

**Industry:**  
Management and IT Consulting

**Organization:**  
Cap Gemini Ernst & Young

**Description:**  
Cap Gemini Ernst & Young, one of the largest management and IT consulting firms in the world, provides management consulting, systems transformation and outsourced IT management services.

**Business Problem:**  
Cap Gemini Ernst & Young needed a standard development process and standard lifecycle tools to: ensure consistent global delivery of software development services, reduce risk, control costs and ensure software quality.

**Solution:**  
Rational Unified Process, Rational Suite, Rational ClearCase and Rational ClearCase MultiSite

**Key Benefits:**  
Met client demands for consistently-delivered global services

Differentiated Cap Gemini Ernst & Young's services and improved their win-rate

Enabled better information sharing and development efficiency, resulting in reduced risk and costs

Delivered solution to meet client's precise requirements with no defects even after 5 months of use

Ensured more robust and flexible system architectures

**Rational** software

## Cap Gemini Ernst & Young Achieves Global Service Delivery Excellence with the Rational Software Development Platform

When your organization consists of 60,000 professionals across the globe, how do you ensure their ability to deliver consistent and truly global services from one region to another? That was the challenge facing Cap Gemini Ernst & Young's Colette Coad, Vice President for Global Delivery Excellence for the Advanced Development & Integration service line.

Cap Gemini Ernst & Young is a global organization that helps customers capitalize on the new economy by harnessing technology to not only survive, but thrive. Complex software development is at the heart of essential business solutions for the connected economy. When it comes to rapidly designing, developing and implementing these new software solutions, Cap Gemini Ernst & Young's Advanced Development & Integration (AD&I) service line stands ready with 16,000 people in Advanced Development Centers (ADCs) serving more than 40 countries.

"When we formed Cap Gemini Ernst & Young as a global organization, we promised our customers that they could count on us to deliver services in a seamless, predictable and consistent way across the globe. This is very important to them because consistent services reduce risk and help ensure project success. We applied the concept of consistency to nearly every aspect of our service—methodologies, tools, training, and even estimating and measuring projects and programs."

Coad turned to Rational Unified Process® and the Rational Suite® software development platform as standard tools to help the AD&I organization deliver with speed, quality and consistency. The Rational Unified Process, or RUP®, was evaluated and selected due to its market leadership, strong support for iterative development and ability to help deliver value to clients. Rational Suite was chosen as part of the standard tool set because it is an

integrated end-to-end solution that automates the development activities of the Rational Unified Process.

"The Rational Unified Process and Rational tools cut across many areas where we need consistency. These tools help us stand out as the organization who can deliver successfully. They have already been proven on over 1,100 of our projects."

### Common Tools, Common Process Ensure Global Consistency and Excellence

Cap Gemini Ernst & Young knew that a common process would serve as the cornerstone for delivering consistent and high-quality services across the worldwide Cap Gemini Ernst & Young organization. "We felt a common process was good, but it wasn't all that we needed to deliver on our promise of consistent and excellent services," Colette added. "So we formed a working group consisting of AD&I representatives from across the world to examine the software development lifecycle and select the standard tools that would be used in addition to the common process at each development stage."

The AD&I working group used four evaluation criteria in selecting their standard tools. Foremost, they wanted market-leading products. They also wanted products that were cost-competitive and supported globally. Finally, the team felt that integration between products across the lifecycle was important to delivering solutions with speed and quality.

"Based on our criteria, we felt that the Rational software development platform offered much of what we were looking for," states Colette, "so we said that if Rational had a tool, it would be the de facto choice. If people questioned or challenged the choice, then we would



“bake-off” the competitive tool.” Many of the Rational tools went unchallenged because they had already been used successfully on previous engagements.

### **Beginning with a Common Process: The Rational Unified Process**

Developing methodologies was at one time a core competency of Cap Gemini Ernst & Young, but is no longer, so they opted to purchase a proven software development methodology.

“Process is a proven accelerator for delivering systems,” asserts Colette. “If you have a project that spans London and New York, for example, the same methods and tools enable the teams to communicate and interact more easily, and thus better serve clients.”

“Rational Unified Process was the cornerstone of why we chose to work with Rational,” she explains. “As we looked at the landscape of available methods, we learned that Rational Unified Process is the leading methodology. We evaluated and purchased it as our standard process across all of our Application Development Centers (ADCs).”

The best practices of RUP help Cap Gemini Ernst & Young stay on track while delivering large-scale, highly integrated projects. Adding RUP and the Rational software development platform to their existing iterative development process enables them to generate more frequent builds and interim releases. Not only does this result in fewer defects, it also increases speed and improves their ability to deliver value to clients.

RUP has been successfully used across North America for two years and is now in the process of being rolled out to ADCs across the globe. “Overall, people have been excited about the fact that there is a standard way to develop software across Cap Gemini Ernst & Young,” concludes Coad.

### **Automating the Global Delivery Process with Rational Suite**

Once the AD&I team selected RUP, they needed to standardize on lifecycle development tools to support their objectives. They chose the Rational Suite software development platform because of its strong support for and integration with RUP. Cap Gemini Ernst & Young’s basic tool kit includes Rational Suite AnalystStudio™, Rational Suite DevelopmentStudio and Rational Suite TestStudio®, as well as Rational ClearCase® and Rational ClearCase Multisite to support distributed development.

Integration between tools in the development platform was also very important. “We were relentless in eliminating steps that added no value. Re-working or translating information as it moves between tools in a non-integrated environment slows us down, and our clients would not support such a process. Rational Suite is an integrated environment and this saves us time,” Coad explains. “When information is integrated and doesn’t have to be re-entered or translated, there is no room for misinterpretation, so we eliminate some errors before they occur,” she says.

Because the AD&I organization helps clients build solutions on the platforms they choose, they also looked for a versatile development environment. The Rational Suite software development platform supports accepted technologies such as Microsoft® .NET™, Java™ 2 Enterprise Edition and many others, and this helps Cap Gemini Ernst & Young to be flexible, yet consistent in their approach.

“When we announced to the AD&I organization that we had selected Rational Unified Process and Rational Suite, the reaction was overwhelmingly positive. Our people ranging from analysts to developers to project managers were happy. Rational Suite and the Rational Unified Process provide rigor and discipline throughout our process. As a result, we expect to see great productivity improvements,” she asserts, “and we think there will be a tremendous payback for us over the long term.”

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## Technology Leadership Makes the Difference

Cap Gemini Ernst & Young offers a unique technology focus in today's connected economy, where IT yields a strong competitive advantage. In particular, the Cap Gemini Ernst & Young Adaptive ITsm service helps clients "architect to evolve" by marrying business and technology strategies into an overarching IT infrastructure that is extremely adaptable to change, innovation and market opportunity.

"Complex software development is at the heart of business solutions required for the new economy. The Rational platform helps us differentiate Cap Gemini Ernst & Young as the organization that can deliver business solutions with consistency, speed and quality—in short, with excellence. We explain the advantages of our development solution during the sales process. Often, the result is an interesting discussion about how this improves the quality and speed of the project. When you couple this environment with our Adaptive IT approach, Cap Gemini Ernst & Young is often differentiated as being able to win the work and deliver it," Coad says.

In the future, Coad expects to move aggressively into distributed development and delivery to further differentiate Cap Gemini Ernst & Young and to enable clients' success. They plan to leverage their global network of ADCs and the Rational software development platform to power 24 x 7 global development schedules.

## PUTTING RATIONAL TOOLS TO WORK

### Rational Tools Reduce Risk, Improve Quality for European Client

Adrian Sheppard is Cap Gemini Ernst & Young's lead European architect for a major global client that is highly dependent on manufacturing processes. In addition to managing the client's IT strategy in Europe, Adrian is responsible for ensuring that new projects adhere to the established strategy and follow the defined development lifecycle which maps to the Rational Unified Process.

Development projects for this client are wide-ranging. One such project was to develop a hand-held device that would coordinate parts

for production runs. This n-tier system used hand-held devices, Microsoft Windows® NT servers, and thin clients with Microsoft Visual Basic® components. On this and other projects, the team is challenged with "reasonably tough" deadlines, budget constraints and distributed development teams.

"We use Rational tools to help us deliver results that align with customer expectations," says Sheppard. "The integration between tools in Rational Suite helps us reduce risk and ensures traceability between requirements and other activities on the project."

The Rational Unified Process helps Sheppard ensure coordination and consistency across the people who perform different functions on a project at different times. The practices of RUP, including developing requirements, building use cases, visually modeling a complete design, completing code, testing throughout the process, and managing change are followed on all projects for this client. "The hand-held device project used the RUP iterative development approach, which let us test early and validate the architecture sooner. This enabled us to gain better visibility with the customer and we got buy-in and feedback earlier in the process," explains Sheppard.

Sheppard had maintained requirements in Microsoft Word® documents, but found that they can quickly become unwieldy. He now relies on Rational RequisitePro® because it enables them to be structured and more easily managed as the project unfolds. Requirements can also be linked with other Rational tools and "downstream" processes which offers Sheppard the traceability needed to reduce risk on each project.

Based on system requirements, the team uses Rational Rose® to model use cases that describe what the system should do from the user's perspective. From these use cases, a complete system design—including sequence and class diagrams—is created in Rational Rose. On the hand-held device project, Sheppard's team employed the class diagram to generate a "first-cut" code framework, then imported it into Microsoft VisualStudio® where coding was completed.

"The integration between tools in Rational Suite helps us reduce risk and ensure traceability between requirements and other activities on the project."

“Cap Gemini Ernst & Young has a best practice to increase quality and reduce costs as part of its commitment to consistent service delivery. Rational tools help us achieve our goals. The integration between the tools help us share information, making us more efficient and helping boost software quality,”

“The software for the hand-held device project came out more quickly because we used good design methods and the integrated Rational tools. Not only were we able to prove the architecture before we got too far, but we were also able to identify and assess the impact of changes earlier in the process,” adds Sheppard. “Rational tools give us more control over the scope of projects and this helps us reduce risk, control costs and stay on schedule.”

When it came to configuration management, the project team had some challenges to contend with on the hand-held device project. Using a competitive solution, there were scalability limitations that slowed down development. They abandoned their previous solution in favor of Rational ClearCase which is now used on all projects. “Rational ClearCase definitely makes life easier given the complexity of most of our projects,” he says.

During development of the hand-held device system, the team was thrown a curveball. The version of Windows NT that was running on the client’s servers was upgraded. “Rational’s testing tools did a great job of identifying regressions and other problems that were the result of the server upgrade,” Sheppard says, “so we were able to maintain higher quality on the project even with the new operating system and we didn’t lose time.”

Adrian is particularly happy with the flexibility of the resulting designs and the ability to reuse components. While he does not foresee reusing code, Rational Suite enabled designs and frameworks to be easily adapted within and across projects. The architecture became more “plug and play”, enabling components to be quickly changed at lower costs.

“Cap Gemini Ernst & Young has a best practice to increase quality and reduce costs as part of its commitment to consistent service delivery. Rational tools help us achieve our goals. The integration between the tools help us share information, making us more efficient and helping boost software quality,” concludes Sheppard.

## PUTTING RATIONAL TOOLS TO WORK

### Building a Defect-Free Claims Processing System with Rational Suite

When a major global automobile manufacturer needed to automate a manual process for re-claiming the cost of warranty work from suppliers, they called on Cap Gemini Ernst & Young to build a system that would save time, ease communication with suppliers, and improve the balance sheet.

When warranty work is done on a vehicle, the auto manufacturer pays the dealer for parts and service and requests reimbursement from the supplier of the affected part. Supplier reimbursement had been a labor-intensive, manual process that resulted in slow collection of reimbursements and lack of information.

Steven Rogers, senior technologist, led a mixed team of Cap Gemini Ernst & Young employees and client employees to automate this process. The task was to build a supplier re-claim system with new technologies including a Web-based interface on the front-end with J2EE™ compliant code, Oracle® and UNIX servers on the back-end. The development team worked with the Rational Suite product family and Rational ClearCase in a Windows NT development environment that also included a Java IDE.

They closely followed the prescribed iterative development approach of the Rational Unified Process. The first task for this cross-functional team of 50 people was to nail down the system requirements for the first 6-month phase of development. Working with the financial analysts who would ultimately use the system, the team agreed on 8 high-level requirements that were to be addressed 2 at a time in each of 4 iterations over the 6-month period.

Initially, the requirements were maintained in a Microsoft Word document and stored in Rational ClearCase. As iterations proceeded, they were moved into Rational RequisitePro where requirements became easier to manage. The integration between Rational RequisitePro and Rational Rose also accelerated development—requirements were more easily leveraged to create use cases which form the foundation for the system design.

"Traceability of the requirements into the system designs such as the class diagram and testing processes was an extremely important goal for us. We measured our success based on our ability to meet our client's needs. The integration in Rational Suite gave us this traceability as a means to ensure success," says Rogers.

Following the RUP process, the team modeled use cases from the requirements in the Rational Rose product found in Rational Suite. After client approval of use cases, further system elaboration took place—development of analysis diagrams, low-level sequence diagrams and class diagrams. "We used Rational Rose because it was the tool of choice for the client, but it is also part of our standard tool set that has been used successfully on other projects," explains Rogers. "Our class diagram in Rational Rose served as the blueprint for developing the code. We closely followed it throughout the development process, and checked our work against it," he adds.

"Complete system testing was critical to making sure the system met user needs and played a key role in our overall success," says Rogers. "Our system testers leveraged low-level requirements in Rational RequisitePro to develop test scripts, then conducted functional tests of the code using the Rational Robot tool in Rational Suite TestStudio. The integration between Rational RequisitePro and Rational Robot was a time-saver because our entire team could see in RequisitePro whether a test case had passed," he explains.

The development team completed code coverage analysis with Rational Suite TestStudio to ensure that no aspect of the system went untested. "This gave us an extremely high degree of confidence that each requirement was implemented with the highest level of quality," he states.

Rational Suite TestStudio was also used for performance testing. It analyzed performance and provided response times and other clear-cut data that helped the team understand performance from early in the process. "We found Rational Suite TestStudio's performance testing features easy to use even for novices. Rational Suite TestStudio saved us time, allowing us to complete performance testing in one week versus two to three," says Rogers. "The same is true for our regression tests which we were able to run automatically overnight versus in three days."

Defects found during test runs were recorded in Rational ClearQuest<sup>®</sup>, providing ready access to the current state of quality for the project. Each morning, Rogers reviewed the defect log and assigned defects to developers for resolution. At project end, the team was able to do hourly reviews of open defects and assign them for resolution.

The final system was delivered on time with very high software quality. "In the end, we felt that Rational Unified Process had worked well. The system was delivered with zero open defects and has gone beautifully since then with few defects even after 5 months of use. We made diligent use of Rational tools. I am proud of the 'zero-defect' solution that Cap Gemini Ernst & Young was able to deliver. We couldn't have achieved this without Rational Suite," he concludes.

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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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