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WM-data Drives Successful Global Development Efforts with IBM Rational Unified Process and IBM Rational Tools

Overview

■ **The Challenge**

Facing increasingly fierce competition from system integrators domestically and abroad, the Component Factory at WM-data needed to build on its reputation for delivering high-quality solutions to its customers on time, while continuing to increase the flexibility and cost-effectiveness of its approach.

■ **The Solution**

The Component Factory adopted IBM Rational Unified Process, or RUP, as a standard for all development projects. The group's model-driven, best practices-based development methodology is supported by IBM Rational Rose Enterprise for visual modeling, IBM Rational RequisitePro for requirements management, IBM Rational TestManager for test management, and IBM Rational ClearQuest for defect tracking and workflow management.

■ **The Benefit**

RUP and integrated tools from the IBM Rational Software Development Platform have enabled the Component Factory team to realize year-after-year improvements in productivity, efficiency and quality in software development. As a result, the team is able to better satisfy customer needs and deliver projects in about two-thirds of the time of WM-data's competitors.

As one of the largest system integrators in the Nordic region, WM-data offers a broad range of design and IT-related services, including application development and maintenance, software development consultancy, outsourcing, and business consulting. WM-data's overall business concept is to create tangible and lasting benefit to its customers.

Within WM-data, the Component Factory is a group of high-skilled software development professionals that take on many of WM-data's most challenging development initiatives. By focusing on results and delivering comprehensive solutions, the Component Factory has helped WM-data established itself as a leader in its market.

Price competition for the fixed-price contracts that characterize that market has grown in intensity as offshore development has become a larger factor. Staffan Angermund, Site Manager of WM-data Component Factory, explains, "We are always ultimately measured by the quality of the solutions we build and our ability to deliver on time. Time and quality are most important to us, and our challenge is to continuously improve quality as we reduce the time needed to deliver results."

A consistent methodology across all projects

In addressing these challenges, WM-data has gained and maintained a competitive advantage by applying a consistent, proven software development methodology. The Component Factory team has been successfully delivering quality solutions using the IBM Rational Unified Process® methodology for more than a decade. Based on proven best practices, IBM Rational Unified Process, or RUP®, is a configurable

software development process platform that provides the Component Factory with a consistent methodology backed by integrated tools from the IBM Rational® Software Development Platform.

Angermund reports, "RUP is very important for us. We really needed a common process for all of our projects. One of the biggest benefits of RUP for us is that we have established a common way of working. We are using the same methodology across all of our projects. It is a process based on best practices, and it covers everything that we need to do. We have been using it for more than 10 years, and it still covers all of our needs. Also, our customers never question our process — as soon as we say we are using RUP, they have confidence in our approach. It is a real plus."

Integrated tools to support the process
In addition to RUP, the Component Factory development team uses a wide range of software development tools from the IBM Rational Software Development Platform. The group decides what tools to implement depending on the needs of a particular project. "Sometimes the decision of what tools to use is driven by the customer. One key benefit of using IBM Rational tools is that they are integrated with the methodology. They fit well with the process and what we need to do."

Component Factory development teams use IBM Rational RequisitePro®

to manage requirements; IBM Rational ClearQuest® to track defects and manage workflow; and IBM Rational TestManager to manage test plans and testing activities. IBM Rational Rose® Enterprise, included in IBM Rational XDE™ Developer Plus, is also central to the group's development efforts and its strong focus on model-driven development. "We really concentrate on model-driven development and on increasing the percentage of code that we generate.That is why we use Rational Rose heavily," says Angermund

A custom-tailored process
The Component Factory has customized RUP to better leverage the group's own expertise, practices, and organizational knowledge. If requested, the group will further customize its process to meet a customer's specific needs.

"We have tailored RUP for the Component Factory, and we call that customized methodology 'K2.' The customization is important for us because the complete RUP process is not required for us in our typical projects. It is however, a real benefit to have a complete process from which we can pick everything we need. We don't really lack anything in the process. The completeness of the methodology along with the ability to tailor it provides us with exactly what we need," says Angermund.

He adds, "Some of our customers also have their own tailoring, which we will use if they want us to. Recently, we had

a customer that was especially happy that we were using RUP as a process. They were adopting a customized version themselves and for the first time we were all using the same methodology, the same process that they wanted to use internally."

Managing geographically distributed, offshore development
The use of RUP and IBM Rational tools have enabled the Component Factory to take advantage of lower cost offshore development centers while maintaining complete control over the development process. As an example, Angermund cites a recent project, named Apoteket, that integrated and automated the prescription process between doctors and pharmacies in Sweden. The customer was a government agency and the solution had to comply with government regulations as well as a strict delivery schedule. WM-data leveraged an offshore development team in India for the construction phase of the project, and used RUP to seamlessly integrate that construction phase with the overall design, development and test effort.

Angermund explains, "For multi-shore development, we really rely on RUP to give us a very good, detailed description of what to do in the process and what should be created in each iteration so we can really control what the subcontractor is doing. We have created a specific process to handle offshore development with RUP, in which keep control but we pick certain artifacts that we want

them to produce. We plugged the subcontractor into the construction phase, and we kept control every step of the way. RUP was a very good basis for working with them."

A model driven approach to offshore development

IBM Rational Rose played a key role in the overall success of the project as well. Before turning construction of the system over to the offshore team, the Component Factory first used Rational Rose to design and architect the system. Using the Unified Modeling Language (UML), the WM-data team created use case diagrams, sequence diagrams, activity diagrams and application models of the entire solution.

Rational Rose and UML enabled WM-data to clearly communicate the system design in a standard, well understood language. In addition, they have helped the WM-data team keep the project on schedule and on budget. "The entire effort is model-driven in Rational Rose. That was really one of the keys to success. Otherwise we would not have managed to keep to the aggressive time schedule for this project," notes Angermund.

Automatic code generation saves time

On many Component Factory projects, including the Apoteket project, the team accelerates development by automatically generating code from models built with Rational Rose. The code development is then typically completed using the open-source Eclipse development platform.

Angermund reports, "We have built a platform for model-driven Java® and C++ development. On one project we generated over 60 percent of the code for a system with 450,000 lines of code. Only the user interface and some part of the business logic were not automatically generated, all of the rest was. Generating code from our Rational Rose models saves us a great deal of time and improves the quality of the finished system."

A different kind of geographically distributed development

For WM-data, one of the major advantages of RUP is its versatility. As completion of the Apoteket project nears, the Component Factory has begun work on a very different kind of project. This project, named FMV-Fenix, is a defense contract and involves the monitoring of aircraft maintenance. It is a complex integration project with thousands of requirements. Development of the system components that WM-data will integrate is being performed in Canada and multiple sites throughout Sweden.

In contrast to the Apoteket project, the Component Factory is responsible for relatively little of the code development on the project. However, as systems integrator, the group is ultimately responsible for the on time delivery of a quality system that fully meets all the specified requirements. "Because this is an integration project there is not much development required on our part, just some

migration tools and interface components. We are still relying on RUP to guide and manage the project," notes Angermund.

Tracing requirements to tests

Although the Component Factory is using the same basic RUP methodology on FMV-Fenix, the project will require a different toolset. Instead of extensive use of Rational Rose, the team is implementing Rational RequisitePro to manage the more than 2,000 project requirements and Rational TestManager to manage the testing effort. More importantly, the team will use the integration between these two tools to ensure complete test coverage of all requirements for the completed system.

Angermund explains, "It is very important for us to keep track of the requirements and connect them to the test cases — not only from a quality and customer satisfaction standpoint, but also from a financial standpoint. It is a fixed price project and we get paid when we have fulfilled all those requirements. So we have a strong interest in proving that we have fulfilled all the requirements."

Using Rational ClearQuest to manage workflow in a distributed environment

The team is also using IBM Rational ClearQuest, tightly integrated with Rational RequisitePro and Rational TestManager, to track defects and enhancement requests and to manage workflow. Problem reports and enhancement requests are tracked

throughout the project with Rational ClearQuest — from the change control board until the time they are resolved or verified in the testing process.

Angermund notes, "We are in a distributed environment all the time so we are using Rational ClearQuest — and the Rational ClearQuest Web interface — to keep track of everything and to connect problem reports to requirements and follow-up tests. We know how important it is keep track of the work process as well, so we use Rational ClearQuest for that too."

The group also plans to use IBM Rational ProjectConsole™ on the project to provide the customer with a detailed view of the project status throughout development. Rational ProjectConsole gathers metrics data from other tools, including Rational ClearQuest, Rational TestManager and Rational RequisitePro, and displays them in an easily accessible and understandable format. "We are going to use Rational ProjectConsole to show the customer where we are at all times. We are going to give them the full insight into what is happening," says Angermund.

RUP improves flexibility in project staffing

One of the guiding principles of the Component Factory is that everyone on the project team is responsible for the successful completion of each project. Unlike many development organizations in which each staff member has a predefined role on the

team, each Component Factory employee regularly assumes multiple roles, including project manager, analyst, developer and tester. Because all projects use RUP as a common methodology, the Component Factory team continues to build expertise in the various roles and responsibilities of a single, well-defined methodology. The result is a highly flexible, interchangeable, motivated, and continuously improving team.

Angermund explains, "We have the luxury of utilizing people when and where they are needed. Because they are all using RUP and they are all experienced with multiple roles, we can move them between the projects and anywhere in the factory. We can very quickly start a new person on any project since we use the same method from project to project. We can also better leverage the experience and knowledge we acquire. This flexibility helps us ensure that we are being efficient at all times. It also gives people the opportunity to improve their competence in many different areas."

Delivering results

The combination of RUP, IBM Rational tools, the Component Factory's skilled team, and its dedication to delivering quality has yielded remarkable results on a wide range of projects. On a typical development effort, Angermund estimates that his group can complete development in significantly less time than a traditional development team. "With, RUP we can

produce quality results in two-thirds of the time of our traditional competitors. On fixed-rate projects, that translates to significant savings to the customer and good business for us. And, we can plug in offshore development to further lower the costs," he reports.

The IBM Rational Software Development Platform, including RUP, has helped the Component Factory improve quality, increase the flexibility of its project staff, accelerate development, and win and retain satisfied customers. Angermund concludes, "Our customers regularly come back to us with new contracts. Using RUP as our methodology, it is much easier for us to compete. We continue to get better every day in our model-driven development with Rational Rose. We focus on quality assurance and meeting customer needs with tools like Rational ClearQuest, Rational TestManager and Rational RequisitePro. We really have confidence in our ability to do what we need to do as a business — deliver quality solutions, on time."

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