

Industry:
Utilities & Telecommunications

Organization:
Philips Consumer
Communications

Description:
Philips Consumer Communications (PCC) is a Business Group of Philips Consumer Electronics, a division of Royal Philips Electronics, which is headquartered in Amsterdam, the Netherlands.

Business Problem:
Philips PCC needed a way to manage, develop and test multiple layers of the same tele-communications software that was being developed by geographically dispersed teams.

Rational Solution:
Rational Test RealTime

Key Benefits:
Enabled PCC to save time by making it easy to manage parallel, distributed development

Relieved PCC development of the burden of building and maintaining their own tools

Rapidly improved quality with easy-to-adopt, easy-to-use tools

Enabled PCC to develop and deliver high quality telecommunications software

Rational® software

Philips Consumer Communications Enhances Its Ability to Deliver Highly Stable Software Using Rational Test RealTime

Philips Consumer Communications (PCC) is a Business Group of Philips Consumer Electronics, a division of Royal Philips Electronics, which is headquartered in Amsterdam, the Netherlands.

PCC has around 7,000 employees in dedicated development, engineering, manufacturing, marketing, distribution and sales operations worldwide.

PCC offers the most comprehensive product range of its type from any one manufacturer. These include cellular phones, digital and analog cordless phones, corded phones, answering machines and fax machines.

PCC products benefit from Philips' strengths in specific areas, such as speech technology by Philips Speech processing, and product and interface design by Philips Design.

The headquarters of PCC are located in Paris and the center of excellence in Le Mans, France, where expertise in design, manufacturing and marketing is concentrated.

PCC was founded in January 1996 to meet the fast-growing demand from consumers and businesses for mobile communications. PCC is a growth engine within the Philips high-volume electronics divisions, acting as a source of system know-how and as an enabler for integrated wireless communication solutions. With the spectacular growth of mobile communications, PCC believes that the next wave of development of the Mobile Information Society will be Mobile Internet. By leveraging its broad technology base in wireless communications and related key components, PCC intends to play a leading role in the expected explosive market growth in the coming years.

Software.... The essential component in the telephone industry

The design and development of phone systems involves the coordination of between 20 or more different departments in a company: design, software, validation, hardware, mechanical design, quality, marketing, manufacturing process, etc. The role of software in phone systems has increased to the extent that it now accounts for 50% of all mobile phone development. Software is made of several layers that manage, from bottom to top, communication between the protocol and hardware, signalling, application and man/machine interface.

The separation between these layers allows several development teams to work in parallel: each team works on a layer and provides the source code, documentation and test results to the team in charge of the integration.

Embedded software development at PCC follows the classical software engineering lifecycle: start with general specifications, then move to detailed requirements, coding, testing of individual units and testing of the integration, and finally, product acceptance. In order to improve development and manufacturing quality, PCC uses the Capability Maturity Model (CMM) level 2 and is working to achieve level 3.

Rational Test RealTime, the standard product for PCC software development

Since the transfer of numeric phone activities to Le Mans in 1995, standard software tools have progressively replaced the existing proprietary tools used within PCC. PCC chose Rational® Test RealTime for their software testing solution. Bertrand Hardy, Methods and Tools Manager in the Le Mans Development



Centre, lists the three main reasons that led PCC to this choice: "first of all the use of external tools relieves PCC of the burden of developing and maintaining their own tools; secondly these tools are powerful, very well adapted to the constraints of the telecommunications market. Finally, these tools are stable and their evolution is well managed; this enables development teams to share their respective knowledge even if they are geographically dispersed."

The Unit Testing feature of Rational Test RealTime was chosen in 1996 to write regression tests to check the reliability of an embedded operating system. Today it is used to test the basic pilots which manage the different equipment (battery, power supply, sound, screen) in the lower layer levels. Rational Test RealTime Unit Testing enables the systematic deployment of standards.

The System Testing feature of Rational Test RealTime was introduced at PCC in 1997 for the testing of protocol layers — which is the core activity of PCC. The objective was to generalize the use of Rational Test RealTime System Testing feature especially its systematic use at all development levels. Rational Test RealTime System Testing has been successfully used on several small protocol projects including the infrared telephones. It was also used by Development as a quality indicator for protocol layers which had been subcontracted to other Philips labs. Rational Test RealTime System Testing is also being used by the team producing the DECT product (wireless fixed phones).

Rational Test RealTime System Testing feature use within the GPRS project (General Packet Radio Service)

Rational Test RealTime System Testing was selected as a core feature within the PCC testing strategy with the GPRS project. This project represented a major evolution of the protocol layers and involved several development teams. A "V" development cycle including unit testing performance is applied to the development of each layer. The duplication of each layer leads to a significant number of events and enables testing while sending stimuli to simulations running under Unix. One of the teams develops test cases, executes them

and makes a comparison between the execution results and the expected ones. The strategy consists of making sub-system partial integrations at a specific level: when the tested layers are integrated, test cases using Rational Test RealTime are applied to the upper level.

The Rational Software support team in charge of Rational Test RealTime Unit Testing and System Testing features were responsive and efficient in handling support inquiries. Additionally, enhancement suggestions made by PCC were always evaluated by Rational and some were even incorporated in subsequent releases.

Denis Chaton, GPRS project software team manager, summarizes his satisfaction: "In the GPRS project, the Unit Testing and System Testing features of Rational Test RealTime enable us to gain time by making parallel team management easy. The use of these components improves traceability and quality assurance. As the GPRS project included the implementation of a new technology with a large team, the use of such components is of a great use to project management. Without this product we would not have been able to reach such a high-level stability".

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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