



Achieving ROI with Rational Solutions

The Benefits of Integrated
Life-Cycle Management

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INTRODUCTION

Software is becoming increasingly vital to corporate survivability. Enterprise applications are no longer tools to support the business; increasingly, they are the business. Software failures can have dire consequences on company reputation, customer loyalty, and, ultimately, the bottom line.

Managing the software life cycle is no longer just a technical issue for the IT department; it has direct business implications. For example, manual or inefficient methods for managing development activities and artifacts or lack of an organized requirements management process can result in unacceptable schedule and cost overruns for IT projects.

Concurrently, software development and deployment is becoming much more complex. Multiplatform, multitier, distributed environments are becoming the norm. Development teams are often geographically dispersed, but the members' activities need to be tightly coordinated. And, of course, requirements for quality, productivity, and time to market are becoming more stringent. Given both the complexity and criticality of today's software applications, solutions that address timeliness, quality, productivity, project predictability, and team collaboration are crucial to business success in the 21st century.

The recent economic slowdown has placed additional pressures on companies to reap the most benefit from each dollar invested in IT. A key to maximizing return on investment (ROI) is integrated application life-cycle management. This means capturing and managing all of the artifacts of the software development process, starting with requirements definition and progressing through design, development, testing, deployment, and maintenance/enhancements. Since all of these activities are dynamic and iterative, it is extremely important to establish processes or best practices to manage workflow, communication, and collaboration.

Solutions to address the full range of development and deployment life-cycle requirements are consequently gaining in popularity in the marketplace. Rational Software is a leading provider of integrated software life-cycle management solutions.

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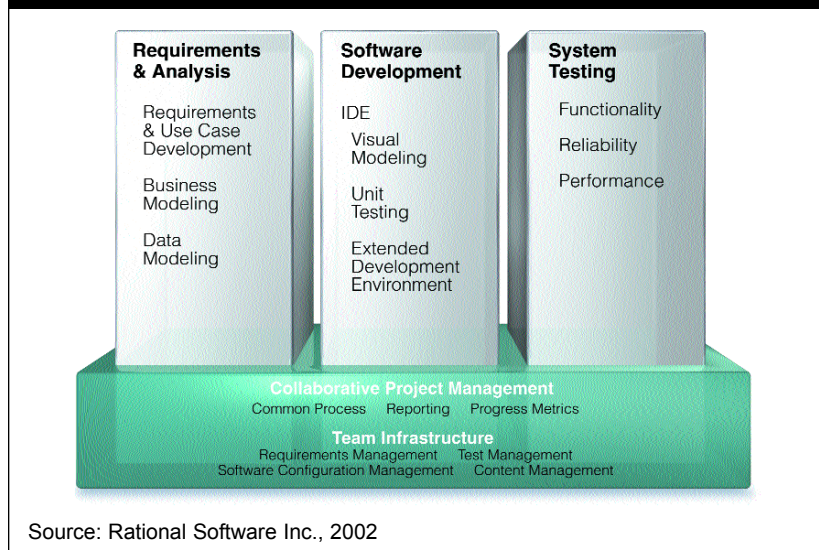
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THE RATIONAL APPROACH TO SOFTWARE LIFE-CYCLE MANAGEMENT

This integrated life-cycle management approach satisfies the requirements of an organization's key stakeholders: project leaders, software practitioners, and executives.

Rational's integrated life-cycle management solution encompasses best practices, tools, and services. Life-cycle activities supported include requirements and analysis, software development, content management, system testing, process/project management, and software configuration management. All of these activities are integrated and coordinated to optimize both individual and team productivity. This integrated life-cycle management approach satisfies the requirements of an organization's key stakeholders: project leaders, software practitioners, and executives (see Figure 1).

Figure 1: The Rational Approach to Software Life-Cycle Management



Rational's integrated toolset helps teams share project work through common access to activities and artifacts throughout the development life cycle.

Rational's integrated toolset helps teams share project work through common access to activities and artifacts throughout the development life cycle. The integrated solution features software development project management capabilities that make it easier for project leaders to successfully track and manage the "true" state of all development efforts.

Rational's integrated approach to software development reduces the amount of time software practitioners (developers, analysts, and testers) have to sit in on nonproductive meetings or chase down answers to project questions and procedures.

Likewise, executives can concentrate on maximizing business results. Realizing customer satisfaction and ROI is at the heart of most business decisions for the executive. The Rational solution

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helps keep projects on track and provides competitive advantages for business applications, embedded applications, and commercial software for sale.

ROI CASE STUDY METHODOLOGY

IDC interviewed several Rational customers to assess the qualitative and quantitative benefits obtained from using Rational life-cycle management products. A three-year "ROI horizon" was employed. Therefore, all of the ROI data shown is for accumulated actual and estimated savings over a fixed three-year period: from 1999 through 2001.

The resulting ROI analysis for four of these companies is summarized in this paper. For additional case study detail, please refer to the other IDC ROI studies posted at <http://programs.rational.com/success/>.

The true value of life-cycle management can be measured in terms of ROI for companies that adopt it. IDC employed a structured interviewing methodology to collect qualitative and quantitative ROI data for Rational customers. For ROI definitions and terminology used in this study, please refer to the appendix.

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CASE STUDIES

Wells Fargo

Company Overview and Business Environment

Wells Fargo, the seventh largest bank in the United States, is a diversified financial services company. As a bank, Wells Fargo is subject to stringent audit requirements that apply directly to its software operations. The IT environment within Wells Fargo is decentralized. Each application development community has the flexibility to select and implement its own application development tools, but all groups are required to use common software version control and distribution tools.

ROI Analysis

Net quantifiable benefits (NQB). Wells Fargo experienced the following benefits from the adoption of ClearCase:

- An approximate increase in productivity of 25% from company-wide development teams in 1999, increasing to 50% by 2001
- A decrease in recovery time due to the automated bill of materials

The resulting ROI for Wells Fargo is 8.9, or 888%.

Qualitative Benefits Associated with Using Rational ClearCase

By using Rational ClearCase, Wells Fargo has achieved the following qualitative benefits:

- Standardized infrastructure for version control and software distribution
- Improved levels of software management and quality

- Reduction in software recovery times
- Reduction in production release cycles
- A fast, reliable, error-free life-cycle process

Choice Hotels

Company Overview and Business Environment

Choice Hotels International franchises more than 4,392 hotels in 43 countries under brands such as Comfort Inn, Quality Inn, and Econo Lodge. Choice Hotels has been in business for more than 50 years, and the smooth operation of its facilities — from online reservation systems to efficient guest services — depends on the development of well-crafted, rapidly deployable applications.

Choice Hotels found that the lack of a formal requirements process, formal defect tracking, or formal development life cycle was costing the organization time and money.

Choice Hotels develops its own hospitality applications to allow the company to differentiate itself within the industry. Its software development started, as it often does in noncentralized organizations, with an informal development environment and methodology. Although this works when the development group and projects are small, problems develop as the group and projects scale upward. Choice Hotels found that the lack of a formal requirements process, formal defect tracking, or formal development life cycle was costing the organization time and money.

Choice Hotels standardized on a Rational solution based on past experience with Rational ClearQuest. Now, in addition to using Rational ClearQuest, Choice Hotels also utilizes Rational Suite AnalystStudio, Rational Suite TestStudio, and Rational Suite Enterprise, as well as a customized version of the Rational Unified Process.

ROI Analysis

NQB. Rational Suite enabled Choice Hotels to implement a unified development life cycle. The quantifiable benefits realized came in the form of:

- Reductions in the time expended to perform requirements management, defect tracking and change management, and automated testing
- Increased developer and quality assurance productivity (Increased developer productivity accounted for just more than \$1.5 million in net benefits; increased productivity of quality assurance staff resulted in just more than \$2.7 million in net benefits.)
- Increased Web availability as a result of higher-quality releases, delivering an NQB of more than \$5.3 million

Total net benefits over the ROI time horizon amounted to \$9.534 million.

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Net costs (NC). The total NC to Choice Hotels over the three-year ROI horizon for software and training amounted to \$179,000. In addition, personnel costs associated with support brought the overall net cost to \$662,000. The investment costs for Rational Suite are not

reflected because the initial implementation took place before the ROI time frame examined in this study.

Choice Hotels recognized an ROI of 1,440% using Rational Suite.

Qualitative Benefits Associated with Using Rational Suite

By using Rational Suite, Choice Hotels has achieved the following additional benefits:

- Improved development productivity
- Improved quality assurance productivity
- Increased application availability
- Increased Web availability
- Improved customer satisfaction
- Better requirements tracking
- Improved team coordination and project control

Lockheed Martin Canada

Company Overview and Business Environment

A leader in systems integration, software development, and the design and manufacture of advanced electronic systems, Lockheed Martin Canada employs more than 600 employees at multiple facilities in Canada. Core lines of business include the Army, the Air Force, the Navy, Intelligent Transportation Systems (ITS), and Information Systems and Support (IS&S).

The Information Systems and Services (ISS) group at Lockheed Martin Canada initiated the use of Rational integrated solutions. This group of 40 employees is responsible for satellite communications, project management, and information technology. Dealing primarily with commercially available packaged applications, the ISS group acts as systems integrators for its clients in the government, military, and industry sectors.

Lockheed Martin Canada began evaluating Rational Suite while examining tools to meet the needs of a specific customer in the military sector that was looking for an integrated environment for software engineering and program management. For Lockheed Martin Canada, the Rational solution had the biggest impact in the area of risk management. Rational tools enabled Lockheed to easily sort and report on the requirements analysis process; distribute ownership of various risks; ease data collection from project members; and quickly identify, evaluate, and resolve issues as they arose. Consequently, the ISS group was able to accomplish more in shorter time frames, allowing new tasks to be undertaken with the resources that became available.

For Lockheed Martin Canada, the Rational solution had the biggest impact in the area of risk management.

The net benefits realized by Lockheed Martin Canada reflect the reduction in labor costs that occurred from the automation of the risk-management process by Rational's tools.

ROI Analysis

NQB. The ROI calculations in this case measure benefits derived from automating workflow and knowledge capture, which are facilitated by all of the Rational products in Rational Suite Enterprise. The net benefits realized by Lockheed Martin Canada reflect the reduction in labor costs that occurred from the automation of the risk-management process by Rational's tools.

- The use of Rational Suite Enterprise enabled Lockheed Martin Canada's ISS group to eliminate 9.4 person years of effort over the three-year ROI time horizon.
- This reduction in effort equates to a reduction of more than \$409,000 in labor costs.

NC. Net costs associated with the use of Rational's tools included costs for licensing, maintenance, training, and hardware upgrades. Total NC for this three-year ROI time horizon was \$184,000. Most of this NC was incurred in 1999 due to significant one-time licensing, training, and hardware upgrade costs. Therefore, ROI payback, while only about 2:1 in 1999, increased to 12:1 in 2001.

The overall ROI for the three-year period was 222% (2.2:1), reflecting a large proportion of the risk-management activities that occurred in 1999. It is anticipated that had the ROI time horizon been longer, the ROI experienced by Lockheed would have increased.

Qualitative Benefits Associated with Using Rational Suite

By using Rational Suite, Lockheed Martin Canada has achieved the following additional benefits:

- Greater ease of data collection
- Improved sorting and reporting on projects
- Quicker and easier identification of project bottlenecks
- Streamlined distribution of ownership on various risks
- Improved project communications, both internally and externally
- Increased speed with which project tasks can be executed

CitiPower

Company Overview and Business Environment

CitiPower, headquartered in Victoria, Australia, is a wholly owned subsidiary of American Electric Power and is a retailer and distributor of electrical power primarily for inner Melbourne. The privatization of the electrical utilities in Australia brought about broad changes in the regulatory environment. To meet the changing regulatory environment and meet evolving customer needs, CitiPower made a significant investment in its IT infrastructure.

Currently, CitiPower's IT department has a staff of approximately 100 to 120, including a large number of contractors. These contract

From a team perspective, RequisitePro enabled IT management to understand and control who executes updates to the project and facilitated versioning of the documentation throughout the project.

The complexity of the FRC system convinced CitiPower that a significant investment in building clear specifications led to productivity gains across the entire life cycle of the project.

employees were hired to work with existing personnel at CitiPower to help implement its Full Retail Contestability (FRC) program. The FRC program was required to conform to the new competitive regulatory environment and support and acquire customers in a newly competitive industry.

Among the products CitiPower is using are the Rational Unified Process, Rational Rose, Rational ClearQuest, Rational Suite TestStudio, Rational Suite AnalystStudio, and Rational RequisitePro, an integral component of Rational Suite AnalystStudio. This case study focuses specifically on the benefits CitiPower derived from using Rational RequisitePro, including centralizing the requirements process and providing traceability from requirements implementation through testing. From a team perspective, RequisitePro enabled IT management to understand and control who executes updates to the project and facilitated versioning of the documentation throughout the project.

ROI Analysis

NQB. CitiPower recognized benefits in three areas from using Rational RequisitePro:

- The complexity of the FRC system convinced CitiPower that a significant investment in building clear specifications led to productivity gains across the entire life cycle of the project.
- While CitiPower estimated moderate productivity gains of only 10% in this process, the financial gains are considerable due to the scale of the requirements-gathering process. CitiPower believes it realized a net benefit of approximately \$630,000 by using RequisitePro instead of pursuing a manual approach using Word documents, spreadsheets, and email.
- CitiPower also believes that developing clear, accurate, and accessible requirements helped developers and quality assurance staff become more productive.

NC. Costs for the FRC project consisted of license and maintenance costs, training costs, and consulting costs. All of these costs were incremental and associated with bringing Rational RequisitePro into CitiPower. Total costs for the FRC project over the three-year ROI time horizon were slightly more than \$145,000.

The ROI for this project is 434%, which equates to an ROI factor of 4.3. This means that for every dollar invested in requirements management for this project, a net benefit of \$4.30 was realized.

Qualitative Benefits Associated with Using Rational RequisitePro

By using Rational RequisitePro, CitiPower has achieved the following additional benefits:

- Centralized requirements process
- Traceability of requirements through testing phase
- Application and documentation versioning

- Improved project control
- Improved accuracy of requirements

IDC ANALYSIS AND CONCLUSION

From the case studies, IDC has found that a clear and quantifiable benefit can be gained from employing Rational's life-cycle management solutions to manage software development and deployment.

From the case studies, IDC has found that a clear and quantifiable benefit can be gained from employing Rational's life-cycle management solutions to manage software development and deployment (see Table 1). While a wide range of advantages was cited by the organizations interviewed, the quantifiable benefits were most evident in the form of productivity gains. These gains were achieved in the form of reduced testing and development cycles, more efficient team interaction, and improved requirements management. For these organizations, the productivity gains did not result in the reduction of personnel but rather in reallocation of resources for additional tasks and projects.

One of the most difficult aspects of software development is the efficient sharing of information among team members. This is also one of the most crucial factors in success.

One of the most difficult aspects of software development is the efficient sharing of information among team members. This is also one of the most crucial factors in success. Effective communication can ensure that the right tasks are accomplished successfully, that issues are addressed quickly, and that project status is discerned rapidly and easily. IDC believes that this is the central benefit of Rational's integrated solutions. Clearly, companies can find point solutions that will perform the same functions as the Rational tools. But it is the integration of the Rational tools and the productivity gains that are made possible that sets them apart.

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In summary, the IDC study has demonstrated that an integrated set of software life-cycle management tools can have a substantial and quantifiable impact on an organization's development processes.

Table 1: Summary of Rational ROI Findings

Case	Net Benefits (\$)	Net Costs (\$)	ROI Benefit (\$)	ROI Factor
Wells Fargo	-	-	-	8.9
Choice Hotels	9,534,000	662,000	8,872,000	14.40
Lockheed Martin Canada	409,000	184,000	225,000	2.22
CitiPower	630,000	145,000	485,000	4.34

Key Assumptions:

- The net benefits and net costs capture the key quantifiable dimensions of ROI for each of the cases listed.
- The ROI time frame for this analysis was a three-year time horizon, although some projects did not span all three years.
- Present value calculations were omitted from the analysis due to the current and actual orientation of the ROI.

Source: IDC, 2002

APPENDIX: ROI DEFINED

The ROI associated with the use of a Rational solution is defined as the net quantifiable benefit (NQB) as a percentage of the net cost (NC).

Net quantifiable benefit (NQB) is the difference between the savings achieved through the implementation of a Rational solution and either not implementing the solution at all or implementing it in a different way.

Net cost (NC) is the difference between the total cost and expenses associated with the Rational solution (e.g., human and other resources used, costs of licenses, additional equipment required) and the similar costs associated with the most likely alternative solution.

ROI is the ratio of total net benefit divided by total net cost. This ratio is equal to 1 when net benefits equal net cost, which represents stasis, equilibrium, or no improvement.

ROI is frequently expressed as a percentage, in which case the ROI result is multiplied by 100. The percentage ROI calculation can thus be represented as:

$$\text{ROI} = (\text{NQB}/\text{NC}) \times 100\%$$

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