

SmartSignal



FAST FACTS

Company:

SmartSignal helps its clients to predict impending equipment and process failures, diagnose the developing problems, and prioritize the problems based on severity and importance.

Industry:

Technology

Geography:

United States

Challenges:

- Improve efficiency while delivering premium application quality
- Maintain broad test coverage across multiple platforms and localizations
- Improve consistency and maintain a reputation for quality

Solution:

Lifecycle Quality Management

Products:

Borland® SilkTest®

Results:

- 15 times faster testing with improved overall efficiency and application quality
- 100 percent reduction in rework through automation with one set of test cases
- 10 times faster structure creation with improved consistency and customer care

COMPANY

SmartSignal helps its clients to predict, diagnose, and prioritize. Its advanced asset analytics applications predict impending equipment and process failures, diagnose the developing problems, and prioritize the problems based on severity and importance. SmartSignal's clients in power generation represent over 350,000 megawatts of power; other SmartSignal clients include industry leaders in refining, pipelines, petrochemicals, airlines, mining, and process manufacturing. For further information, visit www.smartsignal.com.

CHALLENGES

SmartSignal Corporation is a privately held software solutions company founded by the University of Chicago to make the revolutionary Similarity-Based Modeling™ (SBM) technology commercially available. The SBM technology engine in SmartSignal's software enables holistic, real-time analytics on any instrumented industrial equipment – plantwide and fleetwide. With real-time analytics, companies receive early notifications of developing equipment and process anomalies, indicative of reliability, availability, efficiency and compliance problems.

Quality assurance (QA) is a critical component of the software delivery lifecycle that supports the development of SmartSignal's offerings. SmartSignal has a firm commitment to quality which it leverages to speed development, reduce costs and add new features to its products with greater ease. At SmartSignal, the QA team not only enables the delivery of premium software quality to customers, but also has been a catalyst for driving efficiencies and improved customer satisfaction across the organization.

Improve efficiency while delivering premium application quality

The SmartSignal engineering team develops and delivers two primary predictive analytics solutions, including three products each. With a lean engineering team and even leaner QA team, operating as a highly efficient organization is essential to accommodate the volume of work, while maintaining premium quality and service standards.

The QA team is responsible for validating all six products, with two releases and multiple maintenance patches each year. Because of the level of sophistication inherent to SmartSignal's products, test plans are complex and extensive. One test plan has up to 4000 test cases. Additionally, SmartSignal has adopted some Agile development methodologies, therefore the team builds and validates their code every day, with status reviews each morning. With just four QA staff, manual test execution and metrics reporting would be impossible.

“SmartSignal had the need for automated software testing from day one,” said George Cerny, quality assurance manager at SmartSignal. “SmartSignal delivers a highly complex offering, configured for each customer. To scale our offering to meet the needs of our customers would be impossible without the support of automated testing.”

Maintain broad test coverage across multiple platforms, localizations, custom objects and third-party controls

Not only is the QA team responsible for validating all six products, they are also responsible for testing the products across multiple platforms with a large number of variables. SmartSignal has customers located around the world, and needs to validate the products for 7 regions including France, Germany, Spain, Italy, Canada, the United Kingdom and the U.S. The company must also validate for multiple platforms and technologies used by customers,

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including C++ .NET, VB .NET, .ASP .NET, SQL Server (multiple versions), IE (multiple versions) and more. SmartSignal also makes use of third party controls and custom objects, all of which need to be validated. There are literally thousands of combinations that need to be tested. With the requirement for test execution on a daily basis, validation of these thousands of combinations would be impossible if conducted manually.

Improve consistency and maintain a reputation for quality

Engineering staff efficiency is a requirement beyond the QA team. SmartSignal products identify potential equipment problems by analyzing customer data collected from machine sensors. The SmartSignal engineering team accepts relevant process, electrical and condition monitoring sensor data inputs, organizes them, manipulates the data, creates a model and produces a structure which is applied to an algorithm that drives the way the product works for each customer to predict machine failures.

Traditionally, the engineering team conducted this structure creation process for each unique customer using mostly manual processes. However, with the potential for thousands of inputs coming in from each customer, the risk associated with a decline in speed of service and accuracy could begin to become an issue. Additionally, the engineering team saw that it could be spending more time on application design and less on the administrative workload associated with the design process. As SmartSignal grew its customer base, the company started looking at how it could apply automation to the structure creation process, to make the process faster and more importantly, more consistent.

SOLUTION

After evaluating a number of competing solutions, SmartSignal chose Borland® SilkTest®, a component of the Borland Lifecycle Quality Management solution, for automated functional and regression testing. SmartSignal selected Borland SilkTest because it offered the power and flexibility required to address the organization’s sophisticated testing requirements. Specifically, SmartSignal determined that Borland SilkTest could test complex custom objects and third party controls that the other solutions evaluated could not support.

“Borland SilkTest is the only tool that is flexible and robust enough to meet our needs,” said Cerny. “Our QA team can extend the product in a limitless way, to accommodate automated testing for the massive variability in our products. This helps us eliminate rework and speed the validation process.”

Because Borland SilkTest gives the team an exceptional amount of control over how they structure their test plans, migration of test plans and cases from one SmartSignal product to the next is highly efficient. When SmartSignal developed its latest award-winning software, the QA team was able to port all of the test plans and test cases from the previous product to the new product, virtually unchanged. The team simply manipulated the underlying framework to recognize the capabilities that had changed from the old product to the new product, and were able to begin testing the new product with a minimal amount of rework. Cerny estimates the support for this easy port of test plans and cases using Borland SilkTest saved him years of rework. Now SmartSignal can spend less time on building and maintaining test plans, while expanding test coverage and optimizing application quality.

RESULTS

15 times faster testing with improved overall efficiency and application quality

SmartSignal’s QA team is building quality into their products from the beginning of the software delivery lifecycle to the end. Using Borland SilkTest, SmartSignal’s QA team has optimized the use of its testing resources to deliver complete test coverage and support the quality component of the implementation of Agile development methodologies, including daily, continuous build and testing practices. The tool makes the test development effort manageable, and offers reusable and easily maintained test assets, flexibility, and quick and accurate results analysis.

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Using Borland SilkTest, SmartSignal has implemented automated testing for more than 400,000 lines of code. There is just one test plan for each of SmartSignal's products. Each test plan includes up to 4,000 test cases constituting more than 100 man hours of testing and runs overnight, unattended, across multiple Borland SilkTest execution machines, to validate daily builds. Using a report generated by SilkTest using a custom script written by Cerny, each morning the team reviews the status of the tests and determines if defects exist, which are then imported into SeaPine TestTrack Pro for defect tracking and cross-referenced back to defects identified in each test plan. The test results report is then shared with management to provide visibility into product quality and release status. Cerny estimates he has saved more than 78 man days each week leveraging Borland SilkTest, which translates to fifteen times faster testing using the tool.

Cerny continued, “The adoption of Agile methodologies is a key component of our ability to deliver the highest quality of product for our customers. Without Borland SilkTest and the ability to automate the testing cycle of our daily iterations, we simply couldn't keep up.”

100 percent reduction in rework through automation with one set of test cases

Borland SilkTest has enabled SmartSignal to virtually eliminate the rework associated with rewriting test cases by enabling the team to test its products across all supported environments, platforms and locals using a single set of test cases, which makes it dramatically easier and faster to test its products. Borland SilkTest's flexibility makes it easy for the QA team to extend the product to accommodate variable locals, platforms, third party controls and custom objects, and makes it easy to create interfaces with third party technical computing languages, such as The MathWorks MATLAB, a high-level technical computing language and interactive environment for algorithm development, data visualization, data analysis, and numeric computation.

10 times faster structure creation with improved consistency and customer care

With the implementation of Borland SilkTest for automated functional and regression testing well under way, Cerny looked for new ways to leverage the tool to optimize efficiency in other areas of the engineering function. By using Borland SilkTest to automate the structure creation process, Cerny is helping the engineering team to improve speed of service to customers and improve the consistency of the machine modeling process.

Engineers use Microsoft Excel to manipulate data models for application design. The information is then converted into an ASCII text file and uploaded to Borland SilkTest to create the structures which are then delivered to customers.

For example, if the engineering team is working on a model for a steam turbine in a coal plant manually, creating the model of the machine and delivering a structure to the customer would have taken 16 to 24 man-hours. Using Borland SilkTest and an automated process, the structure can be created in just one to two hours, or ten times faster.

By applying Borland SilkTest to this aspect of the engineering function, SmartSignal is not only speeding deployment of the end product, but it eliminates the element of variability of the manual processes. Consistency has improved dramatically, which boost overall product quality.

Phil Fleisch, plant service center manager at SmartSignal stated, “The Quality Assurance team at SmartSignal has really changed the way we operate in engineering through applying ingenuity to how we configure our products for customers. Using Borland SilkTest to automate the structure creation process has enabled us to literally save man-years of work and more importantly, improve consistency and eliminate the risk associated with variability created by manual processes.”

Borland is the leading vendor of Open Application Lifecycle Management (ALM) solutions - open to customers' processes, tools and platforms - providing the flexibility to manage, measure and improve the software delivery process.