

IBM Business Consulting Services and IBM Rational Rapid Developer Empower Legacy Developers at Large State Regulatory Agency to Deliver J2EE Applications

Industry:
Health Care Services

Organization:
Government state agency

Description:
The agency implements an effective regulatory framework in which injured workers receive appropriate benefits.

Business Problem:
Facing budget constraints and legislative mandates, the agency needed a rapid application development platform to help their mainframe developers build and maintain a new J2EE-based system.

Solution:
Rational Rapid Developer, Rational ClearCase LT, Rational RequisitePro, Rational Rose, Rational Suite DevelopmentStudio, Rational Unified Process, IBM WebSphere Application Server

Key Benefits:
Reduced costs and accelerated development by adopting an architected rapid application development environment that enabled on-staff mainframe developers to work productively on a complex J2EE system

Developed an infrastructure and team skills to maintain the system after it was deployed

Implemented a full life cycle methodology supported by effective tools

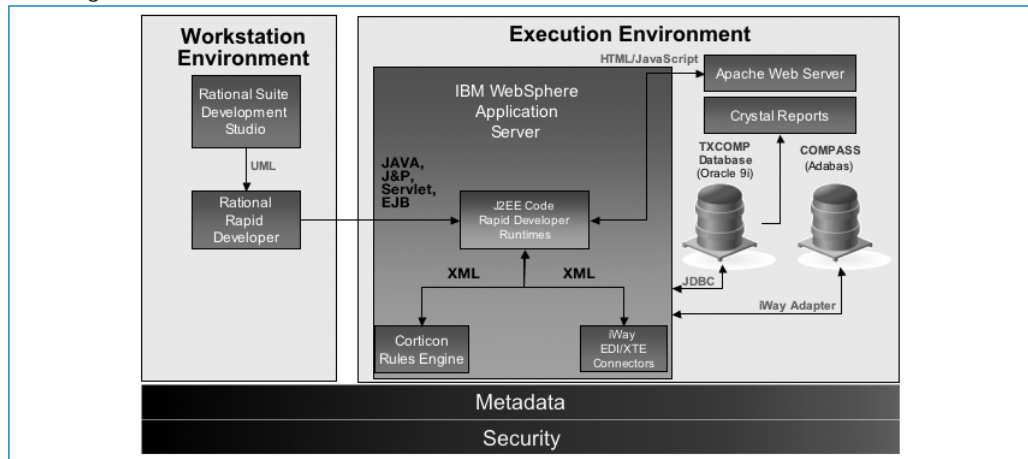
Gained a tenfold increase in development speed through drag-and-drop user interface development, and automatic construction of data access and XML messaging code – cutting estimated development time in half

Sped daily build-deploy-test cycles by using a lightweight application server for development, and then simply transitioning to a production quality application server for testing and deployment

Faced with a mandate to streamline its processes and reduce the cost within its state regulatory environment, a large state agency was confronted with a considerable challenge. Many of the state agency's existing processes were manual and paper-based with almost no computer-assisted automation. The agency needed a system that would enable them to monitor, regulate, and provide better access to services. At the same time, the agency was facing a second mandate to change their technological base, and move away from aging mainframe technology toward newer, cost-effective technologies, based on open standards, including J2EE.

and internal participants by providing timely and appropriate benefits to workers in the state.

Many of the world's top consulting firms responded to the RFP, but only one group – from IBM Business Consulting Services – proposed a solution founded upon IBM® Rational® Rapid Developer™. Rational Rapid Developer is an architected rapid application development (ARAD) environment that offers a number of capabilities perfectly suited to the agency's needs. Rational Rapid Developer constructs reliable, scalable *n*-tier systems while masking the complexities of J2EE development –



When the agency responsible for improving business processes initiated a project to meet these goals, they added two key internal goals of their own. The agency wanted to adopt a more structured software development lifecycle methodology. And more importantly, the agency wanted to leverage their existing mainframe developers throughout the project. When the project was complete the agency wanted not only a working system, but also a skilled team equipped with the right tools to maintain and improve it. The agency issued an RFP (Request For Proposal) to help them achieve all these goals and deliver value to external

enabling the agency's team of mainframe developers to quickly become productive J2EE developers. Joe Kaczmarek, Associate Partner and Service Area Manager for IBM Business Consulting Services, explains, "[IBM] Rational Rapid Developer was the cornerstone of our solution. While there were other components to the solution, such as workflow applications, reporting, and business rules, the key challenge we had was getting the basic Web screens out in front of the end user, managing the persistence layer, and doing all this in a J2EE environment that we could both build

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and deploy very rapidly and confidently. Rational Rapid Developer was really the key element that enabled us to deliver the winning solution to the agency.”

Ultimately, the combination of IBM Business Consulting Services expertise and Rational Rapid Developer not only won the contract, but successfully delivered phase one of the project in just 12 weeks, while building the skills of the agency’s own developers.

Challenge: Leverage Legacy Developers for J2EE

With more than 60,000 consultants and professional staff in more than 160 countries globally, IBM Business Consulting Services is the world’s largest consulting services organization. As part of IBM Global Services, IBM Business Consulting Services provides clients with business process and industry expertise, a deep understanding of technology solutions that address specific industry issues, and the ability to design, build and run those solutions in a way that delivers bottom-line business value. On the agency project, the IBM Business Consulting Services team knew they had the experience and the right development tools to achieve the agency’s goals, but first they had to convince the agency. According to Dennis Stotts, Managing Consultant and IT Architect for IBM Business Consulting Services, Rational tools – and Rational Rapid Developer in particular – played a central role in that process.

Stotts explains, “When the agency issued the RFP, we could see that they were leaning towards IBM hardware, and they were very bullish on having a J2EE environment for the flexibility and ability to add functionality and components in the future. The client had a very limited budget, and as a result, they wanted to reduce costs by leveraging their existing staff, who were Natural Adabas developers, and have them be able to contribute to the production of this new application. It was vital to them that we have a knowledge transfer plan and a training program that would allow their developers to be able to get up to speed very quickly and maintain the application in the future. That was an important stipulation in the RFP.”

Solution: Rational Rapid Developer

Stotts continues, “It was clear to us that this client would need to have tools to be able to establish an infrastructure, do custom development, and maintain their environment going forward. We needed RAD development tools that would enable developers with minimal or no J2EE development experience to be productive – and that is IBM Rational Rapid Developer. We evaluated different types of RAD tools in the market. One of the reasons we chose Rational Rapid Developer was because it integrated well with the Rational tool set – which was also a part of the overall solution. Also, we wanted our bid to be competitive without having to use offshore development. Using Rational Rapid Developer to help their staff do a lot of the development was a great way to make that happen.”

Glenn Galfond, Partner at IBM Business Consulting Services, agrees, “One of the big wins in our presentation was actually demonstrating Rational Rapid Developer, because the client could see just how easily this would fit in their solution and how it would help make their staff more effective. They were very enthusiastic. They wanted to move their mainframe developers forward twenty years – and getting them into an *n*-tier environment working with Java™ and Rational Rapid Developer enabled them to do that and be more productive.”

Scott Ashworth, Project Manager for IBM Business Consulting Services notes that the agency also realized the importance of applying development tools in the context of a proven methodology. “In the past, the agency’s in-house team really wasn’t running with any type of project life cycle methodology. That was another important stipulation in the RFP – they wanted the proposal to include a process – a good sound system development life cycle methodology. That was a key driving point for them, and it fit very well with the IBM Rational Unified Process®-based, or RUP®-based, approach that we proposed. Also, the close integration between the tools in [IBM] Rational Suite® DevelopmentStudio and Rational Rapid Developer really showed them some growth opportunities in their internal organization.”

Transitioning Mainframe Developers

Ashworth discovered that some of the project's requirements needed to be further defined and elaborated before any design could begin.

"We expected it to be a design-build-implementation project, but after sitting down with the business users to understand what they were asking us to do, we realized there was still work to be done in defining those requirements and fleshing them out," Ashworth notes. To meet any of our goals we had to start counting on the legacy developers resources to become productive very rapidly," he adds.

Ashworth explains, "The team was comprised of tenured staff – experienced in the mainframe world and sequential programming languages – but with no experience in relational database concepts, object-oriented development, or methodology. There were also a couple of junior developers, fresh out of school, who had more updated academic experience, but no practical application." The team attended one week of training for Java, another week of training on Rational Rapid Developer, and three days reviewing the essentials of Java required for Rational Rapid Developer. "When we initially laid out our execution plan, we anticipated fairly low productivity from the client's staff to meet our first deliverable. In a fairly short timeframe, they were between 90 and 95 percent productive, and we had only anticipated them being somewhere in the 20 percent range. From my vantage point as project leader, that is probably the biggest benefit of using Rational Rapid Developer on this project."

Kaczmarek notes that in addition to simplifying J2EE development for inexperienced developers, Rational Rapid Developer also helps enforce a modular development approach. "One of the key challenges in transitioning legacy-based developers is to get them away from the monolithic paradigm that they typically work in. They are used to building ten thousand-line COBOL programs. We needed to move them from thinking that way to thinking modularly. Rational Rapid Developer provides the visual development paradigm that is absolutely essential in getting them to make that transition. Without the tool enforcing that modularity it's a very unnatural transition. When you become accustomed to it, of course, it becomes perfectly natural. But in the initial transition process, having a tool that forces

you to do things in a procedurally abstract sense is absolutely vital and Rational Rapid Developer lets you do that."

Tenfold Increase in Development Speed

Early on in development, the team defined standards for the new site's look and feel, and created templates with the selected color schemes and other characteristics in IBM Rational Rapid Developer. With that step completed, it was very easy for even the novice developers to build prototypes with fully functional user interfaces. Luis Murgas, who served as the technical lead on the project for IBM Business Consulting Services, notes, "Without Rational Rapid Developer, the novice developers would have to build JSP pages and everything else themselves. If they had to do that without the capabilities of Rational Rapid Developer to develop the pages in a drag-and-drop environment and construct actual reliable code, I don't think we would have been able to finish this phase of the project on time. It would have been impossible."

Rational Rapid Developer constructs executable applications across all layers of an n-tier system, with support for a wide range of application servers, databases, browsers, and messaging technologies. According to Salman Siddiqui, IBM Business Consulting Services' architect on the project, that capability saved the team a substantial amount of time. "I have worked on numerous custom development projects before where we had to write all the code. Building a presentation layer, all the JSPs, servlets and the Java classes behind them, is a very challenging task. Just the presentation layer takes a long time. With Rational Rapid Developer, we can build the presentation layer right away, using drag-and-drop. It then constructs the page and it builds all the Java code behind the scenes. Another challenging area of custom development is writing the data access layer, and Rational Rapid Developer creates all of that behind the scenes as well. I'd estimate that we were able to develop at least ten times faster as a result." Ashworth adds, "For this particular project with the skill sets we had, I'd say the increase was even greater than that."

"This organization didn't have a background in relational data concepts much less in relational database technology. With the ability to visually

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present data in Rational Rapid Developer, they did not have to worry about how to get that data or how to persist it. Outside of learning how to write the code, there is a challenge in just writing SQL, and interacting with the data. Rational Rapid Developer really accelerated the learning curve. With the ability to abstract data access, abstract the complexity of coding the data representation, and enable developers to interact with the data via the user interface, Rational Rapid Developer has substantially increased productivity in those areas.” Murgas adds.

Reverse-Engineering, XML Support Simplifies Access to Existing Systems

Before the IBM Business Consulting Services team arrived, the agency’s development team had developed a database schema during the requirements definition phase. Using Rational Rapid Developer, the team was later able to jumpstart the development effort by reverse-engineering that database design into a data model. Ashworth recalls, “As part of the re-engineering of their processes, the client’s team defined a data model on which they built their requirements. Early on we found we could reverse-engineer that into a physical data model in Rational Rapid Developer very easily, and leverage that going forward.” Also, Rational Rapid Developer has the ability to access a broad range of legacy databases – including the agency’s aging Adabas system – providing the development team with the flexibility to easily access data first on existing legacy systems, and then on newer systems after the data is migrated.

As part of their proposed solution, IBM Business Consulting Services also recommended using a business rules engine to help the agency’s business users develop, manage and implement business rules in the application. Stotts explains, “Deploying a rules decision engine allows the client’s analyst to craft business decisions on a workstation and then implement them as part of the J2EE environment.” Support for XML in Rational Rapid Developer enabled the development team to easily integrate the business rules engine into the overall solution. “The XML mapping capabilities of Rational Rapid Developer were a significant help in interacting with the rules engine. We were able to take whatever objects had been laid out in the page, and then auto-

matically map those objects and their data into an XML string that we can pass directly to the rules engine,” Murgas says.

Kaczmarek agrees that messaging support was a significant advantage, “Today’s modern application is very much message-based and event-driven. Rational Rapid Developer has a set of out-of-the-box frameworks that enable you to dramatically simplify that whole layer of the application. Additionally, Rational Rapid Developer has a set of security frameworks that help you get a quick start on developing the authorization and authentication components of your application as well.”

Rational Suite DevelopmentStudio Supports Full Life Cycle Methodology

Throughout development, the development team used tools from Rational Suite DevelopmentStudio to apply a sound software development process based on the principles of the Rational Unified Process, or RUP. As part of Rational Suite, RUP provides teams with a consistent, yet flexible development methodology as well as practical guidance in using IBM Rational development tools. The team also used Rational RequisitePro® to define and manage new requirements as the scope of the project evolved. For software artifact management, the entire development team used IBM Rational ClearCase® from within IBM Rational Rapid Developer to check-in and check-out code and other assets.

Looking ahead, Murgas plans to take advantage of the advanced modeling capabilities of IBM Rational Rose® as well. “As I go forward and start using Rational Rose and a full design methodology with sequence diagramming, we can synchronize the class models of that design into Rational Rapid Developer. With the ability to forward-engineer and reverse-engineer, I don’t have to worry as much about supporting things I have already built.”

Auto-Construction and Deployment Flexibility Speeds Daily Development Cycles

Because Rational Rapid Developer enables development teams to easily select target deployment platforms – including application servers and databases from a variety of vendors – development teams are able to reliably develop in one environment, and deploy to an entirely different production environment. The

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team on the regulatory agency project used this capability to further accelerate development by enabling developers to use a lighter weight application server for their day-to-day builds, before moving to the testing and production environment – IBM WebSphere Application Server running on an IBM eServer pSeries 660 server.

“With the skill sets we had on the team, there was a lot of back and forth tweaking and then deploying pages”. Siddiqui notes, “So we decided to develop on a lightweight application server to get faster build and deploy cycles, and so we can have a standalone environment for each individual programmer. That has given us a great productivity increase. Being able to make changes and see the results immediately was a key to the client’s developers being able to go from zero productivity to very high productivity in a matter of weeks.” “With Rational Rapid Developer, just by changing the configuration at build time, you have the capability to switch your deployment environment with no impact to the code. That’s really been a strong benefit,” adds Ashworth.

Broad Applicability for Architected Rapid Application

The merging of RAD (rapid application development) and visual modeling techniques in Rational Rapid Developer makes it an ideal platform for many development teams today. “I’ve long been a proponent of both the RAD-based approach as well as model-based application development, because they offer significant benefits. In the case of RAD, the ability to interact directly and intimately with your end user and stakeholder communities – in a fashion that’s not possible using paper – is very enticing and a critical success factor in projects with very tight timeframes. Model-based development enables you to get away from the technology layer and focus strictly on the application. I am including Rational Rapid Developer in other government proposals – our target clients are enticed by the Rational Rapid Developer solution. You can see the excitement on their faces once they realize the possibilities with Rational Rapid Developer.”

Galfond agrees, “I see a lot of applications for Rational Rapid Developer in our clients – not

only in state and local governments, but in federal government as well. Government as a whole is looking for simpler solutions, not a lot of custom coding. Where possible they’d like to find a COTS (Commercial Off-The-Shelf) solution, but that’s not always possible. Frequently you have to develop Java code, and when that happens, it is good to have a tool that enables you to do it more effectively. In just about any development effort, one of the questions I ask myself and my team is ‘Can we leverage a tool like Rational Rapid Developer?’”

High Marks from the Client

Without Rational Rapid Developer, Ashworth is convinced that the regulatory agency development effort would have required more than twice as much time. Plus, he notes, the agency’s development team now has the tools and skills in place for future development efforts – a benefit that has not gone unnoticed by the agency’s senior management. “We released a first version at the end of February, and without Rational Rapid Developer I think it would have been a mid-summer implementation, if not early fall. And the beauty of the tool is that we have now transitioned the production support activities to the client staff. They are extremely satisfied with the product and with the skill sets we brought to bear, as well as our ability to work with their team, retool them, and help them become better skilled in the technology base,” Ashworth says.

Galfond notes that, citing client budget constraints of doing more with less, the use of Rational Rapid Developer was not merely beneficial, it was essential. “This is a long-term effort. It is a particularly challenging one for the state given the budget constraints that they are under. One of the advantages of our approach is that it allows them – even under a limited budget – to use the people they have and continue on with the work. To think that we could do this without a tool like Rational Rapid Developer would just be impossible.”

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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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