JetBlue flies high with automated QA testing

HP Quality Center cuts testing costs by 73%, reduces post-production failures by 80%; testing cycles accelerated by 40%

jetBlue®

"HP Quality Center software allows us to perform standardized, repeated applications testing. It has reduced our testing costs, while delivering measurable improvements to the quality of the applications that keep our business in flight."

—Sagi Varghese, quality assurance manager, JetBlue

Objective
Establish automated, best practices-based applications testing processes

Approach
Implement software tools to execute and manage automated testing IT improvements

IT improvements
- Post-production application failures reduced by 80%
- Testing cycles accelerated by 40%
- Testing processes standardized, repeatable
- Virtualized environment allows concurrent testing

Business benefits
- Testing costs cut by 73%
- Costs of supporting post-production issues reduced
- Enhanced customer service through improved reservations system performance, availability
- Improved sales potential, profitability of online reservations system
- Testers able to prioritize resources by business value
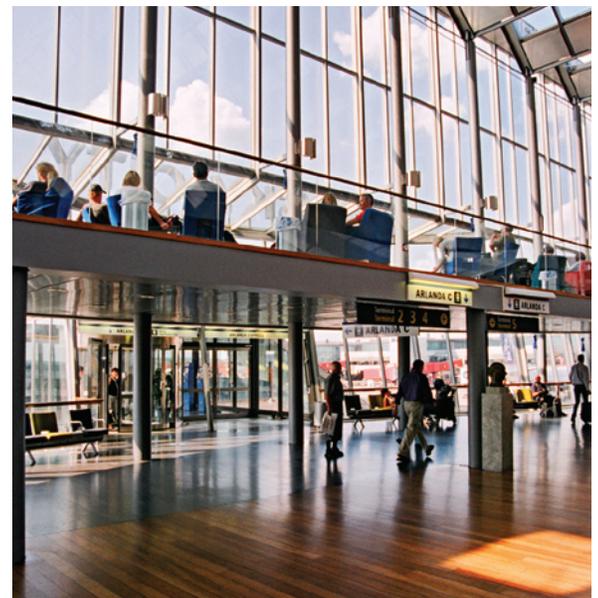
Since its founding in 1999, JetBlue Airways has demonstrated that focusing on customer service is a great business model.

What JetBlue customers may not realize, however, is that the company's commitment to quality extends well beyond its top-notch in-flight service. Behind the scenes, JetBlue has dedicated resources to ensure that its technology systems—including systems that touch customers—meet high standards for availability and performance.

Among the resources JetBlue uses: HP Quality Center, HP QuickTest Professional and HP LoadRunner software.

Manual testing time-consuming, expensive

JetBlue's technology infrastructure comprises over 150 software applications, and is critical to all of its business operations—from its flight, air-traffic, and airport operations, to its business and financial management, sales and marketing, and reservations.

Application

Software functional and
performance testing

Hardware

• HP ProLiant DL385
  G5 servers

Software

HP IT Performance Suite—
Application Lifecycle
Management

• HP Quality Center
  software

• HP QuickTest
  Professional software

• HP LoadRunner software

To ensure these applications run properly, Sagi Varghese, quality assurance manager, JetBlue, replaced the company's manual software testing processes with automated quality testing—a transition that JetBlue needed to make to keep its customers happy and its costs under control.

Take, for example, JetBlue's online reservations system. The online reservations business is highly competitive, Varghese explains, making application quality particularly important. Should JetBlue's system go down, people shopping for airline flights can go elsewhere with the click of a mouse. The cost to JetBlue in lost revenues can add up to thousands of dollars per minute.

"We'd outgrown our old technology. The new system adds significant capabilities to JetBlue's online reservations applications, and delivers more value to our customers."
Sagi Varghese, quality assurance manager, JetBlue

But manual software testing wasn't an ideal way to ensure the quality of JetBlue's reservation system. A full manual regression test of all 534 scenarios associated with the reservation system's use cases, for instance, took 80 hours to run. The overhead costs of performing such extensive, and labor-intensive, procedures were high.

"We've put best practices in place. As a result, we're confident that our software application quality processes and performance will be both cost effective and enable our new reservations systems to meet our customers' expectations for availability and responsiveness."
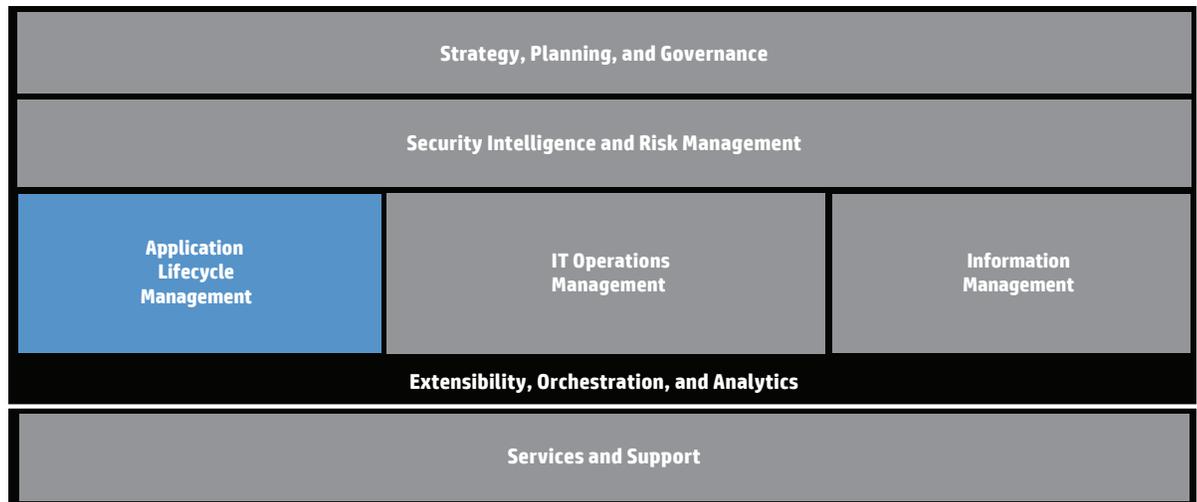Sagi Varghese, quality assurance manager, JetBlue

Because testing took so long, JetBlue sometimes cut back on its regression tests to meet delivery deadlines.

This, in turn, drove up costs in other areas of the JetBlue operation. Some of the impact was associated with troubleshooting software issues after an application had gone into production. Other increases hit JetBlue's customer-facing processes, including its customer call center. JetBlue normally charges a premium when customers make reservations by phone instead of online. In the event of reservations system issues, however, the company waives that extra fee—so any phone reservations made during online outages fall under a cost structure that isn't in line with the company's normal operating margins.

Automated testing in virtualized environment

JetBlue needed a new software testing framework that would be more efficient, while also boosting its quality standards—so it implemented HP Quality Center and HP QuickTest Professional software. Under the new framework, JetBlue creates test scenarios that are converted into standard-format test cases. HP QuickTest Professional software processes and executes the test cases, and publishes test scripts to HP Quality Center. "The new framework uses consistent, repeatable processes," says Varghese. "Our engineers are able to more easily coordinate and execute tests, and analyze test results, which allows them to prioritize testing based on business risk."

Strategy, Planning, and Governance		
Security Intelligence and Risk Management		
Application Lifecycle Management	IT Operations Management	Information Management
Extensibility, Orchestration, and Analytics		
Services and Support		

The software runs under a virtual environment on HP ProLiant DL385 G5 servers. "It's more cost-effective to create virtual instances," Varghese notes. "If we want to test a web application on five different versions of a browser, we can run all five concurrently. HP QuickTest Professional is flexible enough to allow us to do that."

Once JetBlue determines that an application is stable, it next performs load testing using HP LoadRunner software. "Any application that we roll out into production gets certified for performance as well as functionality," Varghese says. JetBlue also uses LoadRunner for capacity testing and to baseline application performance and establish benchmarks. These benchmarks, in turn, allow the company to understand whether future enhancements to an application impact its performance characteristics.

Faster testing, better results

Automating the testing process delivered significant benefits to JetBlue, allowing the company to reduce its testing costs by 73%, and its post-production failures by 80%.

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Testing is also faster. The reservations system testing cycle has been accelerated by 40%, from 120 to 72 hours per cycle. Faster testing means that JetBlue can perform more tests—which in turn reduces downstream costs associated with post-production issues and help desk calls.

In addition to implementing HP Quality Center and HP QuickTest Professional for its reservations system, JetBlue also uses the software elsewhere within its organization. "We're finding ways to extend the capabilities of QuickTest Professional," says Varghese. In JetBlue's operations environment, for instance, testers run a QuickTest Professional smoke script on the fly to validate applications when they move them among servers. The analysis takes only 30 minutes, making moving applications faster and easier than in the past, when testers would have needed eight hours to run 15-20 scenarios.

More effective defect tracking

JetBlue also uses Quality Center as a test repository, to track the progress of testing, and to track defects.

"Before we implemented HP Quality Center, we tracked defects using spreadsheets," says Varghese. With some 50 QA projects in process at any one time, having defects tracked in multiple systems was cumbersome and difficult to manage.

Now JetBlue stores defects in a single, centralized database. This helps JetBlue manage its defects more effectively—and analyze them to identify significant trends. "We produce monthly reports that analyze criteria such as defect density, time to resolution, and number of testing cycles." The development team uses the reports to evaluate its development and quality processes, and has made some changes as a result, including implementing unit testing co-reviews and creating formal release notes. These best practices have, in turn, enabled development to meet its quality goals, including defect density of under 5%, and no more than three testing cycles per application.

Implementing HP Quality Center software delivered significant benefits to JetBlue's bottom line, as well as supporting its ability to meet its quality standards.

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The solution's benefits are more important than ever now. JetBlue plans to replace its existing online reservation system—which it developed entirely in-house—with a new system that leverages third party relationships and codesharing. "We'd outgrown our old technology," Varghese explains. "The new system adds significant capabilities to JetBlue's online reservations applications, and delivers more value to our customers." Customers will, for example, be able to more easily book itineraries that combine flights on other airlines with those from JetBlue.

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With a project that visible—and significant to JetBlue's future—software testing now takes on a more critical role. But thanks to HP Quality Center, HP QuickTest Professional and HP LoadRunner software, the airline is ready. "We've proven the value and functionality of HP Quality Center, HP QuickTest Professional and HP LoadRunner on our existing applications," Varghese says. "We've put best practices in place. As a result, we're confident that our software application quality processes and performance will be both cost effective and enable our new reservations systems to meet our customers' expectations for availability and responsiveness."

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