

The ROI of Enabling Software Development Governance using IBM Rational Solutions

An Alinean White Paper

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Maximizing the ROI from IT Investments (Alinean Press – 2004)*

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THE ROI OF SOFTWARE DEVELOPMENT GOVERNANCE

More and more, businesses are dependent on software applications for competitive advantage, helping to deliver richer customer experiences and superior business process automation. These applications, and the teams that integrate, build and maintain this software, are more important to organization success than ever before. Each year organizations worldwide spend over \$480 billion (USD) on IT based software application development.¹

Critical to this software development success is good governance, which includes:

- Aligning projects with organization goals to help drive success
- Establishing chains of responsibility, authority and communication to empower people to make the right decisions
- Institutionalizing measurement, policy and control mechanisms to enable people to effectively carry out their roles and responsibilities.

Software development governance is first and foremost about alignment, assuring that the projects which are being invested in, or under consideration, fulfill an important business need and that the projects are prioritized according to a set scorecard and risk / reward schema. Second, governance is about accountability – instituting controls so the team has optimized resources and responsibility: knowing who is responsible for approving and performing specific tasks, and providing the tools to make all resources more productive. Finally, governance is about oversight and guidance to assure that mandates and compliance rules are met, and quality, project success rates and velocity to market is improved.

How important is properly implementing IT governance, of which software development governance is an important and vital element? A recent CISR study claims that ‘Effective IT Governance is the single most important predictor of the value an organization generates from IT’ and ‘firms with focused strategies and above average IT Governance had more than 20% higher profits than other firms following the same strategies’.² These findings are further supported by a recent McKinsey study which found that IT investments have less business value impact unless they are accompanied by proper management practices, and those companies that combined superior management practices with IT investments performed best of all.³

The Value Proposition for Improved Software Development Governance

As IT value experts for the past 15 years, the Alinean analyst team studies the business value of various information technology solutions and practices, and builds models to quantify the business case for change. In our return on investment (ROI) studies, IBM® Rational® has been able to help organizations better govern their software delivery lifecycle, from business concept to the deployment of live systems, so a company can more efficiently and effectively:

- **Manage value** – align business priorities and software investments to yield the best business results
- **Develop flexibly** – enable greater development innovation through flexible sourcing and development productivity tools
- **Control risk and change** – evaluate risks and manage risk variance using development analytics tied to business goals and priorities

1 Alinean research. (2006). Based on estimated IT spending totals worldwide of \$2 trillion including all resources, capital investments, operating expenses and overhead, with approximately 24% spent on application development, maintenance and support labor and spending.

2 Weill, P. and Ross, J.W. (2004). How Top Performers Manage IT Decisions for Superior Results. IT Governance.

3 McKinsey & Co. (2005, June). Does IT improve performance? The McKinsey Quarterly.

In the complex world of software development, where requirements change, resources are constrained and risks abound, implementing good governance can result in great business rewards.

In Alinean quantification and modeling of case studies, some of which include IBM Rational products, these rewards can include:

- **Improving team productivity and improving utilization** – in today’s world of geographically distributed business, development and resources, maintaining collaboration and reducing duplicated or wasteful efforts can be difficult. When we look at how much is spent on running IT, we find that on average, 65% of IT resources are currently allocated to running the day to day operations – essentially keeping the lights on. An additional 25% is allocated to migrations, evolutions and upgrades, providing some new features and incremental benefits to the organization, but not drastic fundamental changes to the business. This leaves only 10% available for innovation - providing the business with new applications, automation, improvements, functions and capabilities. The goal of improving team productivity is to drive out the costs of day-to-day operations and free valuable development resources from performing mundane or wasteful tasks, to work on more innovative business solutions.

With improved software development governance productivity and resource utilization can be improved by 15% to as much as 35%, getting greater value from each resource, and freeing resources for more strategic and innovative initiatives.

- **Improving project success rates** – although much improved over the past 5 years, software development projects still suffer too many setbacks and project management issues. In our latest research 17% of all projects are cancelled prior to deployment, and 33% are troubled - exceeding budget estimates, missing schedule deadlines or short originally planned features and functions. According to Alinean research, cancelled projects alone cost \$81B worldwide each year. Of the 50% of projects which are successfully delivered, 28% of these projects are indicated as not yielding value to planned expectations – either from cost overruns or failure to deliver expected business benefits.

Although cancellation rates are down and fewer projects are troubled, improving software development governance providing increased value to projects, producing about 30% more projects that deliver expected value, and 20% or more reduction in the frequency and costs of cancelled or troubled projects.

- **Improve quality** – finding issues earlier in the development lifecycle helps to save development costs and improve productivity. Finding issues before they reach the customer drives higher satisfaction levels and future growth and revenue. Improving quality through better software development governance can help to identify issues earlier in the lifecycle, such as in requirements, design review, unit and functional testing, when the cost and time to fix the issue is significantly lower than in later stages, especially prior to deployment. At the same time, proper governance can help the team resolve issues more efficiently, helping to reduce the labor to mitigate the issue and time to repair.
- **Improved accommodation of internal and external regulatory requirements** – requirements for privacy, security and controls are better met with proper governance tools to track and test changes and assure compliance testing to regulations.

	Percentage of Change Requests Made or Issues Found During Lifecycle Stage	Person Hours to Resolve each Change Request Found During Lifecycle Stage
Requirements	20.0%	0.25
Design review	9.0%	1.00
Unit testing	10.0%	2.00
Functional testing	20.0%	3.00
Integration testing	30.0%	10.00
Acceptance testing	10.0%	15.00
Post deployment	1.0%	160.00
Total (must sum to 100%)	100.0%	

Figure 1: Alinean estimates of the various lifecycle stage rates and costs for issues and issue resolution.

Once an application is deployed, issues are not only more costly, but can cause significant issues for the user base and the business. Issues which cause downtime and outages can cost millions. For high value customer transaction such as financial / trading or e-commerce applications or vital infrastructure back-office applications such as supply chain management, outages can cost from \$600 to \$33,000 per minute.

Business Applications	Outage Cost per Minute
Financial / Trading	\$33,000
Supply Chain Management	\$11,000
Electronic Commerce	\$10,000
Customer Service Center / CRM	\$4,000
ATM / POS / EFT	\$3,500
Messaging	\$1,000
Infrastructure	\$600

Figure 2: Alinean provides estimates for the cost of downtime per minute for various applications. The size of the company and business, industry, type of application and duration of downtime can drastically affect these downtime costs. These estimates can provide valuable guidelines for calculating the risks to the business for various issues.

- **Improving velocity to market** – in most organizations there is a backlog of projects – a long list of to dos that the team cannot get to because of resource constraints and budget limitations. Finishing current projects quicker can help to deliver the expected value of these projects faster, while getting to these backlogged projects could deliver their incremental value sooner rather than later or never in the case of continuous backlogs. Getting to new application development and necessary upgrade projects can help deliver incremental business benefits such as improved business productivity, operating efficiency and additional revenue.
- **Reducing training and learning costs** – a cohesive governance process and integrated toolkit can provide for lower training costs over time, and reduced learning time, allowing new team members to come up to board quicker, as well as helping to improve development staff retention and reduce on-boarding costs.
- **Reduce development infrastructure and operations costs** – an integrated toolkit to manage software development governance can help to reduce the current issue where different non-integrated and independent toolkits are used to manage projects, development, configuration control, test and other portions of the development lifecycle. The non-standardization leads to higher infrastructure and operations costs to manage these non-suite tools.
- **Reduce redundant projects and improve value through alignment** – a recent survey by the alignment experts at SeaQuation indicate that 40% of 1,500 surveyed organizations do not have good alignment between IT plans and business strategy.⁴ This lack of alignment is accompanied by a lack of visibility into actual spending. A survey by IDG Research finds that only 1/3 have good visibility into new application development spending, and only 4% of organizations have good visibility into their application maintenance spending.⁵ Software development governance is designed to increase the visibility into application development spending, assuring that application development investments are being made in the projects that will make the most difference/highest priority to the business, stealth projects are not unduly increasing costs, and duplicate project spending is eliminated.

Alinean research indicates that about 25% of all projects (\$120 billion in application development investments worldwide) have alignment issues where projects do not meet requisite requirements, or the requirements were misaligned with user/business needs. Worse, an additional 5% of project investments are duplicated across the organization. These redundant investments cost \$24 billion in wasted productivity worldwide. IBM Rational tools in support of IT governance deliver visibility and dashboards to help keep the team informed so that budgets can be properly approved, allocated, controlled and aligned to deliver higher value.

⁴ SeaQuation Investment Research. (2005, September). IT and Enterprise Value—Empirical Evidence for Val IT.

⁵ IDG. (2006, May). *New Efficiencies in Application Development*.

SOFTWARE DEVELOPMENT GOVERNANCE CASE STUDY

For this ROI case study, Alinean used their ROI Analyst tool to model a theoretical customer scenario, determining current costs and opportunities, selecting a particular solution set, and modeling the potential savings and benefits from the proposed solution set. The simulation of benefits is performed by using prior industry case studies as to the impact of implementing various solutions and best practice improvements, and extending the results from those case studies in the ROI Analyst tool so that they can be applied to any company. Because these are projected and simulated benefits, although they have a statistical basis with actual case studies, they represent projections and estimates. To make the results achievable and conservative, all soft benefits are heavily discounted (to 10% of any projected real value) and other risk adjustments are made. Since every company has unique costs and opportunities, potential for savings, and solution / practice implementation differences, actual results to any particular company may vary.

The Opportunity

A \$400M financial services company would like to empower their application 150 person (full time equivalent) development and maintenance team with the latest tools to help improve development governance to drive improved productivity, time to delivery and value to the organization. The team is a worldwide distributed team with locations in New York, San Francisco, London and Bangalore, India. The team currently manages a portfolio of 150 existing applications, and plans on developing and launching an additional 50 new application components over the next 12 months.

The team has worked to achieve an awareness of the distributed application development processes, but some activities are incomplete or inconsistent; and there is a decided lack of oversight - no overall measurement or control. In specific areas such as configuration management and test, tools are implemented but not integrated, not fully implemented within a process, nor managed cohesively.

As a result of these inefficiencies, the average team member utilization is currently only an estimated 60% (measured by time and task analysis studies of the core team). As a result of demand and these types of resource issues, the team has a backlog of around 10 new projects and about 40 evolutionary upgrades each year which it needs to get to but cannot due to constraints.

The project management and delivery experience has been troubled, especially because the management and resources are distributed. The team would like to improve project management performance as currently about 45% of all new projects experience some issues, with 15% being cancelled each year, and 30% having issues with schedule or budget overruns. With distributed requirements and application development, about 25% of projects are estimated to be not aligned perfectly with business goals and user needs, or delivered without requisite functionality, and about 5% of all application development projects are duplicated, wasting precious resources.

THE IBM RATIONAL SOFTWARE DEVELOPMENT GOVERNANCE SOLUTION

The team selected a set of solutions specifically designed to help improve the management and oversight of geographically distributed teams. With distributed development teams, although very common in today's flat world and global economy, it remains difficult to empower distributed team members to work together effectively and efficiently. The software development governance solution from IBM Rational can empower these teams to work better and smarter, driving quantifiable business benefits.

The solution includes:

- IBM Rational Method Composer: The next evolution of the IBM Rational Unified Process®. It is a flexible process platform built on top of the Eclipse Process Framework and contains tooling, process libraries, and unified method architecture for use throughout IT Lifecycle Management (ITLM).
- IBM Rational Portfolio Manager: Automates project portfolio management from prioritization to execution and closure.

- IBM Rational Software Modeler: A UML 2.0-based visual modeling and design tool for architects, systems analysts, and designers who need to ensure that their specifications, architecture, and designs are clearly defined and communicated to their stakeholders.
- IBM Rational ClearCase®: Software asset management for medium to large projects.
- IBM Rational ClearCase MultiSite®: An option to IBM Rational ClearCase to support geographically distributed software asset management for medium to large projects.

THE BUSINESS VALUE

ROI Summary

A risk adjusted analysis of the proposed solution's impact will result in an estimated \$13,874,624 of five year cumulative benefits. Of these projected benefits, \$10,562,036 is in direct benefits and \$3,312,588 is in indirect benefits.

Top cumulative benefits for the project are expected to include:

- Improve Change and Configuration Management Productivity - \$3,168,256, 24.0% of total benefits.
- Improve Change Request Handling Efficiency - \$2,580,847, 19.5% of total benefits.
- Improve Project Success Rates by Reducing Cancelled Projects - \$1,796,563, 13.6% of total benefits.
- Improve Design and Construction Productivity - \$1,546,346, 11.7% of total benefits.
- Improve Project Success Rates by Reducing Cancelled Projects (Back Office) - \$1,350,000, 10.2% of total benefits.
- Improve Project Success Rates by Reducing Delayed / Over Budget Projects (Back Office) - \$1,350,000, 10.2% of total benefits.
- Improve Process, Project and Portfolio Management Productivity - \$496,288, 3.8% of total benefits.
- Improve Project Success Rates by Reducing Delayed / Over Budget Projects - \$425,450, 3.2% of total benefits.
- Improve Project Success Rates by Reducing Delayed / Over Budget Projects (Front Office) - \$289,800, 2.2% of total benefits.
- Improve Project Success Rates by Reducing Requirements and Alignment Issues - \$218,476, 1.7% of total benefits.

These benefits can be grouped regarding expected business impact as:

- \$10,593,701 in IT cost reductions
- \$2,700,000 in business operating efficiency improvements
- \$580,922 in business strategic advantage benefits

The proposed project is expected to help the company meet the following goals and drive the following benefits:

- Improve Application Development Productivity: \$7,295,449
- Improve Project Success Rates: \$5,839,672
- Improve Proposal and Portfolio Management Efficiency: \$496,288
- Reduce Compliance Costs: \$168,826
- Improve Business Agility: \$42,722
- Improve Development Staff Retention: \$31,666

To implement the proposed project will require a 5 year cumulative investment of \$3,054,930 including:

- \$497,640 in initial expenses
- \$414,700 in capital expenditures
- \$2,640,230 in operating expenditures

Comparing the costs and benefits of the proposed project using discounted cash flow analysis and factoring in a risk-adjusted discount rate of 9.5%, the proposed business case predicts:

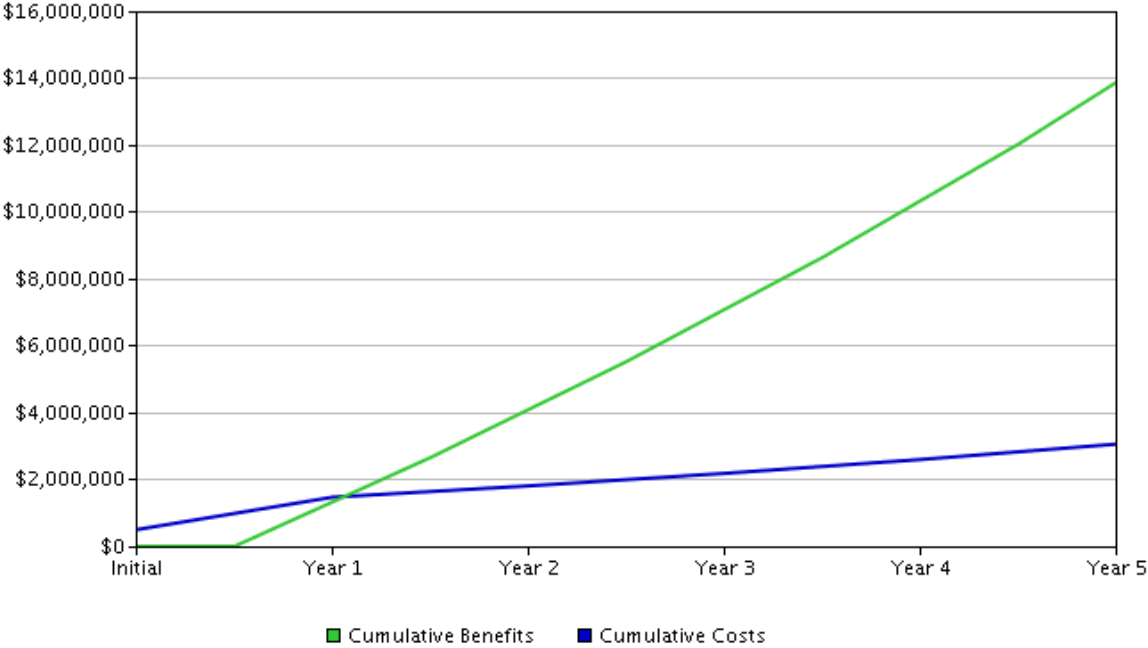
- Risk Adjusted Return on Investment (RA ROI) of 307%
- Return on Investment (ROI) of 354%
- Net Present Value (NPV) savings of \$7,774,500
- Internal Rate of Return (IRR) of 209%
- Payback period of 13 months

Note: The project has been risk-adjusted for an overall deployment schedule of 6 months, realized benefits to include 100.0% of direct benefits and 10.0% of indirect benefits and a deployment schedule (adoption curve) of 100.0%, 100.0%, 100.0%, 100.0%, and 100.0% over each successive year of the analysis.

ROI Analysis	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Expected Benefits	\$0	\$1,327,067	\$2,761,845	\$2,991,261	\$3,250,573	\$3,543,878
Cumulative benefits		\$1,327,067	\$4,088,912	\$7,080,173	\$10,330,746	\$13,874,624
Expected Costs	\$497,640	\$970,435	\$337,981	\$373,687	\$414,392	\$460,795
Cumulative costs	\$497,640	\$1,468,075	\$1,806,056	\$2,179,743	\$2,594,135	\$3,054,930
Cash flow	(\$497,640)	\$356,632	\$2,423,864	\$2,617,574	\$2,836,181	\$3,083,083
Cumulative cash flow	(\$497,640)	(\$141,008)	\$2,282,856	\$4,900,430	\$7,736,611	\$10,819,694

ROI	354%
Risk Adjusted ROI	307%
NPV Savings	\$7,774,500
IRR	209%
Payback period (including deployment period)	13 month(s)
Risk Adjusted Discount Rate	9.5%

Breakeven



Benefits Summary

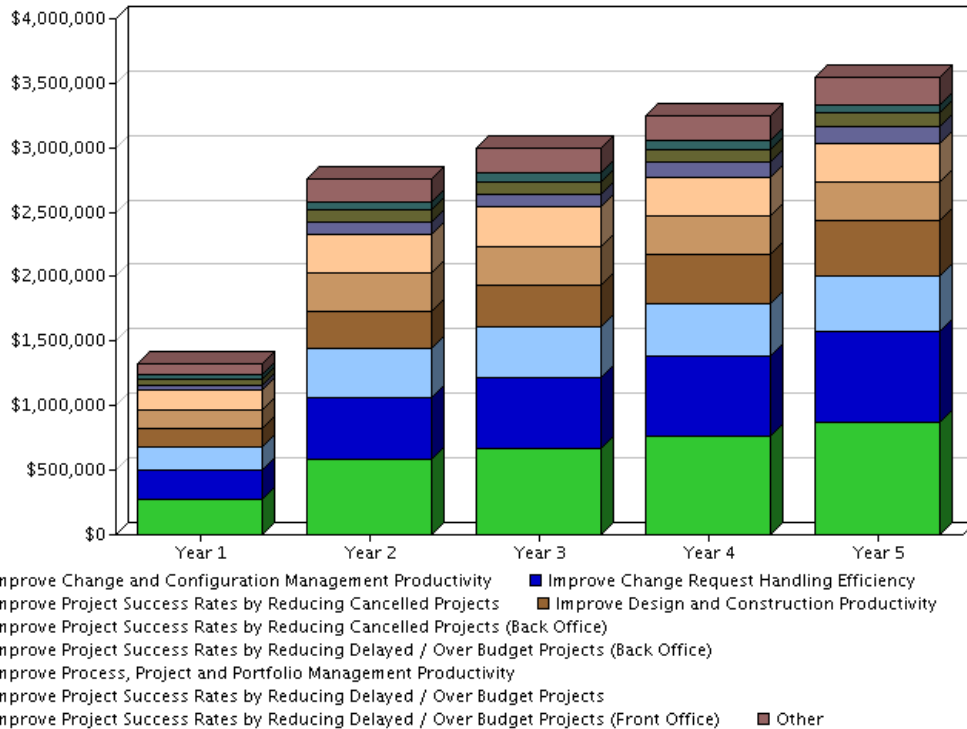
Benefits Summary	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Total expected benefits	\$1,327,067	\$2,761,845	\$2,991,261	\$3,250,573	\$3,543,878	\$13,874,624
Expected direct benefits	\$959,573	\$2,026,564	\$2,255,360	\$2,513,992	\$2,806,548	\$10,562,036
Expected indirect benefits	\$367,494	\$735,282	\$735,901	\$736,581	\$737,330	\$3,312,588

Benefits Summary – IT Cost Reductions	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Improve process, project and portfolio management productivity	\$43,038	\$92,102	\$104,997	\$119,696	\$136,454	\$496,288
Improve design and construction productivity	\$134,100	\$286,975	\$327,152	\$372,953	\$425,166	\$1,546,346
Improve change and configuration management productivity	\$274,754	\$587,974	\$670,290	\$764,130	\$871,108	\$3,168,256
Improve compliance management productivity	\$14,641	\$31,332	\$35,718	\$40,718	\$46,418	\$168,826
Improve change request handling efficiency	\$223,813	\$478,960	\$546,015	\$622,458	\$709,602	\$2,580,847
Improve project success rates by reducing cancelled projects	\$185,926	\$379,289	\$394,460	\$410,239	\$426,648	\$1,796,563
Improve project success rates by reducing delayed / over budget projects	\$44,030	\$89,821	\$93,414	\$97,150	\$101,036	\$425,450
Improve project success rates by reducing requirements and alignment issues	\$22,610	\$46,124	\$47,970	\$49,888	\$51,884	\$218,476
Improve project success rates by reducing duplicate / redundant projects	\$16,660	\$33,986	\$35,346	\$36,760	\$38,230	\$160,983
Reduce development staff attrition (indirect)	\$2,947	\$6,188	\$6,807	\$7,488	\$8,236	\$31,666
Total expected IT cost reductions	\$962,520	\$2,032,752	\$2,262,167	\$2,521,480	\$2,814,784	\$10,593,702

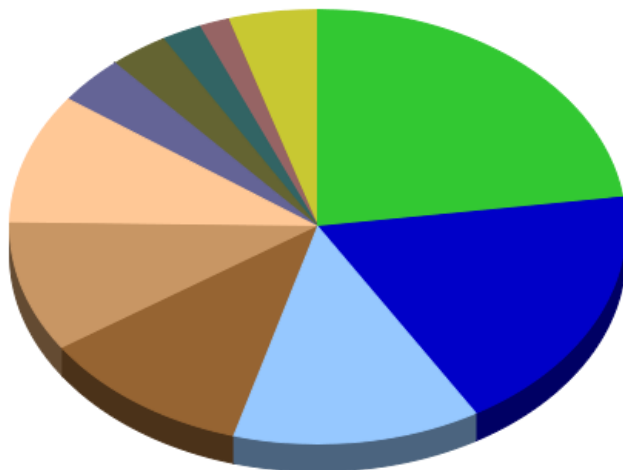
Benefits Summary – Business Operating Efficiency	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Improve project success rates by reducing cancelled projects (back office) (indirect)	\$150,000	\$300,000	\$300,000	\$300,000	\$300,000	\$1,350,000
Improve project success rates by reducing delayed/over budget projects (back office) (indirect)	\$150,000	\$300,000	\$300,000	\$300,000	\$300,000	\$1,350,000
Total expected business operating efficiency	\$300,000	\$600,000	\$600,000	\$600,000	\$600,000	\$2,700,000

Benefits Summary – Business Strategic Advantage	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Improve business agility - deliver upgrade projects sooner (front office) (indirect)	\$2,447	\$4,894	\$4,894	\$4,894	\$4,894	\$22,022
Improve business agility - deliver additional upgrade projects sooner (front office) (indirect)	\$2,300	\$4,600	\$4,600	\$4,600	\$4,600	\$20,700
Improve project success rates by reducing cancelled projects (front office) (indirect)	\$23,000	\$46,000	\$46,000	\$46,000	\$46,000	\$207,000
Improve project success rates by reducing delayed / over budget projects (front office) (indirect)	\$32,200	\$64,400	\$64,400	\$64,400	\$64,400	\$289,800
Improve project success rates by reducing requirements and alignment issue projects (front office) (indirect)	\$4,600	\$9,200	\$9,200	\$9,200	\$9,200	\$41,400
Total expected business strategic advantage	\$64,547	\$129,094	\$129,094	\$129,094	\$129,094	\$580,922

Benefits

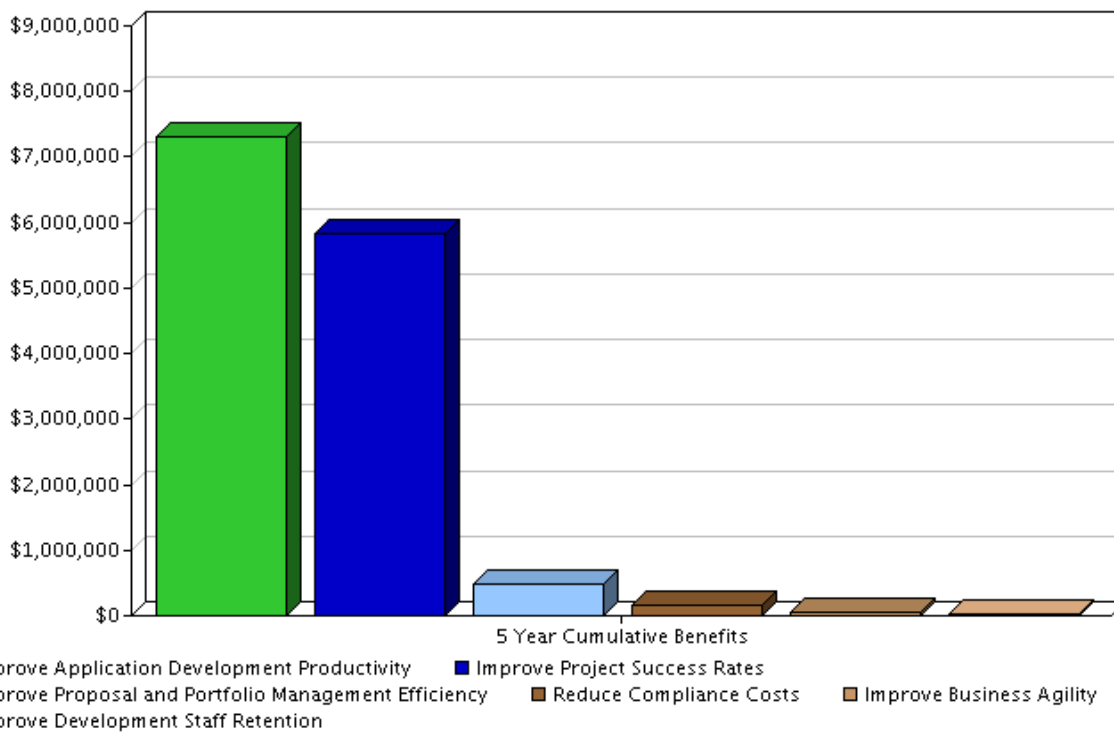


Top Benefits



- Improve Change and Configuration Management Productivity [22.8%]
- Improve Change Request Handling Efficiency [18.6%]
- Improve Project Success Rates by Reducing Cancelled Projects [12.9%]
- Improve Design and Construction Productivity [11.1%]
- Improve Project Success Rates by Reducing Cancelled Projects (Back Office) [9.7%]
- Improve Project Success Rates by Reducing Delayed / Over Budget Projects (Back Office) [9.7%]
- Improve Process, Project and Portfolio Management Productivity [3.6%]
- Improve Project Success Rates by Reducing Delayed / Over Budget Projects [3.1%]
- Improve Project Success Rates by Reducing Delayed / Over Budget Projects (Front Office) [2.1%]
- Improve Project Success Rates by Reducing Requirements and Alignment Issues [1.6%]
- All other included benefits [4.7%]

Benefits By Goal



Costs Summary

Total expected initial costs for the IBM Rational solution include licensing of the software, based on list pricing, professional services and labor to setup and implement the solution, data migration costs, training and learning. As well, ongoing costs include ongoing administration of the toolset and annual support and maintenance contracts.

Costs Summary	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Total expected costs	\$497,640	\$970,435	\$337,981	\$373,687	\$414,392	\$460,795	\$3,054,930

Costs Summary – Capital Expenditure	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IBM Rational software licensing cost (IT)	\$417,700	\$0	\$0	\$0	\$0	\$0	\$0
Total expected capital expenditure	\$417,700	\$0	\$0	\$0	\$0	\$0	\$0

Costs Summary – Operating Expenditure	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IBM Rational software annual support and maintenance cost (IT)	\$0	\$0	\$82,940	\$82,940	\$82,940	\$82,940	\$331,760
Data migration cost (IT)	\$0	\$380,800	\$0	\$0	\$0	\$0	\$380,800
Ongoing IBM Rational administration cost (IT)	\$0	\$223,720	\$255,041	\$290,747	\$331,452	\$377,855	\$1,478,815
Administrator training cost (IT)	\$0	\$5,285	\$0	\$0	\$0	\$0	\$5,285
Constituent training cost (IT)	\$0	\$207,120	\$0	\$0	\$0	\$0	\$207,120
Independent learning / ramp up time / mentoring cost (IT)	\$0	\$142,800	\$0	\$0	\$0	\$0	\$142,800
Process improvement / re-engineering labor (IT)	\$0	\$10,710	\$0	\$0	\$0	\$0	\$10,710
Change and transformation professional services (IT)	\$82,940	\$0	\$0	\$0	\$0	\$0	\$82,940
Total expected operating expenditure	\$82,940	\$970,435	\$337,981	\$373,687	\$414,392	\$460,795	\$2,640,230

Benefit Details

Improve Process, Project and Portfolio Management Productivity

Project and portfolio managers need to prioritize investments across projects, to accurately scope, estimate, schedule, and manage resources and execute projects to deliver business benefit. IBM delivers comprehensive process and portfolio management capabilities with tools to manage the project portfolio lifecycle, reusable processes with the templates and guidance you need to manage project work, , and the proven expertise in facilitating the organizational transformation that is essential to aligning IT with business objectives.

With the solution as implemented for this case study, the 11 process, project and portfolio management full time equivalents (FTEs), currently costing the organization \$1.2M per year in annual labor costs will be expected to experience a 6.9% improvement, an \$86,000 annual savings. This expected savings translates to 0.76 of an FTE, helping the company grow without hiring additional resources, or reallocating this resource workload to other more important and less mundane tasks. Cumulatively over five years, this improvement is expected to result in over \$568,000 in productivity improvements.

At a detailed level, comparing the Current (As Is) annual tasks and costs for process, project and portfolio management before the solution is implemented, with the improvements from the solution, is expected to yield the following annual results.

Current (As Is) Process, Project and Portfolio Management Tasks	Person Hours per Week	FTEs	Average Annual Burdened Salary	Total Annual Labor Cost
Demand capture and tracking	17.6	0.44	\$113,261	\$49,835
Portfolio management and optimization	26.4	0.66	\$113,261	\$74,752
Project tracking and management	140.8	3.52	\$113,261	\$398,679
Scope management	66.0	1.65	\$113,261	\$186,881
Financial management and budgeting	35.2	0.88	\$113,261	\$99,670
Resource management and optimization	55.2	1.38	\$113,261	\$156,300
Time and expense tracking	8.8	0.22	\$113,261	\$24,917
Asset management	8.8	0.22	\$113,261	\$24,917
Process definition, customization, and publishing	11.2	0.28	\$113,261	\$31,713
Work breakdown structure, templating, and task guidance	11.2	0.28	\$113,261	\$31,713
Reporting and metrics creation	17.6	0.44	\$113,261	\$49,835
Other process, project and portfolio management tasks	42.0	1.05	\$113,261	\$118,924
Total	440.8	11.02		\$1,248,136

Proposed Process, Project and Portfolio Management Tasks	Task Savings with Proposed IBM Rational Solution	Person Hour Savings per Week	Annual FTE Savings	Average Annual Burdened Salary	Total Annual Labor Savings
Demand capture and tracking	10.0%	1.8	0.04	\$113,261	\$4,530
Portfolio management and optimization	13.0%	3.4	0.09	\$113,261	\$10,193
Project tracking and management	6.0%	8.4	0.21	\$113,261	\$23,785
Scope management	8.0%	5.3	0.13	\$113,261	\$14,724
Financial management and budgeting	10.0%	3.5	0.09	\$113,261	\$10,193
Resource management and optimization	7.0%	3.9	0.10	\$113,261	\$11,326
Time and expense tracking	5.0%	0.4	0.01	\$113,261	\$1,133
Asset management	2.0%	0.2	0.00	\$113,261	\$0
Process definition, customization, and publishing	15.0%	1.7	0.04	\$113,261	\$4,530
Work breakdown structure, templating, and task guidance	5.0%	0.6	0.01	\$113,261	\$1,133
Reporting and metrics creation	10.0%	1.8	0.04	\$113,261	\$4,530
Other process, project and portfolio management tasks	0.0%	0.0	0.00	\$113,261	\$0
Total	6.9%	31.0	0.76		\$86,077

As labor costs rise every year, in this case 4% annually, and the number of projects increases each year, 10% in this case, labor productivity savings grow over time. Measured in years from deployment, the following summarizes the expected benefits:

Process, Project and Portfolio Management Productivity Benefits	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits with IBM Rational	\$86,077	\$98,128	\$111,866	\$127,527	\$145,381
FTE productivity improvement with IBM Rational	0.76	0.84	0.92	1.01	1.11

Improve Design and Construction Productivity

Design and construction, the core of the development lifecycle is also the most costly regarding labor costs. As well, it represents the largest opportunity for productivity improvements, particularly with regards to optimizing global development.

IBM Rational solutions can help the development team to better define the right solution with analysis, design and construction tools that help managers, business analysts and developers understand the problem space, capture and manage evolving requirements, model user interactions, define database architectures, and incorporate stakeholder feedback throughout the project lifecycle.

Currently, the 41 analysis, design and construction FTEs are expected to cost the organization \$3.9M annually in burdened labor costs. With the IBM Rational solution, various collaborative tasks can be streamlined and communication improved helping to reduce manual tasks and save person hours. The expected result is a productivity improvement of 6.8% overall, with savings of almost 3 FTEs per year. This is expected to provide a substantial \$268,000 annual savings in year 1, and a substantial cumulative 5 year productivity improvement / labor cost savings of \$1.7M.

At a detailed level, comparing the Current (As Is) annual tasks and costs for design and construction before the solution is implemented, with the improvements from the solution, the following annual results are expected.

Current (As Is) Design and Construction	Person Hours per Week	FTEs	Average Annual Burdened Salary	Total Annual Labor Cost
Requirements analysis and design	82.0	2.05	\$95,445	\$195,662
Understand and track software assets	49.2	1.23	\$95,445	\$117,397
Use case analysis and design	106.8	2.67	\$95,445	\$254,838
Architecture design	106.8	2.67	\$95,445	\$254,838
Database design	106.8	2.67	\$95,445	\$254,838
Subsystem design	106.8	2.67	\$95,445	\$254,838
User interface design	98.4	2.46	\$95,445	\$234,795
Design and architectural reviews	82.0	2.05	\$95,445	\$195,662
Code reviews	82.0	2.05	\$95,445	\$195,662
Structure the implementation model	156.0	3.90	\$95,445	\$372,236
Implement design elements	156.0	3.90	\$95,445	\$372,236
Developer unit testing	123.2	3.08	\$95,445	\$293,971
Integrate components	123.2	3.08	\$95,445	\$293,971
Analyzing run time behavior	65.6	1.64	\$95,445	\$156,530
Generating design and construction documentation	49.2	1.23	\$95,445	\$117,397
Communicating and collaborating with team members	82.0	2.05	\$95,445	\$195,662
Other design and construction tasks	65.6	1.64	\$95,445	\$156,530
Total	1,641.6	41.04		\$3,917,063

Proposed Design and Construction Tasks	Task Savings with Proposed IBM Rational Solution	Person Hour Savings per Week	Annual FTE Savings	Average Annual Burdened Salary	Total Annual Labor Savings
Requirements analysis and design	0.0%	0.0	0.00	\$95,445	\$0
Understand and track software assets	10.0%	4.9	0.12	\$95,445	\$11,453
Use case analysis and design	15.0%	16.0	0.40	\$95,445	\$38,178
Architecture design	15.0%	16.0	0.40	\$95,445	\$38,178
Database design	0.0%	0.0	0.00	\$95,445	\$0
Subsystem design	10.0%	10.7	0.27	\$95,445	\$25,770
User interface design	5.0%	4.9	0.12	\$95,445	\$11,453
Design and architectural reviews	30.0%	24.6	0.62	\$95,445	\$59,176
Code reviews	0.0%	0.0	0.00	\$95,445	\$0
Structure the implementation model	0.0%	0.0	0.00	\$95,445	\$0
Implement design elements	10.0%	15.6	0.39	\$95,445	\$37,224
Developer unit testing	5.0%	6.2	0.15	\$95,445	\$14,317
Integrate components	5.0%	6.2	0.15	\$95,445	\$14,317
Analyzing run time behavior	3.0%	2.0	0.05	\$95,445	\$4,772
Generating design and construction documentation	3.0%	1.5	0.04	\$95,445	\$3,818
Communicating and collaborating with team members	5.0%	4.1	0.10	\$95,445	\$9,545
Other design and construction tasks	0.0%	0.0	0.00	\$95,445	\$0
Total	6.8%	112.7	2.81		\$268,201

As labor costs rise every year, in this case 4% annually, and the number of projects increases each year, 10% in this case, labor productivity savings grow over time. Measured in years from deployment, the following summarizes the expected benefits:

Design and Construction Productivity Benefits	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits with IBM Rational	\$268,201	\$305,749	\$348,554	\$397,352	\$452,981
FTE productivity improvement with IBM Rational	2.81	3.09	3.40	3.74	4.11

Improve Change and Configuration Management Productivity

Ask any member of the development team and they will tell you, change is a constant in the development process. A good change management system allows the team to track and manage change across multiple locations and teams, and across multiple projects. IBM provides comprehensive, integrated software configuration management solutions that streamline and automate change across the application life cycle. Through enterprise-class process-centric change management capabilities IBM software configuration management solutions provide management and control of software assets, and better insight, predictability and control of the software development process.

As part of the development process, through core team tasks and dedicated change and configuration management headcount, 15 FTEs are consumed each year on change and configuration management tasks. This can cost the organization a surprising \$1.6M each year.

With the proposed solution, key change and configuration management tasks can be automated particularly by improving the day to day activities such as access and retrieval of elements, access and comparison of files in multiple sites, working with files and baseline (comparisons), notifications, creating and managing workspaces and creating, using and merging branches. For a distributed team, one of the big benefits can be reducing the issues encountered, particularly by reducing the number of hours lost due to failed builds by an expected 60%, and reducing recurring defects across multiple releases. The expected 34% total savings from the implementation can result in productivity improvements of 5 FTEs annually, an expected \$549,000 first year savings, and a significant cumulative \$3.6M productivity improvement over five years.

At a detailed level, comparing the Current (As Is) annual tasks and costs for change and configuration management before the solution is implemented, with the improvements from the solution, the following annual results are expected.

Current (As Is) Change and Configuration Management Tasks	Person Hours per Week	FTEs	Average Annual Burdened Salary	Total Annual Labor Cost
Access and retrieval of elements	42.0	1.05	\$108,171	\$113,580
Access and comparison of files in multiple sites	60.0	1.50	\$108,171	\$162,257
Working with files and baseline (comparisons)	60.0	1.50	\$108,171	\$162,257
Creating, using and merging branches	60.0	1.50	\$108,171	\$162,257
Hours lost due to failed builds	120.0	3.00	\$108,171	\$324,513
Notification between staff	30.0	0.75	\$108,171	\$81,128
Reporting and metrics creation	54.0	1.35	\$108,171	\$146,031
Create and manage workspaces	54.0	1.35	\$108,171	\$146,031
Reduce recurring defects across multiple releases	60.0	1.50	\$108,171	\$162,257
Increase reuse of common components across teams	30.0	0.75	\$108,171	\$81,128
Other change and configuration management tasks	30.0	0.75	\$108,171	\$81,128
Total	600.0	15.00		\$1,622,567

Proposed Change and Configuration Management Tasks	Task Savings with Proposed IBM Rational Solution	Person Hour Savings per Week	Annual FTE Savings	Average Annual Burdened Salary	Total Annual Labor Savings
Access and retrieval of elements	20.0%	8.4	0.21	\$108,171	\$22,716
Access and comparison of files in multiple sites	15.0%	9.0	0.23	\$108,171	\$24,879
Working with files and baseline (comparisons)	30.0%	18.0	0.45	\$108,171	\$48,677
Creating, using and merging branches	50.0%	30.0	0.75	\$108,171	\$81,128
Hours lost due to failed builds	60.0%	72.0	1.80	\$108,171	\$194,708
Notification between staff	60.0%	18.0	0.45	\$108,171	\$48,677
Reporting and metrics creation	65.0%	35.1	0.88	\$108,171	\$95,190
Create and manage workspaces	10.0%	5.4	0.14	\$108,171	\$15,144
Reduce recurring defects across multiple releases	10.0%	6.0	0.15	\$108,171	\$16,226
Increase reuse of common components across teams	2.0%	0.6	0.02	\$108,171	\$2,163
Other change and configuration management tasks	0.0%	0.0	0.00	\$108,171	\$0
Total	33.9%	202.5	5.08		\$549,508

As labor costs rise every year, in this case 4% annually, and the number of projects increases each year, 10% in this case, labor productivity savings grow over time. Measured in years from deployment, the following summarizes the expected benefits:

Change and Configuration Management Productivity Benefits	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits with IBM Rational	\$549,508	\$626,439	\$714,140	\$814,120	\$928,097
FTE productivity improvement with IBM Rational	5.08	5.59	6.15	6.77	7.45

Improve Compliance Management Productivity

A key component of improving software development governance is implementing compliance management. For this case study's financial management organization, compliance management is more than an afterthought; it is a federally mandated requirement with Cx level visibility.

With the proposed solution as implemented for this organization, the ability to maintain a repository of common regulatory requirements for reuse across select projects is enabled. A line-of-sight from regulatory policies through deployment is provided. A compliant software development process that documents separation of duties procedures, quality checkpoints and financial approval cycles is automated and enforced. The solution automated many of the key components that before were manually tracked and managed – helping to improve both the efficiency of the compliance management staff and team tasks, as well as reduce the risks of potential non-compliance issues.

The team quantified the expected costs of compliance management and was surprised by the amount of time it estimated to track and manage compliance tasks. Over 280 hours per week, a total of 7 FTEs each year were expected to be spent on compliance management tasks such as maintaining policies, implementing the compliance rules, change management, testing and validation and approvals reporting. The productivity improvements are expected to provide a savings of 0.4 FTEs for the core compliance team, as well as team compliance task savings. From the current expenditure of \$525,000 per year, a savings of 5.5%, or \$29,000 per year was expected.

More important than the labor savings, the process is not only expected to be more efficient than before, but more effective at assuring compliance is maintained and validated, and that risks of non-compliance or resultant damage is avoided.

At a detailed level, comparing the Current (As Is) annual tasks and costs for compliance management before the solution is implemented, with the improvements from the proposed solution, the following annual results are expected.

Current (As Is) Compliance Management Tasks	Person Hours per Week	FTEs	Average Annual Burdened Salary	Total Annual Labor Cost
Maintaining a policy repository	70.0	1.75	\$75,083	\$131,395
Implementing and deploying the policies	70.0	1.75	\$75,083	\$131,395
Change management, testing and validation, approvals and reporting	70.0	1.75	\$75,083	\$131,395
Other compliance management tasks	70.0	1.75	\$75,083	\$131,395
Total	280.0	7.00		\$525,580

Proposed Compliance Management Tasks	Task Savings with Proposed IBM Rational Solution	Person Hour Savings per Week	Annual FTE Savings	Average Annual Burdened Salary	Total Annual Labor Savings
Maintaining a policy repository	5.0%	3.5	0.09	\$75,083	\$6,757
Implementing and deploying the policies	10.0%	7.0	0.18	\$75,083	\$13,515
Change management, testing and validation, approvals and reporting	7.0%	4.9	0.12	\$75,083	\$9,010
Other compliance management tasks	0.0%	0.0	0.00	\$75,083	\$0
Total	5.5%	15.4	0.39		\$29,282

As labor costs rise every year, in this case 4% annually, and the number of projects increases each year, 10% in this case, labor productivity savings grow over time. Measured in years from deployment, the following summarizes the expected benefits:

Compliance Management Benefits	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits with IBM Rational	\$29,282	\$33,381	\$38,054	\$43,382	\$49,455
FTE productivity improvement with IBM Rational	0.39	0.43	0.47	0.52	0.57

Improve Change Request Handling Efficiency

For this global team, change is a reality as over 10,000 change requests are generated annually. Many of these change requests could be reduced with better coordination and communication amongst the various distributed development teams, particularly in the earlier stages of development and test.

With the proposed solution, it can be ensured that the team is working from the same page, and that compliance requirements are accurately captured, validated and delivered as specified. This can help to drive an expected 8% reduction in the number of overall change requests, and reducing overall workload by avoiding unnecessary change requests, saving an expected 5 FTEs and \$447,000 the first 12 months from deployment.

Current (As Is) Change Request Handling	Average Number of Change Requests per Project	Total Number of Change Requests (all projects)	Total Person Hours (total change requests * hours to resolve)	Average Burdened Salary Rate	Total Change Request Handling Labor Costs
Requirements	8.0	2,000	560.0	\$47.60	\$26,656
Design review	3.6	900	900.0	\$47.60	\$42,840
Unit testing	4.0	1,000	2,000.0	\$47.60	\$95,200
Functional testing	8.0	2,000	6,000.0	\$47.60	\$285,600
Integration testing	12.0	3,000	30,000.0	\$47.60	\$1,428,000
Acceptance testing	4.0	1,000	15,000.0	\$47.60	\$714,000
Post deployment	0.4	100	15,100.0	\$47.60	\$718,760
Total	40.0	10,000	69,560.0		\$3,311,056

Proposed Change Request Handling	Average Number of Change Requests per Project	Total Number of Change Requests (all projects)	Total Person Hours	Average Burdened Salary Rate	Total Change Request Handling Labor Costs
Requirements	7.4	1,840	515.2	\$47.60	\$24,524
Design review	3.3	828	803.2	\$47.60	\$38,232
Unit testing	3.7	920	1,674.4	\$47.60	\$79,701
Functional testing	7.4	1,840	5,188.8	\$47.60	\$246,987
Integration testing	11.0	2,760	25,944.0	\$47.60	\$1,234,934
Acceptance testing	3.7	920	12,972.0	\$47.60	\$617,467
Post deployment	0.4	92	13,058.5	\$47.60	\$621,585
Total	36.9	9,200	60,156.1		\$2,863,430

Change Request Handling Benefits	Year 1	Year 2	Year 3	Year 4	Year 5
Current (As Is) costs	\$3,311,056	\$3,774,604	\$4,303,049	\$4,905,476	\$5,592,243
Proposed costs	\$2,863,430	\$3,264,310	\$3,721,313	\$4,242,297	\$4,836,219
Benefits with IBM Rational	\$447,626	\$510,294	\$581,736	\$663,179	\$756,024
FTE productivity improvement with IBM Rational	5.00	5.00	5.00	5.00	5.00

Reduce Development Staff Attrition

With the proposed solution, basic and rather mundane tasks can be reduced, requirements and documentation improved, and collaboration and teamwork enhanced helping to reduce team stress and improve morale, eliminating a certain percentage of staff attrition by an estimated 14%. With an annual attrition of a modest 15% the problem is not large, but would be surprisingly more expensive than many would realize. At \$19,000 per replacement, the annual costs are estimated at \$451,000 per year. With 14% reduction in the attrition rate, savings of more than \$58,000 per year are expected.

Reduce Development Staff Attrition	Current (As Is)	Proposed Benefits with IBM Rational Solution	Proposed Solution
Total number of application development and team FTEs	150		150
Annual staff attrition rate	15.00%	14.0%	12.90%
Annual replacement hires (# of FTEs * annual attrition rate)	23	3	20
Average replacement cost per staff FTE	\$19,645	0.0%	\$19,645
Total annual replacement cost (replacement hires * replacement cost)	\$451,835	\$58,935	\$392,900

Improve Project Success Rates – Reducing Cancelled Projects

With proposed solution, assessment tools can help this organization eliminate the funding of poorly aligned, duplicate or ill-conceived projects increasing the success rate of funded projects. A standard software development process proven to increase the success rate of projects or allows customers to standardize the deployment of their own proven processes is provided along with earlier detection of troubled and misaligned projects. Detailed real-time reports on project status allow projects to be canceled early in the lifecycle avoiding the additional investment in failing projects.

Currently 15% of the new projects, an estimated 7.5 projects each year are cancelled prior to deployment. Each of these projects costs the organization an average of 3,000 person hours per project.

With the implemented IBM software development governance solution, better visibility and management is expected to provide a reduction in the Cancelled Project rate of 10%, eliminating almost a project a year from the chopping block. More significantly, troubled projects can be recognized earlier in the cycle, reducing the person hours expended before troubled projects were cancelled by 28%. This is expected to result in a total annual savings of \$371,852. These savings will drive almost an additional 5.0 FTE productivity improvement per year.

Project Success Rates - Cancelled Projects	Current (As Is)	Proposed Benefits with IBM Rational Solution	Proposed Solution
Total costs for cancelled projects (front office + back office)	\$1,071,000	\$371,852	\$699,148

When examining back-office projects only, those aimed at driving business operating efficiency improvements, 6 projects are expected to be cancelled on average each year. This is expected to cost the organization about \$5,000,000 in expected first year value from these projects – a total of \$30,000,000 in unrealized and undelivered operating expense and working capital savings each year – the expected benefits of the cancelled projects. Although an indirect (soft) benefit, improving project success rate by 10% will yield an additional 0.6 projects delivered each year, an estimated ideal benefit of \$3,000,000 per year (only counting the first years benefit on any project), and even more when considering the cumulative effect of each project's success to the business. Because this is an indirect benefit, the actual contribution to the business case is reduced by 10%, yielding a \$300,000 value contribution.

For the front-office projects, those customer facing applications which derive revenue for the business, an estimated 1.5 projects are cancelled each year. With each revenue-generating project expected to deliver \$20M the first 12 months in incremental revenue, and an estimated \$4.6M (23.0%) incremental margin, each of these cancelled projects has a big impact on the business. A modest 10% improvement realized is expected to yield \$2M in incremental revenue and \$460,000 in incremental profit each year. Risk adjustments, as this is also an indirect benefit, are applied resulting in an expected \$46,000 annual incremental margin contribution.

Improve Project Success Rates by Reducing Duplicate/Redundant Projects

Many organizations do not realize that resources are duplicating development efforts, a particular issue in globally distributed teams. By providing better project visibility and a governance process on approvals, the proposed solution can help eliminate duplicate and redundant projects before they are funded.

In analyzing this organization, a modest 5% of projects are projected to be duplicate efforts, with an estimated 1000 person hours per duplicate project estimated as wasted effort. This conservative estimate is expected to net \$119,000 a year in wasted effort and lost productivity.

With IBM Rational's portfolio management solution, at least 30% of these duplications can be recognized and eliminated, expecting to result in \$33,000 in annual savings the first year, and a projected 0.4 FTE productivity improvement.

Project Success Rates – Duplicate/Redundant Projects	Current (As Is)	Proposed Benefits with IBM Rational Solution	Proposed Solution
Total costs for duplicate / redundant projects (front office + back office)	\$119,000	\$33,320	\$85,680

Improve Project Success Rates by Reducing Delayed/Over Budget Projects

The organization is struggling with projects that are behind schedule, delivered late and delivered over budget. Almost one in three projects are troubled in this fashion - about 15 projects each year. Each delay is estimated to cost the organization 500 additional person hours of over-budget effort, 1 FTE and about \$350,000 each year in additional development labor costs.

With the proposed solution, delayed projects can be reduced through real-time reporting which offers early indication of troubled projects when corrective action is possible to keep projects on track. Also, the product's ability to provide visibility into supply and demand allows upper management to make more realistic commitments. A standard software development process is offered, which has been proven to increase the success rate of projects or allows customers to standardize the deployment of their own proven processes. As a result, a 25% improvement in reducing troubled projects is possible for this organization. This improvement will mean that almost 4 additional projects per year are delivered on-time and on-budget, potentially resulting in a conservative savings estimate of \$88,000 per year in labor cost benefits, and an additional 1.0 FTE productivity improvement for the team.

Project Success Rates – Delayed/Over Budget Projects	Current (As Is)	Proposed Benefits with IBM Rational Solution	Proposed Solution
Total costs for delayed / over budget projects (front office + back office)	\$357,000	\$88,060	\$268,940

Each delayed back-office project is expected to cost the organization \$1M in lost operating efficiency improvements the first year – lost value to the business because the project is not delivered on time. By reducing the number of back-office troubled projects by 25% from 12 to 9, the team will be able to recapture \$3,000,000 in incremental operating efficiency improvements by launching these projects as originally scheduled. As an indirect (soft) benefit, these are risk adjusted in the overall ROI analysis to 10%, expecting to result in a significant impact of \$300,000 per year in incremental on-time delivery benefits.

For the front-office projects, a similar savings, avoiding potentially \$4M of estimated revenue impact per delay, can result in almost 1 project per year avoiding issues, delivering \$2.8M in expected incremental revenue benefits, and \$644,000 in incremental margin. Risk adjusted as an indirect benefit, the net benefits included in the ROI analysis are an estimated \$64,000 per year.

Improve Project Success Rates by Reducing Requirements and Alignment Issues

In most organizations aligning application development projects with business goals and needs is a challenge. Non-automated processes, particularly for distributed teams usually causes issues with the projects – the right ones are not always prioritized correctly, investment priorities are not aligned with value and risk, and requirements are often not captured properly. This causes the team to have to dedicate extra resources to meet requirements, and costs the business precious time by not having the right projects delivered to match various business operating efficiency and strategic effectiveness goals.

For this financial organization, about 25% of projects are estimated to be not aligned perfectly with business goals and user needs, a total of over 12 projects each year. For each project that is not aligned, it is estimated that an additional 500 person hours of effort is wasted per project through mis-prioritization or mis-appropriation, or having the team have to expend additional resources to get the projects aligned properly – delivering to expectations and needs.

With the proposed solution, maintenance work continues to be tracked against assets once they are in production providing visibility into the true cost of the asset over its lifecycle and feedback to the software development process on how well requirements are being met. Additionally, a standard software development process proven to increase the success rate of projects or allows customers to standardize the deployment of their own proven processes is offered.

Reducing requirements and alignment issues by 15% with the proposed solution, this organization can experience a reduction of about 2 projects with issues, reducing current annual costs of almost \$300,000 per year by \$45,000 in productivity savings annually, about ½ of an FTE.

By reducing requirements and alignment issues, projects can be delivered to the business units that better match their goals and objectives. Although there is likely value delivered by these improvements, the team did not quantify the incremental value of having better alignment.

Project Success Rates – Requirements and Alignment Issues	Current (As Is)	Proposed Benefits with IBM Rational Solution	Proposed Solution
Total costs for requirements issue related projects (front office + back office)	\$297,500	\$45,220	\$252,280

Additional Benefits

Several additional benefits were discussed and analyzed in the case study, but were not included in the analysis results because they were too indirect (soft). However, some of these benefits are substantial to the organization strategically, and in some ways, would be the reason for implementing the solution, even though arriving at a consensus quantification was not possible for this case study, even with indirect risk adjustment of the results:

- **Improve Business Agility - Deliver New and Upgrade Projects Sooner:** With the proposed solution, the cycle time for project funding is reduced and project delivery is accelerated by having one consolidated system supporting automated processes, professional project management and team collaboration. The time to realized business benefit is reduced by delivering functionality earlier in the lifecycle. Although not quantified into a cash flow benefit, the team estimated that projects can be delivered about 3-4% earlier than prior to the solution being implemented.
- **Improve Business Agility – Get to Backlogged Projects:** With the proposed solution, an iterative method for prioritizing and managing requirements is promoted allowing resources to be deployed to the most important projects. As well, productivity and utilization can be improved, freeing resources to work on additional projects that they just couldn't get to before. This helps the team get to backlogged, more important projects sooner.

ABOUT ALINEAN

Since 1994, the Alinean team has been the pioneering builder of tools to help quantify and improve the ROI and TCO of IT investments. Alinean was named for the Spanish word for "Align", matching the Alinean mission as the leading developer of analytical tools to help IT vendors, consultants and IT executives align IT investments with business strategies.

The Alinean team has over a decade of experience in the practical development and application of ROI and TCO methodologies, models and tools to optimizing IT investment decision making. In 1994, the Alinean team formed Interpose, the original pioneers of ROI tools, developing analytical software for over 50 major IT vendors and consulting companies worldwide, and creating the industry standard TCO Manager and TCO Analyst software. Interpose was sold to Gartner in 1998, where the team continued their developments and marketing of ROI and TCO software tools. The original team reunited to form Alinean in 2001, once again becoming the leading pioneers and developers of ROI sales and analytical tools. Current customers include leading IT solution providers such as HP, IBM, Dell, Intel, Symantec, NetIQ, EMC, SAP, Oracle, SBC, and Microsoft, as well as leading consultancies and Global 1000 companies.

Additional information about Alinean and helpful ROI educational resources can be found at <http://www.alinean.com>.

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