

A Forrester Total Economic
Impact™ Study
Commissioned By IBM

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The Total Economic Impact™ Of IBM Integration Bus

FORRESTER®

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Executive Summary

IBM commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying IBM Integration Bus. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the Integration Bus on their organizations and compare that impact with other existing alternatives.

“The maturity and support of the IBM Integration Bus solution were definitely higher.”

~ Executive Director, Architecture, U.S.-based multinational financial services company

To better understand the benefits, costs, and risks associated with an Integration Bus implementation, Forrester interviewed an existing enterprise customer with multiple years of experience using IBM WebSphere Message Broker, an earlier version of IBM Integration Bus.

As part of an overall IT transformation, the company evaluated two products to potentially provide integration and messaging capabilities: an open source ESB and IBM Integration Bus. The company undertook extensive evaluations of both products across a range of criteria, including metrics such as throughput, CPU utilization, and response time. In the end, when it came to the decision criteria, the perceived cost savings afforded by adopting the open source ESB solution were not extensively evaluated since potential savings did not outweigh a number of other factors that the organization judged more important, such as performance and reliability.

While the open source ESB solution was capable in many respects, it was not able to achieve the throughput and scalability provided by IBM Integration Bus. In addition, moving to the open source ESB solution increased potential customization, and implementation and support costs and business risks.

“We determined that moving to the open source ESB product would be high risk,” said the organization’s executive director for architecture. “Because of our scale, we find bugs that other companies haven’t found yet. The maturity and support of the IBM Integration Bus solution were definitely higher.”

Interviews conducted during the study revealed the following key results, based on the interviewed organization’s evaluation, along with Forrester analysis:

- › IBM Information Bus had significant scalability and throughput advantages over the open source ESB alternative.
- › Use of the IBM Information Bus solution would reduce testing effort and time.
- › Selecting the open source ESB significantly increased business risk.
- › Open source solutions remain a viable part of the organization’s IT strategy, for use in the right situations.

FIGURE 1

Financial Summary Showing Three-Year Risk-Adjusted Results

**ROI:
93%**

**Total benefit
(PV):
\$1,552,857**

**Payback:
14 months**

**Transaction
Throughput
improvement:
▲ 50% to 85%**

Source: Forrester Research, Inc.

- › **Benefits.** The interviewed organization highlighted the following risk-adjusted benefits of IBM IBB over the open source ESB:
 - **Reduced support incidents with increased reliability.** The increased reliability of the IBM Integration Bus, especially in enterprise-class deployments with high throughput and scalability requirements, results in a significant decrease in the number of support incidents and resources that need to be assigned to manage them.
 - **Improved team efficiency with increased development and testing efficiency.** IBM Integration Bus provides an intuitive, drag-and-drop functionality for building messaging flows and comprehensive capabilities for unit testing, increasing developer and team productivity.
 - **Reduced hardware requirements by significantly increased throughput.** Extensive evaluation of throughput and scalability proved that the open source ESB alternative would require at least 100% more servers than the IBM-based solution.
 - **Reduced integration requirements through more comprehensive integration options.** As a more mature product, the IBM Integration Bus provides better integration with a wide range of other commercial infrastructure components and 3rd party solutions, saving integration time and resources. For example, the alternative open source ESB solution would require custom coding to connect with some of the software used by the organization.
- › **Costs.** The interviewed organization identified the following:
 - **Software licensing fees.** For this study, software licensing fees are estimated on an annual “chargeback” basis for internal access to the product, since the organization has a licensing structure where it’s charged back on a monthly basis for IT hardware and software. However, after technical evaluation of both solutions, the organization determined that the licensing differential between the open source ESB solution and the solution from IBM would not be as important to their decision as product limitation issues and business risk factors.
 - **Implementation costs.** Internal costs associated with developers and administrators upgrading the organization’s previous IBM WebSphere Message Broker to the new version of IBM Integration Bus. The implementation costs detailed in this study do not reflect a greenfield deployment of IBM Integration Bus.
 - **Professional services.** These are one-time fees paid for consulting and professional services to implement an upgraded solution based on IBM Integration Bus.
 - **Training costs.** Training costs include initial (and limited ongoing) investments in corporate training on IBM Integration Bus.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by IBM and delivered by Forrester Consulting.
- › Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in IBM Integration Bus.
- › IBM reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester’s findings or obscure the meaning of the study.
- › IBM provided the customer names for the interviews but did not participate in the interviews.

TEI Framework And Methodology

INTRODUCTION

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing IBM Integration Bus. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that IBM/Integration Bus can have on an organization (see Figure 2). Specifically, we:

- › Interviewed IBM marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to IBM Integration Bus and the marketplace for integration solutions.
- › Interviewed a large financial services organization currently using WebSphere Message Broker, an older version of IBM Integration Bus, to obtain data with respect to costs, benefits, and risks.
- › Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the representative organization.
- › Risk adjustment is a key part of the TEI methodology. While the interviewed organization provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted, increasing the costs by 5% and decreasing the benefits by 5%, and is detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling IBM Integration Bus' service: benefits, costs, flexibility, and risks.

Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase and deployment decisions. Please see Appendix B for additional information on the TEI methodology.

FIGURE 2
TEI Approach



Source: Forrester Research, Inc.

Analysis

REPRESENTATIVE ORGANIZATION

For this study, Forrester conducted a total of two interviews with representatives from an IBM customer in the financial services industry.

The business unit interviewed is the consumer-oriented part of a large, US-based multinational financial services firm. In addition to being responsible for consumer-facing technologies (such as online banking, branch banking support, and ATMs), the organization also manages several shared services, such as a US currency deposit system. The business unit includes approximately 2,000 technologists.

Based on the interviews, Forrester constructed a TEI framework and an associated ROI analysis that illustrates the areas financially affected.

INTERVIEW HIGHLIGHTS

The interviews uncovered a number of characteristics about this organization and its strategy to improve throughput and scalability, increase agility and responsiveness, and decrease risk through the use of IBM Integration Bus.

Situation

- › The business unit had been using version 6.1 of IBM WebSphere Message Broker (WMB) for many years as its enterprise messaging system for its core transactional systems, including consumer-facing transactional systems. IBM's WMB was an integral part of the financial services company's real-time operating environment, but the product was reaching its end-of-life status and the organization needed to evaluate new integration and messaging solutions.
- › The company's various retail channels use integration and message brokering technology to connect to the bank's back-end systems. As such, it's crucial that the integration/messaging solution be able to handle high volumes of transactions and provide very low latency and high availability. In essence, the integration and message brokering system can't go down because its failure could cause an outage of business-critical systems. Such outages could not only result in negative financial impact for the organization, but might also have regulatory and reputational impacts.
- › In 2012, the company started a major re-engineering initiative to transform its legacy and mainframe systems into a more modern technology stack. An important part of its transformation plan was to update its messaging system to either IBM Integration Bus or a leading open source ESB product that was already being used by another portion of the organization.
- › To select a next-generation integration solution, the company undertook an extensive proof-of-concept evaluation between IBM Integration Bus and a leading open source ESB product. A key test of each solution was its ability to efficiently handle 10,000 transactions (or more) per second.

“We reevaluated our core technologies to make sure we’re doing the right things in terms of cost, agility, and responsiveness to the business.”

~Executive Director, Architecture, U.S.-based multinational financial services company

“In order to get the same throughput with an open source solution, we needed more CPUs and the response time was consistently longer.”

~Executive Director, Architecture

Solution

After an extensive evaluation, the company selected IBM Integration Bus over an alternative open source ESB solution due to the significantly greater throughput that the IBM solution achieved during a proof-of-concept evaluation. In addition, the IBM Integration Bus also provided improved team efficiency, more robust integration with other solutions, and more effective and efficient scalability with reduced support requirements at the enterprise-class throughput levels required. The licensing cost differential between the open source ESB solution and IBM solution did not end up being an important factor for the studied organization.

Results

The interviews revealed that:

- › **IBM Integration Bus had significant scalability and throughput advantages over the open source ESB alternative.** Based on extensive testing, the organization determined that the open source ESB alternative to IBM Integration Bus would require 100% more hardware resources to meet its throughput and scalability requirements. Not only would this incur more upfront costs, but it would mean a more complex deployment and higher ongoing maintenance costs. In addition, the organization simply couldn't accept lower throughput because the throughput requirements were driven by customer demand across different channels and reducing throughput would have had a negative impact on a wide range of customer experiences.
- › **Use of the IBM Integration Bus solution would reduce testing effort and time.** Because of the size of the organization and the scale of the customer-facing applications relying on the integration/messaging solution, testing is an important consideration for the organization. With any change to the system, the organization has to undertake a lot of regression testing due to the complexity of the environment and potential cost impacts. Interviews revealed that the IBM Integration Bus solution provided more robust and mature testing capabilities that would reduce the testing time required while also increasing testing capabilities and flexibility.
- › **Selecting the open source ESB product significantly increased risk.** The organization acknowledged that while the open source ESB alternative might be suitable for limited deployment scenarios and, with enough work and money, it might be able to meet similar scalability requirements, selecting the open source ESB product for deployment would be a high risk. Initial testing of the open source ESB product identified some defects with the solution. It was the organization's analysis that full deployment of the open source ESB product at the anticipated scale and volume would uncover additional defects and open the organization up to an unknown number of risks with its business-critical systems.
- › **Open source solutions remain a viable part of the organization's IT strategy, for use in the right situations.** However, because of the need for high throughput and robust scalability, open source products were deemed not the best fit for the organization's new messaging platform—it needed a more robust and proven solution such as the IBM Integration Bus.

“Our evaluation showed that hardware requirements would be significantly higher if we went with the open source solution.”

~Executive Director, Architecture

BENEFITS

The organization identified a number of benefits that Forrester quantified as part of this case study:

- › Reduced support incidents.
- › Improved team efficiency.
- › Reduced hardware requirements.
- › Reduced integration requirements.

As part of its decision analysis, the organization undertook an extensive test involving both IBM Integration Bus and the open source ESB product, evaluating them across many criteria (see Table 1 for an example).

TABLE 1- MEASUREMENT CRITERIA - IBM INTEGRATION BUS

	Open source ESB product	IBM Integration Bus	IBM improvement
Response times (milliseconds)	93 ms	45 ms	106% improvement
Measurement of CPU use (virtualized environment)	7.5	3.5	114% improvement
Throughput (transactions/second)	6,600	10,000	52% increase

Source: Forrester Research, Inc.

The results of these evaluations, and the data from them, led Forrester to the identification and quantification of the following benefits as a framework for evaluation.

⊕ Reduced Support Incidents

The organization has determined it is able to realize significant cost savings through reduced support incidents by implementing IBM Integration Bus instead of the alternative open source ESB product. The increased reliability of the IBM Integration Bus, especially in enterprise-class deployments with high throughput and scalability requirements, results in a significant decrease in the number of support incidents and resources that need to be assigned to manage them.

Based on the interviews, it's clear that by deploying the open source ESB product, the organization will encounter more support incidents than by using the IBM Integration Bus solution. To calculate the savings obtained by deploying the IBM Integration Bus, the model takes an estimated total number of incidents and multiplies it by the length of time required to address and resolve the incident (45 hours), the number of resources required (8), the cost per resource (\$65). That total of the incident costs is then multiplied by the percentage savings (70%) obtained by deploying IBM Integration Bus (through a 70% reduction in required support) to calculate the future cost savings within the environment. Table 2 illustrates the calculation used.

TABLE 2

IT Operational Savings: Reduced Support Incidents Lead To IT Operational Savings

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Number of incidents		12	12	12
A2	Length of time (hours)		45	45	45
A3	Resource requirement		8	8	8
A4	Cost per resource		\$65	\$65	\$65
A5	Reduction in number of incidents		70%	70%	70%
A6	Reduction in time to restore		60%	60%	60%
A7	Total incident cost	$A1 * A2 * A3 * A4$	\$280,800	\$280,800	\$280,800
A8	Total savings from reduction in incidents	$A5 * A7$	\$196,560	\$196,560	\$196,560
A9	Total savings from improved time to restore	$A1 * (1 - A6) * A2 * A3 * A4 * A6$	\$50,544	\$50,544	\$50,544
At	Total annual savings		\$247,104	\$247,104	\$247,104
	Risk adjustment		↓ 5%		
Atr	IT operational savings(risk-adjusted)		\$234,749	\$234,749	\$234,749

Source: Forrester Research, Inc.

✦ Improved Team Efficiency

A second area of benefit identified by the interviewed organization is improved development and deployment team efficiency. Specifically, the use of the IBM Integration Bus solution would reduce testing requirements and time, through its intuitive, drag-and-drop functionality for messaging flows and comprehensive capabilities for unit testing, increasing developer and team productivity. Because of the size of the organization and the scale of the customer-facing applications relying on the integration/messaging solution, testing is an important consideration for the organization. The organization has to undertake a lot of regression testing due to the complexity of the environment and potential cost impacts.

Interviews revealed that the IBM Integration Bus solution provided more robust and mature testing capabilities that would reduce the testing time required (compared to the open source ESB alternative) while also increasing testing capabilities and flexibility.

To calculate this benefit, the model assumes a total of 10 team members responsible for testing and deployment, with an average cost of \$120,000 per year. This is based on a blended, fully-burdened number for both on-shore and off-shore resources. Annual savings are calculated based on a 20% reduction in the resource requirements. Table 3 illustrates the calculation used. It's also worth noting that the interviewed company believes the top-line value from avoiding downtime and business-impacting IT events is much larger than the bottom-line numbers in the table, For example, in many cases, an hours downtime for a critical enterprise application can cost hundreds of thousands or even millions of dollars. However, to be conservative with the analysis Forrester chose not to quantify the potential range of top-line benefits.

TABLE 3
Improved Team Efficiency: Testing Improvements Lead To Resource Savings

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Team size		10	10	10
B2	Cost per resource		\$120,000	\$120,000	\$120,000
B3	Estimated reduction		20%	20%	20%
Bt	Savings		\$240,000	\$240,000	\$240,000
	Risk adjustment		↓ 5%		
Btr	Annual savings from improved team efficiency (risk-adjusted)		\$228,000	\$228,000	\$228,000

Source: Forrester Research, Inc.

✦ Reduced Hardware Requirements

A critical part of the interviewed company's evaluation was determining the CPU requirements and throughput of both the open source ESB product and the IBM Integration Bus solution. Based on extensive testing, the organization determined that the open source ESB solution would require 100% more hardware resources to meet the company's throughput and scalability requirements. Not only would this incur more upfront costs, but it would mean a more complex deployment and higher ongoing maintenance costs. In addition, the organization simply couldn't accept lower throughput because the throughput requirements are driven by customer demand across different channels and reducing throughput would have had a negative impact on a wide range of customer experiences.

To calculate this benefit, the model starts by assuming that it would require 12 additional partitioned, virtualized servers to use the open source ESB solution and calculates the capital investment required for those partitioned servers (at \$20,000 each) as well as a 20% ongoing annual support fee. It's worth noting that the server cost is low because of the following two factors. First, the interviewed organization had existing capacity in-house to make the transition, so the incremental cost for the servers was low. And second, the organization used partitioning as part of its server allocation for reducing the incremental hardware costs. Other organizations may have significantly higher server costs, which would increase ROI.

Table 4 illustrates the calculation used.

TABLE 4					
Hardware Savings: Significantly Greater Throughput Results In 50% Hardware Savings					
Ref.	Metric	Calculation	Year 1	Year 2	Year 3
C1	Number of servers avoided		12	0	0
C2	Cost per server (partitioned)		\$20,000	\$20,000	\$20,000
C3	Annual server support fee			20%	20%
C4	Annual server support cost (assumed covered year 1)	C1(Year 1) *C2*C3		\$48,000	\$48,000
C5	Savings		\$240,000	\$48,000	\$48,000
	Risk Adjustment		↓ 5%		
Ctr	Annual IT operational savings — hardware efficiency(risk-adjusted)		\$228,000	\$45,600	\$45,600

Source: Forrester Research, Inc.

✦ Reduced Integration Requirements

The core of integration solutions like IBM Integration Bus is all about integration and connecting and communicating among a wide range of corporate applications and technology resources. The solutions that have more robust connectivity and make it easy to enable communication and connection to a broad set of current and future technology resources will end up being more effective and efficient. Through its extensive evaluation, the interviewed company established that the IBM Integration Bus provides better integration to a wide range of infrastructure components and third-party solutions, compared to the open source ESB alternative. The result is an incremental savings in integration time and resources. It does not represent the total cost to deploy the upgraded solution, only the incremental costs that would have been incurred from the additional work that would have been required had the organization deployed the open source ESB solution.

To calculate this benefit, the model starts by assuming that deploying the open source ESB product would need four additional FTEs 200 hours a year at an average rate of \$65 per hour in order to support the integration of the solution with other existing and new applications or business processes.

Table 5 illustrates the calculation used.

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
D1	Number of FTEs		4	4	4
D2	Hours per FTE		200	200	200
D3	Cost per hour		\$65	\$65	\$65
D4	Annual savings		\$52,000	\$52,000	\$52,000
	Risk Adjustment		↓ 5%		
Dtr	Annual revenue from additional new business initiation (risk-adjusted)		\$49,400	\$49,400	\$49,400

Source: Forrester Research, Inc.

Total Benefits

Table 6 shows the total of all benefits across the five areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the interviewed organization expects risk-adjusted total benefits to be a PV of more than \$1.552 million.

TABLE 6
Total Benefits (Risk-Adjusted)

Ref	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	IT operational savings — reduced support incidents	\$234,749	\$234,749	\$234,749	\$704,246	\$583,786
Btr	IT operational savings — improved team efficiency	\$228,000	\$228,000	\$228,000	\$684,000	\$567,003
Ctr	IT operational savings — hardware efficiency	\$228,000	\$45,600	\$45,600	\$319,200	\$279,200
Dtr	IT operational savings — integration to other solutions	\$49,400	\$49,400	\$49,400	\$148,200	\$122,850
	Total benefits	740,149	557,749	557,749	1,855,646	1,552,857

Source: Forrester Research, Inc.

INCREMENTAL INVESTMENT COSTS

The added incremental costs considered for this TEI of the interview organization's comparison of the IBM Integration Bus solution versus an open source ESB alternative included:

- › Cost No. 1. Software licensing fees.
- › Cost No. 2. Implementation costs.
- › Cost No. 3. Training costs.

These represent Forrester's analysis of internal and external incremental costs that would be experienced by the organization for initial planning, implementation, and ongoing maintenance associated with the upgraded solution. They are not the costs for a full implementation, but instead represent the incremental costs of the organization moving from its existing solution to an upgraded IBM Integration Bus solution. These costs are incremental because the organization already had existing enterprise agreement with IBM and had extra hardware capacity to leverage. The actual cost of the solution will vary depending on the size of the development staff, the number and size of applications, as well as the overall level of support.

Total Costs

Over three years, Forrester analysis shows that the interviewed organization expects total incremental costs to total a little more than \$800,000.

FLEXIBILITY

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so. There are multiple scenarios in which a customer might choose to implement IBM Integration Bus and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix B).

Forrester recommends readers to compare the flexibility of metadata management in their specific case of IBM Integration Bus and an open source alternative. Depending on the given complexity and change frequency of integration points and services, the metadata management have significant contribution to the allover flexibility. While Forrester believes that organizations purchasing IBM Integration Bus may take advantage of these flexibility options, quantification (using the financial industry standard Black-Scholes or the binomial option pricing models) of the additional value associated with these options for this customer would require scenario development and forward-looking analysis that is not available at this time.

In addition, Forrester believes that the IBM Integration Bus platform does provide increased flexibility through overall better metadata management, which can lead to greater reuse and agility. An important consideration for some organizations will be the consideration of how quickly they can propagate changes across their IT infrastructure and how easily one product can work or integrate with another. Solutions such as IBM Integration Bus, which have more robust integration and connections to many other solutions, can improve agility.

RISKS

Forrester defines two types of risk associated with this analysis: implementation risk and impact risk. "Implementation risk" is the risk that a proposed investment in IBM Integration Bus may deviate from the original or expected requirements, resulting in higher costs than anticipated. "Impact risk" refers to the risk that the business or technology needs of the organization may not be met by the investment in IBM Integration Bus, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

Quantitatively capturing investment and impact risk by directly adjusting the financial estimates results in more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as “realistic” expectations since they represent the expected values considering risk.

The following implementation risks that affect costs are identified as part of this analysis:

- › Installation and testing could demand more time than originally anticipated.
- › Developer productivity may not be as high or additional training may be required.
- › Cost of the license may be higher.
- › Cost of the hardware requirement may be higher.

The following impact risks that affect benefits are identified as part of the analysis:

- › The level of savings might be lower than originally anticipated due to unforeseen changes within the environment such as an increase in support incidents expected, smaller increases in developer or team productivity, or less need for integration with other infrastructure components.

Table 7 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates. The TEI model uses a triangular distribution method to calculate risk-adjusted values. To construct the distribution, it is necessary to first estimate the low, most likely, and high values that could occur within the current environment. The risk-adjusted value is the mean of the distribution of those points.

Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

TABLE 7

Benefit And Cost Risk Adjustments

Benefits	Adjustment
IT Operational Savings	↓ 5%
Improved Team Efficiency	↓ 5%
Hardware Savings	↓ 5%
Reduced Integration Requirements	↓ 5%
Costs	Adjustment
Cost	↑ 5%

Source: Forrester Research, Inc.

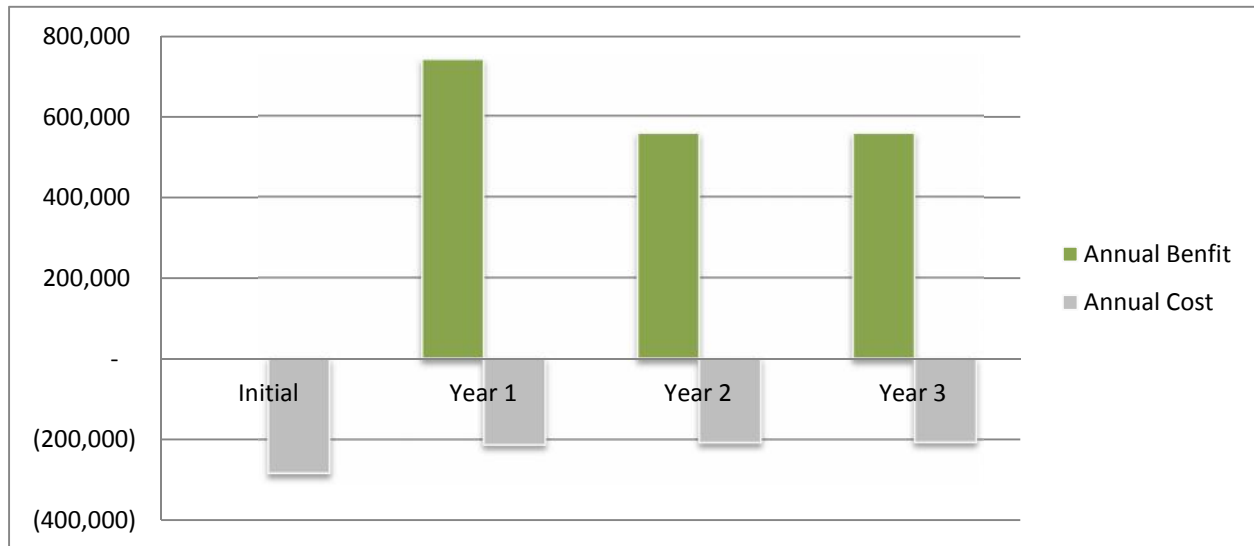
Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the organization's investment in Integration Bus.

Figure 3 below shows the risk adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 8 in the Risks section to the unadjusted results in each relevant cost and benefit section.

FIGURE 3

Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 8
Cash Flow: Risk-Adjusted

	Initial	Year 1	Year 2	Year 3	Total	Present value
Costs with IIB	(283,500)	(213,360)	(207,648)	(206,791)	(911,299)	(804,439)
Benefits		740,149	557,749	557,749	1,855,646	1,552,857
Net benefits	(283,500)	526,789	350,101	350,958	944,347	748,418

ROI 93%

Payback period 14 months

Source: Forrester Research, Inc.

Appendix A: Total Economic Impact™ Overview

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, flexibility, and risks.

BENEFITS

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often, product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

COSTS

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

FLEXIBILITY

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprisewide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point. However, having the ability to capture that benefit has a PV that can be estimated. The flexibility component of TEI captures that value.

RISKS

Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections, and 2) the likelihood that the estimates will be measured and tracked over time. TEI applies a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the underlying range around each cost and benefit.

Appendix B: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own a discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organizations to determine the most appropriate discount rate to use in their own environment.

Net present value (NPV): The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

Present value (PV): The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.

Payback period: The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Return on investment (ROI): A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

A NOTE ON CASH FLOW TABLES

The following is a note on the cash flow tables used in this study (see the example table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in years 1 through 3 are discounted using the discount rate (shown in Framework Assumptions section) at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations are not calculated until the summary tables are the sum of the initial investment and the discounted cash flows in each year.

TABLE [EXAMPLE]

Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.