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Customer Perspectives on the Benefits of a Collaborative Process to Deliver Software Quality

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Introduction

The delivery of high quality software in today's increasingly interconnected and computerized world is more critical than ever to an organization's success. Why? In one form or another, this software touches the customer. Today, software drives everything from equipment on the factory floor to controls managing traffic flow on crowded city streets. Whether it is a system to process claims and deliver information to customers and partners, an online banking system, or the embedded technology systems in an automobile or household appliance, businesses rely on software assets to build competitive advantage and grow their businesses.

Organizations understand the need to anticipate and respond more quickly to their customers' priorities and requirements. This responsiveness demands increasing levels of business agility and is predicated on effective management of the complex set of systems that support the products and services delivered to customers and partners. To respond to this changing market requirement, the software delivery lifecycle has begun to mature. It has become more iterative and dynamic, as organizations strive to optimize business outcomes in an environment of constant change.

Organizations are, therefore, taking a hard look at how to ensure that the software delivery process is aligned with the strategy and goals of the business. IT management wants to improve their processes for delivering quality software and optimize the benefits from their investment in software assets. Software developers, quality managers, line of business managers and other stakeholders need a consistent and reliable way to connect with each other so the right information is shared among the right people at the right time.

For example, both development and testing organizations need to immediately know about any changes to application requirements so that they can plan and react quickly. Many sophisticated organizations are moving to automate and track the distribution of this kind of information to all members of the software delivery team. This is a continuous, integrated, flexible approach to software delivery which also involves measuring key metrics and reporting on these metrics to increase visibility and improve decision making.

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This level of change isn't easy for organizations. For many, this move to a more collaborative software delivery lifecycle requires a cultural shift for both the business and IT. Traditionally, IT teams have been comfortable with manual methods of recording changes to requirements and test cases. However, given the dynamic rate of business change, organizations are discovering that these methods fall short. The only viable option for many IT organizations is to find ways to leverage automation and increase productivity.

Hurwitz & Associates was commissioned by IBM to interview three of its customers (Sogeti Group, Accident Compensation Corporation (ACC) of New Zealand, and Scotiabank) to understand how they improved software quality by following a collaborative approach throughout the software delivery lifecycle. All three companies recognized an increasing rate of change in their business environment and focused on streamlining and optimizing the software delivery process as a way to deliver more value to the business.

The Challenges of Delivering Quality Software

Many companies have traditionally followed a siloed approach to the delivery of software. The various components of software delivery including requirements definition, design, development, testing, and deployment are often the responsibility of distributed teams with limited visibility into each other's work. Without a consistent approach to ensure the right level of collaboration between teams, many companies face cost overruns and missed revenue opportunities because they must correct defects late in the software delivery cycle. Any gap in the flow of information throughout the software delivery life cycle hurts companies because it adds time and cost to the development process.

The three companies interviewed for this paper all implemented IBM Rational software to help them increase the value and performance they were getting from their software investments. Although each company's situation is unique, all experienced challenges in the requirements and testing phases of the software delivery lifecycle.

Sogeti Group, a large technology services company with a specialty in quality assurance and testing, needed a more efficient and cost effective way to manage

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and track test plans of its customers in the Netherlands in order to improve operational performance. ACC, New Zealand's government sponsored provider of personal injury coverage, knew the only way it could effectively manage the requirements and testing phases of the implementation of a new core application was by increasing the level of collaboration between the business and IT and by adopting a more standardized approach to software delivery. Scotiabank, based in Canada, needed more frequent changes to business applications as it rapidly grew through mergers and acquisitions into a global diversified financial organization. The IT organization couldn't keep up with the base of change with its structured approach to software delivery and its manual processes for requirements and testing.

Developing a Strategy to Mitigate Risk in the Software Delivery Process

In a complex and changing world, it is difficult to meet customer needs without a standardized framework for managing the software delivery process. In order to mitigate risk, organizations need to apply standards and best practices throughout all phases of the software delivery cycle. There are many elements of this process – ranging from requirements to design to development to test and project management – that require collaboration in order to get the job done right.

One of the key inhibitors the three companies highlighted in the paper recognized was the inefficiency of manual processes. They needed to implement integrated software solutions that would enable more effective sharing of information about software requirements and testing across all the stakeholders. All aspects of the software delivery process needed to become more visible to everyone on the requirements and testing teams. In effect, these companies needed to support an iterative lifecycle approach to quality management that fostered collaboration among all of the members of the software delivery team. Based on the customer interviews, Hurwitz & Associates has identified the following key characteristics of this collaborative approach to delivering software quality:

- Consistent, standardized, and well-integrated processes and tooling to build cohesion and enable communication between IT developers, testers, and the business

In order to mitigate risk, organizations need to apply standards and best practices throughout all phases of the software delivery cycle.

- Automation across all phases of the software delivery cycle, which enables all stakeholders to efficiently manage change and improve productivity

- Processes to manage effective reuse of software assets that increase productivity, improve accuracy, and save money

- Accurate and timely quality metrics to help to ensure continuous improvement in the software delivery process

- Executive sponsorship, careful planning, and training to ease business culture adjustments

- Deeper visibility into the software delivery process that results in higher quality software without overstepping budget and time constraints

As you will see from the case studies below, efforts to improve software quality management are part of an ongoing process to drive the organization towards greater flexibility and agility. Sogeti Group, ACC, and Scotiabank all became more efficient and improved software quality after moving to a more collaborative and flexible approach to software delivery. They all implemented IBM Rational software to help them achieve goals of innovation and growth. In the following three case studies, we discuss their challenges, successes, and plans for future process improvement.

Sogeti Group

Sogeti Group is a leading provider of professional technology services, specializing in Application Management, Infrastructure Management, High-Tech Engineering and Testing. The company, one of the largest testing service providers in Europe and USA developed a widely-adopted industry standard in structured testing called TMap® (Test Management Approach).

Sogeti Netherlands (NL) is a major contributor to Sogeti's worldwide testing revenues and is a quality assurance innovator within the Group. With over 750 quality assurance experts, it manages hundreds of test plans for its clients in multiple locations in the Netherlands, other European countries and India. The Dutch test teams have adopted a test factory approach and the majority of the work involves manual test processes using TMap.

Sogeti, ACC, and Scotiabank all became more efficient and improved software quality after moving to a more collaborative and iterative approach to software delivery.

However, the company wanted to make a major change in its business model to expand from its strong base in manual testing to become a leader in automated testing. The new business model would depend on several key factors: speed, price, and flexibility. The company wanted to provide its customers with automated testing services that would deliver results more quickly, accurately, and cost effectively than if the customers performed this work themselves or if a Sogeti team performed it using manual test processes.

Although Sogeti NL's standardized testing processes based on TMap are highly structured and business driven, it wanted to improve the implementation of these processes. The TMap test processes would stay the same, but the implementation would become more automated. The company decided to utilize the capabilities of the Rational products built on Jazz – IBM's technology platform that enables collaboration among teams – to help achieve the following goals:

- Develop an automated testing solution that could support multiple projects and multiple clients, as well as quickly scale up and move resources between projects.

- Standardize its testing centers and develop them into more highly efficient software testing factories.

- Move to a single licensing model to more effectively support multiple clients rather than acquiring a new license for each new customer test environment.

The workflow structure in Rational Quality Manager- a web-based centralized test management environment based on Jazz - has been a significant factor in enabling Sogeti NL to automate its testing services and find greater efficiencies in its processes. In the past, development and test teams were located in close proximity and the project lead could easily check in with all members of the team on a daily basis, to review goals for the day and answer questions. However, today there are cost and productivity benefits to utilizing people in geographically distributed development and test teams. As a result of this change, project leads no longer have daily face-to-face contact with each team member, making it harder to manage projects. Sogeti NL used the capabilities of Rational Quality Manager (RQM) to bring back the valuable continuity of communication and knowledge-sharing that is derived from good collaboration techniques. RQM serves as the foundation for an infrastructure of continuous improvement for Sogeti NL.

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Paul Bentvelzen, Manager of Sogeti's Test Service Center in the Netherlands, summarizes: "Using TMap and a structured test process, Sogeti NL has been able to satisfy a major customer's request to cut testing costs by 25% over 3 years. Now using Rational Quality Manager and leveraging automated test processes based on Rational Jazz-based solutions, we plan to help this customer reduce testing costs by an additional 25%. By leveraging the key strengths of Rational, Sogeti Netherlands can further improve the quality of service it provides to its customers."

Accident Compensation Corporation (ACC) of New Zealand

ACC provides comprehensive, no-fault personal injury coverage to all New Zealand residents and visitors to the country. In 2003, the company decided that it needed to change its core application for managing claims, payments, and entitlements. The existing legacy application was not web-based and the company wanted to move to a more flexible application to allow greater visibility to its customers and provide a more configurable system for its staff.

The company purchased a packaged application to replace its core legacy application with the understanding that it would require customization to support its claims processing and other business processes. There was much iteration of the business requirements, resulting in a lengthy and iterative testing process. The "waterfall" approach to development typically followed by the IT team became much more iterative out of necessity.

As soon as ACC purchased the new core application, Colleen Meads, Test Manager at ACC, recognized that the team needed to create a more formal process for managing requirements and testing. A key priority was to improve traceability – having the appropriate level of insight to understand requirements and all changes made to these requirements. Traceability was a challenge due to the increasing complexity of requirements documents and the lack of a standardized approach for managing test scripts. This lack of traceability added a lot of risk into the software delivery process. Confusion over multiple versions of requirements and test scripts could lead to developers and testers working with incorrect versions.

ACC implemented Rational RequisitePro, a requirements management solution, to help increase collaboration among its software delivery teams. This software is designed to allow teams to share requirements, track them to other requirements

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and project deliverables, perform impact analysis, and keep track of the various versions in an automated way as well as manage multiple streams of builds based on the correct versions of requirements for each build phase. Using Rational Requisite Pro helped the testing team to improve its requirements traceability and test management processes by:

- Creating a master repository of requirements documents and test scripts, giving the team greater insight into changes in requirements and eliminating confusion over test versions

- Linking all test scripts to requirements so the test team has good visibility into all tests scripts that might be impacted by a change in requirements

With a new standardized best practices approach for software delivery in place, IT improved its ability to align project deliverables with the goals of the business. They met the project deadline, kept the project within its budget, and increased the quality of the new business application. As Colleen reflected on her team's experience she said that, "the only way we could have met the project deadline without RequisitePro would have been to substantially increase the size of the test team."

The test management team currently uses Rational Test Manager to unify the various processes by including master requirements documents, master system specifications, configuration documents, and test scripts in the platform. ACC has purchased Rational Quality Manager and is looking to implement this product in order to help the company continue its journey to improve software quality management. According to Meads, "The main reasons we are implementing Rational Quality Manager are to improve predictability and consistency in software quality delivery and to help us achieve greater value and performance from our software investments."

Scotiabank

The IT organization at Scotiabank, a global financial services organization based in Canada, faced a number of challenges in its goal to deliver high quality software to the business. Collaboration across project teams became more difficult as the staffing model for projects grew to include resources located in different regions and time zones. In order to take advantage of

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new opportunities, the business needed more frequent changes to internal and customer facing business applications which increased the complexity of requirements and, more importantly, made these requirements harder to nail down.

Given the rapid pace of change in the business, IT found it could not provide adequate support to the business with its existing software delivery methods. Large IT departments of Scotiabank followed a structured, waterfall approach to software delivery and typically sent business experts extensive requirements documents covering the entire scope of the project and requested a review.

This process led to two main problems. First, the business experts had a hard time visualizing results from the requirements documents and didn't realize that the requirements didn't fulfill their objectives until later on in the process. The second problem was that the requirements kept changing during the course of the development cycle leading to many changes to these large and complex requirements documents. These two issues contributed to software quality suffering and bug fixes becoming quite costly and time consuming.

In 2003, the IT organization began a journey towards a more interactive and agile software delivery process. They adopted the IBM Rational Unified Process (RUP), a framework for iterative software development, to help them get started on this journey.

Shazam Abass, Head of Project Delivery, Practices and Tools at Scotiabank's Technology Application Group indicated that his team helped projects to significantly reduce time spent reworking requirements once they began following a more iterative and collaborative process. This has, in turn, reduced the costs associated with developing high quality software. By deploying Rational tools designed to automate many of these processes, Scotiabank can now link requirements and testing more closely together. This enables the company to identify and fix problems earlier in the development life cycle. Since implementing this collaborative process and the Rational tools, the number of errors at the final stage of testing and release has dropped by over 70% on a number of projects. One important benefit to fixing bugs earlier in the software delivery process is that the fixes are usually more strategic because the team is under less pressure. The team is able to make deadlines and budgets with "greater peace of mind and less risk," says Shazam.

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A 2007 Scotiabank study on the internal costs of repairing software defects provides strong evidence that it's smart to repair defects early in the development process. The results of the study showed that the cost/defect increased from about $100 if the bug was fixed in the requirements or design phases up to over $14,000 if was fixed during production. With these results in mind, Scotiabank is continuing its efforts to reframe the software delivery process in order to deliver quality software faster and at a lower cost. Their plans include implementing Rational's Jazz- based solutions to further improve collaborative communities and provide a common and flexible tooling environment for internal IT, off-shore development staff, and partners. In addition, one of the key reasons for implementing the new solutions is to provide integrated data on software quality management including a better overall view into managing the scope of projects, metrics, and improve on cost estimation.

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Conclusion

Sogeti Group, Scotiabank, and ACC all recognized the need for greater efficiency and collaboration in the software delivery process and implemented IBM Rational to facilitate and support them in their journey. As each of these organizations moves forward, they will look to the capabilities of IBM Rational products based on the Jazz platform to further enrich their business processes and optimize software quality management.

Although each situation is unique, the IT Managers we interviewed for this paper all benefitted from moving to a more collaborative approach to software quality management. By increasing collaboration across the software delivery lifecycle they synchronized the work processes of the business and IT teams and decreased the risk of delivering poor quality software. By following a solid methodology, they ensured repeatability of best practices in the software delivery processes which led to more predictable outcomes and higher quality software. The net result is that by integrating requirements and quality management more effectively with business goals, these organizations found they were able to decrease rework, improve decision making and provide a faster time to market.

About Hurwitz & Associates

Hurwitz & Associates is a consulting, market research and analyst firm that focuses on how technology solutions solve real world business problems. The firm's research concentrates on disruptive technologies, such as Service Oriented Architecture and Web 2.0, Cloud Computing, Service Management, Information Management, and Social and Collaborative Computing. We help our customers understand how these technologies are reshaping the market and how they can apply them to meet business objectives. The team provides direct customer research, competitive analysis, actionable strategic advice, and thought leadership. Additional information on Hurwitz & Associates can be found at www. hurwitz.com.

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