Industry:
Education

Organization:
ecampus.com

Description:
ecampus.com is a virtual college bookstore selling books and textbooks in current and future formats, college emblematic apparels, other men's women's and children's apparel, electronics, computers, office and general supplies, music, and gifts.

Business Problem:
Develop and deploy an e-business application in six months to meet back-to-school marketing window and facilitate communications between widely dispersed developers and testers.

Rational Solution:
Use Rational Suite PerformanceStudio, Rational ClearCase, and Rational ClearQuest to successfully launch a scalable e-business venture.

Key Benefits:
- Synchronize development efforts between all members of a geographically distributed development and testing team
- Centrally manage all Web development, content and test artifacts in a secure and scalable repository
- Automate manual testing operations
- Speed development by identifying defects during the early stages of development
- Use regression testing to ensure application accuracy at every stage of development

Technical Architecture:
Software: Oracle Application Server 4.0.7; Oracle 8.05 Enterprise database software
Hardware: Sun Solaris servers
Number of ecampus.com Developers: 17
Number of ecampus.com content providers: 12
Number of Oracle Developers: 3-4
Number of Testers: 4-5

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Rational Helps ecampus.com Launch a Unique Online, Virtual College Bookstore in Record Time

Even in the accelerated world of "Internet time," the launch of the electronic business venture known as ecampus.com took place at breathtaking speed.

ecampus.com was born on January 20, 1999 when ten people — including three executives from Wallace's College Books Co., the third largest college textbook sellers and several consultants from Oracle Corporation — met in Lexington, Kentucky to explore the possibilities of creating a faster, easier, and less expensive way for college students to buy textbooks and other merchandise.

Five months later, in time to meet the fall back-to-school rush, ecampus.com, the globe's largest virtual college bookstore, went live. One of the reasons ecampus.com was able to meet its ambitious target deadline was the efforts of a hard working team of developers and testing professionals armed with integrated software development tools from Rational® Software.

The ecampus.com Web site provides a fully-transactional, easy to navigate and highly innovative Web store for books and textbooks, apparel, electronics, computers, gifts and much more. Over 3,000,000 items are available.

"This is a very user friendly site," said Steve Stevens, president and CEO of ecampus.com. "The site, which features what we think is the first 'travelling book bag' on the Internet, requires minimal effort on the part of the customer and is designed to make the shopping experience easy and fun. The customer is in charge during every step of the buying process. Making all this possible is a team of technicians, content managers and customer service representatives dedicated to constantly improving the site and making it work for our growing base of customers."

In addition to its new book and textbook line, ecampus.com also buys used textbooks and allows its customers to download electronic books online. An online auction is becoming an increasingly popular feature of the site.

"We have partnership programs with the schools in order to provide on-line services," said Doug Alexander, ecampus.com Vice President of Strategic Planning and Development. "At the University of South Carolina, for example, ecampus.com has established a secure link with the school's registration system in order to match course materials to a student's class schedule on a course by course basis. Using the University's interface, the student simply loads his or her virtual book bag with new or used editions at discounted prices and electronically checks out. Our standard shipping is free."

Meeting the Back-to-School Deadline

Launching the ecampus.com Web site in time to serve the rush of college students returning to school called for a highly accelerated development effort.

"To meet both our time and quality goals, we added Rational Software products to our project toolbox early in the process," said Chris Gonzales, Director of Security for ecampus.com, formerly e-campus's Director of Quality Assurance. "We needed automated testing as well as configuration and change request management software that would facilitate communication and synchronize development efforts between our distributed team of developers and testers. Handling the complexity of a Web site with over three million items and a variety of interfaces we needed a reliable solution. I had worked with Rational products in the past so I was familiar with their capabilities. We evaluated other software, but Rational was the clear leader in providing complete development life cycle solutions, from requirements to testing and managing all our Web software artifacts. A big factor in choosing Rational Software was the tight integration of all its testing modules."

"It is the combination of all the Rational tools—Rational Suite PerformanceStudio, ClearCase and ClearQuest—that has allowed us to meet our ambitious development schedules and provide ecampus.com with a Web site that is working the way it should."

The technical architecture of the ecampus.com Web site was created using Oracle 8.05 Enterprise database software and Oracle Application Server 4.0.7. The company is also running several Sun Microsystems servers powered by the Solaris operating system. The application was written in Java, Java Script and HTML.

Gonzales said that when he arrived, a prototype of the Web site was already running, but most of the testing was being done manually, a time-consuming and error-prone process. Another problem that needed immediate attention was that the development team was a virtual one, working from various locations around the U.S. and even a few overseas locations. They had to coordinate closely with the ecampus.com developers located at the company's Lexington, Kentucky headquarters. Not only was the development team widely disbursed geographically, but they had stored critical Web site software artifacts, including use cases and project requirements, in a variety of locations. Communications between team members and the coordination of project data became a major priority.

▶ ecampus "war room"—development happening in Internet time.

Rational Suite PerformanceStudio and Rational ClearCase to the Rescue

One of Gonzales' first steps was to implement Rational Suite PerformanceStudio™— designed specifically for e-business —and import the program files containing these artifacts into a centralized repository.

"We decided on Rational Suite PerformanceStudio and Rational ClearCase® because the combination of these two tools met our life cycle requirements," Gonzales said. "For example, PerformanceStudio and Rational ClearCase have helped us improve communications between all the team members by linking all the team assets—requirements, plans, procedures, tests and results—in a single repository, with a single tracking system and a common user interface. Now we're all working with the same updated and accurate information. We can easily locate and reproduce defects, which is essential in the communications between developers and testers. Team members can retrieve detailed reports on requirements coverage, code coverage, defects and even specific team assignments and responsibilities.

"Fortunately, given the tight deadlines we were under, we implemented Rational Suite PerformanceStudio and ClearCase early in the development process," Gonzales continued. "PerformanceStudio allowed us to provide the developers with key information to make informed architectural decisions very early in the project life cycle. It allowed the QA team to find the defects up front, track defect resolution much more effectively, and retest subsequent builds. That included regression testing of the application to make sure that a subsequent fix didn't impact code that had already been written and tested."

Gonzales said the QA team used Rational Suite Performance-Studio to simulate usage on the site under various conditions, including hundreds of students logging on to take advantage of special promotions and sales. These stress tests uncovered problems that otherwise might not have surfaced until after the Web site was live.

"A lot of our testing has to do with basic functionality," said Gonzales. "When you click this button, does the proper GIF pop up; when you activate this link, does it take you where you want to go. With Rational Suite PerformanceStudio, we have been able to test this functionality under production loads using flexible, scalable scripts packed with variable input data."

Among the innovations in Rational Suite PerformanceStudio is WebSmart Recording which allowed ecampus testers to thoroughly test the site, which includes HTML, DHTML and Java, without special training, coding or consultants. "These capabilities allowed us to cut our testing time by at least one-third without having to rely on outside help," Gonzales commented.

Rational Suite PerformanceStudio's DataSmart Recording automatically identifies user input from recorded sessions that may need to be varied when a single recorded session is used to generate a load of hundreds or thousands of virtual users. Other features include LoadSmart Scheduling which allows testers to build complex usage scenarios without programming — using a few simple commands, load tests can be scaled from a few users to thousands, each performing various tasks. PerformanceStudio's TransactionSmart Analysis breaks down the transaction component by component allowing ecampus.com testers to pinpoint the precise location of bottlenecks.

Rational ClearCase and Rational ClearQuest On the Job

"In addition to meeting a very tight time schedule, our biggest challenge was communication—especially between the development and our testing teams. The Rational ClearCase software configuration management product and ClearCase MultiSite® which bridges the gap between distributed teams proved to be invaluable."

Rational ClearCase is the market-leading software configuration management product. A comprehensive solution for software configuration management (Rational ClearCase), distributed development (Rational ClearCase MultiSite), and defect tracking (Rational ClearQuest™).

"This was more than version control — we used Rational ClearCase MultiSite to coordinate our development and testing activities here in Lexington, across the country and even the developers located overseas," Gonzales said. "We created a common staging area that could be accessed by the developers, the content people and the QA testing team members. By using ClearCase MultiSite, we were able to streamline our communications and ramp up our development cycles in order to meet the July deadline. We knew that each release would be accurate and that every build would be audited, allowing our QA team to guarantee every build."

Rational ClearCase MultiSite is part of an integrated change management solution that supports both Windows and UNIX platforms. The software delivers automated, error-free replication of ecampus.com's project database and provides team members with transparent access to all software elements. In the event of a network failure, Rational ClearCase automatically recovers information stored in its scalable repositories. It scales easily to support projects regardless of the team size, location of its members, or platform usage. ClearCase has saved ecampus.com time and resources by only transmitting incremental changes that appear in its project repositories rather than an entire file.

 "Behind the scene, Rational ClearCase was performing automatic merges of files and directories, highlighting code conflicts and resolving inconsistencies," Gonzales continued. "Rational ClearCase is tightly integrated with other Rational products and allows us to track the defects that were fixed in

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each release. We knew that everyone was working with the same information and that the information was accurate."

Gonzales said that the development and testing team is using Rational ClearQuest to track and report on defects and other changes throughout the development life cycle. "All our content people, the developers, and the testing team are using the software to shorten our development cycles. Rational ClearQuest allows us to log bugs as they are found and email the information to wherever it's needed. Every week we have a meeting to review the bug list and categorize our problems by type — for example, Java, GUI, in the engine, and so forth — and then allocate the fixes to the proper people. Once our team members got used to working via email, they liked it a lot and productivity took an upward jump."

Rational ClearQuest is totally integrated with Rational ClearCase and Rational Suite PerformanceStudio and fully supports the Oracle software which forms the backbone of the ecampus.com Web site. "It is the combination of all the Rational tools — Rational Suite PerformanceStudio, ClearCase and ClearQuest—that has allowed us to meet our ambitious development schedules and provide ecampus.com with a Web site that is working the way it should," Gonzalez added.

Success Launching A Complex Site

"We set the bar pretty high in terms of going live with a highly complex site in a very short time," said ecampus.com's Alexander. "It was very exciting to move from a concept created by ten people sitting around a conference table to a live beta site in less than six months. The rapid development time allowed us to launch our national marketing program in mid-August and move into the school year with a very successful response from students at colleges around the country. We never would have made these tight deadlines without Rational ClearCase and Rational Suite PerformanceStudio."

"We're now in a combined maintenance and development mode," he added. "Even though ecampus.com is breaking new ground in this market, we have to continue to develop new and enhanced services to keep ahead of our competition and firmly establish our brand as the leading on-line supplier of text books and a wide variety of other merchandise that college students need. We'll be giving the Rational software a real workout as we grow our e-business in the months and years ahead. I know from experience, it's the one solution that will evolve with us as our demands change over time."