TestComplete by SMARTBEAR

Customer Success Story

TestComplete by SmartBear Automated Regression Testing Quickly Pinpoints Software Bugs to Accelerate Application Development and Testing

Employing more than 37,000 people worldwide, Philips Healthcare combines unique clinical expertise with human insight to develop innovations that simplify healthcare so doctors and other medical personnel can improve the quality of people's lives. With a growing presence in cardiology, oncology, and women's health, the company focuses on technology solutions addressing fundamental health problems such as congestive heart failure, lung and breast cancers, and coronary artery disease. Philips Healthcare delivers value throughout the care continuum from disease prevention to screening and diagnosis to treatment monitoring and health management.

Business Need

In recent years, medical system product functionality at Philips Healthcare has grown increasingly more complex as the number of features and the types of technologies offered by products has increased. The internal software quality assurance team that tests client server applications supporting the medical-device products thus needed a well-planned, more consistent and repeatable application testing environment. The testing environment also needed to facilitate compliance with HIPAA and FDA regulations.

"With applications growing more complex, one of the major problems we faced was the lack of an automated regression testing tool to ensure bugs have been fixed and previously-working functions have not failed as a result of software changes," said Sandor Albert, a Senior Software Engineer at Philips Healthcare who initiated and leads the continuous testing integration effort. "We also need to make sure newly-added features do not create problems with previous software versions."

Albert's team builds testing frameworks for various Philips Healthcare products such as Xper Information Management, a personalized cardiovascular workflow solution, and Xper Connect, a bi-directional hospital information system interface, and Xper FlexCardio, a physiomonitoring system. For each of these products, the team conducts continuous integration testing and needs a consistent method for logging user actions.

Doctors and other medical personnel rely heavily on Philips Healthcare products to help them deliver the best care possible to patients. It's critical that the company

Business Challenges

- Identify application bugs and ensure fixes
- Implement an automated testing solution for regression tests
- Deploy a well-planned, consistent and repeatable application testing environment
- Ensure product software complies with HIPAA and FDA regulations

SmartBear TestComplete Solution

- Enables automated testing of any application regardless of development language
- Automates testing of HTML5 content including new tags and Web forms
- Runs tests on multiple physical and virtual machines
- Merges test results from multiple machines into a single, comprehensive report

Measurable Results

- Improves application testing time between 40-50%
- Reduces testing resource costs by as much as $350K
- Helps stabilize product performance to positively impact revenue streams
- Supports overall lifecycle development processes for complying with HIPAA and FDA regulations

ensures product software works properly when first created and as software upgrades are released. Any malfunction could cause problems with the care that Philips Healthcare customers provide to patients.

"Since building our testing framework and running scripts for our regression testing scenarios, we've seen significant improvement in code quality. We forecast improvements in process efficiency of at least 40 to 50 percent."

Sandor Albert, Senior Software Engineer, at Philips Healthcare

Targeted Solution

To tackle the challenge of automating the software regression and integration testing processes, Philips Healthcare explored various options including TestComplete from SmartBear. "We selected TestComplete because of its ability to more easily record tests," said Albert. "TestComplete supports many scripting languages including DelphiScript, which is a big key for us since our products are mostly developed using the Delphi IDE. In addition, TestComplete is strong in parallel testing, data-driven testing and running synchronized testing scenarios."

TestComplete provides Philips Healthcare with an automated software testing tool for creating, managing, and automatically executing tests for Windows, rich-client and Web applications. With an easy-to-use interface featuring script-free, keyword-driven testing, TestComplete also captures and displays comparisons of screenshots during recording and playback. The Philips Healthcare choice of TestComplete was also influenced by the prompt and efficient communication demonstrated by the SmartBear sales and technical support teams.

"SmartBear went above and beyond to help us accurately evaluate TestComplete by offering a temporary solution for evaluation," Albert said. "This helped us receive hands-on experience on what the solution offers and convinced us TestComplete was the missing key element in our product-validation process. Our testing team quickly picked up how to manipulate TestComplete and adopted its capabilities to fully automate our testing processes."

With TestComplete, Philips Healthcare can now efficiently test client server applications created in its Windows environment against Microsoft SQL database servers. Some modular applications rely on.NET technology but most leverage the DelphiScript and C/C++ environments. As far as the local version-control system, the software quality assurance team uses TestComplete in conjunction with Microsoft Team Foundation Server and TeamCoherence from QSC Software for legacy projects.

"By inserting the TestComplete continuous integration build and attaching the testing scripts to the build and internal release process during the development phase, bugs are captured much earlier in the testing phase," Albert said. "This occurs even without the involvement of the software quality assurance team. Developers are notified in real-time on the findings and receive detailed test logs for the scripts that a module failed on."

Benefits and Results

For the Philips Healthcare software quality assurance team, the most important benefits delivered by TestComplete framework are the reduction in application testing time and improved test accuracy. The team also benefits from bug traceability by leveraging the detailed and consistent logging mechanism offered by TestComplete.

"Other benefits we value include parallel testing and automated regression testing, which both decrease our testing time," Albert added. "Our software quality assurance team now has more time to focus on ad-hoc and random testing rather than having to repeat the same set of tests with each new build."

Additionally, TestComplete also integrates well with the processes Philips Healthcare must follow to ensure compliance with HIPAA and FDA regulations. "The TestComplete HIPAA compliance features and FDA-

approved logging system integrate well with our product development lifecycle," Albert said. "We can store all the encrypted test logs for which the content cannot be altered for later reference. This helps us prove compliance when required."

Having a consistent testing framework greatly increases the stability and reliability of Philips Healthcare products. The software test team is also able to more quickly replicate anomalies and usage scenarios reported by customer sites by scripting user actions and repeating them automatically while logging partial results.

"This is a tremendous help in reducing the software-anomaly turnover time." Albert said. "It also helps our software developers understand and pinpoint root causes of reported anomalies. They can then fix issues sooner so we can more quickly address customer issues."

The TestComplete framework also indirectly motivates developers to improve their code quality and more rigorously adhere to coding standards. Having developers write the test for new modules increases adherence to modular programming best-practices and eliminates work-around coding.

"Knowing ahead of the time that the code will be tested using a script, the component-naming standards are now a major aspect to consider along with simple procedures taking the place of the several hundred lines of 'do-everything' style procedures," Albert said. "Since building our testing framework and running scripts for our regression testing scenarios, we've seen significant improvement in code quality—we forecast improvements in process efficiency of at least 40 percent to 50 percent."

Philips Healthcare also will significantly reduce testing resource costs. "With very limited testing resources, TestComplete is a big help and a possible long-term solution to address the lack of resources," Albert explained. "By deploying TestComplete, we project that we might save as much as $300-350K in resource costs. The company will also benefit from increased product stability, which will positively impact revenues."