MetaSolv uses IBM Rational Software Development Platform to Streamline Geographically Distributed Development

Overview

■ ***The Challenge***

In an increasingly competitive business environment, MetaSolv was looking for new approaches to satisfy customer needs and grow revenue while reducing costs. To align the organization across its multiple geographically distributed locations, leverage expertise and skills at every site, and improve efficiency, productivity and quality, MetaSolv needed an integrated software development platform– one that includes a proven process as well as tools to support and automate that process.

■ ***The Solution***

The company began using the IBM Rational Software Development Platform, including IBM Rational Unified Process and IBM Rational tools for requirements management, model-driven development, software configuration management (SCM) and test management.

■ ***The Benefit***

IBM Rational solutions have enabled the MetaSolv development team to get up to speed quickly on new projects and shift development resources rapidly as business needs evolve. The team is better able to meet its scheduling and cost commitments and is spending less time fixing defects and more time enhancing their product line. The company has realized gains in product quality, efficiency and customer satisfaction.

MetaSolv Software, Inc. is a global leader in comprehensive service fulfillment software solutions for communications service providers. MetaSolv's multi-service order management, network resource management, service activation, and network mediation capabilities automate the order-to-activate provisioning process for next-generation IP-based wireline and mobile service providers. More than 180 service providers from around the world use MetaSolv's solutions to achieve increased revenues, reduced costs, and enhanced customer service.

Recently MetaSolv undertook an initiative to reduce its own costs, improve customer satisfaction and accelerate the delivery of new products by aligning its geographically distributed development team around a unified, best-practices based methodology and a unified set of development tools. Initially, MetaSolv's development organization was located at corporate headquarters in Plano, Texas. When the company added development sites in Canada, England and India, the new, geographically distributed team lacked a common development methodology. Laura Elliott, Quality Manager at MetaSolv, recalls "Each development site was using different tools and following different processes and each had a different culture. We wanted an industry standard process and a shared set of tools to get alignment across the organization. Our goal was to improve our process in order to reduce costs, increase efficiency, accelerate development and improve quality. Our customers are satisfied when we can show that we have a quality management program in place and

that we are improving our service to them and the quality of the software release over release. Demonstrating continued progress in improving quality and service allows us to continue to make sales and keep revenue growing."

After evaluating a number of options, including formalizing and continuing to develop the company's existing processes, MetaSolv standardized on IBM Rational Unified Process®, or RUP®. The development team also began using several tools from the IBM Rational® Software Development Platform, including:

- IBM Rational RequisitePro® to manage requirements
- IBM Rational Rose® Professional Java®I to model use cases and system architectures,
- IBM Rational ClearCase® and IBM Rational ClearQuest® to manage change
- IBM Rational TestManager to manage test plans and testing activities

"One of the advantages of RUP for us is that it is built on best practices and we did not have to start from scratch. We saw that the tools would help us automate different aspects of the process and we could build on that. From experience we knew that just buying a tool is not the answer, so we were really looking for a complete solution. We were looking for a process and tools that support the process. We also wanted a set of tools that were already integrated out of the box, that worked together, and that we could customize. That was our motivation for selecting RUP and IBM Rational." says Elliott.

Scott Sargent, CM Manager at MetaSolv, notes that choosing RUP ultimately made it easier for all the development sites to adopt a new development methodology. "Rather than trying to conform to one site's process, everybody was making the change. It was an advantage to move to a new industry-standard process, and that turned out to be a big plus, in the long run."

Moving From Waterfall to Iterative Development

Before adopting RUP, MetaSolv primarily relied on a waterfall approach to development. The switch to an iterative approach represented a significant change for the development teams, but a change that was made easier by automated tools. Elliott recalls, "Our Toronto and Plano locations were using the traditional waterfall, where you try to get all the requirements defined, do the designs, code it, test it and ship it. The Ottawa site was split between traditional waterfall and extreme programming (XP) practices."

Starting with the four phases of RUP–inception, elaboration, construction, and transition– the various MetaSolv teams began to work with a common process framework across all sites. "We started small, and got people aligned with the four phases and the milestones that we had formalized. We would agree on project scope in inception, get a working architecture in elaboration and then finish the functionality during construction. During transition we would perform knowledge transfer and ensure that our customer care and production support teams are up to speed on what we are shipping," says Elliott.

From there, MetaSolv began to tailor RUP to the company's specific needs while maintaining consistency across the team. Elliott continues, "After aligning around the phases, we started looking at each of the disciplines–including requirements, analysis, design, and implementation — and customizing those to the way we do business at MetaSolv. As much as possible we tried to adopt the RUP terminology and the RUP artifacts, but we made simplifications and modifications where it was appropriate for us."

MetaSolv's customized RUP methodology is made available to the entire team via the company's intranet. "Our customizations are in an internal Web site, which is based on one of the samples that is included with RUP. We have standardized templates for Microsoft Word, Excel, and PowerPoint documents; Microsoft Project schedules; and other artifacts. We put those in a shared location, so that everybody can setup their work group locations and get the latest assets from there."

IBM Rational Services provided training and consulting to accelerate the implementation of an integrated toolset and an iterative development process. Elliott recalls, "We had training classes onsite at our Canadian locations, and the course on managing

iterative development was most valuable. Rational consultants also helped us with our initial customization and implementation of Rational ClearQuest and Rational RequisitePro. They reviewed our needs and advised us on an approach and strategy to use with those tools."

IBM Rational RequisitePro and IBM Rational Rose

At MetaSolv, development efforts on new and existing products typically start with HTML prototypes of the user interface. Business analysts then begin modeling use cases in Rational Rose. The use cases, which describe system functionality from the perspective of the user, are then further detailed in Rational RequisitePro and serve as requirements for the project. Mark McGuire, Requirements Analyst for MetaSolv, explains, "After creating HTML prototypes we start by creating a use case diagram in Rational Rose, so that we can ensure that all our teams are on the same page, and that we agree with the way use cases interact to each other. Then we enter those use cases in Rational RequisitePro. In our process, we first create an outline. We then review the outline and add details. Later we have another detailed review with everyone involved. We have traceability from our Rational Rose models over to the use cases in Rational RequisitePro, and that is a real benefit. At that point the developers can start coding, and the testers will use the use cases to start creating test plans and tests."

Rational RequisitePro provides a Web interface that enables the geographically distributed team to access use cases and requirements information wherever they are. The MetaSolv team is also using the integration between Rational RequisitePro and Rational TestManager to trace requirements to the test cases used to validate them. "We can provide our customers with the specific Rational RequisitePro use cases and flows that are included in any release or project iteration. We can also show them the specific test cases that are mapped to those use cases. If we did not have the integration between those tools, we would have to do that manually," says Sudduth.

McGuire agrees that Rational RequisitePro is a big help in managing iterative development. He explains, "When you write 50 to 100 use cases and you are only doing a subset of those in each iteration, you have to have something that can track all that. I think that is one of the biggest benefits of Rational RequisitePro. We could not do iterative development effectively without a tool like Rational RequisitePro."

Rational Rose Improves Communication

Rational Rose and the Unified Modeling Language (UML) help MetaSolv communicate requirements and system designs to everyone involved on a project, including the geographically distributed development team and customers. Leena Prabhu, Java Developer at MetaSolv, explains, "We use Rational Rose to create class diagrams and sequence diagrams. We use it for analysis, as well as for the final designs. Rational Rose helps us establish what we are doing up front so we find potential problems early and not late into the development cycle. It also helps with communication; we can put the models into a technical specification for the customers and also to help everyone on the development team know what everyone else is doing. The models help our customers better understand what we are building, and they ensure that we understand what their needs are."

She adds that UML models in Rational Rose will be a significant advantage to the teams that maintain software in production. "Rational Rose also improves maintainability. We have one group of people that work on enhancements and another group that maintains the product. With Rational Rose, everything is documented in a very consistent way, which can be a big help to the production support group. Previously, our technical specifications were not living documents; but our Rational Rose models are living artifacts. From a development standpoint, that makes a big difference," says Prabhu.

Simplifying Distributed Development with IBM Rational ClearCase and IBM Rational ClearQuest

MetaSolv is using IBM Rational ClearCase for software asset management together with IBM Rational ClearQuest for defect and

change tracking as an integrated software configuration management solution to automate and streamline its development process across five major development sites in North America, Europe and Asia. MetaSolv engineers use a variety of interfaces to access Rational ClearCase and Rational ClearQuest, including Windows® and UNIX® clients as well as Web browsers. Many developers save time by performing version control activities using Rational ClearCase directly from within their Eclipse Integrated Development Environment (IDE).

With Rational ClearCase MultiSite and Rational ClearQuest MultiSite, MetaSolv is able to be more flexible in staffing projects because developers with specific skills can work on any project in the company regardless of where they are located. "We could not live without them. We are very much a multi-site organization. We have a lot of co-development projects and teams, distributed across continents and these tools are built into the very fabric of how MetaSolv works," says Sargent.

Improving Quality

Sargent reports that quality control has been one of the principle benefits of using IBM Rational software configuration management tools. "With Rational ClearCase and Rational ClearQuest, we have a really good tracking system for every software build. We know exactly what was changed, and we can trace each change to the actual issue or problem tracked in Rational ClearQuest. We also use charts created by Rational ClearQuest that show metrics, such as the amount of change per software release. And with Rational ClearCase we are better able to control content–for example we can stop people from checking code out when a product has been locked down. Quality is a top benefit of these tools."

Elliott agrees, "From an SCM perspective, we have much better control over what is in a build and what we have shipped to our customers. We can really pin down what we have shipped to our customers, with a level of precision that really helps us on a daily basis."

Tammy Sudduth, QA Manager at MetaSolv adds that IBM Rational TestManager is also instrumental in meeting MetaSolv's high standards for quality. She explains, "We are using Rational TestManager to manage our manual testing activities. Previously we were using a homegrown tool that worked well. But, when we began using the whole suite of IBM Rational tools, we wanted to go with something that was more tightly integrated. Now, we use Rational TestManager on each release to track our testing progress and create customized reports."

More Efficient Project Management and Auditing

At MetaSolv, having the right information at the right time is key to successful project management. With Rational ClearQuest, project managers have gained insight into the development process and are now able to make more informed decisions as they guide projects to completion. Elliott explains, "From a project management perspective we know what the issues are, we know what the project status is, and we know what our backlog is. Today we have the information that we need to make better decisions and control scope. Rational ClearQuest has helped us improve not only SCM but also quality and project management."

For Larry Joseph, Development Manager at MetaSolv, the ability to link code changes with change requests is a particularly valuable capability. "Before we started using Rational ClearCase, it was difficult to determine if all the code was being rolled forward from one branch to another. MetaSolv's CM team used the Rational ClearQuest and Rational ClearCase APIs to create our own customized integration of the two tools. Now, we can clearly tell what releases the code is associated with, and what branches it is on. Plus, we can see what activities in Rational ClearQuest the changes are related to. In Rational ClearQuest, we look up the activity records and then go to the Rational ClearCase tab to see what objects are listed. All the information is there, it is all linked, and the whole audit traceability is there when we do our independent, internal audits."

Measuring Success

MetaSolv has used several approaches to gauge the gains in quality, development efficiency and customer satisfaction that the company has realized since adopting the IBM Rational Software Development Platform. Internal audits using the Software Engineering Institute's Capability Maturity Model Integration (CMMI) as an assessment guide have shown significant, steady improvement. Senior management has noted advances in quality and predictability. Mike Cullen, Executive Vice President of Engineering and Global Customer Care says, "We are not interested in merely getting a certificate to hang on the wall, we want to produce software better, cheaper and faster—and our process work has helped enable us to do that. Using IBM Rational Software Development Platform for the past two years, we have made significant improvements in our software quality, time to market and we consistently meet our customer delivery commitments." Elliott reports, "Our project teams are meeting their objectives. We are working hard to achieve our goals, but we have a much better handle on the projects and we have the information we need to make the right decisions. Our most recent customer satisfaction survey reflected a significant improvement and was the most positive I have seen."

She concludes, "RUP and IBM Rational tools have provided an integrated solution that has helped us improve alignment across our organization, leverage available expertise at any development site, and improve product quality and team productivity. The tools really support the process for our distributed teams. And the complete solution helps us to automate development activities and it simplifies our lives."

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1 IBM Rational Rose Professional Java is included in IBM Rational Rose XDE™ Developer for Java

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