The Total Economic Impact™ Of An API Management Solution

Cost Savings and ROI Enabled By
IBM API Connect

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ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit forrester.com/consulting.

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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 implementing IBM API Connect, an API management solution. IBM API Connect allows organizations to create, run, manage, and secure their APIs with both internal developers and external partners and generate new markets, consumers, and revenue streams for their products and services. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of IBM API Connect on developing new opportunities for businesses, developers, and customers.

IBM API Connect can help organizations accelerate API development and drive faster time-to-market across both internal and external projects while providing a secure and scalable API management platform.

The three-year benefits and costs for a composite organization based on survey results from 32 IBM API Connect customers are:

- **Total benefits: $12.7 million.**
- **Total costs: $1.6 million.**
- **Net present value (NPV): $11.1 million.**

To better understand the benefits, costs, and risks associated with IBM API Connect, Forrester conducted an in-depth survey with 32 US-based customers across industries who invested in IBM API Connect to assist in creating and managing a secure platform that allows internal and external developers to quickly discover and consume APIs to drive growth. The risks considered in this study account for the uncertainty in the cost and benefit estimates that similar organizations can achieve with their investment in IBM API Connect.

IBM API Connect provides organizations with a comprehensive API life-cycle platform designed to create, run, manage, and secure APIs across various different project types and use cases. Surveyed customers use IBM API Connect to reach new markets, develop new revenue streams, improve operational efficiency, and deliver a better customer experience. Surveyed organizations recognized that APIs are important in driving innovation and expanding their business model. The survey results show that the key reasons customers chose IBM API Connect were that IBM's API management solution provided better access to data, stronger governance and controls, and faster run times than the other solutions in the marketplace. Over 80% of the surveyed customers claimed that they would recommend IBM API Connect to their peers. One of the IBM API Connect customers claimed that "in the new API economy, IBM API Connect stands out as they strive to deliver a better customer experience and open up new revenue streams while ensuring having the right controls, visibility, and security in place." While the benefits in this study capture the additional value of developing new projects, some organizations may also get value from reducing auditing costs, improving inventory of assets, improving business decision making, and driving customer loyalty.

IBM API CONNECT ACCELERATES DEVELOPMENT AND TIME-TO-MARKET AND DRIVES NEW BUSINESS MODELS WHILE PROVIDING ORGANIZATIONS WITH BETTER DATA ACCESS, MORE CONTROL, AND BETTER RUN TIME

Forrester developed a composite organization that is based on the representative responses collected from an in-depth survey with 32 IBM customers. The survey was used to determine the benefits and costs that resulted from an organization's investment in IBM API Connect to help deliver projects more quickly and reach new markets across some specific areas that were part of the survey. Forrester aggregated the data and developed a model representative of all the responses of customers who had implemented IBM API Connect.

The subsequent financial analysis found that the composite organization experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1. The analysis points to three-year benefits of $12.7 million versus three-year costs of about $1.6 million, adding up to a net present value (NPV) of over $11 million. The composite organization realized a payback for the investment within one year of implementing IBM API Connect.

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FIGURE 1

Financial Summary Showing Three-Year Risk-Adjusted Results

| ROI: 674% | Three-year benefits: $12,699,626 | Three-year costs: $1,641,824 | NPV: $11,057,802 |

Source: Forrester Research, Inc.

› **Benefits.** The composite organization experienced the following quantified three-year risk-adjusted present value (PV) benefits (further detailed in the Benefits section). There are additional benefits that organizations can get value from with an investment in IBM API Connect, but they were not calculated in this study. These include reducing audit costs, improving business decision making driven by insights, and increasing customer loyalty.

> *"IBM API Connect has made interacting with applications easier. Our developers can go into the cloud quickly, test different scenarios, and react to changing business conditions faster."*
>
> ~ IBM API Connect Customer

• **A 20% improvement in time-to-market for internal development of mobile projects.** Surveyed customers are increasingly using APIs to create new interfaces on mobile or tablets to support product development, supply chain, marketing, and distribution and drive customer experience. These APIs are made available to internal developers to launch new mobile initiatives. Organizations across industries use mobile APIs to provide general information about their companies' offerings (i.e., product catalogs, pricing, and availability) and custom offerings (i.e., customer and payment information). Additionally, internal developers work to create APIs to utilize mobile functionalities (i.e., GPS services, camera, and near-field communication [NFC]) for their lines of business to create new revenue opportunities. On a monthly basis, each project drives $40,000 of revenue for the composite organization and has an average of five internal consumers. Over three years, this results in $1,671,165 of additional revenue for the composite organization from internal mobile projects.

• **A 30% improvement in time-to-market for internal development of social media projects.** Surveyed customers used IBM API connect to help their internal developers create APIs for their social media projects. Organizations wanted to create awareness using social media channels, respond quickly to social media comments, and develop games and contests to drive sales using social media APIs. On a monthly basis, each social media project drives $16,666 of revenue for the composite organization and has an average of three internal consumers. Over three years, this results in $775,867 of additional revenue for the composite organization from internal social media projects.

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- **A 30% improvement in time-to-market for internal development of data and analytics projects.** Surveyed customers who invested in IBM API connect are increasingly using APIs to monetize their internal data by making data and analytics available to new audiences inside and outside the organization. APIs can be used to help drive efficiency across the supply chain, leverage customer analytics to deliver more effective marketing campaigns, and collect third-party data on product uses to help optimize offerings. On a monthly basis, each data and analytics project drives $24,500 of revenue for the composite organization and has an average of four internal consumers. Over three years, this results in $935,852 of additional revenue for the composite organization from internal data and analytics projects.

- **A 20% improvement in time-to market for internal development of other projects.** Surveyed customers who invested in IBM API Connect were able to improve time-to-market for their internal developers by 20% to complete other internal projects and applications. These projects included using APIs to create applications across various use cases, such as sharing information across lines of business, R&D, supply chain management, distribution, marketing, and regulatory compliance efforts in which APIs are made available to developers within an organization. On a monthly basis, each project drives $28,000 of revenue for the composite organization and has an average of five internal consumers. Over three years, this results in $1,169,815 of additional revenue for the composite organization from other internal projects.

- **A 25% improvement in time-to-market projects by external partner developers consuming APIs.** Surveyed customers who invested in IBM API connect got one of the biggest revenue benefits from having external partners use APIs for new applications and projects. Organizations provide APIs to partners to help manage their supply chain, onboard new suppliers, develop new marketing channels, help other companies market and sell the organization's products and services, and integrate information across partner systems. On a monthly basis, each partner project drives $35,000 of revenue for the composite organization and has an average of three consumers. In addition, each of these three partners that consumes the API develops four net-new revenue streams. Over three years, this results in $4,595,702 of additional revenue for the composite organization from partner projects.

- **A 35% improvement in time-to-market projects by public developers consuming APIs.** Surveyed customers who invested in IBM API Connect shared many of the same APIs developed for internal and partner consumption with the public. Many third-party sites use public APIs to show comparative pricing and promote brands. On a monthly basis, each public project drives $42,500 of revenue for the composite organization and has an average of three consumers. In addition, each of these three public consumers of APIs develops five net-new revenue streams. Over three years, this results in $3,551,225 of additional revenue for the composite organization from public projects.

"IBM API Connect is the leader in API management solutions. Its secure and user-friendly portal allows us to create an API-based ecosystem where our partners can consume APIs that help us reach new customers and serve our customers better."

~ IBM API Connect customer

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› **Costs.** The composite organization experienced the following quantified three-year risk-adjusted present value (PV) costs (further detailed in the Costs section). For this composite organization example, an on-premises API Connect implementation was sized based on the projected utilization requirements for the defined number of projects. In this example, the composite organization experienced:

- **Initial implementation and upfront costs of IBM API Connect of $1,003,200.** The composite organization took eight months to implement IBM API Connect as an on-premises solution into its production environment. IBM offers hybrid and cloud deployments of IBM API Connect, which would reduce the implementation timelines. The composite organization also dedicated six internal resources, including engineers, developers, project managers, and business analysts, who spent an average of 70% of their time assisting in integrating the solution into the environment. To utilize IBM API Connect, the organization had to invest in 10 16-core servers to support the implementation across all environments (from development to production). Within eight months, the composite organization was able to leverage IBM API Connect to create, run, manage, and secure API development and have developers start to discover and consume APIs. In addition, the composite organization incurred professional services fees to integrate IBM API Connect. The three-year cost of $1,003,200 includes initial license costs, server costs, internal labor costs, and professional services fees.

- **Annual license fees and internal labor costs of IBM API Connect of $256,800.** The composite organization incurs annual maintenance with IBM for API Connect, which gives it ongoing support to manage its end-to-end API life-cycle solution and provides support for automated API creation and self-service access for developers. In addition, the composite organization dedicates a portion of four resources to support the platform. Over three years, the composite organization experiences annual costs totaling $638,624.

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Disclosures

The reader should be aware of the following:

› The study is commissioned by IBM and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

› 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.

› 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.

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TEI Framework And Methodology

INTRODUCTION

From the information and data gathered by administrating an in-depth survey, Forrester has constructed a Total Economic Impact (TEI) framework for those organizations considering implementing IBM API Connect. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision, to help organizations understand how to take advantage of specific benefits, reduce costs, and improve the overall business goals of winning, serving, and retaining customers.

APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that IBM can have on an organization (see Figure 2). Specifically, we:
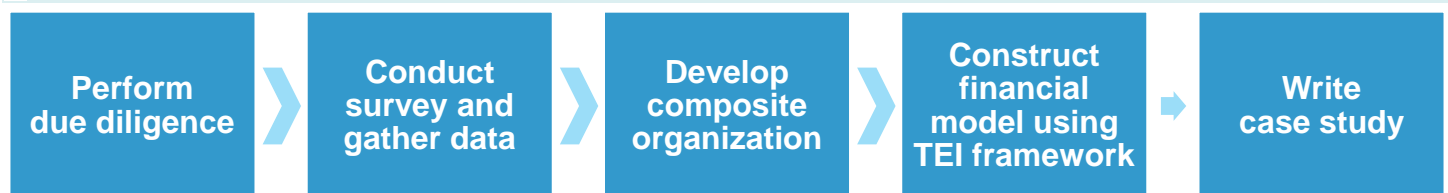
› Interviewed IBM management, marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to IBM and the marketplace for IBM API Connect.

› Conducted a survey across 32 IBM API Connect customers to obtain data with respect to costs, benefits, and risks.

› Constructed a financial model representative of the surveyed organizations using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interview.

› Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted in the interview. Risk adjustment is a key part of the TEI methodology. While the surveyed organizations provided cost and benefit estimates, some categories included a broad range of estimations 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 and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling IBM API Connect: 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 decisions. Please see Appendix A for additional information on the TEI methodology.

FIGURE 2

TEI Approach

Perform due diligence → Conduct survey and gather data → Develop composite organization → Construct financial model using TEI framework → Write case study

Source: Forrester Research, Inc.

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Analysis

IBM API CONNECT: PRODUCT DESCRIPTION

IBM API Connect is an integrated creation, runtime, management, and security foundation for enterprise-grade APIs and microservices to power modern digital applications.

IBM API CONNECT: PRODUCT FEATURES

› Automated, visual, and coding options for creating APIs.

› Life cycle and governance for APIs, products, and plans.

› Node.js and Java support for creating microservices.

› Integrated enterprise-grade clustering, management and security for Node.js and Java.

› Access control over APIs, API plans, and API products.

› Advanced API usage analytics.

› A customizable, self-service developer portal for publishing APIs.

› Policy enforcement, security, and control.

> *"If you are an IBM shop, there is no better alternative. Integration and compatibility with other systems is seamless, and IBM has superior partner support."*
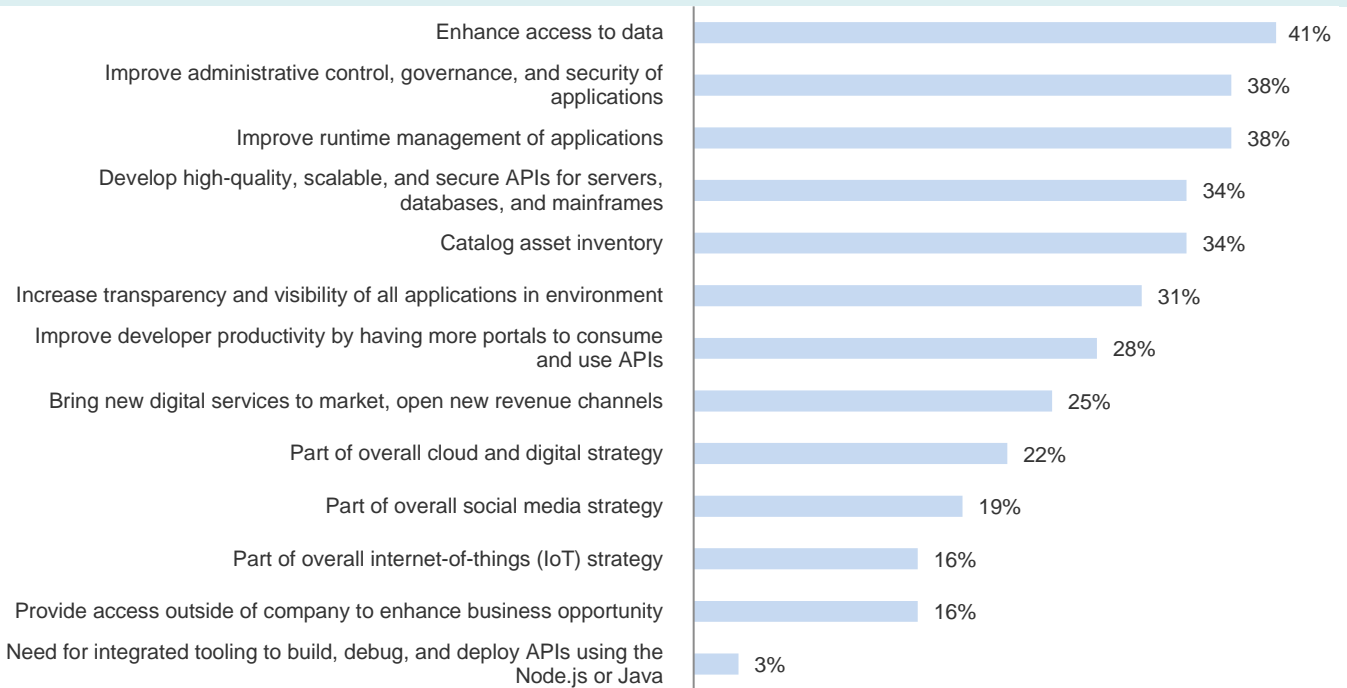>
> ~ IBM API Connect customer

SURVEY HIGHLIGHTS

For this study, Forrester developed an in-depth survey and collected detailed responses across 32 organizations that had invested in IBM API Connect. All the respondents were from North American organizations in a variety of industries, including manufacturing, financial services, travel, government, education services, and automotive.

› Seventy-eight percent of the surveyed organizations have over two years of experience using IBM API Connect.

› The surveyed organizations had the following types of deployments of IBM API Connect: 38% on-premises, 34% hybrid, and 28% cloud.

› Seventy-nine percent of surveyed organizations have more than 1,000 employees.

› Eighty-one percent of surveyed organizations have greater than $100 million in revenue.

› The average API call volume of surveyed organizations is 438 million per month.

› Surveyed organizations use APIs for internal mobile, data and analytics, partner, social media, public, and other internal projects.

› Seventy-five percent of the surveyed organizations claimed that IBM API Connect helped improve their customer experience.

› Eighty-one percent of the surveyed organizations would recommend IBM API Connect to their peers.

› Surveyed organizations that deployed on-premises took an average of eight months to implement IBM API Connect into their production environment. Hybrid and cloud deployments were implemented in less time.

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FIGURE 3

Reasons Why Surveyed Organizations Selected IBM API Connect

Reason	Percentage
Enhance access to data	41%
Improve administrative control, governance, and security of applications	38%
Improve runtime management of applications	38%
Develop high-quality, scalable, and secure APIs for servers, databases, and mainframes	34%
Catalog asset inventory	34%
Increase transparency and visibility of all applications in environment	31%
Improve developer productivity by having more portals to consume and use APIs	28%
Bring new digital services to market, open new revenue channels	25%
Part of overall cloud and digital strategy	22%
Part of overall social media strategy	19%
Part of overall internet-of-things (IoT) strategy	16%
Provide access outside of company to enhance business opportunity	16%
Need for integrated tooling to build, debug, and deploy APIs using the Node.js or Java	3%

Source: Forrester Research, Inc.

"IBM API Connect is the leader in API management solutions. Its secure and user-friendly portal allows us to create an API-based ecosystem where our partners can consume APIs that helps us reach new customers and serve our customers better."

~ IBM API Connect Customer

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COMPOSITE ORGANIZATION

Based on an in-depth survey with 32 existing IBM API Connect customers, Forrester constructed a composite organization that highlights the financial benefits, costs, and associated ROI experienced from implementing IBM API Connect. The composite organization used for our analysis is described below:
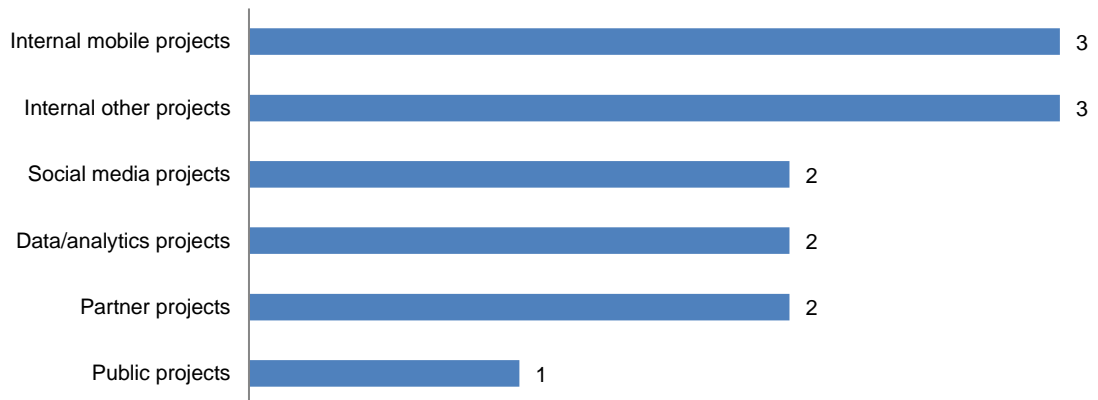
FIGURE 4

Composite Organization Profile

The Composite Organization

❯ A US-based organization with 1,500 employees and $2.5 billion in annual revenue.

❯ On-premises deployment of IBM API Connect.

❯ API call volume per month of 438 million.

❯ Seventy-two APIs exposed to internal and external partners as well as public developers.

❯ Multiple data centers.

❯ High availability (HA) a requirement for its API environment.

❯ Implementation time of eight months.

FIGURE 5

Types Of API Projects The Composite Organization Executes Per Year

Project type	Value
Internal mobile projects	3
Internal other projects	3
Social media projects	2
Data/analytics projects	2
Partner projects	2
Public projects	1

Source: Forrester Research, Inc.

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BENEFITS — QUANTIFIED

The composite organization experienced a number of quantified benefits as a result of its investment in IBM API Connect across its various API projects. These benefits are highlighted in this study:

› A 20% improvement in time-to-market for internal development of mobile projects.

› A 30% improvement in time-to-market for internal development of social media projects.

› A 30% improvement in time-to-market for internal development of data and analytics projects.

› A 20% improvement in time-to-market for internal development of other projects.

› A 25% improvement in time-to-market for external partner projects consuming APIs.

› A 35% improvement in time-to-market for public developers consuming APIs.

Reduced Time-To-Market For Internal Development Of Mobile Projects

The composite organization estimated that prior to implementing IBM API Connect, its internal developers would take an average of seven months to create and launch new internal mobile projects. The composite organization estimates completing three mobile projects each year and uses APIs to create new interfaces on mobile or tablets to support product development, supply chain, marketing, and distribution and drive customer experience. These APIs are made available to internal developers to launch new mobile initiatives. With IBM API Connect, the composite organization was able to improve the development time of internal mobile projects and realize value from these projects 20% faster. The composite organization estimated that the average monthly revenue for these mobile projects is $40,000 and an average of five consumers use these mobile projects.

The benefit realized by the composite organization for the reduction in time-to-market of these internal mobile projects amounts to $840,000 in annual savings (see Table 1). Due to the inherent uncertainty in estimating monthly revenue and the number of consumers, Forrester has applied a risk adjustment of 20%, lowering the cost savings that similar organizations can achieve to $672,000 per year.

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TABLE 1

Incremental Revenue From Internal Mobile Projects

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Total internal mobile projects		3	3	3
A2	Number of months to develop project prior to IBM API Connect		7	7	7
A3	Reduction in time to develop project with IBM API Connect		20%	20%	20%
A4	Average monthly revenue of internal mobile projects		$40,000	$40,000	$40,000
A5	Average number of internal consumers per mobile project		5	5	5
At	Incremental revenue from internal mobile projects	A1*A2*A3*A4*A5	$840,000	$840,000	$840,000
	Risk adjustment	↓20%			
Atr	**Incremental revenue from internal mobile projects (risk-adjusted)**		**$672,000**	**$672,000**	**$672,000**

Source: Forrester Research, Inc.

Reduced Time-To-Market For Internal Development Of Social Media Projects

The composite organization estimated that prior to implementing IBM API Connect, its internal developers would take an average of 13 months to create and launch new social media projects. The composite organization developed new social media applications to create awareness across the internet and social media platforms, respond quickly to social media comments and customer questions and complaints, and use games and contests to drive sales using social media APIs. The composite organization estimates completing two social media projects each year. With IBM API Connect, the composite organization was able to decrease the development time of social media projects and realize value from these projects 30% faster. The composite organization estimated that the average monthly revenue for these social media projects is $16,666 and an average of three consumers use APIs for its social media initiatives.

The benefit realized by the composite organization for the reduction in time-to-market of these social media projects amounts to $389,984 in annual savings (see Table 2). Due to the inherent uncertainty in estimating monthly revenue and the number of consumers, Forrester has applied a risk adjustment of 20%, lowering the cost savings that similar organizations can achieve to $311,988 per year.

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TABLE 2

Incremental Revenue From Social Media Projects

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Social media projects		2	2	2
B2	Number of months to develop project prior to IBM API Connect		13	13	13
B3	Reduction in time to develop project with IBM API Connect		30%	30%	30%
B4	Average monthly revenue of social media projects		$16,666	$16,666	$16,666
B5	Average number of internal consumers per social media project		3	3	3
Bt	Incremental revenue from social media projects	B1*B2*B3*B4*B5	$389,984	$389,984	$389,984
	Risk adjustment	↓20%			
Btr	**Incremental revenue from social media projects (risk-adjusted)**		**$311,988**	**$311,988**	**$311,988**

Source: Forrester Research, Inc.

Reduced Time-To-Market For Internal Development Of Data And Analytics Projects

The composite organization estimated that prior to implementing IBM API Connect, its internal developers would take an average of eight months to create and launch new data and analytics projects using APIs. The composite organization used APIs to help develop big data applications to arm its business with real-time information, insights, and reporting to make more effective decisions. The composite organization used APIs to develop data and analytics projects, including driving efficiency across the supply chain, leveraging customer analytics to drive better marketing campaigns, and using third-party data to deliver a better product mix and optimize customer experience. The composite organization estimates completing two data and analytics projects each year. With IBM API Connect, the composite organization was able to decrease the development time of these data and analytics projects and realize value from these projects 30% faster. The composite organization estimated that the average monthly revenue for these data and analytics projects is $24,500 and an average of four consumers use APIs for its social media initiatives.

The benefit realized by the composite organization for the reduction in time-to-market of these data and analytics projects amounts to $470,400 in annual savings (see Table 3). Due to the inherent uncertainty in estimating monthly revenue and the number of consumers, Forrester has applied a risk adjustment of 20%, lowering the cost savings that similar organizations can achieve to $376,320 per year.

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TABLE 3

Incremental Revenue From Data And Analytics Projects

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
C1	Data/analytics projects		2	2	2
C2	Number of months to develop project prior to IBM API Connect		8	8	8
C3	Reduction in time to develop project with IBM API Connect		30%	30%	30%
C4	Average monthly revenue of data/analytics projects		$24,500	$24,500	$24,500
C5	Average number of internal consumers per data/analytics project		4	4	4
Ct	Incremental revenue from data/analytics projects	C1*C2*C3*C4*C5	$470,400	$470,400	$470,400
	Risk adjustment	↓20%			
Ctr	**Incremental revenue from data/analytics projects (risk-adjusted)**		**$376,320**	**$376,320**	**$376,320**

Source: Forrester Research, Inc.

Reduced Time-To-Market For Internal Development Of Other Projects

The composite organization estimated that prior to implementing IBM API Connect, its internal developers would take an average of seven months to create and launch other internal projects. The composite organization estimates completing three other internal projects each year. These projects include using APIs to share data across lines of business or to create applications to drive customer experience, R&D, supply chain management, distribution, marketing, and regulatory compliance efforts. With IBM API Connect, the composite organization was able to decrease the development time of these other internal projects and realize value from these projects 20% faster. The composite organization estimated that the average monthly revenue for these other internal projects is $28,000 and for each API, an average of five consumers use these other internal projects.

The benefit realized by the composite organization for the reduction in time-to-market of these other internal projects amounts to $588,000 in annual savings (see Table 4). Due to the inherent uncertainty in estimating monthly revenue and the number of consumers, Forrester has applied a risk adjustment of 20%, lowering the cost savings that similar organizations can achieve to $470,400 per year.

TABLE 4

Incremental Revenue From Other Internal Projects

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
D1	Total number of other internal projects		3	3	3
D2	Number of months to develop project prior to IBM API Connect		7	7	7
D3	Reduction in time to develop project with IBM API Connect		20%	20%	20%
D4	Average monthly revenue of other internal projects		$28,000	$28,000	$28,000
D5	Average number of internal consumers per other project		5	5	5
Dt	Incremental revenue from other internal projects	D1*D2*D3*D4*D5	$588,000	$588,000	$588,000
	Risk adjustment	↓20%			
Dtr	**Incremental revenue from other internal projects (risk-adjusted)**		**$470,400**	**$470,400**	**$470,400**

Source: Forrester Research, Inc.

Reduced Time-To-Market For External Partner Projects

The composite organization estimated that prior to implementing IBM API Connect, its external partners would take an average of 11 months to launch new projects using APIs. The composite organization provided APIs to partners to help manage its supply chain, onboard new suppliers, develop new marketing channels, and develop new partners that can market and sell the organization's products and services. The composite organization estimates that its external partners complete two projects each year using its APIs. With IBM API Connect, the external partners were able to consume the APIs faster and decrease the development time of these partner projects by 25%. The composite organization estimated that the average monthly revenue for these external partner projects is $35,000 and an average of 12 new revenue streams are generated by having external partners use APIs for their initiatives.

The benefit realized by the composite organization for the reduction in time-to-market of these external partner projects amounts to $2.3 million in annual savings (see Table 5). Due to the inherent uncertainty in estimating monthly revenue and the number of consumers, Forrester has applied a risk adjustment of 20%, lowering the cost savings that similar organizations can achieve to about $1.8 million per year.

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TABLE 5

Incremental Revenue From External Partner Projects

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
E1	Total number of partner projects		2	2	2
E2	Number of months to develop project prior to IBM API Connect		11	11	11
E3	Reduction in time to develop project with IBM API Connect		25%	25%	25%
E4	Average monthly revenue per partner project		$35,000	$35,000	$35,000
E5	Average number of net-new revenue streams from external partners using APIs		12	12	12
Et	Incremental revenue from partner projects	E1*E2*E3*E4*E5	$2,310,000	$2,310,000	$2,310,000
	Risk adjustment	↓20%			
Etr	**Incremental revenue from partner projects (risk-adjusted)**		**$1,848,000**	**$1,848,000**	**$1,848,000**

Source: Forrester Research, Inc.

Reduced Time-To-Market For External Public Projects

The composite organization estimated that prior to implementing IBM API Connect, it would take an average of eight months for a public project to use the organization's APIs to launch a new project. These include use cases where APIs are made available to public developers. The composite organization allows for these public developers to access its business APIs to reach new customers and markets, participate in comparison platforms, and create new revenue streams. The composite organization estimates that it completes one public project each year using its APIs. With IBM API Connect, the public developers were able to consume the APIs faster and decrease the development time of these partner projects by 35%. The composite organization estimated that the average monthly revenue for these external public projects is $42,500 and an average of 15 new revenue streams are generated by having external partners use APIs for their initiatives.

The benefit realized by the composite organization for the reduction in time-to-market of these external public projects amounts to $1.8 million in annual savings (see Table 6). Due to the inherent uncertainty in estimating monthly revenue and the number of consumers, Forrester has applied a risk adjustment of 20%, lowering the cost savings that similar organizations can achieve to about $1.4 million per year.

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TABLE 6

Incremental Revenue From External Public Projects

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
F1	Total number of public projects		1	1	1
F2	Number of months to develop project prior to IBM API Connect		8	8	8
F3	Reduction in time to develop project with IBM API Connect		35%	35%	35%
F4	Average monthly revenue per public project		$42,500	$42,500	$42,500
F5	Average number of net-new revenue streams using public projects		15	15	15
Ft	Incremental revenue from public projects	F1*F2*F3*F4*F5	$1,785,000	$1,785,000	$1,785,000
	Risk adjustment	↓20%			
Ftr	**Incremental revenue from public projects (risk-adjusted)**		**$1,428,000**	**$1,428,000**	**$1,428,000**

Source: Forrester Research, Inc.

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Total Benefits

Table 7 shows the total of all benefits across the areas listed above, as well as PVs discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of $12.7 million.

TABLE 7

Total Benefits (Risk-Adjusted)

Ref.	Benefit	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Incremental revenue from internal mobile projects	$0	$672,000	$672,000	$672,000	$2,016,000	$1,671,165
Btr	Incremental revenue from social media projects	$0	$311,988	$311,988	$311,988	$935,964	$775,867
Ctr	Incremental revenue from data/analytics projects	$0	$376,320	$376,320	$376,320	$1,128,960	$935,852
Dtr	Incremental revenue from other internal projects	$0	$470,400	$470,400	$470,400	$1,411,200	$1,169,815
Etr	Incremental revenue from partner projects	$0	$1,848,000	$1,848,000	$1,848,000	$5,544,000	$4,595,702
Ftr	Incremental revenue from public projects	$0	$1,428,000	$1,428,000	$1,428,000	$4,284,000	$3,551,225
	Total benefits (risk-adjusted)	**$0**	**$5,106,708**	**$5,106,708**	**$5,106,708**	**$15,320,124**	**$12,699,626**

Source: Forrester Research, Inc.

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COSTS

The composite organization experienced the following costs related to its investment in IBM API Connect:

› Implementation and upfront costs: $1,003,200.

› Annual maintenance and internal support costs: $256,800.

Implementation And Upfront Costs

The composite organization's investment in the IBM API Connect on-premises solution included initial costs of software licensing fees, hardware purchases, professional services fees, and internal support requirements. The composite organization took eight months to fully integrate IBM API Connect into its environment, with an initial license cost of $350,000. The integration also required a purchase of 10 16-core servers totaling $50,000 and professional services fees of $100,000. In addition to these direct costs, the composite organization dedicated six internal resources over eight months during the implementation of IBM API Connect. In total, the composite organization incurred $836,000, or $1,003,200 in risk-adjusted costs upfront to get IBM API Connect up and running into production.

TABLE 8
Implementation And Upfront Costs

Ref.	Metric	Calculation	Initial Costs
G1	IBM API Connect: Initial software cost		$350,000
G2	Hardware cost (10 16-core servers)		50,000
G3	Number of internal resources to support implementation		6
G4	Percent of time dedicated to IBM API Connect		70%
G5	Average monthly cost of internal resource		$10,000
G6	Number of months of implementation		8
G7	Professional services fees		$100,000
Gt	Total implementation/upfront costs	G1+G2+(G3*G4*G5*G6)+G7	$836,000
	Risk adjustment	↑20%	
Gtr	**Total implementation/upfront costs (risk-adjusted)**		**$1,003,200**

Source: Forrester Research, Inc.

Annual License And Ongoing Internal Resource Costs

The total annual cost of IBM API Connect includes software maintenance costs as well as the allocation of internal resources to manage the solution.

The composite organization incurs a maintenance cost $70,000, or 20% of its initial software cost with IBM. In addition, the composite organization dedicates two resources who spend about 30% of their time supporting IBM API Connect. The annual cost for the composite organization is estimated to be $214,000, or a risk-adjusted annual amount of $256,800 (see Table 9). This results in a total three-year risk-adjusted cost of $770,400, when discounted at 10%, and represents a total three-year present value cost of $638,624 (see Table 10).

TABLE 9
IBM API Connect Annual Costs

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
H1	IBM API Connect: annual maintenance cost		$70,000	$70,000	$70,000
H2	Number of ongoing internal resources dedicated to IBM API Connect		4	4	4
H3	Average annual fully burdened cost per internal resource		$120,000	$120,000	$120,000
H4	Time dedicated to IBM API Connect		30%	30%	30%
Ht	IBM API Connect annual costs	H1+(H2*H3*H4)	$214,000	$214,000	$214,000
	Risk adjustment	↑20%			
Htr	**IBM API Connect annual costs (risk-adjusted)**		**$256,800**	**$256,800**	**$256,800**

Source: Forrester Research, Inc.

Total Costs

Table 10 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the composite organization expects total costs to be a net present value of about $1.6 million.

TABLE 10

Total Costs (Risk-Adjusted)

Ref.	Benefit	Initial	Year 1	Year 2	Year 3	Total	Present Value
Gtr	Total implementation/ upfront costs	$1,003,200	$0	$0	$0	$1,003,200	$1,003,200
Htr	IBM API Connect annual costs	$0	$256,800	$256,800	$256,800	$770,400	$638,624
	Total costs (risk-adjusted)	**$1,003,200**	**$256,800**	**$256,800**	**$256,800**	**$1,773,600**	**$1,641,824**

Source: Forrester Research, Inc.

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 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 A).

With IBM API Connect, organizations can quickly add and scale users as required. Additionally, its ease of use and compatibility with systems provides the flexibility for organizations that may change their policies and internal systems that need to link with IBM API Connect.

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 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, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides 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.

Table 11 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the composite organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

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TABLE 11

Benefit And Cost Risk Adjustments

Benefits	Adjustment
Incremental revenue from internal mobile projects	↓ 20%
Incremental revenue from social media projects	↓ 20%
Incremental revenue from data/analytics projects	↓ 20%
Incremental revenue from other internal projects	↓ 20%
Incremental revenue from partner projects	↓ 20%
Incremental revenue from public projects	↓ 20%

| Costs	Adjustment
Implementation and upfront costs	↑ 20%
Annual costs	↑ 20%

Source: Forrester Research, Inc.

Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI and NPV for the composite organization's investment in IBM API Connect. The benefits quantified were based on the value created for new projects developed by using APIs. There are additional benefits that organizations can get value from that were not calculated in this exercise. These include benefits around reducing audit costs, improving business decision making driven by insights, and increasing customer loyalty.

Table 12 below shows the risk-adjusted ROI and NPV. These values are determined by applying the risk-adjustment values from Table 11 in the Risks section to the unadjusted results in each relevant cost and benefit section. For the composite organization, the payback of its initial investment was realized within the first year after implementation.

FIGURE 6

Cash Flow Chart (Risk-Adjusted)

Financial Analysis (risk-adjusted)
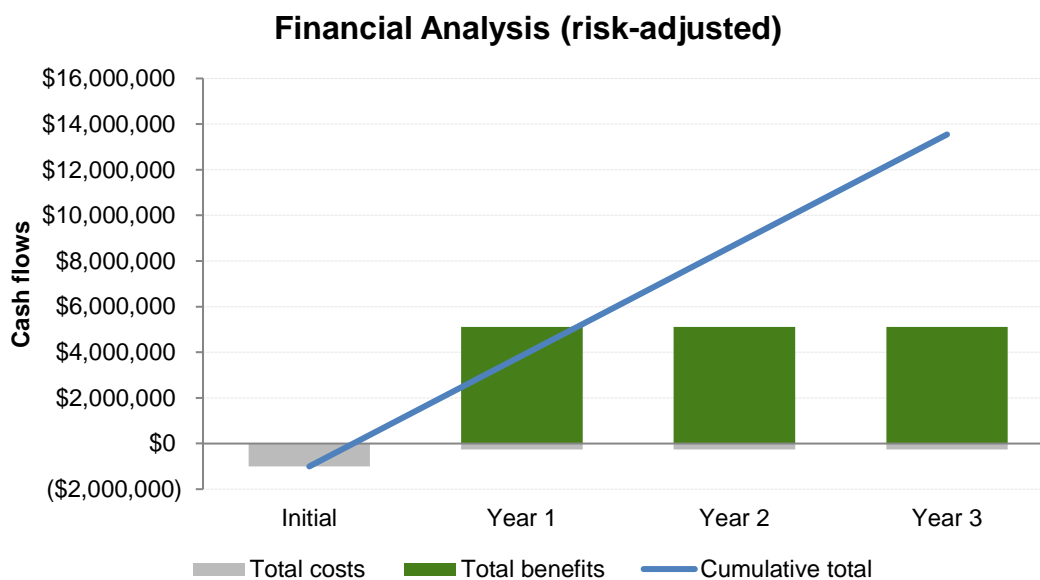
Source: Forrester Research, Inc.

TABLE 12

Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	($1,003,200)	($256,800)	($256,800)	($256,800)	($1,773,600)	($1,641,824)
Benefits	$0	$5,106,708	$5,106,708	$5,106,708	$15,320,124	$12,699,626
Net benefits	**($1,003,200)**	**$4,849,908**	**$4,849,908**	**$4,849,908**	**$13,546,523**	**$11,057,802**
ROI						**674%**

Source: Forrester Research, Inc.

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About IBM API Connect: Overview

The following information is provided by IBM. Forrester does not endorse or validate the claims by IBM.

SIMPLIFY YOUR JOURNEY INTO THE API ECONOMY

Organizations can address the challenges of the API life cycle and drive digital transformation with the integrated IBM® API Connect solution. Designed for organizations looking to streamline and accelerate their journey into the API economy, API Connect is a comprehensive management solution that addresses all four aspects of the API life cycle: create, run, manage, and secure. This makes API Connect far more cost-effective than limited point solutions that focus on just a few life-cycle phases and can end up collectively costing more as organizations piece components together. Standout capabilities in API Connect include:

› An end-to-end integrated experience across the API life cycle, including API and microservices creation that can reduce costs and simplify application development.

› Automated API creation and discovery from systems of record for fast time-to-market.

› Self-service access to APIs to speed discovery and consumption by developers, while providing security and governance controls for IT operations.

› Unified management and administration of Node.js and Java plus support for multiple development languages and frameworks to enhance developer productivity and reduce dependence on central IT.

› Hybrid cloud licensing for seamless platform flexibility and lower cost of ownership.

CREATE APIS IN MINUTES

Organizations can create high-quality, scalable, and secure APIs for enterprise systems such as application servers, databases, enterprise service buses (ESBs), and mainframes in minutes. Intuitive tooling allows developers to visually compose APIs, connect them to data, deploy them securely, and monitor and troubleshoot them. By building up a library of reusable APIs, the organization can speed new application development and ongoing application evolution.

QUICKLY RUN APIS AND MICROSERVICES

With API Connect, developers can take advantage of integrated tooling to build, debug, and deploy APIs and microservices using the Node.js or Java skills they already have. The unified management console helps developers be more productive; they can also iterate new ideas faster to drive the continuous improvement an organization's leadership team desires.

MANAGE APIS WITH EASE

The IT department can use API Connect to create and manage self-service portals that empower internal and external developers to quickly discover and consume APIs and securely access enterprise data. They can also control access to APIs and set usage limits to protect the system of record against usage spikes. Administrators and developers can maintain version control of APIs to ensure existing applications using an older API version remain unaffected.

READILY SECURE APIS AND MICROSERVICES

With API Connect, administrators hold security and governance control over APIs and the microservices applications that are deployed as part of the API life cycle. IT can set and enforce API policies to secure back-end information assets and comply with governance and regulatory mandates.

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DELIVER KEY BENEFITS ACROSS THE ORGANIZATION

API Connect promotes visibility and consistency among development, IT operations and line-of-business (LOB) teams, helping the organization better align technology strategy with business strategy. Here are some advantages of using API Connect across all divisions of an organization:

› **Fast results and better application quality for developers.** Developers can easily discover existing APIs and back-end data sources and create new APIs faster using model-driven tools. These unique automated API creation capabilities help developers quickly unlock the value of the organization's technology and information assets and shorten time-to-market for innovative revenue-generating applications. In addition, integration between API Connect and the IBM MobileFirst™ platform gives developers an open, comprehensive foundation to develop, test, secure, and manage mobile applications.

› **Simplicity and reduced risk for IT managers and architects.** API Connect allows IT managers to expose selected information assets to developers through configuration features in the solution's self-service portal. API policies are enforced through an integrated gateway to ensure access and usage are in line with enterprise requirements.

› **New revenue and extended brand reach for business analysts.** Business analysts can use advanced analytics included with API Connect to determine which APIs are having the most impact. Analysts can also determine which APIs to monetize directly by charging third-party developers to use them.

› **Innovation and growth for LOB managers.** Using customer and competitive insights from the built-in analytics, LOB managers can better manage their market initiatives. They can create new business models that monetize existing information assets, grow the customer base, and cultivate new partnership opportunities to help the company compete in the API economy.

› **Flexibility and cost savings in a hybrid deployment for CIOs.** API Connect provides seamless portability between on-premises and cloud services, such as by pushing an API from on-premises development environments to off-premises staging and production environments. This flexibility enables organizations to avoid the expense and complexity of multiple licensing arrangements for hybrid hosting.

› **Support for Node.js.** Node.js is an emerging open standard for creating, deploying, and scaling APIs that connect mobile, IoT and web applications to enterprise data and services. Node.js is based on JavaScript, which is familiar to many developers from their work building the front ends of modern applications. API Connect uses open source frameworks for Node.js such as Express.js and the LoopBack® framework from StrongLoop, an IBM company, to speed the creation of APIs with Node.js.

CHOOSE FROM FLEXIBLE OFFERINGS THAT GROW WITH YOUR NEEDS

API Connect is available in three offerings with flexible licensing so organizations can start small and easily scale to meet growing demands. Available as on-premises or software-as-a-service (SaaS), API Connect offers three subscription licenses based on API calls per month:

› API Connect Essentials is a no-charge offering targeted for developers. It provides a complete foundation to create, run, manage, and secure APIs and microservices, plus up to 50,000 API calls per month.

› API Connect Professional is designed for departmental use. It includes high-availability support, analytics, Node.js and Java run times, an integrated micro-gateway, and up to 5 million API calls per month.

› API Connect Enterprise is intended for enterprise use. It provides multi-data center high-availability capabilities, advanced analytics, Node.js and Java run times, an advanced gateway, and up to 25 million API calls per month.

Add-on subscriptions are available to increase the number of API calls per month or increase the amount of Node.js or Java run times used across the API life cycle. Alternative licensing options are available upon request.

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Please contact your IBM representative to assist in quantifying the benefits and costs specific to your organization.

TEI FRAMEWORK ASSUMPTIONS

Table 13 provides the model assumptions that Forrester used in this analysis.

The discount rate used in the PV and NPV calculations is 10%, and the time horizon used for the financial modeling is three years. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

TABLE 13
Model Assumptions

Ref.	Metric	Calculation	Value
I1	Average cost of 16-core server		$5,000
I2	Discount rate		10%
I3	Average annual monthly salary of resource		$10,000

Source: Forrester Research, Inc.

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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. TEI assists technology vendors in winning, serving, and retaining customers.

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 enterprise wide 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.
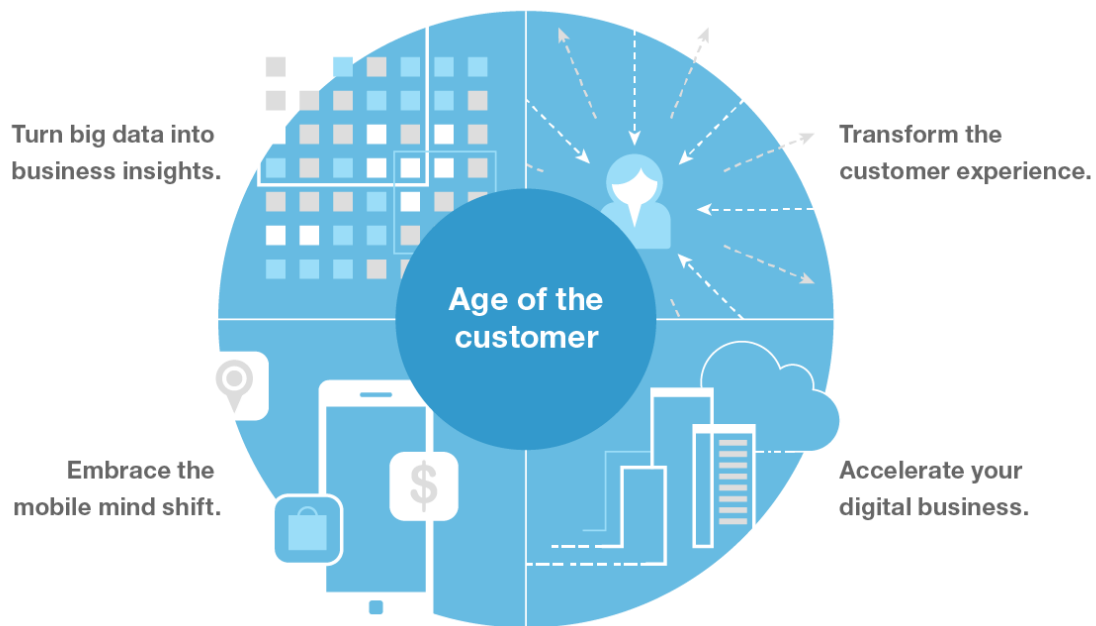
RISKS

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 risk factors are based on a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the risk factor around each cost and benefit.

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Appendix B: Forrester And The Age Of The Customer

Your technology-empowered customers now know more than you do about your products and services, pricing, and reputation. Your competitors can copy or undermine the moves you take to compete. The only way to win, serve, and retain customers is to become customer-obsessed.

A customer-obsessed enterprise focuses its strategy, energy, and budget on processes that enhance knowledge of and engagement with customers and prioritizes these over maintaining traditional competitive barriers.

CMOs and CIOs must work together to create this companywide transformation.

Turn big data into business insights.

Transform the customer experience.

Age of the customer

Embrace the mobile mind shift.

Accelerate your digital business.

Forrester has a four-part blueprint for strategy in the age of the customer, including the following imperatives to help establish new competitive advantages:

Transform the customer experience to gain sustainable competitive advantage.

Accelerate your digital business with new technology strategies that fuel business growth.

Embrace the mobile mind shift by giving customers what they want, when they want it.

Turn (big) data into business insights through innovative analytics.

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Appendix C: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own 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 the 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.

Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

TABLE [EXAMPLE]
Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

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