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Rational software

Computing Devices Uses Rational Software to Cut the Software Development Cycle

Information continues to be a key competitive advantage in almost every industry. For Computing Devices International, it is not just information. Computing Devices' mission is to provide end-to-end solutions delivering mission-critical information on demand anytime, anywhere.

As a leading defense electronics and information integration company, Computing Devices develops everything from military tactical command, control, and communications systems to intelligence-related tools and technologies. In the fierce competitive environment of defense contracting, Computing Devices had become concerned about its ability to deliver consistently high-quality products on schedule and on budget — a capability that becomes even more essential as the company expands into new markets. Today, thanks to software development tools from Rational® Software, Computing Devices has been able to reduce its software development costs by 33 percent while also improving quality. These improvements are passed on to Computing Devices' demanding customers, enhancing their ability to deploy powerful techniques to deter and defend.

Computing Devices Focuses on the Process

The sophisticated systems that Computing Devices develops for its customers are highly dependent on software that has to be designed to stringent requirements. Computing Devices first turned its attention to the process of writing safety critical software.

Different business units within the organization were using a variety of tools based on structured design, or "waterfall" methods. The development process was consequently slow and lacked a consistent approach. This in turn, led to slipped deadlines, higher costs, and software quality that did not always meet Computing Devices' high standards. Computing Devices realized it needed to take action, and fast.

As Steve Wilding, lead software architect puts it, "Although we were delivering on our contracts, it was clear that we needed to fix the software development process in order to remain competitive. The key for us was to acquire a set of tools that would provide the organization with a standard, comprehensive design environment based on an iterative design approach."
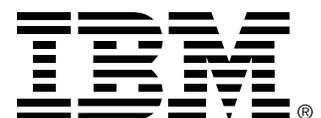
The Rational Solution

After considering the wide range of products on the market, Computing Devices selected Rational Software. Several factors led Computing Devices to select Rational and both its Rational Rose family of software tools and Rational Apex. According to Wilding, "Besides its reputation as a leader in object-oriented tools, Rational had all the right elements we were looking for: a fully integrated, round-trip software development environment, strong support for the iterative design approach and Booch methodology. The tools are supplemented by excellent training, consulting and support services." To date, Computing Devices has deployed Rational products in three areas:

- image processing ground stations developed in Ada and C++

- custom-embedded airborne reconnaissance management systems

- stores management systems (avionics) programs

Design is the Key to Managing Complexity

The inherent complexity of the systems developed by Computing Devices mean that extensive customer involvement and a strong emphasis on design are imperative. These are two areas where Rational excels. Rational Rose, which includes design tools for a variety

IBM

of languages, allows Computing Devices' developers to graphically model the system requirements as well as the business objects. Rational Rose also helps the developers construct the architecture of the software systems necessary to fulfill those requirements. Rational Rose then automatically creates, from the graphical model, parts of the detailed source code that will make up those software systems.

Rational Apex is also proving to be an important tool for software integration and release. Much of Computing Devices' software development involves teams of developers working on individual modules in separate locations. Rational Apex provides the development organization with an integrated software engineering environment that supports geographically distributed development teams working in parallel. The product also includes configuration management and version control to help Computing Devices' teams develop, build, and release software reliably.

"Rational's iterative design approach is crucial for us in matching the software to rigorous requirements, from prototype to product release," says Wilding. "Rational products form the basis of our software development process, both here in the U.K. and in Canada. With Rational, we have a standard software process and methodology that supports our diverse product line and the mixed language environment, such as Ada and C++."

Streamlined Cycle Provides Computing Devices the Added Edge

Since deploying Rational products, Computing Devices has been able to cut the software development process down to 19 months — a dramatic reduction from the three to five year cycle which has been typical in the defence industry. Computing Devices believe they will be able to shrink the cycle to 12 months or less. "A great deal of our streamlined process can be attributed to a renewed focus on deliverables and sound software engineering design supported by Rational Rose," says Wilding. "However, Rational's tools have also enabled us to expose and eliminate non-value added tasks. And because the artifacts and objects are online, our paperwork load has dropped significantly."

Consequently, Computing Devices' development and release costs have come down 33 percent, releasing precious skilled staff to work on more programs as the company grows. Software quality is up, and so is customer satisfaction.

Looking Forward

The defense industry is only now benefiting from the global move from analogue to digital technology. As a result, things are changing fast in Computing Devices' traditional markets. Wilding cites an example, "Everything's going digital because information now plays such a dominant role. The good news is we're far along the digital learning curve."

One particular area that will help Computing Devices gain an edge in securing contracts as well as continue to complete software projects on and ahead of schedule is reusable software.

"We're focusing a great deal on reuse. Now, we just need to keep doing what we do best — creating high-quality information solutions for our customers. And I'm sure Rational will continue to play a big role in this mission," concludes Wilding.

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.