

Industry:
Hardware/Software

Organization:
EzGov, Inc.

Description:
Based in Atlanta and operating worldwide, EzGov develops software specifically tailored to meet the unique needs of all levels of government. As the e-government technology specialist, EzGov provides the software and services governments need to become more efficient and to better serve citizens, businesses, and internal government employees.

Business Problem:
Faced with unique and stringent requirements of developing software for e-government, EzGov needed a proven, effective development process and powerful tools that support it.

Rational Solution:
Rational ClearCase
Rational ClearQuest
Rational RequisitePro
Rational Rose
Rational SoDA
Rational Services
Rational Developer Network
Rational Suite Enterprise
Rational Unified Process

Key Benefits:
Reduced project risk and met tight deadlines by adopting a proven development process, an iterative development approach and best practices

Improved communication both internally and with customers through the Unified Modeling Language (UML)

Supported multiple ongoing projects concurrently with effective software configuration management

Rational software

EzGov Delivers Fast, Reliable e-Government Solutions with the Rational Unified Process and Rational Suite Enterprise

Based in Atlanta and operating worldwide, EzGov develops software specifically tailored to meet the unique needs of all levels of government. As the e-government technology specialist, EzGov provides the software and services governments need to become more efficient and to better serve citizens, businesses, and internal government employees. For EzGov, success depends on developing applications for one of the most diverse and demanding user bases around – essentially everyone – while satisfying customers with set budgets, firm deadlines and high quality standards. Faced with these constraints, EzGov adopted the Rational Unified Process® (RUP®) and a wide range of Rational development and testing tools to help them build an impressive track record of delivering reliable solutions on tight schedules.

According to Brad Hipps, Vice President of Consulting Services for EzGov, the EzGov FlexFoundation™ software platform combined with Rational processes and tools form the basis for EzGov's remarkable success. FlexFoundation is an enterprise solution that enables government agencies to deliver services and information via the Internet and other distribution channels. In addition, FlexFoundation integrates and supports services and information within government itself. Hipps explains, "From our standpoint, our business is predicated on FlexFoundation. FlexFoundation reduces development time and effort because components are used to render complete applications. Our credibility depends upon being able to deliver the most effective solution more quickly for governments and our ability to show them how we go about doing that. The reality is that it is pinned upon two things – the FlexFoundation platform and the exceptionally strong, definable, repeatable methodology of the Rational Unified Process and the tools that support it."

It Starts with the Process

Rational Unified Process is a web-enabled set of software engineering processes and best practices. As an industry-wide process platform, RUP helps teams streamline development activities by choosing the best set of process components for any project's specific needs. Shortly after EzGov was founded, the management team recognized the potential benefits of adopting the Rational Unified Process. Douglas Wait, EzGov's CTO, remembers, "Our founding team included a group of software engineers that had a pretty technical bent. All of them had experience with the Unified Modeling Language (UML) and some of the other processes that eventually led to the UML. When we gained a critical mass a few months later, we felt we really needed to solidify our process. We considered creating our own process but that seemed unnecessary given that the Rational Unified Process was available and it reflected the values that we had." Hipps adds, "It was really Doug who introduced me to Rational, and as I started reading the material it was very clear that the RUP was a far superior methodology for what we were trying to accomplish."

e-Government Is Not The Same As e-Business

What EzGov was trying to accomplish – and what they very quickly did accomplish – was to become a leading supplier of e-government software and services. While the 'e' in "e-government" is the same as the one in "e-business", developers of e-government software face a much stricter set of requirements than e-business developers. One of the biggest differences is that e-government applications must comply with Section 508 requirements. Under Section 508, all federal agencies' electronic and information technology must be accessible to people with disabilities. Wait notes, "e-government applications have a different set of constraints on them than e-busi-



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Vice President of Consulting
Services for EzGov

ness applications. Governments are chartered to deliver a consistent level of service to all constituents including people with disabilities that cannot access standard Web sites. Section 508 addresses that, and all of our applications are built to the 508 standards, to support access by a broad constituency."

There are other significant differences, Wait continues, "Security is also a top priority for governments. It is for most e-businesses too, but governments are particularly sensitive. In addition, e-government applications need to be resilient in light of legislative mandates and changes; and our FlexFoundation suite is designed to support that kind of dynamic environment. The government environment tends to have a lot of legacy systems, and governments are relatively cautious about adopting new technologies compared to a typical private sector environment. Lastly, we frequently find that an agency or politician has committed to deliver some functionality by a specific date and that commitment is very public which provides us with a very hard deadline."

When taken all together, these considerations can really make it hard for governments to get out of the starting gate. EzGov's solution relies on the iterative approach of the Rational Unified Process. This approach facilitates an increasing understanding of the project through successive refinements, allowing teams to incrementally grow and test an effective solution over multiple iterations. "Because of all these constraints, there is a fair amount of 'Analysis Paralysis' that besets governments," Hipps says. "One of the things that we have a lot of success with, especially with our larger clients, is this notion of taking an iterative approach. What we say to them is, 'It's great that you have a grand vision and that you're working towards it. But it's also important that you actually begin somewhere to start proving out that grand vision.' We abide by the iterative methodology in RUP, and the more we work with a client the more they are able to come to us and say 'Here's all the stuff we want to get accomplished. What should we bite off first that we can get done in that first round? And what are we going to learn coming out of it?' I've been very impressed. Now many of our customers are even using Rational's terminology, and it's really great to

see." A key benefit of this approach for EzGov and their customers is that it significantly reduces a project's risk by addressing the highest risk items at every stage in the lifecycle. Wait concludes, "Governments really are risk averse, and when we can demonstrate that the iterative approach mitigates that risk they are happy with that."

A Cure for "Analysis Paralysis"

EzGov uses Rational tools in every phase of the development life cycle, including analysis and design, development and testing. Rational Suite® Enterprise™ is a perfect match for EzGov's needs because it includes the Rational Unified Process and the full array of Rational's award-winning tools for every member of EzGov's development team.

As part of Rational Suite Enterprise and Rational's Team Unifying Platform, Rational RequisitePro® helps the EzGov team effectively manage project requirements at the outset of each project and throughout development. Rational RequisitePro makes it simple for team members to collaborate on project requirements and track those requirements through implementation and testing. Hipps reports that Rational RequisitePro is key to keeping projects on track, "RequisitePro has really become a kind of anchor for us. It ensures we're on top of the things that our customers are saying to us, and the way we're reflecting those things back to them — and how those things are being reflected throughout the rest of the development organization. We use RequisitePro to capture all of our requirements and to map those requirements to test cases. We use the automated notification function; so if a requirement changes, there's an automatic distribution sent out to the folks that are going to be impacted. That is critical. And, with RequisitePro we have a concrete audit trail for what changed when and why."

Selling an Engagement

As project requirements are defined in Rational RequisitePro, the EzGov team begins developing use case diagrams for the project in Rational Rose®. The leading model-driven development tool, Rational Rose helps the EzGov teams build resilient component-based architectures and collaborate more effectively. According to Wait, one of the biggest benefits

that EzGov has realized through the use of Rational solutions is improved communication both internally and with customers, which is a direct result of using a common language – the Unified Modeling Language (UML) – and Rational Rose.

The use of Rational Rose, UML and the Rational Unified Process has had a positive impact on EzGov's ability to meet business goals as well as development goals. In the Rational Unified Process, the primary goal of the inception phase is to reach agreement among all stakeholders on the objectives for the project – as well as the scope of the project, critical use cases, and estimates for cost, schedule and potential risks. Hipps explains that for many customers, EzGov's ability to clearly delineate this phase is a big selling point. "Rational has been very helpful in selling an engagement in which we will do only the Inception phase. We tell the customer that at the conclusion of the inception phase we'll have a much better sense of the size, scope and risks associated with the project. We'll be able to give them a much more accurate estimate and we can proceed from there. Rational makes that possible in two ways. First, because each phase in the RUP is clearly defined and delineated — you have set objectives and set exit criteria – we are able to sell a very precise package of services. We can provide a very precise inventory of what we'll deliver, not just a vague commitment of analysis. Second, because we'll also deliver a use case model, it's particularly compelling for those clients that realize the value – they see that there is actual work that's been done and that we can generate code from this. It's not an esoteric exercise, it's actual systems engineering. Rational Rose, UML, and visual modeling makes all that real; it is not just about talk and theorizing." Once the inception phase is complete, the customers have the option of continuing the work themselves, or having EzGov complete the project.

Synchronized Models, Code and Documentation

Wait reports that the EzGov team follows a proven process as they develop their models and systems. "We follow the RUP template that comes with Rational Rose. We have all our use cases and actors in the analysis

model. In the design model we go through all the use case realizations. We use the deployment model to map our realizations and our components into the deployment view." EzGov developers also use Rose for round-trip engineering of their Java code to ensure that the models always accurately represent the underlying code. "We tend to do more forward engineering, because once you've got your models and code in sync, if you make all your changes in the models then you can keep it synchronized with just forward engineering. It has been very beneficial in that we can be confident that our design matches the code."

Rational SoDA (Software Documentation Automation) provides EzGov with one more mechanism to communicate designs and architectures effectively. Using templates, Rational SoDA automatically generates systems documents based on current models in Rose and other software development artifacts. "SoDA is a very valuable tool because you can change the model and generate documentation without doing cut-and-paste into a document. We do provide our customers with software architecture documents and some other SoDA generated documents. It is really nice because they're easy to update and maintain," Wait reports.

Managing Change

EzGov development efforts are divided into two related groups. One group works on developing new releases of their core product, FlexFoundation. A second set of teams uses that foundation to deliver solutions to their customers. Developing any solution as comprehensive as FlexFoundation requires solid software configuration management tools and practices. But when dozens of custom projects are thrown into the mix, effective software configuration management becomes absolutely crucial.

In the earliest days of EzGov, developers used an open source change control system. But it wasn't long before they outgrew it. In need of a tool that could easily handle many concurrent projects, EzGov switched to Rational ClearCase® and eventually adopted Rational ClearQuest® and Unified Change Management (UCM) as well. UCM is an out-of-the-box process for managing activities and

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EzGov

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artifacts across the software development lifecycle with Rational ClearCase and Rational ClearQuest. "Rational ClearCase really allowed us to manage many different products easily. When we first started the company we were deploying applications to a lot of local governments. At one point early on we had twenty projects going on concurrently and today we have well over one hundred UCM projects in ClearCase. We recognized that we were going to have a lot of complexity in handling branches and variations in our code base for these individual clients. The introduction of UCM made the branching much easier. We also use Rational ClearQuest to track our changes. When defects or enhancement requests come in, we create Rational ClearQuest records and that ties through the whole process," says Wait. With UCM, EzGov is able to link individual change requests and defects in Rational ClearQuest with the version that they were addressed in, as managed in Rational ClearCase. "For us, the integration between Rational ClearCase and Rational ClearQuest is critical. It's fundamental — everything starts with that." The EzGov team also links requirements changes in Rational RequisitePro to enhancements and defects tracked in Rational ClearQuest. "Once requirements are baselined, they are treated like source code and any modification must be tied to a ClearQuest record," Hipps adds.

Quality is the Key to Success

Frank Moyer is EzGov's CIO and is ultimately responsible for testing and ensuring the quality of the applications that EzGov delivers to its customers. "When you look at our corporate strategy, delivering with high quality has been key to our success. We really rely on Rational testing products to maintain that quality and help us achieve that strategy," Moyer says.

The testing team at EzGov uses Rational Robot to automate and simplify regression testing, and they use Rational TestManager to manage the entire testing effort. Moyer reports, "Rational Robot has been a very effective tool for automating our tests. It has enabled us to save a tremendous amount of time as we go through the iterative development process. TestManager has also improved our testing process, and it has been very effective in testing FlexFoundation. We need to test different configurations. With

Rational Robot and TestManager, we can configure a standard set of test cases and use them across multiple platforms — different runtime platforms as well as different browsers running on those platforms. The ability to use the same exact test cases on different configurations has been a huge benefit."

He continues, "One of the great things about Rational's products, especially Rational Robot, are their modularity. For example, we developed an online tax-filing application with 16 pages on it. For test cases that required execution on the last page of that application we first had to go through the first 15 pages. Robot allowed us to have a standard set of execution steps for those pages, so all we needed to do was modify the different test scenarios for the last page. When we are developing our test scripts, that modularity saves us a lot of time."

According to Moyer, the greatest advantage of using Rational testing tools is the integration with the development process. "The tight, well-thought-out integration of the tools and the different pieces of the development process is beautiful. For example, we can associate our requirements in RequisitePro with our test cases in TestManager so we can see what requirements have been tested and which have passed. The tight integration of TestManager with Robot and RequisitePro gives us everything right out-of-the-box. The ultimate benefit is time-savings by eliminating manual steps and from being able to regression test quickly after a new iteration is completed."

Rational Training and a Rational Community

Rational's approach to software development combines software engineering best practices, integrated tools, and services that accelerate implementation. EzGov has taken advantage of all three. EzGov developers and testers received training on-site to enhance the substantial advantages they gained by adopting the Rational Unified Process. Wait explains, "We selected the Rational Unified Process and with that we got all the benefits of an out-of-the-box process — including the RUP software itself and the training that goes along with that. We didn't have to develop our own training course, and that saved us a lot of

time. The Rational training really complemented the product and the fact that we were able to bring it in house really made it easier for us to do. Plus we've had experience in companies that used proprietary processes and developed their own training. So we know how difficult it is to develop and maintain those processes. That's a massive cost and it takes time. Organizations develop a culture, and what we've done is develop a Rational culture here."

For Hipps, unifying the team was a clear benefit of the training and the Rational Unified Process, "We could have easily buried ourselves in shifting terms and changing approaches. But, with Rational, in fairly short order we got everyone on the same page, talking about the same things in the same way, and addressing issues with the same mindset."

In addition to formal training, the EzGov team has found a lot of value in some of Rational's on-line resources. "There's real value in having a community — not only an internal community but also a broader external community," he adds. "We use the Rational Developer Networks forums to hear how other folks are doing things. It is great to have a community that's continuing to push new ideas. We think Rational's Webinars are great too. And we also read the Rational Edge quite a bit."

"The Most Successful Systems Project I've Ever Been Associated With"

The tax filing application Moyer talked about is actually a success story in its own right. It is one of the largest projects that EzGov has delivered to date, and it was completed in a stunningly quick 12 weeks. The customer was the national government of a large European nation. Because the tax-filing deadline was set, the project's completion date could not slip, even by a day.

"That three month time frame was possible only because of FlexFoundation and Rational's iterative approach. We were able to pull a lot of high-risk technology into the early phases, prove it out, and ensure that we understood how it would behave. The customer hadn't had a relationship with us; but because within the first three weeks of the project we were able to show them prototypes of a working system you could feel the pressure begin to deflate. As we went point-by-point through each iteration we got real-time feedback because they could play with the system and tell us what they liked and what they didn't. Rational Rose and UML made the entire process fluid and easier to accomplish," Hipps recalls.

He concludes, "It was the most successful systems project I've ever been associated with. It was amazing. The client wrote us full-page letters of thanks. But it simply would not have been accomplished without Rational tools, the Rational Unified Process and the iterative approach."

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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