EPL Streamlines and Accelerates Development with IBM Rational ClearQuest and IBM Rational ClearCase

Overview

■ *The Challenge*
Looking to rapidly respond to customer needs, lower costs, and gain a competitive advantage, EPL began a J2EE™ development initiative to update and ultimately phase out their aging legacy mainframe systems. Disparate tools for version control and change management made it difficult for the company's J2EE and legacy mainframe developers to work effectively together. EPL needed a comprehensive software configuration management solution to unify the entire development team.

■ *The Solution*
EPL adopted IBM Rational® ClearCase® for software asset management and IBM Rational ClearQuest® for workflow management and defect and change tracking. Together, these tools provide an integrated solution that is helping EPL automate and enforce a consistent development process.

■ *The Benefit*
Rational ClearCase and Rational ClearQuest have helped the EPL development team shorten time-to-market for new functionality, double the number of releases it produces per year, and improve the quality of its solutions. EPL has established an open, flexible architecture and is now positioned to more rapidly respond to the needs of its customers.

Headquartered in Birmingham, Alabama, EPL is a full-service provider of integrated data processing solutions and technology to credit unions. Serving more than 150 credit unions nationwide, EPL provides a complete data processing solution, which includes hardware, software, training, installation, and ongoing support, as well as remote access technology via full-service touchscreen kiosks, Internet financial services, e-commerce, and ATM/debit cards.

As the only software vendor in its market wholly owned by credit unions that are also users of its products and services, EPL is deeply committed to

quickly responding to customer needs with quality solutions. For much of its almost three decades in business, EPL was primarily focused on data processing solutions. The company recently recognized, however, an opportunity to more rapidly and fully meet the evolving demands of its ownership group and its other customers. At the same time, EPL sought to gain a competitive advantage in the marketplace while reducing its own costs.

Kelly Cloud, Chief Quality Officer at EPL, explains, "Our Board of Directors decided to invest in a new development effort so that we could do a better job of meeting the business needs of our credit union customers. We wanted to move in a direction where we would have the ability to be more scalable with our solutions, to be more open and, also, to be able to drive changes in our software systems that would enable us to respond quickly to our credit union customers and ultimately help them to respond to their business needs quickly as well."

She adds, "We had situations

where we were not able to respond as quickly to our customers' needs as we wanted to because of the older architecture and the existence of the COBOL code. Also, in large part because of the cost of mainframe hardware, our margins were shrinking. We have a very large data center where we support our credit unions in an ASP model. For some time, the focus of the company had been on maintaining that data center functionality, so we were a little behind the curve on investing in new technologies. When the decision was made to fund this new development, our goal was to basically go to the front of the line as fast as we could. We wanted to leapfrog our competition, even though we starting out from a little further back in the pack. We wanted to get on an architecture that would move us forward very quickly."

Addressing Technical Challenges
EPL's development organization began working on what would become the company's flagship product, i-POWER. Based on a Java 2, Enterprise Edition compliant architecture, the system integrates with legacy mainframe systems. Over time, the team is phasing out legacy components and replacing them with Java-based equivalents that are easier to maintain and extend.

EPL began expanding its development team to accelerate the J2EE development efforts, adding new J2EE engineers to complement its existing COBOL and mainframe development team. With a development organization split into two groups, EPL found it difficult to establish a single, collaborative culture. The difficulties caused by this split were exacerbated by the lack of a common set of tools for version control and change management.

Cloud recalls, "We had a large influx of new employees coming in with a very different skill set from the employees that we already had at EPL. At the time, we were using a mixture of tools for version control. We were using an open-source tool for version control on the mainframe software, and a Windows-based tool for the client server software. As we started to write the Java, we already had a relatively large number of engineers working. We were trying to get ramped up quickly, and these tools were very inadequate to support the number of people that we had working."
A similar problem existed in the area of defect tracking and change management. "Our defect and change tracking was also split across a couple of platforms. We had a homegrown system that we used to track issues on the mainframe side. It relied on actual hard-copy papers being printed out and folders that had the issue number on them. There

was some very rudimentary defect and change tracking in place, but it was not adequate. On the new development side, we purchased a tool that required significant customization. Of course, that produced overhead on the testing team to maintain that part of the tool," Cloud notes.

To address these challenges and help automate and enforce the company's development workflow with a single, comprehensive software configuration management solution, EPL adopted IBM Rational ClearCase and IBM Rational ClearQuest. This integrated solution provided a solid foundation to bring the development organization together and standardize the team's development process. Cloud reports, "We were really fragmented. We had basic version control and basic defect tracking, but it was a very inelegant solution — and it just reinforced the cultural challenges that we had at EPL at the time. As a company, one of our challenges has been to really blend the older parts of our company and the newer parts of our company. We were looking for ways that we could standardize. In my view, Rational ClearCase and Rational ClearQuest have been a huge benefit in unifying the whole company and getting us away from having multiple solutions."

Evaluating Alternatives

EPL selected Rational ClearCase and Rational ClearQuest after carefully evaluating several available solutions. "We looked at four or five different packages, and did a fairly formal evaluation of those tool sets," says Cloud. In the end, Rational ClearCase and Rational ClearQuest provided the most flexible, complete, and easy-to-maintain solution to meet EPL's needs. "We wanted to be able to track all of our artifacts, not just our software artifacts. So we wanted to be able to manage documentation, use cases, use case models, technical documentation having to do with software releases within the same tool set and we wanted everyone in the company to be able to have access to that information. With Rational ClearCase, we are able do that and open those artifacts to the whole company cost-effectively —even for customer service staff who may only need to look at documentation once or twice a week," says Cloud.

Another key advantage for EPL was the Unified Change Management (UCM) capability in Rational ClearCase and Rational ClearQuest that enables changes to be managed at the activity level. "We found UCM very attractive. At that point, we only had one configuration manager and we knew that he was going to have to support both the mainframe engineers and the Java engineers. With UCM, we were able to support a process that was maintainable by a very small configuration management team."

Jeff Clark, Assistant Vice President of Configuration Management at EPL, agrees that the UCM capability helps simplify and accelerate the development process. "With UCM, engineers are able to get started quicker. Also with our old version control tool, the more changes that were made to a file throughout its history, the more difficult it was for the engineer to work on a problem in that file, because of all the sub-branches that were happening off the tree. With the Rational ClearCase UCM feature, you are really branching from the project method, which, as far as the engineer is concerned, is just a lot cleaner."

Rational ClearQuest Provides Insight, Contributes to Improved Quality

According to Clark, Rational ClearQuest helps the development team at EPL improve not only the quality of the software they produce, but also the quality of the process they use to produce it. He explains, "Rational ClearQuest offered capabilities that we did not have. We had no efficient way to work with defects or enhancements. We use Rational ClearQuest to see how we are making improvements to the product. But we are also using it to help with our own process here internally from a QA point of view."

While the development and quality assurance teams at EPL are the most frequent users of Rational ClearQuest, it is an important tool for virtually everyone in the company, from customer service representatives to senior executives. Cloud explains, "Rational ClearQuest has a lot of visibility around our company. Almost every employee, at some time, uses it. Our customer service team, sales team, and installation team all use it to see what is going on with defects and features. From a business point of view, the visibility that it has given us for project management is vital."

In regularly scheduled meetings, the team uses Rational ClearQuest to examine defect rates and drill down into the specifics of individual defects when necessary. They use this information to assist in resource allocation and to take corrective action as early as possible. "When we have cross-departmental meetings to talk about where we are with a release, we will use Rational ClearQuest to look at charts or specific information about the different projects that we are working on. We use Rational ClearQuest to get visibility into our status of our different projects. Everyone has instant access to that data — it is not just a report that is pulled out and given to the executives," says Cloud.

Managing Software Development Workflow with Rational ClearQuest

IBM Rational ClearQuest lies at the heart of EPL's software development workflow for addressing enhancement requests and defects. For example, when a defect is reported to the company's Client Services team, they qualify it and enter it into Rational ClearQuest, where it is assigned a unique identifier. The Client Services representative can attach screen shots and detailed notes, and they can set the priority of the request based on EPL's own standards. The request in Rational ClearQuest is then routed to a business analyst to review and ensure that it is fully documented. Next, it flows into project management — and is assigned to one of the EPL's engineers.

By automating this workflow, the EPL development team can enforce a development process and ensure that each defect is tracked through to completion, without any being lost, delayed or misrouted. Cloud continues, "The request then flows through engineering and flows into Configuration Management to be compiled and tested. It flows through the testing team and then ultimately ends up in the release. If we did not have the visibility and the ability to be able to flow through the different states, set the priorities, and add the documentation within Rational ClearQuest, the entire process would be very difficult to manage."

For Hemanth Guttikonda, Assistant Vice President of Testing at APL, one of the key benefits of Rational ClearQuest is provided by its automated e-mail notifications. He explains, "The e-mail notifications in Rational ClearQuest are very beneficial for me. I handle a lot of issues and I have to assign them to members of my group to test. Not having to go and notify them personally or compose an e-mail makes my job a lot easier."

Keeping Track of History

Integration between Rational ClearQuest and Rational ClearCase enables EPL engineers to link all defect submissions or change requests to the specific code changes made to implement them. Cloud notes that this capability provides invaluable information when the team is trying to track down when, where, and why a particular change was made. "The audit capability is another very valuable benefit of Rational ClearQuest and Rational ClearCase. Being able to connect an activity in Rational ClearQuest with the code that was changed — and to be able to drill into that with Rational ClearCase histories and the version tree — is very powerful," she reports.

Cloud continues, "For example, we recently had a high priority issue that we gave to an engineer to research. She was able to pinpoint code that she put into the system almost two

years earlier that was causing the problem. She initially started going down the wrong path, but using Rational ClearQuest and Rational ClearCase, she saw the activity and the code changes and knew exactly what happened, saving hours of research. The power that the audit capability gives us really helps when we need to track something down or when we just need to know what we have done with specific Rational ClearQuest activities."

Achieving High Ratings during Audits

The EPL development team also uses Rational ClearQuest to ensure that the company's customers are compliant with the latest federal regulations for credit unions. Cloud explains, "In a sense, our software is regulated because the credit unions that use it are regulated. For example, each year it seems, the IRS makes a change that requires us to change our software so our credit unions will be in compliance with end-of-year reporting. We track those features through Rational ClearQuest. The ability to attach specific government documents or interpretations of documents to the Rational ClearQuest item and track it through in that way is very helpful."

In addition, Rational ClearQuest has helped EPL achieve the highest ratings on its two most recent SAS 70 (Statement on Auditing Standards Number 70) audits. "The SAS 70 audits are required by the

National Credit Union Association (NCUA). Credit unions are audited for particular accounting functions, and EPL usually goes through one of these audits every two years so that our credit unions can show their auditors that their data processor is certified. For the second audit in a row, we received the highest rating for the audit. In 27 years at EPL, those last two audits are the two highest ratings that we have had, and Rational ClearCase and Rational ClearQuest played a big part in that. When the auditor was here, we ran Rational ClearQuest queries to help her understand how we control changes to the software. Our QA team also performs internal audits, and Rational ClearQuest is very valuable for that effort as well," Cloud recalls.

Improving Quality through Better Resource Allocation

Using trend reports in Rational ClearQuest, EPL project managers are able to accurately and objectively assess project quality, and as a result are better able to make informed decisions on allocating resources. Recently, as developers were completing the initial coding on a major development project, project managers using Rational ClearQuest saw that the number of defects outstanding on the project was too high for EPL's stringent standards. The company reallocated resources from other projects to work on those defects,

and rapidly cut the defect count by more than 80 percent.

The ability to identify trends using Rational ClearQuest and to add resources as needed has helped contribute to quality improvements in the software EPL delivers. Cloud notes, "Our primary goal is to not create defects in the first place; but when they do occur, we want to find them internally before they go out the door. We use the trending and the overall numbers in Rational ClearQuest as metrics to help us understand how clean our products are and where we have issues that we need to concentrate on. Last year, we had a six-fold increase in production transactions on our i-POWER system over the previous year. During that timeframe, our defect rates remained stable and actually trended down in some key areas. Rational ClearQuest really enables us to focus in on the quality of our systems. If we do see a trend starting to occur, we can have Engineering take a look or just divert more resources to address it very quickly."

Managing Risk with a Lifecycle Management Approach

Together, Rational ClearQuest and Rational ClearCase have helped the EPL team manage risk throughout the development lifecycle and deliver reliable, highly available application into production more rapidly. "When we are testing new features, we are able to look at the coverage of

business rules and how many defects are outstanding. So we have a lot of information to tell us when testing is complete. We have been delivering services releases, and even our major releases, on a very aggressive schedule. If we did not have that capability to really measure quality and, get hard metrics from Rational ClearQuest about how we are doing in creating quality software, it would be impossible to push these releases out as we have," says Cloud.

She adds, "We continue to use Rational ClearQuest to track the project as we get into production and receive feedback going from our customers. In addition, by using Rational ClearCase for asset management, we are able to isolate our production level code from development code and very strictly control everything that goes from a development environment into the production environments."

Enabling Efficient Parallel Development

For parallel development, Rational ClearCase represents a significant improvement over the team's previous version control system, and has enabled the EPL development team to streamline parallel development across multiple projects and project phases. "Our level of parallel development is very intense. We have six active significant projects going on from that Java code base for the i-POWER system, in addition to mainframe development efforts.

We do daily merges between the streams and keep everything up to date. It is very demanding, but Rational ClearCase enables us to do parallel development in this complex environment. It enables our QA team to test different projects that are at different levels of readiness. We try to get testing going as early as we can, which is one of the principles of IBM Rational Unified Process. Without the ability to track these parallel streams in Rational ClearCase, all of those tasks would be extremely difficult," Cloud reports.

Clark agrees, "Without Rational ClearCase, the manual overhead would be tremendous. More configuration management resources would be needed, and the team's productivity would be reduced. In addition, the stability of the source library would be in question because changes to files could not be controlled as easily."

Accelerating Development and Delivering Value to the Organization

The development team recently began work on a Web services and service-oriented architecture (SOA) development initiative to facilitate integration with third party vendors and to enhance business-to-business and business-to-consumer capabilities for its credit union customers. The development team for this effort also relies on Rational ClearCase and Rational ClearQuest for comprehensive software

configuration management. On its ongoing i-POWER development project, EPL has already achieved a significant increase in productivity and has effectively doubled its rate of development. Clark reports, "Prior to the using Rational ClearCase and Rational ClearQuest, we were providing one service release a month to our customers. Last year alone, EPL delivered twenty-five service releases and five nonservice release projects. With the integration between Rational ClearCase and Rational ClearQuest, we are able to more easily support the numerous platforms that we have without unnecessary delays."

EPL began its J2EE development initiative to gain a competitive advantage and improve responsiveness to customer needs. In contributing to the success of i-POWER, Rational ClearCase and Rational ClearQuest have helped the EPL team achieve those objectives. Cloud notes, "I would say we are well on the way to accomplishing our goals. We are actively looking at leveraging our open architecture to integrate with key partners so that we can really put more of the power of our software systems into the credit unions' hands. Instead of our credit unions reacting to the competition, we are now in a position to partner with them to identify emerging business needs and then very rapidly enhance our system with the functionality they need. With

Rational ClearCase and Rational ClearQuest we were able to rapidly get an open architecture in place, and position ourselves to serve our customers' needs much more quickly."

She concludes, "Rational ClearCase and Rational ClearQuest are really part of our company's culture. They have become part of the day, part of our infrastructure like e-mail or the telephone. If we didn't have these tools, it would be very difficult for us to do business as a software company."