ROI Case Study:

Applying IBM Rational ClearQuest & IBM Rational ClearCase for Regulatory Compliance

Fifth Third Bancorp

Payback Assessment

Through deployment of IBM Rational ClearQuest and IBM Rational ClearCase, Fifth Third Bancorp implemented a development environment that met certain regulatory requirements. These change and configuration management tools enabled the bank to strengthen its IT internal controls to achieve a secure, controlled and auditable process for developing and deploying software. The bank is now in complete control of its active software assets. IBM Rational ClearQuest and IBM Rational ClearCase not only enforce the process infrastructure necessary to meet regulatory compliance requirements, but deliver process automation that improves development efficiency and software quality.

Top Value Delivery

- Achieves IT internal controls and back-office processes to meet regulatory compliance requirements.
- Administrates the enforcement of separation of duties required for regulatory compliance.
- Manages software assets, isolating active applications in production and the location of all related source code.
- Enforces and audits a controlled change process.
- Eliminates time-consuming manual compliance documentation efforts.
- Increases software build accuracy and efficiency; average software build time reduced from 2 hours to 20 minutes.
- Reduces software errors released into production.
- Improves development collaboration of complex projects involving cross-team development.
- Achieves higher quality software with lower failure rates in production.

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Company Profile

Providing quality financial services for the past 147 years, Fifth Third Bancorp has established itself in over 1,100 locations in 9 states throughout the Midwest and Florida. Recently, Fifth Third made the decision to completely revamp its global source management business processes using IBM Rational ClearQuest and IBM Rational ClearCase. Fifth Third looked to IBM Rational's tools to accomplish four critical corporate goals:

1. Adopt best practices around our control environment while complying with regulatory obligations.

2. Develop a universal, standardized approach to manage software assets enterprise-wide for the bank's IT Open Systems group.

3. Increase visibility into software development group efficiency and software quality through performance metrics.

4. Increase software development efficiency and quality.

This case study examines the business impact that Fifth Third achieved through deployment of IBM Rational's change and configuration management tools. The bank applied these tools to the 1,500 software applications and 600 software developers in its IT Open Systems group.

Company Challenge

"Fifth Third didn't want to just elect the most expedient path to address regulatory compliance – we wanted to do the right thing for the long term. That's why we invested in IBM Rational ClearQuest and IBM Rational ClearCase as our global, enterprise -wide tools for change and configuration management."

Jim Conrady
Development Project Manager – Phase 2
Fifth Third Bancorp

Two years ago Fifth Third's IT Open Systems group decided that it did not have sufficient management tools to consistently enforce a standardized enterprise-wide development process and achieve corporate software quality goals. Paramount was the need to preclude malicious or accidental actions that could be costly. Fifth Third needed full accountability and traceability of all software changes.

Recognizing the need to strengthen its IT internal controls to achieve a more secure, controlled and auditable process for developing and deploying software, the bank concluded that there were improvements that could be made, including:

- **Software & Data Asset Control** – full inventory and safeguarded storage of all software assets and data sources (e.g., operating systems, applications, databases, data feeds) that are involved in the financial reporting process.

- **Software Change Control** – comprehensive change histories detailing why each software change was made, what changed, who changed it and when it was changed... *at per line of code granularity.*

- **Separation of Duty** – consistent management of the code revision process: the person who changes the code … is different from the person who approved the code change … is different from the person who approves the updated code to be released to the production environment (i.e., for official use by banking personnel and customers) to prevent fraud and to document process compliance.

The bank had grown rapidly through acquisition, resulting -- like many in the industry -- in silos of software development and significant organizational and business process pain. As development teams became more geographically dispersed, development became more distributed and cross-team software project complexity and dependencies steadily increased. The partitioned and distributed nature of the IT organization presented a formidable obstacle to addressing Fifth Third's challenges and compliance requirements, including:

- Control of software asset management to pinpoint the function and location of all active (i.e., in production) software at the bank.

- Lack of disciplined separation of duties for all code changes.

- Inconsistent development processes.

- Inadequate control and audit history of all changes to all software applications.

- Difficulty ensuring that the right source code modules were collected for a given build. The build process was inefficient and error-prone.

- Recurring regressions in deployed applications.

- Sub-optimal project schedules attributable to inefficient processes and practices.

- Poor visibility into code stability and quality due to an inability to track development organization performance metrics.

The IT open systems group – comprised of 600 developers distributed across 20 groups– was not standardized on one software development life cycle management process enterprise-wide for its 1,500 software applications. Instead, a variety of silo-ed development environments, platforms, tools and processes were used within each development group. As a result, there were no common methods established for managing software change, quality, integration and updates. Software development processes had become incrementally inconsistent across the merged groups. This made it difficult for Fifth Third to have a comprehensive view of all software assets under management within the bank, let alone a complete record of all changes being made to each asset. Further, Fifth Third had no means to gain visibility across an entire software project to effectively manage and gauge its success.

Fifth Third needed a complete inventory and audit trail of all its software assets. The bank did not limit itself to the expedient path to address regulatory compliance, but instead elected to do the right thing for the long term. This included simultaneously addressing Sarbanes Oxley (SOX) compliance requirements. In doing so, the bank expected to gain development economies and efficiencies from following a single set of consistent processes.

The Cost of Non-Compliance

Today, most of the business processes within enterprises are automated to some degree by software solutions. Enterprise software solutions guide access to financial information, process financial transactions, and generate reports on financial data and business performance metrics. Indeed, it is *software* that predominately touches and manipulates the heart of the business: the financial data.

It's no surprise then that many of the regulatory requirements are directed to methods and processes within the IT organization. The IT group's internal controls for the entire software development life cycle are now under regulatory scrutiny to ensure financial data accuracy and visibility.

The implications of an enterprise failing a regulatory compliance audit and/or operating with discrepancies can be severe. Penalties include:

- Prohibitions on business expansion activities during the time compliance is being regained following a failed audit. Missed opportunity for business growth represents a high cost for most companies, measured in lost revenue, lost market share and reduced competitiveness.

- Personal and criminal liability for CEOs, CFOs, auditors and board members for financial discrepancies and/or operating the enterprise in a state of non-compliance.

Selecting IBM Rational

> *"Financial institutions – and any enterprise subject to regulatory compliance - must make the investment in change and configuration management to achieve the IT internal controls.*
>
> *Fifth Third wanted tools that offered a workflow process, were simple for the developers to use and would readily scale as the bank grew ... we chose IBM."*
>
> **Eric Strunk**
> **Compliance Project Manager – Phase 1**
> **Fifth Third Bancorp**

Fifth Third concluded that change and configuration management tools were essential to address all eight of their key corporate objectives and compliance strategy:

- Software asset management
- Enforced, consistent development processes
- Secure and auditable source code changes
- Enforcement of separation of duties for all changes
- Efficient, reliable builds
- Development efficiency
- Increased quality and accuracy of deployed applications
- Visible development performance metrics to determine code quality and stability

The bank looked for proven tools that offered a workflow process, were simple for its developers to use and would readily scale as the bank grew. After a detailed evaluation of market offerings, Fifth Third selected IBM Rational. Fifth Third recognized that IBM

Rational ClearQuest and IBM Rational ClearCase were the premiere tools for change and configuration management and IBM was the vendor of choice. Also factoring into its selection criteria was IBM Rational tools' integration with the IBM WebSphere Application Server – Fifth Third's primary custom development environment.

The IBM Rational tools were the acknowledged market leaders that would put Fifth Third on the lowest risk path to accomplishing its goals. As a vendor, IBM Rational offered fully integrated tools with a successful track record for large-scale deployments. Rational ClearQuest and Rational ClearCase were recognized as mature, best-in-class tools, demonstrated to be capable, and provided by a company that has longevity in the industry. Fifth Third concluded that other vendors' solutions were insufficiently scalable to the enterprise.

Fifth Third recognized that IBM Rational would be its long-term business partner. IBM Rational would bring strong professional services support to help them successfully deploy the tools, revamp IT life cycle processes, ensure compliance, and engender further software development efficiencies in the organization.

Deployment Strategy

Fifth Third launched an aggressive two-step initiative to fully identify software assets and control access to these assets. The first step aimed to rapidly meet audit compliance requirements. The second step took a broader, but more refined view – far beyond compliance requirements. It examined all software assets within the business framework, evaluating the entire inventory of software that was in use and the underlying business need for each asset.

Implementation of Rational ClearQuest and Rational ClearCase began in early 2003. Fifth Third immediately identified 20 applications as "A" applications that were most critical to the bank. These first applications were implemented quickly, and completed by mid 2003. The remaining custom applications were prioritized for implementation over a 12 - 18 month period.

IBM Rational ClearQuest change management software was to be the centralized hub for orchestrating all code modifications and change requests. By doing this, all software change requests would be subject to a defined and audited change management workflow. Rational ClearQuest would provide the organization with the visibility and control over the change history of all software assets. As an additional benefit, Rational ClearQuest inherently would provide the bank with an indication of its software asset quality and stability.

IBM Rational ClearCase configuration management software oversaw Fifth Third's life cycle management processes and software asset control. Rational ClearCase provides the capabilities needed to create, update, build, deliver, reuse and maintain business-critical assets. Because Rational ClearCase is fully integrated with Rational ClearQuest, every source code change could be controlled and audited through the Rational ClearQuest-defined change management process.

Infrastructure

As a first step, Fifth Third created a new executive post within the organization: VP of Change Management. Rational ClearQuest and Rational ClearCase were configured on IBM P650s servers running the AIX operating system. While Rational ClearCase has an embedded database, Rational ClearQuest uses IBM DB2 (and other databases) as its integral database management system. All client systems at Fifth Third run MS Windows. Fifth Third has deployed 5 production Rational ClearCase servers, 3 located at corporate headquarters in Cincinnati, Ohio, 1 at a remote facility in Cincinnati, and 1 in Milwaukee, Wisconsin. For performance and redundancy, Fifth Third leverages Rational ClearCase MultiSite to provide replicas of the configuration management repository close to the development teams.

Project Phase 1: Achieving Compliance

Working with IBM Rational Professional Services, Fifth Third designed and implemented a resilient and responsive software development and deployment process based on IBM Rational tools. The bank focused its attention on developing a scrubbed list of active applications at the bank. The next step was to establish change management for the most critical 20 applications within the Rational ClearQuest-unified change management system. Once completed, Rational ClearQuest expanded the Rational ClearQuest repository to cover all 400 internally developed software applications.

Through IBM Rational ClearQuest and IBM Rational ClearCase, Fifth Third was able to implement a new, fully compliant software development process for its Open Systems group. Over the course of the first-year roll-out of these tools, Fifth Third accomplished the following milestones:

- Rational ClearQuest and Rational ClearCase were deployed with 400 critical applications under management.
- 400 developers were trained to use Rational ClearQuest and Rational ClearCase.

Project Phase 2: Achieving Quality & Efficiencies

Fifth Third is now engaged in the second phase of Rational ClearQuest and Rational ClearCase deployment to improve software quality and software development efficiency. In short, Fifth Third wants its software developers to develop better-performing, reliable, error-free code. Already realizing initial efficiency and quality improvements in its software development processes, Fifth Third continues to strive for further improvements during 2005-2006. The bank is achieving this software quality level without incurring any penalty in process overhead.

Phase 1 Payback

At the conclusion of Phase 1 (a 12-month period) IBM Rational ClearQuest and IBM Rational ClearCase deployment, Fifth Third accomplished the following areas of process improvement and corporate payback.

Ongoing regulatory compliance enforcement

Fifth Third regards the kind of detailed change management process they achieved through Rational ClearQuest and Rational ClearCase as mandatory for any financial institution. Change and configuration management tools are the only means to achieve the level of IT

internal control for back-office processes necessary to manage the bank's systems and data safely.

Improved software asset management

Rational ClearQuest and Rational ClearCase now track and manage all software assets at Fifth Third. The inventory of all software assets and their respective source code storage locations are always known. Directory structures are now formalized, improving the efficiency and accuracy to source code access and the software build process. Incidents of lost and overlaid code have been substantially reduced.

Enforced, consistent development processes

Rational ClearQuest and Rational ClearCase completely oversee the software change and configuration management process, enforcing consistency of the development process across the entire software development team.

Secure and auditable source code changes

Today, no Fifth Third developer can check out a source code module for modification until it is assigned a job in Rational ClearQuest. The bank now has two-way traceability through the change request and the audit trail and the software change. For Commercial Off-the-Shelf (COTS) applications, a defined Rational ClearQuest process is used. Each COTS package has an appointed person in charge of it, authorized within Rational ClearQuest to approve (or not approve) that a COTS package has been adequately regression tested and is certified to be ready for launch.

Enforcement of separation of duties for all changes

The IBM Rational tools administrate the enforcement of separation of duties required for regulatory compliance. At the granularity of each line of code, Fifth Third knows the complete change history of:

- Who made the change
- Why the change was made
- Who approved the change to be made
- Who approved the change to be released to production

Increased build dependability and efficiency

As the direct result of Rational ClearCase deployment, Fifth Third's software builds now occur on a regular and dependable basis. Rational ClearCase organizes the source code and facilitates the build process. Software build times at Fifth Third are reduced, on average, from 2 hours to less than 20 minutes. The build process was simplified sufficiently to eliminate the need for dedicated build and release engineering staff. Instead software engineers now conduct builds as part of their normal responsibilities. Fifth Third has substantially raised the probability that the first build is a clean, fully functional build.

The Rational ClearCase-based build process has eliminated challenges with software build quality. The risk of incorrect files being included in builds has been largely eliminated. The risk of insufficiently regression-tested code being mistakenly pushed into production has been mitigated.

Increased development efficiency

The bank realized reduced cycle times, diminished rework, and higher quality in its software builds and software released to production. The improved change request, prioritization and management approach has helped many of the bank's software development projects achieve more efficient implementation schedules.

With the software develop-build-test cycle time improved, more software build iterations can occur within a fixed period of time. The result is that software under development reaches stability sooner. Fifth Third achieved more software development with the same amount of people. This productivity increase enabled the company to accommodate bank growth.

Fifth Third has a number of software development projects that require resources from multiple development teams, including offshore resources. IBM Rational ClearQuest and IBM Rational ClearCase are essential for coordinating software module access and cross-team builds. The development process of such complex projects are streamlined by the coordination enforced by the IBM Rational tools.

Increased quality and accuracy of deployed applications

A top goal for Fifth Third was to improve the quality of software solutions developed in-house. Through improved change and configuration management, modified software is managed to ensure routine regression testing and the inclusion of the correct software builds. The result is higher quality, less error-prone software.

Improved visibility of development performance metrics

Fifth Third has now established a set of development performance metrics. Using Rational ClearQuest and Rational ClearCase, the bank will apply these metrics to gauge the efficiency of its software development processes, as well as the accuracy, stability and quality of its software code. These metrics include:

- *Recalled builds* – the number of builds that have to be redone over time

- *Emergency changes* – the number of code changes needed to be performed in production code releases over time

- *Change volume* – the number of changes implemented in a given code module over time

- *Percentage of successful changes* – measures the rate that bugs are introduced into production

- *Bugs found in testing vs. production* – measures the effectiveness of regression testing processes

The Bottom Line

Fifth Third is now in Phase 2 of its initiative to bring further efficiencies and quality improvements to their software development process. As the result of IBM Rational ClearQuest and IBM Rational ClearCase, the bank has improved regulatory compliance and has achieved:

- A universal, standardized approach for its Open Systems group to holistically manage software assets enterprise-wide.

- A defined set of business performance metrics to gauge software development quality and efficiency, and the means to actually monitor these metrics.

- Significant improvement in the efficiency and accuracy of software builds.

In short, software developers' lives have become more predictable and the quality and reliability of the applications they support has improved. Collaboration on dependent code has improved for complex, cross-team, multi-site projects. Fifth Third is in complete control of its active software assets, measured in terms of location, access, change history, change authorization and production authorization.

About Gantry Group

The Gantry Group uses analysis drawn from practiced operational experience, supported by custom primary research, to help IT vendors and enterprises forecast accurate ROI and TCO. Gantry Group translates the business process enhancements that result from IT solutions into enterprise bottom-line impact. This analysis helps vendors to sell their solutions more persuasively and enterprises to make more informed buying decisions. Through a rigorous interview approach, Gantry Group profiles real enterprises with solution deployments to isolate and capture actual business performance metrics before and after implementation. Then, by applying industry best practices and the documented impact of the technology under consideration, Gantry Group develops predictive ROI tools that measure and quantify the effect of the technology on business performance prior to investment. Using these results, technology vendors can substantiate their solutions' real ROI and expected payback horizons to increase revenue. Enterprises can realistically evaluate and forecast the likelihood of net financial benefit derived from a technology solution.

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