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Philips Modernizes Defect Tracking Capabilities with Deployment of Rational ClearQuest

While professional software testers are paid to relentlessly expose software bugs, their efforts often pale in comparison with the impromptu "testing" done by the average consumer. Consumers plugging in a brand new television receiver, set-top box, or any other home electronic device expect it to work perfectly in ways often unimagined by manufacturers. And when defects in the embedded software cause problems, consumers are likely to voice their displeasure by either bad-mouthing the product or switching brands. In a rapidly growing, hotly competitive marketplace there's enormous pressure on manufacturers to design and ship products with flawless embedded software. Rational ClearQuest™ tracks and manages every type of change throughout the software development lifecycle, helping organizations deliver quality software, more predictably.

Philips ASA Lab Develops Software for Next-Generation Consumer Products

Philips, the Dutch technology giant, is a brand well known to consumers around the world for televisions, stereos, VCRs, mobile phones and a growing line of set-top boxes and other "e-devices." ("e-device" is a term to describe devices such as Internet-enabled television receivers, set-top boxes, mobile phones, pagers, digital assistants, etc. that people use or soon will use to access the Internet.)

The Philips ASA Laboratory in Eindhoven, the Netherlands, is a primary research and test facility for the hardware and software components of the company's burgeoning home electronics and e-device product lines. Current products in development include flat panel video displays, high definition television receivers, set-top boxes for TV-platformed Internet access and DVD recorders. Of the 500 people working at the lab, approximately two-thirds are involved in software development and testing.

Quality is key to the entire operation, with software defect and change tracking a critical component of quality assurance. "Defect and problem tracking in the software development process is vital to our business," said Wim Geerdink, leader of the management group for tools used by the software development teams. "All our products are dependent upon their embedded software. Without accurate, reliable and flexible defect tracking process and tools we can't guarantee the product quality that our customers have learned to expect from us."

Replacing the In-House Defect Tracking Tool

For several years the Philips lab had been using a software defect tracking tool developed in-house. While adequate for some time, the tool's deficiencies eventually caught up with it in the form of non-Y2K compliance, inability to evolve in a manner reflecting current state-of-the-art techniques, and inability to integrate with other tools in use by the lab.

Rather than invest the considerable time and effort necessary to develop a new tracking tool of its own, Philips looked for a customiz-able off-the-shelf solution. "We had been successfully using Rational ClearCase® as our configuration management tool for several years," Geerdink recalled, "so it was natural for us to consider other Rational tools. When we looked at everything Rational ClearQuest™ offered: flexibility, easy customization, a Web interface and integration with other Rational® Software tools, it just made sense to go with it as our new defect and change tracking tool."

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Rational ClearQuest Adapts to the Way People Work

Philips began implementing Rational ClearQuest at the Eindhoven laboratory in January 1999. Quick implementation and widespread user acceptance were significantly enhanced by ClearQuest's flexibility. Instead of having to relearn an entirely new method for tracking defects, the Eindhoven staff found that the new tool had been tailored to emulate the old one, only with more capabilities and more reliable performance.

"One of the Rational ClearQuest characteristics which we benefited from immediately was its ease of customization," said Geerdink. "We could easily customize it to our existing process, which we felt worked very well. This made it easy for our developers to move up from our in-house defect tracking tool to ClearQuest. And as we continue to optimize our defect tracking process, we can continue to customize ClearQuest to reflect this optimization. For example, we work closely with our developers to minimize the number of data fields they have to fill-in to get a particular task done. ClearQuest can adapt to these kinds of changes very quickly, helping us improve end-product quality," he elaborated.

Another important Rational ClearQuest benefit to Philips is the tool's built-in flexibility. Geerdink noted the value of being able to use slightly different defect tracking processes for different projects: "All projects are different and that means that we would like to change the defect tracking process as needed. ClearQuest allow us to do that."

Versatile, Comprehensive, Web-enabled for Better Defect and Change Tracking

One challenging aspect of defect tracking at the Philips lab is the use of both UNIX and Microsoft Windows NT platforms by different development teams. Because Rational ClearQuest can work effectively in this sort of increasingly complex development environment, many of the lab's past problems associated with platform-specific defect tracking have been eliminated. ClearQuest also supports Oracle databases on Solaris and HP/UX, providing even more options for developers.

Philips is benefiting from Rational ClearQuest's comprehensive metrics and reporting capabilities. Geerdink noted that current projects at the ASA lab rely strongly upon ClearQuest's customizable reporting and charting capabilities. In the future, more specific information will be extracted from ClearQuest for even better project control and planning. "For example," Geerdink pointed out," a metric giving the number of time that a particular source code or file was updated within a specific period will help us concentrate the review activities on those documents or files. This will most likely result in better quality in the weak areas of the system being developed. And as we develop larger and more complex projects with a number of other Philips sites, good tool support for metrics collection and reporting will be a must."

Another Rational ClearQuest capability which Philips is already taking advantage of is the product's built-in Web interface for supporting geographically distributed, software development. This powerful feature allows multiple test sites to share defect tracking data through the Internet. Geerdink noted that the Web interface has proved itself invaluable on two recent projects: "Without this feature, the remotely located teams wouldn't have been able to communicate their change requests easily between sites. We know that a good Web interface is essential in our varied and multi-site development environment. We looked at other tools and found the ClearQuest Web interface to be the best."

Preparing for Unified Change Management

Rational tools are characterized by their tight integration with one another, streamlining the development process to shorten development cycles. Such cross-product integration exists for Rational ClearQuest, which is not only integrated with Rational's ClearCase configuration management tool but is also part of the Rational Suite™.

The Rational ClearCase and Rational ClearQuest integration provides the foundation for a new, out-of-the-box, intuitive change management process Rational calls Unified Change Management (UCM). UCM organizes work around activities and components rather than volumes of source code, binaries, executables and other development artifacts. By working at the activity level, users can implement one change across an activity, rather than multiple changes across a set of file versions. UCM provides a logical, intuitive and more efficient process for tracking and managing changes throughout a project's development cycle.

Philips sees UCM is a solid and sensible growth path. "Efficient change management process support is, in our opinion, the most important issue," says Geerdink. "With the introduction of UCM functionality with Rational ClearCase 4.0 and Rational ClearQuest 2.0, our current models can be replaced by an 'out-of-the-box' model which gives us the great advantage of reducing our maintenance effort on our customization. We see the introduction of UCM as the most valuable improvement to our configuration and change management process."

Easy Conversion, Improved User Interface

Rational ClearQuest is now an established part of Philips' consumer electronics software development program, having proven itself to be reliable, easy to use and flexible. Geerdink noted that migrating data from the old defect tracking tool to ClearQuest was very easy. ClearQuest's customizability allowed Philips engineers to add or delete data fields as necessary so that the old system data could be easily mapped to ClearQuest.

The developers are also happy with Rational ClearQuest's user-friendly interface. "Rational ClearQuest has a very much improved user interface for both the Web and the Windows client," noted Geerdink. "It's much better than what we used to have and it makes the user interface on other products seem old-fashioned. In my opinion, ClearQuest has the most advanced user interface on the market and that's important to me and to our developers who use the tool everyday."

Moving Towards Ever Higher Quality at Internet Speeds

The Internet is clearly the driving force behind Philips' consumer electronic products. Indeed, every product in development is intended to provide users with some form of Internet-related functionality.

As a company focused on e-business and e-devices, Philips is feeling the tremendous pressures created by the "e-software paradox." This dilemma states that for a company to successfully compete it must not only develop very high quality software but deploy that software at "Internet speed."

The pressures are particularly intense on laboratories like the Eindhoven facility where there is essentially no room for error with software designed for consumer products. The pace of change complicates matters even more. "Every one to two months something is different in our market," says Geerdink. "The products are changing, the customers are changing and our developers have to modify and remodify their software. It's a very tough struggle."

Fortunately Philips is able to stay ahead of the curve through Rational tools such as Rational ClearQuest. In fact, ClearQuest is already helping Philips dramatically improve its quality rating in the short term since its deployment. "ClearQuest's many features and capabilities will become increasing valuable as we move towards the highest CMM level," noted Geerdink. (SEI CMM is a method of measuring process maturity where level 1 is the least mature and level 5 is the most.) "Such process maturity increases our quality, competitiveness and time to market. In today's business environment, in this industry in particular, you just can't afford to ship products with software defects."

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About Rational

Rational provides a software development platform that improves the speed, quality, and predictability of software projects. This integrated, full life-cycle solution combines software engineering best practices, market-leading tools, and professional services. Ninety-six of the Fortune 100 rely on Rational tools and services to build better software, faster. This open platform is extended by partners who provide more than 500 complementary products and services.

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