

Industry:
Hardware/Software

Organization:
Rational Software

URL:
www.rational.com

Business Problem:
Rational's original Web site, based on a proprietary infrastructure, offered limited scalability, lacked reliability and provided inadequate back-end integration with their CRM and financial systems.

Rational Solution:
Rational ClearCase, Rational ClearQuest, Rational RequisitePro, Rational Rose, Rational Suite TestStudio, Rational Unified Process and Rational e-development Services

- Key Benefits:**
- Enabled Rational to provide faster response times, easier navigation, improved shopping and personalization experience for its customers
 - Provided Rational with 99.999 percent site availability as well as the latest in disaster recovery and security
 - Enabled Rational to meet tight development deadlines and launch the new site on schedule
 - Gained worthwhile experience using own tools in an intensive development environment which will be shared with internal product development teams to enhance future product releases

Rational Utilizes Its Own Software Development Solution to Launch a High-Quality e-Business Site

"What was cutting edge in 1997 is no longer applicable today," said Christina Howe, Rational's Director of i-Net Services, commenting on the sweeping changes that Rational has made to its Web site. Rational® Software realized its Web site did not measure up to its own high standards as the industry-leading e-development company. In order to meet the current needs of its customers and rapid company growth, Rational concluded it was time to rebuild the entire site, looking no further than its own Rational Suite of software development tools to accomplish the initiative. The complete site overhaul was an opportunity to showcase Rational's own e-development solution in a demanding implementation environment.

Rational's new and improved company Web site went live August 14, 2000 on schedule after two and-a-half months of intense development. The site, www.rational.com, which included more than 5,895 Java Server Pages; 8,000 pages of static content; and 14 Enterprise Java Beans supporting 14 new application subsystems, utilized more than 100 reusable design patterns and Java components for the design and implementation. The site was seamlessly integrated with existing back-office systems within the same timeframe — dramatically improving its e-commerce capability.

The Redesign

A number of factors prompted Rational's Web site redesign. The original site was based on a proprietary infrastructure created by an outsourced vendor that was no longer being supported. In addition, it did not scale to keep up with Rational's rapid growth and long-term business needs. Rational has two major software releases every year, occurring in Rational's FYQ1 and FYQ3. Rational set an aggressive delivery goal of less than three months in order to have the new Web site up and running well before the second release cycle. The site would also be used to feature Rational's annual User Conference, scheduled for the end of August 2000.

In conjunction with a team of Web developers and engineers specializing in Java development, Rational engaged Context Integration, a Burlington, Massachusetts-based Internet professional services firm to assist in the systems integration of the Web site.

Tight Time Frame

Context, a member of Rational's Unified Partner Program, utilizes a development methodology that is based on the Rational Unified Process™ (RUP®). RUP is a Web-enabled software engineering process that enhances team productivity and puts the experiences of thousands of projects in the hand of each project member. The Context and Rational teams used RUP to develop guidelines, templates, and examples for all critical phases of the Web-site development. RUP is tightly integrated with Rational tools, which allowed the development team to take advantage of the Unified Modeling Language (UML), software automation and other industry best practices.

"We had a very tight time line for a complex project," said Matthew Burnett, Context's project manager for the Rational Web site redesign. "When developing software this fast, it is essential that you follow the Rational Unified Process principles. Because we were working from a shared vision and using the Rational Unified Process, the Inception and Elaboration phases went smoothly."

Burnett said that RUP enhanced communications between all the developers and engineers by providing each team member with one knowledge base, one modeling language, and one view of how to develop the content and infrastructure software to support the Web site.



From Inception to Construction

During the Inception phase of the new Web site development, Context performed a comprehensive evaluation of the application and a thorough technology assessment of personalization servers currently on the market. After a server was selected, a four-week elaboration phase began. This phase included developing a prototype of the site and determining the site's software architecture using Rational Rose®, Rational's market-leading visual modeling product.

"We used UML with Rational Rose" from Inception to the end of Construction," said Burak Akbulut, Context's technical architect. "During Inception, we analyzed and documented the user requirements and Use Case requirements using Rational RequisitePro® and Rational Rose. During the Elaboration phase, we used Rose for the analysis and detailed design of the system."

Akbulut explained that with the use of the UML, the whole team was able to understand and provide feedback on the overall architecture of the system. Rational Rose saved a significant amount of time during the construction stage with its automatic code generation feature.

Rational ClearCase® was used as the configuration management solution and Rational ClearQuest® for defect tracking and workflow management. Particularly useful was ClearCase's versioning functionality including the ability to store all aspects of each version. The combination of Rational ClearQuest and Rational ClearCase provided the Rational team with a single, comprehensive platform for efficient Web content and code management.

Rational ClearCase stores all project work in a shared, versioned database. By accessing this repository, teams of developers can work on related development activities simultaneously. The centralized repository allows team members to check out parts of the project and work on them in their own private workspace. These private workspaces are highly flexible — content contributors can either view their work in relation to changes made by other team members or keep their work isolated until all changes are complete and checked in.

"Our team was highly cross-functional — it included content developers, designers, Web developers, and software engineers all working in concert," said Howe. "All members had access to the assets stored in the Rational ClearCase database. It gave our team managers a clear understanding of what they needed to control by specifying precisely what would be in the Web site and what would not be included."

Howe said that because team members were physically located on both the east and west coast, Rational ClearQuest was used to provide browser-based defect and change tracking. Rational ClearQuest, with its Web interface, proved invaluable for coordinating the efforts of the geographically distributed team members.

Overcoming the Hurdles

Even though the Web redesign team was confident they could make the tight development schedule, they faced several significant hurdles. The Web design and content development team was used to working with HTML, GIFs, and JPEGs, but Rational ClearCase was a brand new tool to them. Rational consultants provided on-the-job training and held classroom sessions to bring the team up to speed on how they could use Rational ClearCase to manage Web content.

"Once the entire team reached a core competency with Rational ClearCase, everyone really appreciated the structure it brought to the development effort," said Howe. "We never could have made our rapid deployment target without it."

Howe continued, "I now look forward to using Rational ClearCase technology as part of the new Rational Suite® ContentStudio, which also includes Vignette's V/5 Content Management Server. The integrations between these tools will make our job even easier the next time around. It provides an exceptional level of control over the combined management of Web code and content."

Clearly spelling out all the Web site's high-level requirements using the Rational Unified Process and Rational RequisitePro® were essential factors in the project's success. Rational ClearCase and Rational ClearQuest combined with Rational Unified Process provided the structure needed to meet the short project time frame. Within that structure, Context and team

"Once the entire team reached a core competency with Rational ClearCase, everyone really appreciated the structure it brought to the development effort," said Howe. "We never could have made our rapid deployment target without it."

were able to use a rapid prototyping methodology that was particularly critical when tackling the highest risk points, such as the back-end integration of the Web's e-commerce capabilities with the Rational legacy infrastructure.

Testing the Site

Rational Suite TestStudio™ proved invaluable in testing the new Web site. This solution contains Rational RequisitePro®, a best-of-class requirements management tool, which allowed the testing team to access the project's requirements and create their own test requirements and plans.

"As we moved into the load testing phase, we used Rational Suite TestStudio tools to record GUI users for basic functional testing and to create Virtual Users for load and performance testing," Burnett continued. "This was especially valuable in developing the e-commerce site — we were able to record a wide variety of test cases that could be rapidly executed at any time during the development cycle. Integration of this kind can be frustrating to achieve in that it involves a highly repetitive process of 'test and fix'. We had to repeat this process many times to verify integration with the back-end systems. Rational Suite TestStudio regression-testing capabilities allowed us to quickly regenerate and run all the scenarios after we corrected an error in order to be sure that a bug fix didn't break the rest of the site."

Due to the tight development schedule, the team conducted load and performance testing even before the production environment was completed. Based on Rational's previous Web site statistics, the team was able to profile the site's projected user base.

The popularity of Rational's site became evident as construction on the new site got underway. The previous Web site had received 19.5 million hits and provided 2.2 million page views on a monthly basis. The average page views per day were 75,838.

With the user profiles and patterns clearly defined, the team then generated a set of virtual user groups that performed various virtual activities — for example, one group simply browsed the site, while another used its e-commerce capabilities.

"Once we had our user profiles scripted, we were able to begin load and performance testing in our staging environment," Burnett said. "Rational Suite TestStudio allowed us to discover

and address performance bottlenecks in a controlled and iterative fashion. We moved into production far ahead of where we would normally be given a development process as complex as this one."

Rational e-development Services

Having the overall training and support from day one of the development lifecycle through Rational e-development services saved a significant amount of development time and resulted in a much smoother implementation. As specific issues came up during the course of the project, the team was able to depend on the help of Rational consultants and Technical Support.

"Rational e-development Services was part of the solution from the very beginning of the project. This was crucial in accelerating the implementation and meeting our deadlines," said Burnett. "Training and support transferred knowledge to the entire team. We not only received the short-term benefit of accelerating this particular implementation, but we now have a broad set of skills that we can use for future developments."

Burnett added, "As we began using Rational Suite TestStudio, we received a significant amount of training from consultants who transferred knowledge about the testing process helping us use the tool quickly. Technical Support also provided quick problem resolution whenever needed. Without Rational e-development Services, we would not have met our tight deadline."

Going Live

The new Web site offers several benefits to Rational customers. Ease-of-use is significantly improved as well as Web site response time. In addition, a high-level of personalization has been added to improve the customers' overall shopping experience. Visitors can now obtain individualized content — for example on support issues or information on appropriate courses and schedules at Rational University.

Since the launch of the new Rational.com site, 70,000 people have registered and established profiles to receive personalized content. In addition, the new Web site currently generates 3,882,225 page views per month, a 76% increase in page views from the previous version.

"Rational Suite TestStudio allowed us to discover and address performance bottlenecks in a controlled and iterative fashion. We moved into production far ahead of where we would normally be given a development process as complex as this one."

About Rational Software Corporation:

Rational Software Corporation® (Nasdaq: RATL), the e-development company, helps organizations develop and deploy software for e-business, infrastructure, and devices and embedded systems through a combination of tools, services and software engineering best practices. Rational's e-development solution helps organizations overcome the software development paradox by accelerating time to market while improving quality. Rational's integrated solution simplifies the process of acquiring, deploying, and supporting a comprehensive software development platform, reducing total cost of ownership. IDC has recognized Rational as the revenue leader in multiple application development and deployment markets for four years in a row. Founded in 1981, Rational, one of the world's largest software companies, had revenues of \$754 million in its twelve months ended December, 2000 and employs more than 4,000 people around the world. Rational is a component of the Nasdaq-100 Index®. Additional information is available on the Internet at www.rational.com

Rational[®]
the e-development company™

Dual Headquarters:
Rational Software
18880 Homestead Road
Cupertino, CA 95014
Tel: (408) 863-9900

Rational Software
20 Maguire Road
Lexington, MA 02421
Tel: (781) 676-2400

Toll-free: (800) 728-1212
E-mail: info@rational.com
Web: www.rational.com

International Locations:
www.rational.com/worldwide

"Site availability has also been improved. The Web site is being run out of the new Rational data center in Boulder, Colorado," said Howe. "At the data center we have IBM host that is providing us with 99.999 percent availability as well as the latest in disaster recovery and security."

Howe said that after the site went live, the development team continued to use Rational Suite TestStudio to test and resolve some problems that cropped up. "It was very helpful to have all our virtual users scripts already created to load test the site, identify any problems, and be confident that the fixes did not cause further problems."

"The development process was a unique opportunity to get to use our own products in an intense Web development environment," she concluded. "We're very pleased with the results and the fact that we were able to launch the site on schedule despite the tight development timetable. Using Rational tools to develop the Rational Web site made all the difference."

Rational, the Rational logo, Rational the e-development company, Rational Rose, ClearCase, ClearQuest, RequisitePro, Rational Suite, Rational Unified Process, RUP and TestStudio are trademarks or registered trademarks of Rational Software Corporation in the United States and/or other countries. All other names are used for identification purposes only and are trademarks or registered trademarks of their respective companies. ALL RIGHTS RESERVED. Made in the U.S.A.

© Copyright 2001 by Rational Software Corporation.

CS-315 Subject to change without notice.