP Performance Center Suite is anchored by HP Performance Center software and HP LoadRunner software, and also includes HP Diagnostics software.
- **HP Application Security Center** software solutions enable your developers, quality assurance (QA) teams, and security experts to successfully conduct Web application security testing and remediation. Sophisticated, scalable, Web application security solutions from HP help you find and fix security vulnerabilities for Web applications throughout the application software development lifecycle. HP Application Security Center includes HP WebInspect software, QAInspect software, and HPDevInspect software.

Forrester estimates that within the next year, 80 percent of all companies will have suffered through an application security incident. The cost of these incidents ranges from $90 to $305 per compromised record.

The HP Software advantage

Advantage	Evidence
Technical vision	Pioneer in many BTO trends: • Application management • User-experience monitoring • Service level management • Business process testing
Business technology optimization (BTO) focus	The industry's first software and services suite that enables the business outcome of IT. Unlike other offerings that focus on improving internal IT processes, HP Software BTO Enterprise optimizes the strategic touch points between business and technology to provide that IT investments produce the intended outcome.
Breadth and depth of technical expertise	• Strong history in QA, testing, and security • Deployment planning and enterprise monitoring best practices guides available
Successful customer implementations	• Thousands for application quality management customers • Hundreds of deployments worldwide • Cross-industry, global experience • Comprehensive support, training, and consulting offerings on a global scale
Strength of service and support offerings	Comprehensive support, training, and consulting offerings on a global scale
Partnerships	• Strong alliances with top-tier integrators • Collaborative relationships with other technology innovators

Case studies

HP Quality Center: Aurora Energy

A government-owned electricity distribution and retail company, Aurora Energy has operated in mainland Tasmania since 1998 and offers 24-hour-a-day service to customers to ensure a safe, reliable electricity supply across an area of about 67,800 square kilometers. To meet an increasingly service-driven strategy, Aurora set a company-wide objective to ensure 99.95 percent system availability and flawless application functionality upon deployment. The company selected HP Quality Center software and HP Functional Testing software, to undertake essential aspects of quality management and perform functional and regression testing on development work.

With its HP solution, Aurora has:

- Delivered availability of 99.95 percent for core business applications
- Optimized application quality and reduced deployment risks on go-lives by leveraging a consistent, repeatable, and automated test process
- Reduced testing time by automating repetitive tasks
- Minimized risk by gaining confidence on application quality, reliability, and stability

"In terms of delivering business process savings, operational efficiencies and productivity gains, there is no doubt these solutions offer good value for the money. In fact, they have truly paid for themselves time and time again."

–Cindy Askey-Doran, corporate business systems administrator, Aurora Energy

HP Performance Center: Rabobank

Rabobank, based in The Netherlands, serves nine million individuals and corporate clients in 38 countries. That means it has a high number of regional IT environments as well as a central IT organization. The company was challenged to deliver stable, reliable software throughout its geographically dispersed environments, while building trust around the adoption of a more centralized model. Thus the role of software testing is business-critical to Rabobank—both operationally and strategically.

Rabobank leveraged HP Performance Center software to enable that its centrally developed applications are stable and fully meet the cooperative's business needs. With HP Performance Center software, Rabobank has:

- Improved its ability to determine that software meets specifications
- Shortened SAP test script develop times from four hours to under 60 minutes
- Cut the cost of testing through automated, repeatable scripts
- Improved the stability of software applications
- Developed and deployed applications that better support the bank's business needs

"HP Performance Center gives us a comprehensive range of test and diagnostic capabilities, enabling us to support our developers at every phase in conjunction with our other performance services and tools."

–Henri Mulder, team load performance competence center, Rabobank

HP Application Security Center: Global Payments

Every year, millions of businesses worldwide depend on Global Payments to handle billions of transactions, including credit and debit card payments, cash transfers, and financial reporting. The company also provides point-of-sale, back-office, and treasury management/EDI solutions for merchants, financial institutions, and treasury managers.

Global Payments institutes multiple state-of-the-art security procedures such as "penetration tests" or simulated attacks on its production-ready applications performed by security specialists. This type of testing, however, has a fundamental drawback: Security issues, if they exist, are discovered late in the development process—when fixing them is expensive, disruptive, and often requires extensive re-coding.

- Reduced risk of data security issues impacting business or customers
- Lower cost of "fixes" with less impact on application development time lines
- Rapid return on investment, with no overhead added to QA processes
- Additional layer of security testing
- Early identification of vulnerabilities in software under development
- Integrated with HP Quality Center software, new security testing tool requires no additional staff or servers

"HP QAInspect lets us integrate automated security testing into our QA processes without adding time or overhead. We help reduce the risk that security issues will only be discovered late in our development cycles—when they'll be relatively cumbersome and expensive to fix. It's a tremendous return on a very modest investment."

–Mike Dwyer, vice president, quality assurance, Global Payments Inc.

Conclusion

For many companies, "quality management as usual" has actually become an obstacle to delivering business success. The decision is no longer whether or not to move to a more efficient model of applications, but how to do so with maximum efficiency and at minimal cost and risk.

By managing strategic control points throughout the entire application lifecycle and optimizing the functionality, performance, and security of applications, IT can have a more direct—and positive—impact on the business outcomes associated with these applications.

It's time to turn the page on traditional application development approaches. Take a closer look at how HP business-centric application lifecycle management can make a positive impact at your company. And make the move to a more efficient, agile enterprise.

Technology for better business outcomes

To learn more, visit www.hp.com

4AA2-2975ENW, October 2008