

FORRESTER®

The Total Economic Impact™ Of IBM i

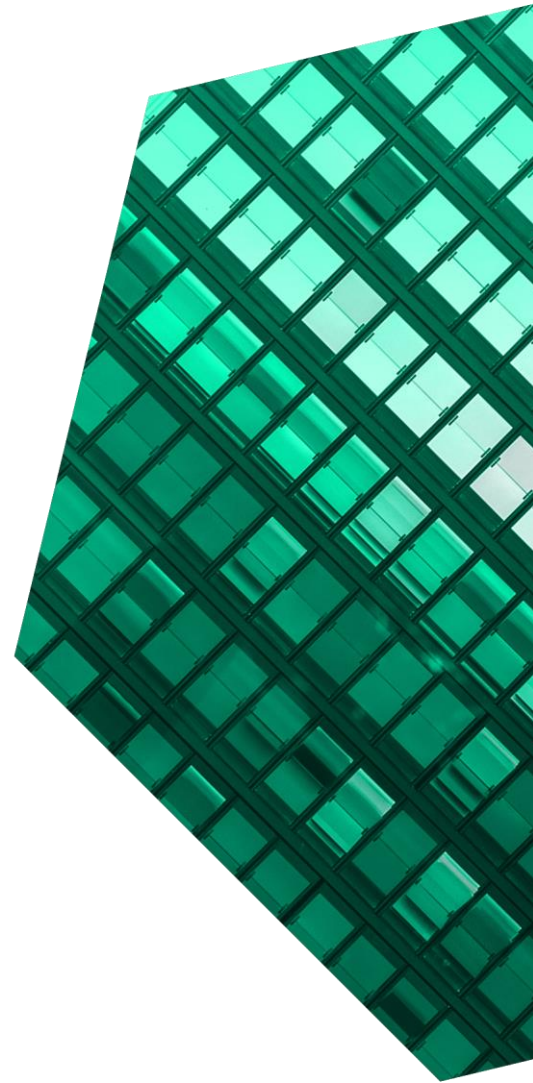
Cost Savings And Business Benefits
Enabled By IBM i

APRIL 2023

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Executive Summary

Managing an operating system or the applications running on it should be a business leader's last concern. IBM i is an environment that integrates an operating system with the database, virtualization layer, application server, and transactional system. The reliability and security of this environment makes it possible for businesses to reduce system downtime, increase productivity of technical support staff, and improve productivity of business users.

IBM i 7.5, the latest release of the [IBM i operating system](#), contains enhancements to many base operating system components and to the licensed program products in the IBM i portfolio. The new capabilities include security enhancements, application development tooling, and system administration features. IBM i is supported on selected IBM Power servers with Power9 and Power10 technology-based processors.

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 the IBM i operating system on IBM Power hardware or in the cloud.¹ The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of IBM i on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed five representatives with experience using IBM i. For the purposes of this study, Forrester aggregated the experiences of the interviewees and combined the results into a single [composite organization](#) that is a global enterprise that generates \$28 billion annually and has approximately 15,000 employees.

Prior to using IBM i, the interviewees' organizations used a diverse number of platforms. These solutions left these organizations with multiple siloed systems and applications to manage, leading to disruptive and

KEY STATISTICS



Return on investment (ROI)

191%



Net present value (NPV)

\$1.69M

expensive downtime, exorbitant administration costs, and inefficient operations.

With an investment in IBM i, the interviewees' organizations integrated their operating systems with the database, virtualization layer, transactional system, and other operational applications.

Key results from the investment included reduced system downtime cost, reduced system admin cost, and the elimination of manual tasks through the automation of IBM i, which improved the productivity of business unit employees.

KEY FINDINGS

Quantified benefits. Three-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **Reduced system downtime, worth \$1.06 million over three years.** The composite organization saw a reduction in the number of

times it experiences unplanned downtime compared to other systems it used in the past. IBM i eliminates 3.5 instances of downtime annually. These usually last about 30 minutes on average at a cost of about \$270,000 per event.

- **Increased productivity of technical support team, worth \$470,000 over three years.** Because IBM i is an integrated platform, it allows the composite organization's technical support teams to focus on other systems and be more proactive. It combines functions, such as systems and database administration, and reduces the number of technical support FTEs by 50%. The composite organization goes from three technical support FTEs per year before IBM i to 1.5 FTEs after this environment is implemented.
- **Improved productivity of business users, worth \$1.05 million over three years.** With IBM i, the composite organization automates many tasks. Functionalities in some applications allows for the repurposing of 3.75 business user FTEs annually to more value-added tasks.

Unquantified benefits. Benefits that aren't quantified in this study include:

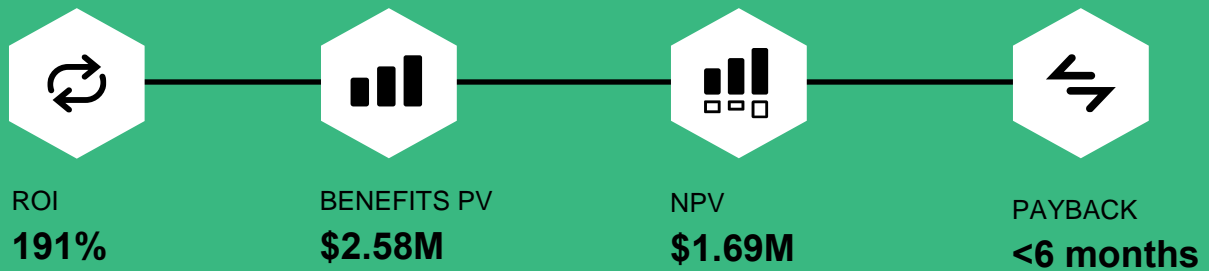
- **Scalability from integration of IBM software.** IBM i allowed interviewees' organizations to integrate open-source applications and technologies, making it easier to scale and add applications to serve their organizations' unique needs.
- **Ability to easily integrate in-house developed applications.** Interviewees told Forrester that their organizations could design and easily integrate in-house applications to the operating environment, enabling them to customize applications to their organizations' individual needs without having to buy and run other independent operating systems.

- **Trust in security against malware.** Interviewees called out system security as one of their main reasons for using IBM i.
- **Peace of mind about uptime.** Interviewees trusted in the consistency and reliability of IBM i and could focus on running their businesses, rather than their operating system.

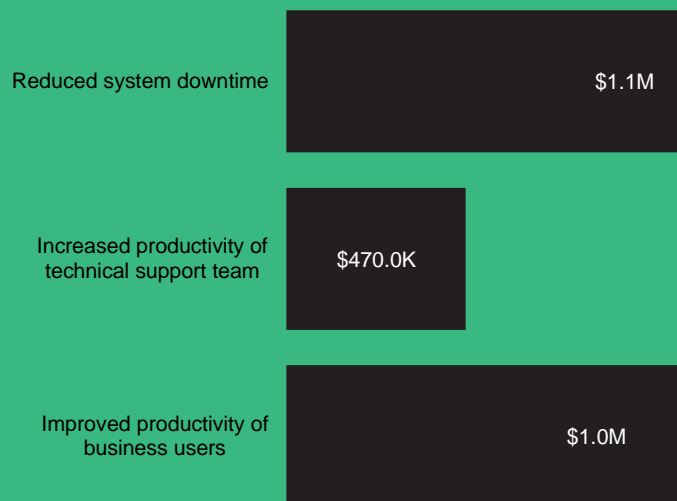
Costs. Three-year, risk-adjusted PV costs for the composite organization include:

- **System costs totaling \$336,000 over three years.** This includes the cost of an IBM Power model S924 8-core server, which is \$77,000, incurred upfront. Additional system costs included an annual \$2,100 maintenance fee and annual \$102,000 IBM i fee for five licenses.
- **Ongoing integration and administration expenses of \$548,000 over three years.** This cost is for 1.5 FTEs who are dedicated to technical support for IBM i with a fully burdened salary of \$140,000 for each systems administrator.

The representative interviews and financial analysis found that a composite organization experiences benefits of \$2.58 million over three years versus costs of \$884,000, adding up to a net present value (NPV) of \$1.69 million and an ROI of 191% with a payback period of less than six months.



Benefits (Three-Year)



“IBM i is running the whole business. I think that’s pretty incredible that you’re able to run your whole business from one box like that. That’s simply amazing to me.”

— Director of information technology, healthcare product manufacturing

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in IBM i.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that IBM i can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This 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 study to determine the appropriateness of an investment in IBM i.

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.



DUE DILIGENCE

Interviewed IBM stakeholders and Forrester analysts to gather data relative to IBM i.



INTERVIEWS

Interviewed five representatives at organizations using IBM i to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' organizations.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewees.



CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The IBM i Customer Journey

Drivers leading to the IBM i investment

Interviews

| Role | Industry | Revenue | Size |
|------------------------------------|------------------------------------|---------|------------------|
| Software architect | Financial services | \$4.4B | 8,300 employees |
| Director of information technology | Healthcare product manufacturing | \$9M | 70 employees |
| Director of architecture | Healthcare provider | \$135B | 58,000 employees |
| Senior programmer/analyst | Sign and display manufacturer | \$250M | 850 employees |
| Chief digital information officer | Industrial machinery and equipment | \$7.7M | 150 employees |

KEY CHALLENGES

The interviewees noted how their organizations struggled with common challenges, including:

- **Operations disruptions due to system downtime.** The interviewees noted that, as often as every week, their systems experienced unplanned downtime when demand surged. This caused a loss in revenue and, in some cases, loss of data that hindered operations. Interviewees wanted an environment that scaled rapidly to meet demand at a short notice, cutting down on these operation disruptions.
- **Siloed systems that did not communicate well with each other.** The interviewees employed additional staff to manage these independent systems. Rather than focusing on the business, interviewed decision-makers spent excessive time managing technology to ensure that FTEs working on siloed systems and applications could collaborate efficiently.
- **Manual processes.** Many repetitive business processes like invoicing, data backups, and imaging were done manually and cost thousands of employee hours. Business leaders wanted technology that automated repetitive tasks,

making them easier to replicate and scale quickly as their businesses grew.

SOLUTION REQUIREMENTS/INVESTMENT OBJECTIVES

The interviewees' organizations searched for a solution that could:

- Integrate across the technology stack and still provide room for customization to meet unique needs.
- Save the organization money by freeing up employees' hours through automation and autonomic computing.
- Be reliable and scalable to meet growth needs.

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the five interviewees, and it is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization is a global enterprise with \$28 billion in

sales and approximately 15,000 employees. It is a large and complex industrial, healthcare, or financial services corporation with a sophisticated IT organization with on-prem and cloud environments.

Deployment characteristics. The organization has operations worldwide, including North America, Europe, Asia Pacific, and South America. The composite organization uses a centralized IBM i environment to run its enterprise resource planning (ERP) software and other departmental applications.

Key Assumptions

- **\$28 billion in sales**
- **15,000 employees**
- **Global markets**
- **Complex IT organization**
- **On-prem and cloud environments**

With everything that IBM i is doing, there really isn't anything you can't do anymore. You can do AI, run your data warehouse, rewrite your RPG applications, and more.

— Senior programmer/analyst, sign and display manufacturer

Analysis Of Benefits

■ Quantified benefit data as applied to the composite

| Total Benefits | | | | | | |
|----------------|--|-------------|-------------|-------------|-------------|---------------|
| Ref. | Benefit | Year 1 | Year 2 | Year 3 | Total | Present Value |
| Atr | Reduced system downtime | \$425,250 | \$425,250 | \$425,250 | \$1,275,750 | \$1,057,534 |
| Btr | Increased productivity of technical support team | \$189,000 | \$189,000 | \$189,000 | \$567,000 | \$470,015 |
| Ctr | Improved productivity of business users | \$421,875 | \$421,875 | \$421,875 | \$1,265,625 | \$1,049,141 |
| | Total benefits (risk-adjusted) | \$1,036,125 | \$1,036,125 | \$1,036,125 | \$3,108,375 | \$2,576,690 |

REDUCED SYSTEM DOWNTIME

Evidence and data. Interviewees explained that downtime on previous systems was a major driver for their organizations' transition to IBM i.

Modeling and assumptions. To calculate the value of this benefit, Forrester assumes the following:

- The number of annual system reboots is 3.5.
- The average downtime per system reboot is 0.5 hours.
- The average cost per downtime hour is \$270,000.

Risks. The value of this benefit can vary across organizations due to differences in:

- The applications running on the technology and the demand on them.
- The skill set of the administrators operating the system, including how the system was configured and how fast they can bring it back online.

“IBM i is always up. In December, we migrated from a Power8 to a Power10 — our downtime was one hour.”

Director of information technology, healthcare product manufacturing

- The size of the organization and how it affects the cost of downtime.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.06 million.

| Reduced System Downtime | | | | | |
|--------------------------------------|---|-----------|--|-----------|-----------|
| Ref. | Metric | Source | Year 1 | Year 2 | Year 3 |
| A1 | Reduction of system reboots | Composite | 3.5 | 3.5 | 3.5 |
| A2 | Average hours of downtime per reboot | Composite | 0.5 | 0.5 | 0.5 |
| A3 | Average cost per downtime hour | Composite | \$270,000 | \$270,000 | \$270,000 |
| At | Reduced system downtime | A1*A2*A3 | \$472,500 | \$472,500 | \$472,500 |
| | Risk adjustment | ↓10% | | | |
| Atr | Reduced system downtime (risk-adjusted) | | \$425,250 | \$425,250 | \$425,250 |
| Three-year total: \$1,275,750 | | | Three-year present value: \$1,057,534 | | |

INCREASED PRODUCTIVITY OF TECHNICAL SUPPORT TEAM

Evidence and data. Interviewees’ organizations employed various admins to run their previous environments, including systems administrators and database administrators. Prior to the IBM i, organizations had an average of 3 FTEs dedicated to technical support.

Modeling and assumptions. To calculate the value of this benefit, Forrester assumes the following:

- The FTE effort reallocated to other value-added tasks after IBM i is 1.5 FTEs.
- The fully burdened annual salary for systems administrators on the technical support team is \$140,000.

Risks. The value of this benefit can vary across organizations due to differences in:

- The technical skill set of the administrators used within each organization.
- The complexity and demands on the applications being used in each organization.
- The number of applications that administrators must manage, among other variables that can influence workload within an organization.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$470,000.

“The fact that I can manage IBM i with a smaller number of people. That’s great. That’s a tangible benefit.”

Software architect, financial services

| Increased Productivity Of Technical Support Team | | | | | |
|--|--|--------------|--|-----------|-----------|
| Ref. | Metric | Source | Year 1 | Year 2 | Year 3 |
| B1 | Number of FTEs dedicated to technical support before IBM i | Composite | 3.0 | 3.0 | 3.0 |
| B2 | Number of FTEs dedicated to technical support after IBM i | Composite | 1.5 | 1.5 | 1.5 |
| B3 | FTE effort reallocated to other value-added tasks after IBM i | B1-B2 | 1.5 | 1.5 | 1.5 |
| B4 | Fully burdened annual salary for systems administrators | TEI standard | \$140,000 | \$140,000 | \$140,000 |
| Bt | Increased productivity of technical support team | B3*B4 | \$210,000 | \$210,000 | \$210,000 |
| | Risk adjustment | ↓10% | | | |
| Btr | Increased productivity of technical support team (risk-adjusted) | | \$189,000 | \$189,000 | \$189,000 |
| Three-year total: \$567,000 | | | Three-year present value: \$470,015 | | |

IMPROVED PRODUCTIVITY OF BUSINESS USERS

Evidence and data. Because of automation of various processes in each organization, interviewees reported productivity improvements and savings in employee hours. Previously manual and repetitive tasks and processes like invoicing, data capture, content management, process workflows, etc. were eliminated.

Modeling and assumptions. To calculate the value of this benefit, Forrester assumes the following:

- There are 150 business users leveraging applications running on IBM i.
- Business user productivity gain after IBM i was 5%.
- The average fully burdened annual salary for business users is \$125,000.
- The net FTE savings after IBM i with a 50% productivity adjustment factor is 3.75 business users.

Risks. The value of this benefit can vary across organizations due to differences in:

- The current level of automation within the organization.
- The complexity and number of processes within the organization’s industry.
- The distribution of tasks to workers, new tasks assigned to replace those eliminated by automation, and other unidentified factors.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.05 million.

| Improved Productivity Of Business Users | | | | | |
|---|---|--------------|---------------------------------------|-----------|-----------|
| Ref. | Metric | Source | Year 1 | Year 2 | Year 3 |
| C1 | Business users using applications running on IBM i | Composite | 150 | 150 | 150 |
| C2 | Business user productivity gain after IBM i | Interviews | 5% | 5% | 5% |
| C3 | Net FTE savings after IBM i | (C1*C2)*50% | 3.75 | 3.75 | 3.75 |
| C4 | Fully burdened annual salary for business users | TEI standard | \$125,000 | \$125,000 | \$125,000 |
| Ct | Improved productivity of business users | C3*C4 | \$468,750 | \$468,750 | \$468,750 |
| | Risk adjustment | ↓10% | | | |
| Ctr | Improved productivity of business users (risk-adjusted) | | \$421,875 | \$421,875 | \$421,875 |
| Three-year total: \$1,265,625 | | | Three-year present value: \$1,049,141 | | |

UNQUANTIFIED BENEFITS

Additional benefits interviewees’ organizations experienced but were unable to quantify include:

- **Scalability from integration of IBM software.** The system allowed room for the integration of open-source applications and technologies, making it easier to scale and add applications to serve the interviewees’ organizations’ unique needs. Interviewees noted that the operating environment came already ported for dozens of open-source applications and languages.
- **Ability to easily integrate in-house developed applications.** Interviewees applauded the fact that they could easily integrate in-house applications with the operating environment, enabling them to customize applications to their organizations’ specific needs without having to buy and run independent operating systems.
- **Trust in security against malware.** Interviewees called out system security as one of their main reasons for using IBM i.
- **Peace of mind about uptime.** Interviewees trusted in the consistency and reliability of IBM i

and could focus on running their businesses, rather than their operating system.

FLEXIBILITY

An organization might experience increased agility due to IBM i’s built-in flexibility, including:

- **Integration of various open-source and in-house applications.** IBM i came ported for dozens of open-source applications, giving interviewees’ organizations flexibility to customize their environments. Interviewees all expressed the attractiveness of this functionality.
- **Scalability of the operating environment.** Interviewees’ organizations could scale as demand surged, including the ability to integrate a local IBM i system with cloud-based systems. IBM i allowed for running a hybrid cloud scenario where core business applications were run internally while being able to extend to the cloud using a service offering available in the operating system.

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in [Appendix A](#)).

Analysis Of Costs

■ Quantified cost data as applied to the composite

| Total Costs | | | | | | | |
|-------------|--|----------|-----------|-----------|-----------|-------------|---------------|
| Ref. | Cost | Initial | Year 1 | Year 2 | Year 3 | Total | Present Value |
| Dtr | System cost | \$77,000 | \$104,100 | \$104,100 | \$104,100 | \$389,300 | \$335,881 |
| Etr | Ongoing integration and administration | \$0 | \$220,500 | \$220,500 | \$220,500 | \$661,500 | \$548,351 |
| | Total costs (risk-adjusted) | \$77,000 | \$324,600 | \$324,600 | \$324,600 | \$1,050,800 | \$884,232 |

SYSTEM COST

Evidence and data. System costs totaling \$336,000 over three years comprised hardware core and yearly hardware maintenance fees, as well as software license fees for IBM i.

Modeling and assumptions. To calculate the value of this cost, Forrester assumes the following:

- The initial cost of the hardware S924 8 — core is \$77,000.
- There is a maintenance fee of \$2,100 annually in Years 1 through 3.
- Annual software license fees are \$102,000 for Years 1 through 3.

Risks. The value of this cost can vary across organizations due to:

- Varying license requirements across organizations of different sizes.
- Varying core hardware and related maintenance fees across different organizations.

Results. To account for these risks, Forrester adjusted this cost upward by 0%, yielding a three-year, risk-adjusted total PV of \$336,000.

| System Cost | | | | | | |
|------------------------------------|----------------------------------|------------|--|-----------|-----------|-----------|
| Ref. | Metric | Source | Initial | Year 1 | Year 2 | Year 3 |
| D1 | Hardware: S924 8 — core | Interviews | \$77,000 | | | |
| D2 | Hardware: Yearly maintenance fee | Interviews | | \$2,100 | \$2,100 | \$2,100 |
| D3 | Software: IBM i — 5 licenses | Interviews | | \$102,000 | \$102,000 | \$102,000 |
| Dt | System cost | D1+D2+D3 | \$77,000 | \$104,100 | \$104,100 | \$104,100 |
| | Risk adjustment | 0% | | | | |
| Dtr | System cost (risk-adjusted) | | \$77,000 | \$104,100 | \$104,100 | \$104,100 |
| Three-year total: \$389,300 | | | Three-year present value: \$335,881 | | | |

ONGOING INTEGRATION AND ADMINISTRATION

Evidence and data. Interviewees’ organizations incurred annual ongoing integration and administration fees totaling \$548,000 for Years 1 through 3.

Modeling and assumptions. To calculate the value of this cost, Forrester assumes the following:

- Number of FTEs dedicated to technical support after implementing IBM i is 1.5.
- The fully burdened annual salary for technical support staff is \$140,000.

Risks. The value of this cost can vary across organizations due to:

- Varying technical support requirements across organizations of different sizes.
- Varying salary levels for technical support staff across organizations of different sizes.

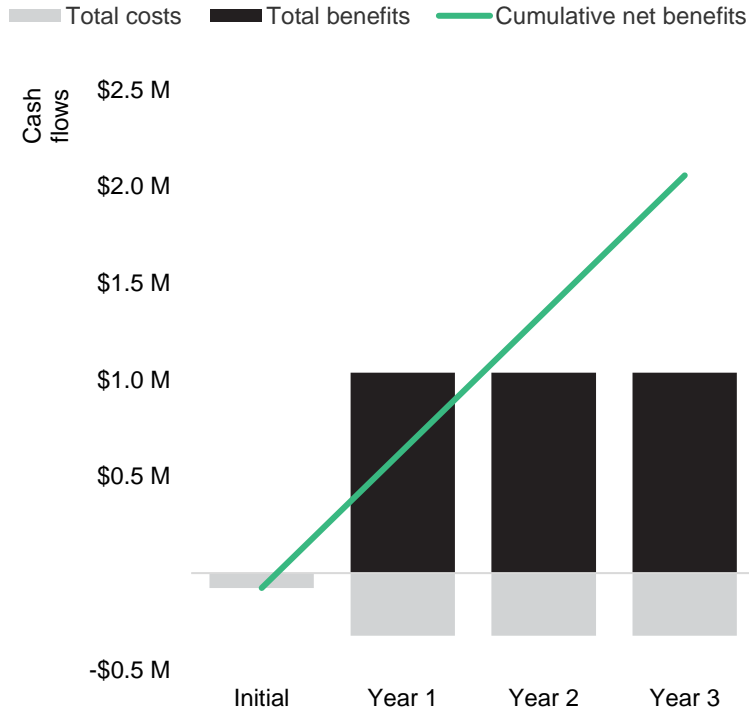
Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV of \$548,000.

| Ongoing Integration and Administration | | | | | | |
|--|---|------------|--|-----------|-----------|-----------|
| Ref. | Metric | Source | Initial | Year 1 | Year 2 | Year 3 |
| E1 | Number of FTEs dedicated to technical support after IBM i | Interviews | | 1.5 | 1.5 | 1.5 |
| E2 | Fully burdened annual salary for systems administrators | Interviews | | \$140,000 | \$140,000 | \$140,000 |
| Et | Ongoing integration and administration | E1*E2 | \$0 | \$210,000 | \$210,000 | \$210,000 |
| | Risk adjustment | ↑5% | | | | |
| Etr | Ongoing integration and administration (risk-adjusted) | | \$0 | \$220,500 | \$220,500 | \$220,500 |
| Three-year total: \$661,500 | | | Three-year present value: \$548,351 | | | |

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

| | Initial | Year 1 | Year 2 | Year 3 | Total | Present Value |
|----------------|------------|-------------|-------------|-------------|---------------|---------------|
| Total costs | (\$77,000) | (\$324,600) | (\$324,600) | (\$324,600) | (\$1,050,800) | (\$884,232) |
| Total benefits | \$0 | \$1,036,125 | \$1,036,125 | \$1,036,125 | \$3,108,375 | \$2,576,690 |
| Net benefits | (\$77,000) | \$711,525 | \$711,525 | \$711,525 | \$2,057,575 | \$1,692,458 |
| ROI | | | | | | 191% |
| Payback period | | | | | | <6 months |

Appendix A: Total Economic Impact

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.

TOTAL ECONOMIC IMPACT APPROACH

Benefits represent the value delivered to the business by the product. The TEI methodology places 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.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in 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.



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.



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.



RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



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.

Appendix B: Endnotes

¹ 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.

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