

A Forrester Total Economic
Impact™ Study
Commissioned By
IBM

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The Total Economic Impact™ Of IBM Information Integration And Governance Solutions

Cost Savings And Business Benefits
Enabled By IBM

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 leveraging IBM InfoSphere Information Integration and Governance (IIG) solutions within their environment. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of increasing data governance maturity through standardizing on IBM IIG solutions.

To better understand the total financial benefit associated with increasing data governance maturity through IIG implementation, Forrester interviewed existing IIG customers standardizing on IBM information integration and governance products to help drive maturity around their data governance processes. IBM IIG solution areas include data integration and quality (InfoSphere Information Server, InfoSphere Data Replication, InfoSphere Federation Server), master data management (InfoSphere MDM), data life-cycle management (InfoSphere Optim), and data security and privacy (InfoSphere Guardium and InfoSphere Optim). Please see page 21 for an overview of the different IBM IIG solutions covered. This study illustrates the value that organizations see by increasing tool adoption and standardizing on a common IBM tool set.

Prior to standardizing on a core set of IBM IIG solutions, customers lacked common processes and tools to manage and leverage the value of data governance. Organizations saw that a combination of building a cross-organization Data Governance Center of Excellence (DGCoE) and a common set of data integration and governance tools and processes enabled improvement in data governance maturity and efficiency and effectiveness benefits. With an investment in standardizing and consolidating the data integration and governance function on IBM IIG solutions, customers were able to streamline and automate processes across key functions and lines of business, enabling them to meet their objectives, increase productivity, and become more responsive to business stakeholders.

Standardizing on IBM Information Integration and Governance solutions can help drive efficiency and effectiveness across the organization.

The benefits for a representative organization of 10,000 employees, based on customer interviews, are:

Total cost savings and benefits: \$14 million.

“Standardization on data management tools and data governance maturity go hand in hand. Having a common tool set across the organization is critical to achieve our data governance objectives.”

~VP, data architecture, healthcare services provider

IBM ENABLES ORGANIZATIONS TO IMPROVE DATA GOVERNANCE MATURITY

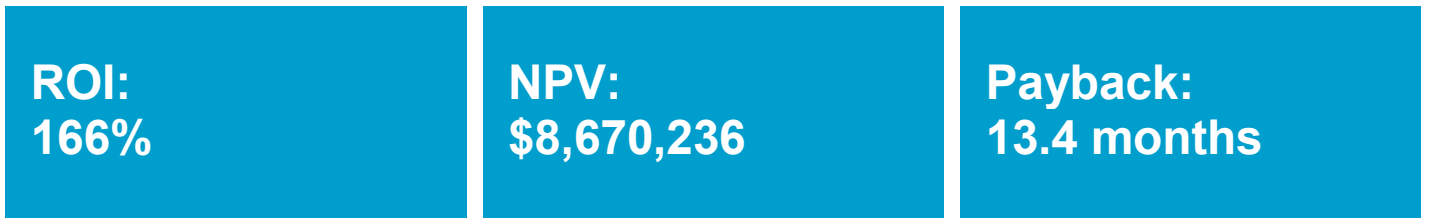
Our interviews with eight existing customers and subsequent financial analysis found that a representative organization based on these interviewed organizations experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1.¹ See Appendix A for a description of the representative organization.

The representative organization analysis identifies benefits of \$13,895,848 versus license and implementation costs of \$5,225,612, adding up to a net present value (NPV) of \$8,670,236.

With Information Integration and Governance, organizations saw cross-functional efficiency savings and improved scalability and flexibility to react to changing business demand.

FIGURE 1

Financial Summary Showing Three-Year Risk-Adjusted Results



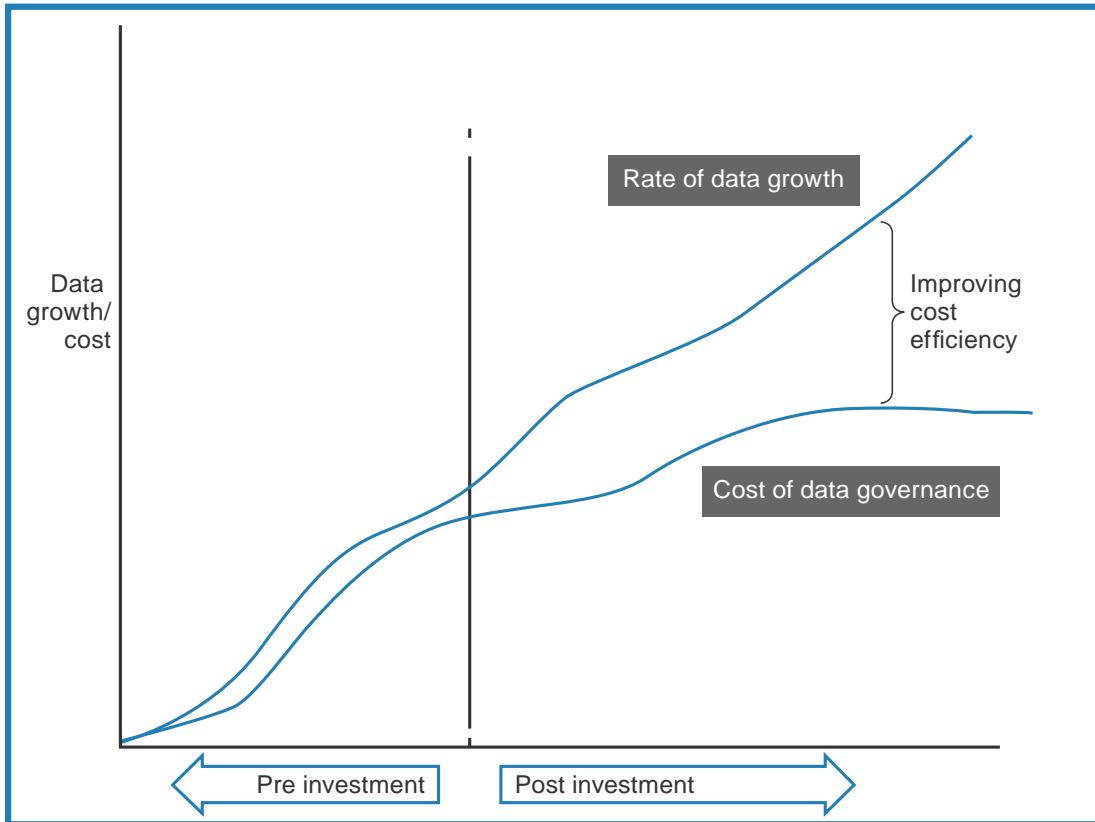
Source: Forrester Research, Inc.

- › **Benefit drivers.** Underlying the shift to standardize on a common tool set was the need to balance increasing demands from business stakeholders to leverage and extend data for new internal and external initiatives and the need to maintain cost efficiency within the data management function. Making trusted data more available and usable while maintaining or even reducing costs was a key driver for the interviewed organizations.
- › **Additional benefits.** Specific clients also experience additional benefits associated with completion of projects that deliver business benefits in areas like customer acquisition and retention, churn reduction, identification of new market opportunities, etc. Total benefits aren't just those associated with IT but those linked to the business initiatives enabled by the IIG solutions. These benefits were made possible in part by a common user experience and metadata layer that made integration across products easier and more efficient, especially as subsequent projects were undertaken.

Figure 2 highlights the results for one organization pre and post investment in a common set of data governance tools. Prior to the standardization initiative, the organization saw the growth of data and the cost to manage data increasing at the same rate year over year. However, through a standard set of tools and processes, the organization was able to manage data growth effectively, while at the same time improving the per unit cost efficiency.

FIGURE 2

Data Growth Versus Cost To Manage Data Pre Versus Post Investment



Source: Forrester Research, Inc.

In addition, the representative organization identified the following investment drivers in standardizing on IBM IIG solutions:

- › Leverage trusted data from different sources inside and outside the organization.
- › Better control and manage information assets across the data life cycle.
- › Better understand the potential exposure and risks of inadequate controls of information.
- › Integrate better across systems.
- › Reduce cost and improve efficiency with archiving, test data management, and data privacy and integration.
- › Adapt better to increasing business demands.
- › Become more mature around data governance and integration.

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 Information Integration and Governance.
- › 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 Information Integration and Governance solutions. 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 Information Integration and Governance can have on an organization (see Figure 3). Specifically, we:

- › Interviewed IBM marketing, sales, and consulting personnel, along with Forrester analysts, to gather data relative to Information Integration and Governance and the marketplace for Information Integration and Governance.
- › Interviewed eight organizations currently using IBM InfoSphere Information Integration and Governance offerings to obtain data with respect to costs, benefits, and risks.
- › Designed a representative organization based on characteristics of the interviewed organizations (see Appendix A).
- › 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 interviewed organizations 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, and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling IBM's 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 decisions. Please see Appendix B for additional information on the TEI methodology.

FIGURE 3
TEI Approach



Source: Forrester Research, Inc.

Analysis

REPRESENTATIVE ORGANIZATION

For this study, Forrester conducted a total of eight interviews with representatives from the following companies, which are IBM customers based in the US and Europe:

- › A US-based food manufacturer.
- › A global North American financial services institution.
- › A North American government agency.
- › A US-based healthcare services provider.
- › A US-based insurance and financial services organization.
- › A US-based transportation and logistics provider.
- › A European-based financial services organization.
- › A European-based manufacturer of consumer products.

Based on the interviews, Forrester constructed a TEI framework, a representative company, and an associated ROI analysis that illustrates the areas financially affected. The representative organization that Forrester synthesized from these results is an organization with the following characteristics:

- › A US-based global services organization.
- › 16,000 employees.
- › 20 primary locations.
- › Six business units.

Prior to the investment, the organization was using multivendor tools for Information Integration and Governance across each of its six business units. Several business units currently use IBM IIG tools while the rest use ad hoc or nonstandard tools. The goal of the organization is to increase its maturity around IIG through standardizing on a common core of IIG tools that can be used across the organization. A primary driver for this is to leverage trusted data from different sources both inside and outside the organization. This is part of the organization's strategy around being better able to leverage big data opportunities:

- › The representative organization saw this as a transformational process over five years to improve its data governance capabilities.
- › The goal of leveraging IBM was to standardize where possible on a common core of data governance products.
- › The investment was made in conjunction with an investment in a centralized DGCoE to drive common data governance processes throughout the organization.

“For us, the benefits of standardizing on data governance were to reduce costs and improve our effectiveness to the business.”

~VP, data architecture, healthcare services provider

The organization was using a combination of data integration and governance products across each of its six business units. Figure 4 illustrates the usage pattern both prior to the investment in IBM and after the organization had migrated to a standard governance model.

The organization had decided to focus on standardizing on integration and master data management (MDM) solutions first for several reasons:

- › The organization was undergoing an initiative to improve the consistency and accuracy of its master data assets prior to focusing on test data management and data privacy initiatives.
- › The organization felt that prior to the investment in expanded standardization, it was more standardized on integration and MDM solutions across the six business units. As a result, the focus of the standardization initiative was to focus on standardization of those products first, while secondarily increasing adoption of standard data life-cycle management and data security and privacy tools.

FIGURE 4

Pre- Versus Post-Information Governance Capabilities

Enterprise adoption of IBM solutions	
Limited use of IBM solutions	
No adoption/ad hoc use	

Current tool usage matrix — by business unit

	Integration	MDM	Data life-cycle management	Data protection
Business unit 1				
Business unit 2				
Business unit 3				
Business unit 4				
Business unit 5				
Business unit 6				

Future (post-investment) usage — by business unit

	Integration	MDM	Data life-cycle management	Data protection
Business unit 1				
Business unit 2				
Business unit 3				
Business unit 4				
Business unit 5				
Business unit 6				

Source: Forrester Research, Inc.

INTERVIEW HIGHLIGHTS

The findings from the interviews were the primary driver for the analysis. Several common themes were seen across the customers interviewed as they standardized on Information Integration and Governance tools:

- › **Organizations saw the value in improving their information integration and governance maturity.** Across all of the enterprise organizations that were interviewed, there was a strong top-driven initiative to improve data governance. Several of the organizations saw this initiative as a competitive market issue, seeing their competitors in this space overtake them in using data to improve customer insight and reach. Other organizations saw the initiative as a way to control or cap spending within their data environment, which had historically seen double-digit increases in the annual cost to manage data growth.
- › **There was a tie between maturity, developing a DGCoE, and standardizing on a common tool set.** For many organizations, the decision to standardize was tied to building out a common set of data governance tools and processes across the organization. However, many organizations' data governance practices remained siloed in individual business units, limiting the speed with which standardization could occur. This challenge was overcome in part by investing in a Data Governance Center of Excellence across individual business units, allowing for centralized oversight for the data governance function. This also allowed organizations to build a common tool set of data integration and governance process and products across the individual business units. Business stakeholders experienced both positive business impact and cost savings. In making the case for improving data governance maturity through standardization, IT stakeholders generally needed to prove to management the value of the investment. Most of the organizations noted that the case was made using a combination of business impact benefits (faster delivery of trusted information, greater speed of reaction to change) as well as process and technology efficiency increases (improved training efficiency, improved software and hardware spend). The balance of efficiency and effectiveness benefits resulting from the combination of a Center of Excellence approach and a common tool set enabled a move away from tactical investments in data governance tools to a more holistic, cross-business-unit approach.
- › **The paths to value varied.** Each interviewed organization was at a different point in data governance maturity and had a different set of common tools and processes based in part on its short- and long-term business priorities around trusted data. As a result, the path to standardization varied depending on which tools an organization had in place and the need to balance speed versus risk of change across processes and tools. For example, several organizations prioritized standardizing on InfoSphere Information Server (information integration) followed by InfoSphere Optim (information lifecycle management), as the greatest initial business need was to reduce cost and improve effectiveness within the test data management and application production environment. On average, prior to the investment, organizations had already standardized on some data governance tools, but had not built a Data Governance Center of Excellence and did not have a centralized data governance function.

“Maturity of data governance is linked to standards on processes and tools.”

~Data architect, NA financial services firm

BENEFITS

The representative organization experienced a number of quantified benefits in this case study. Benefits were seen from two perspectives:

- › The value of having a standardized set of tools working together across the organization for data integration and governance.
- › The value from increased use of data integration and governance solutions across the organization.

Combined, these two sets of benefits highlight the value of increased adoption of IBM IIG solutions as well as the value of standardizing on a core set of information integration and governance tools.

★ Value From Standardization

Organizations that were interviewed saw a direct link between maturity and standardization of tools, people, and processes. As the interviewed organizations matured, they increased their focus to move away from a siloed environment to a shared model driven in large part by a centralized DGCoE that drove standardization of tools, processes and terms across the individual business units.

Standardization provides organizations with a way to reduce the overall costs of managing and supporting multiple tools across business units as well as improve the compatibility of tools across the data governance process. These costs include training and skills management, management of multiple licenses from different vendors, and the cost of integration across tools. Through IBM InfoSphere integration, data life-cycle management, data security, and MDM offerings, organizations noted that having a common tool set provided them with a more integrated data governance function across the organization.

A key feature of standardizing across data governance solutions is the ability to share and integrate metadata across processes and functions. Being able to leverage technical and operational metadata across tools allows for organizations to improve the speed and reduce the cost for compliance, risk management, and business/IT collaboration. This allows for consistent and trusted data across product combinations such as InfoSphere MDM and InfoSphere Guardium, InfoSphere Information Server and InfoSphere Optim, and InfoSphere Information Server and InfoSphere MDM, reducing the level of rekeying of data and minimizing the possible level of errors when data is moved between processes. With shared metadata, users can define common glossaries of business terms as well as policies related to metadata that span corporate divisions and governance disciplines such as data lifecycle management, data quality, and data security and privacy.

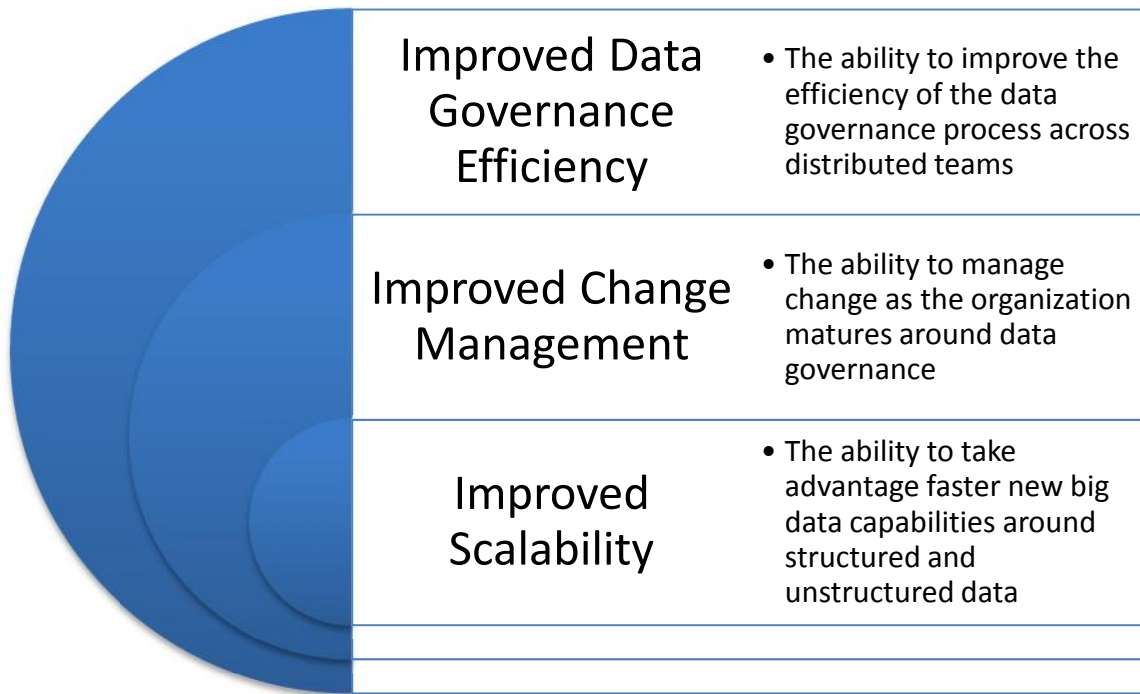
In addition to metadata integration, clients benefit from participation in advances across the platform — planned and executed at a platform level. This approach makes it easy to plan, easy to take advantage of new capabilities as they are introduced, and easy to get knowledgeable assistance, whether with implementations or with longer-term strategies. Clients gain implementation efficiencies by working with one team that understands all of the technologies.

To calculate the gains from standardization, we calculate value in several different benefits:

- › Improved data governance efficiency — the ability to improve the efficiency of the data governance process across distributed teams.
- › Improved change management — the ability to manage change as the organization matures around data governance.
- › Improved scalability to take advantage of big data opportunities — the ability to take advantage of new big data capabilities around structured and unstructured data faster.
- › Interviewed organizations recognized the importance of having a clear and impactful business case to communicate the gains from such a transformational investment. All of the organizations noted that the case for information governance balances the benefit around IT and process efficiency with top line benefits to the overall business. In addition, while they are difficult or time consuming to quantify fully, many benefits are observable over a longer time frame than typical

for technology investments (3 years vs. 5 years). As a result, organizations noted that the quantitative analysis, while solid, actually is the tip of the iceberg. Governance, or good and useful data, is the cornerstone of a data-driven business, and the benefit is significantly greater than what companies measure to justify the project's capital expenditure.

FIGURE 5
Gains from Standardization



Source: Forrester Research, Inc.

Data Governance Team Efficiency

One of the benefits noted by the interviewed organizations was improvements within the data governance process as the role and scope of a centralized data governance function grew over time. Organizations were able to manage a common set of tools across business units while having improved integration between different parts of the data integration and governance life cycle: integration, archiving, test data management, master data management, and data privacy and security.

To calculate this benefit, we assume that the team can become 15% to 25% more efficient by managing a common set of tools within the centralized data integration and governance function.

TABLE 1
Key Metrics — Improved Data Governance Team Efficiency

Benefit	Key metrics	
Improved team efficiency	Number of platforms	5
	Average administration cost per platform — pre investment	\$450,000
	Estimated cost savings	15% to 25%
	Total five-year value (PV)	\$1.8 million

Source: Forrester Research, Inc.

Improved Change Management

Another benefit resulting from increased tool standardization identified by the interviewed organizations was the ability to drive change across the organization. Having a common set of tools and processes allows an organization to make changes and updates more quickly across the organization, reducing the time and number of individuals required to push through necessary updates. Also, organizations noted that having a common set of tools provides a way to develop a common set of processes across the data governance function. In addition, organizations noted that they saw cost-saving gains by being able to consolidate licenses around a common set of tools as compared with multivendor tools. This resulted in reductions in annual operational spending through leveraging a common enterprise licensing agreement and a consolidation of licenses.

TABLE 2
Key Metrics — Improved Change Management

Benefit	Key metrics	
Improved change management	Number of business units	6
	% adoption of common integration and governance processes	30%
	Annual cost of data integration and governance per business unit	\$1,500,000
	Estimated savings through standardized integration and governance	28%
	Total five-year value (PV)	\$2.8 million

Source: Forrester Research, Inc.

Process Improvement — Improved Scalability To Take Advantage Of Big Data Opportunities

One of the key recurring benefits mentioned by the interviewed organizations was increased responsiveness and scalability to changing business requirements. Several organizations noted a tie between the ability to leverage big data opportunities and the need to ensure that they were ready from a data governance perspective to minimize the risk of such a project. Organizations were being pushed and saw the value of leveraging big data in new ways but were also concerned that their data governance processes and tools were not sufficient to see a successful return from these initiatives. The investment in data integration and governance standardization and maturity was a way to increase the likelihood of success from these initiatives. To calculate the value from this benefit, we assume over the next five years the organization will undertake a big

data investment at a cost of \$5 million. By having a common tool set across business units, the organization is able to see a return, on average, 34% faster than if the investment in IIG was not undertaken.

TABLE 3

Key Metrics — Improved Scalability To Take Advantage Of Big Data Opportunities

Benefit	Key metrics	
Improved scalability	Average return (ROI) on big data initiative	40%
	Initiative cost	\$5 million
	Estimated time improvement	34%
	Estimated time improvement — months	5
	Total five-year value (PV)	\$2.81 million

Source: Forrester Research, Inc.

Total Benefits — Standardization

Table 4 illustrates the total benefits from standardization on a common tool set. Benefits peak during the year when the representative company kicks off a significant big data initiative.

TABLE 4

Total Benefits — Standardization

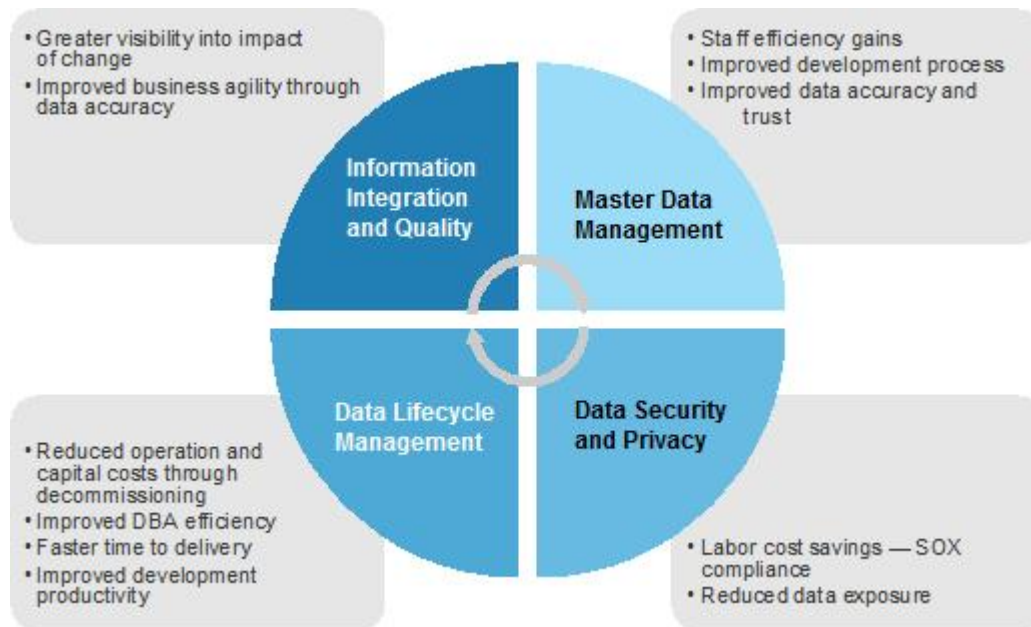
Benefit Category	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Present Value
Improved team efficiency	\$337,500	\$450,000	\$562,500	\$562,500	\$562,500	\$2,475,000	\$1,834,797
Improved change management	\$756,000	\$756,000	\$756,000	\$756,000	\$756,000	\$3,780,000	\$2,865,835
Improved scalability to take advantage of big data opportunities	\$0	\$850,000	\$1,700,000	\$850,000	\$0	\$3,400,000	\$2,560,276
Total benefits (risk-adjusted)	1,093,500	2,056,000	3,018,500	2,168,500	1,318,500	9,655,000	7,260,908

Source: Forrester Research, Inc.

+ Increased Use Of Data Governance Solutions Across The Organization

A second area of benefit for the representative organization was to drive value from adoption across the organization. These benefits were solution-specific and resulted from leveraging functionality found within the IBM solutions.

FIGURE 6
Improved Usage Benefits



Source: Forrester Research, Inc.

Increased Adoption — InfoSphere Information Integration And Quality

By having consistent identification of different key performance indicators (KPIs) as well as sources of data, IT is able to more quickly respond to requests from individual business stakeholders, allowing the organization to worry less about reconciling potentially different sources of data and focusing on improving the time to deliver projects with higher levels of data quality and trusted information.

Organizations cited the use of InfoSphere Information Server as a core enabling solution, helping improve data accuracy and ultimately shorten the time to delivery of data integration projects. Many of the organizations began using InfoSphere Information Server on a single business line initiative and then expanded to additional products and across business units. Business glossary capabilities provide the ability to reconcile conflicting information for cross-departmental projects. Information profiling and analysis capabilities improve data quality proactively and optimize extract, transform, and load (ETL)/MDM solutions by reducing errors in design, development, and test phases to reduce IT support costs to troubleshoot production systems. And metadata management capabilities enable the organization to audit and ensure data accuracy.

In addition, the ability to see the data profiling and quality statistics results from data profiling within the metadata tool was another important factor in the benefits that the representative organization received from InfoSphere Information Server. Prior to this implementation, the organization was using a point solution for its data profiling requirements and had to manually integrate the results of that profiling and quality assessment with the rest of its data integration infrastructure.

Replacing this point solution with InfoSphere Information Server profiling capabilities reduced their development cycles that were previously spent on manual metadata integration. With InfoSphere Information Server, the quality assessment results of data sources and their profiling statistics were automatically stored in the metadata repository layer and shared with the metadata management tool users.

To calculate this benefit, the model assumes data integration projects typically provide a tangible return on investment to the business. Improving data accuracy from 67% to 95% through the use of InfoSphere Information Server—one of the benefits cited by the surveyed organizations--allows the organization to recover a greater share of the expected value of the project over five years.

TABLE 5

Key Metrics — InfoSphere Information Server

Benefit	Key metrics	
Greater visibility and impact of change	% of change requests that have direct impact on business process	20%
	Estimated time improvement	15% to 40%
	Total five-year value (PV)	\$86,491
Improved business agility through data accuracy	Estimated % of data classified as accurate — pre investment	67%
	Estimated % of data classified as accurate — post investment	95%
	Data return on investment	15%
	Total five-year value (PV)	\$1,432,917

Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
\$378,000	\$396,432	\$403,344	\$412,560	\$424,080	\$2,014,416	\$1,519,409

Source: Forrester Research, Inc.

Increased Adoption — InfoSphere Master Data Management

As the interviewed companies came up to speed in their InfoSphere MDM deployments, they were increasingly able to reduce the number of developers formerly involved in tasks associated with managing this data, in some cases by retiring legacy solutions or manual processes. To quantify the benefit, we estimate that four resources onshore as well as four offshore are able to be redirected by the third year of the analysis. We ramp up this benefit in accordance with the organization's use of InfoSphere MDM.

Due to the use of InfoSphere MDM, the representative company is able to gain efficiency for its business users. One of the interviewees described this benefit as follows: "With one place to gather data, we were able to push the workload of setting it up on our vendors, while our staff was able to refocus on more strategic activities. It helps tremendously, as they are able to avoid keying in data and resolving issues." To quantify this benefit, we estimate that the group of approximately 37 people is able to redirect between 8% and 12% of their time.

TABLE 6
Key Metrics — Master Data Management

Benefit	Key metrics	
Staff efficiency gains	Total staff	37
	Estimated time improvement	8% to 12%
	Total five-year value (PV)	\$716,015
Improved development process	Developer FTE avoided — onshore	2
	Developer avoided — offshore	4
	Total five-year value (PV)	\$936,225

Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
\$0	\$442,400	\$595,500	\$643,600	\$643,600	\$2,325,100	\$1,652,240

Source: Forrester Research, Inc.

Increased Adoption — InfoSphere Optim

Organizations that leveraged InfoSphere Optim solutions for application retirement found a benefit in the potential savings resulting from decommissioning legacy applications. Decommissioning through the use of InfoSphere Optim solutions allowed organizations to avoid the operational and capital cost of supporting and maintaining those legacy applications while at the same time allowing in-context access to the data contained in decommissioned applications independent of the original application.

In order to calculate this benefit, the model assumes that the representative organization can initially decommission small, medium, and large applications. The model assumes an average running cost of \$75,000, \$100,000, and \$120,000 per year, respectively, for each of the decommissioned applications prior to decommissioning. Based on data from the interviewed organizations, the model assumes that the average savings for small, medium, and large applications are 25%, 30%, and 50%, respectively.

While capital cost savings represent the bulk of the return cited by the interviewed customers from investment in archiving and decommissioning solutions from InfoSphere Optim, the additional key benefit realized by the interviewed organizations included the efficiency savings for database administrators (DBAs). With the rapid growth in both storage and server costs prior to the investment, DBAs were challenged to keep up with the demands on their time in responding to increasing complexity within the environment. InfoSphere Optim allowed organizations to reduce the burden on DBAs, freeing up their time for more proactive planning and configuration activities.

Being able to improve the efficiency of the development process also allowed for improved time-to-market for application development projects. In the case of the representative organization, the average development time prior to the investment in test data management solutions equated to roughly four months per project, with roughly five development projects produced per year. In addition, the average project cost for each of those five development projects equates to \$120,000 per year, with an average application ROI of 30%. Through the use of InfoSphere Optim solutions, the estimated time improvement for the application development project equates to roughly 20%, speeding the ROI from four months to three months. Assuming the organization can achieve benefits one month faster, we can calculate the added benefit of the time improvement by factoring in the cost of capital of 10%.

The InfoSphere Optim Test Data Management solution, particularly within the quality assurance (QA) and development processes, provides additional benefits as part of the investment case. Prior to the investment in InfoSphere Optim, organizations did not have an efficient way of creating test databases that accurately mirrored end-to-end business processes. In addition, several organizations noted an improvement, through the use of InfoSphere Optim, in identifying defects early in the development process, reducing the amount of rework that might arise later and, as a result, reducing the overall cost of development.

In the case of the QA process, the model assumes prior to the investment in InfoSphere Optim, the representative organization did not have a standard process for identifying development errors and defects early within the test data environment. Of the 20 developers within the environment, roughly 20% are allocated specifically to the QA process. Through the use of InfoSphere Optim tools, the model assumes a 20% reduction in time devoted to QA.

TABLE 7
Key Metrics — InfoSphere Optim

Benefit	Key metrics	
Application decommissioning	Total applications decommissioned	5
	Average initial cost reduction per application	\$65,000
	Total five-year value (PV)	\$247,934
Improved DBA efficiency	Total staff allocated to production	2
	Estimated improvement in efficiency	40%
	Total five-year value (PV)	\$703,402
Faster time to delivery	Estimated improvement in time to delivery	67%
	Application upgrade ROI	30%
	Total five-year value (PV)	\$108,189
Improved developer productivity	Total development FTE	20
	% allocated to TDM — production	20%
	Estimated reduction	30%
	Total five-year value (PV)	\$567,708

Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
\$269,568	\$609,504	\$493,440	\$389,376	\$389,376	\$2,151,264	\$1,627,234

Source: Forrester Research, Inc.

Increased Adoption — InfoSphere Guardium

From its investment and deployment of the InfoSphere Guardium solution, the representative organization has gained greater efficiency and effectiveness in its database security, auditing, and reporting capabilities required for Sarbanes-Oxley

(SOX) compliance. Organizations noted that discussions with the auditors have been simplified using a purpose-built product for SOX auditing, avoiding what would likely have been challenging discussions about the completeness of the audit data provided and verification of actions taken to meet compliance.

Another larger benefit of the InfoSphere Guardium product has been the detailed insight the product provides regarding database usage, and this insight is being employed across core applications and improving application performance. Development, operations, and security teams can use the Guardium-generated reports to determine precisely which individuals (or which applications) are accessing each database, when they are accessing them, and how they are accessing them. This functionality can provide an efficient alternative to labor-intensive tasks. Several organizations noted that the impact of reduced data exposure was a key benefit for business stakeholders.

TABLE 8

Key Metrics — InfoSphere Guardium

Benefit	Key metrics	
Labor cost savings — ongoing support of in-house SOX auditing	Reduction in DBA support staff	3
	Total five-year value (PV)	\$1,137,236
Reduced data exposure	Average data breach cost	\$3,500,000
	Probability of exposure due to malicious event	12%
	% reduction in severity of breach impact	45%
	Total five-year value (PV)	\$511,756

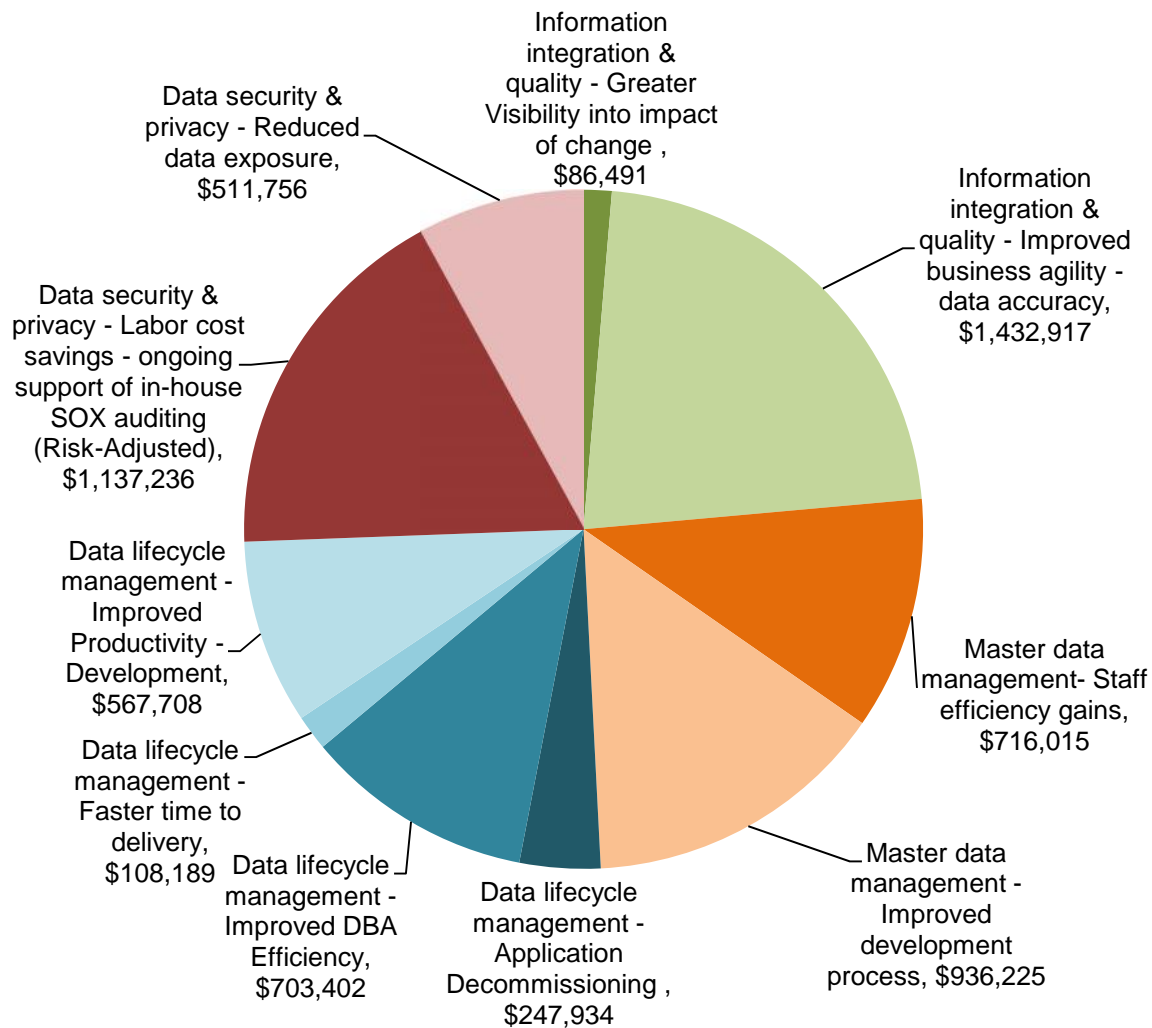
Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
\$435,000	\$435,000	\$435,000	\$435,000	\$435,000	\$2,175,000	\$1,648,992

Source: Forrester Research, Inc.

Total Benefits

Figure 6 illustrates the breakdown of benefits across the Information Integration and Governance product set. Over five years, the representative organization expects risk-adjusted total benefits to be a PV of more than \$6.4 million.

FIGURE 7
Total Benefits (Risk-Adjusted)



Source: Forrester Research, Inc.

COSTS

The representative organization experienced a number of costs associated with the IBM InfoSphere Information Integration and Governance solution:

- › Cost No. 1. Software licensing fees.
- › Cost No. 2. Annual maintenance costs.
- › Cost No. 3. Internal support/change management.

These represent the mix of internal and external costs experienced by the representative organization for initial planning, implementation, and ongoing maintenance associated with the solution.

Total Costs

Table 9 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the representative organization expects total costs to total a net present value of a little more than \$2.5 million, or \$3,862 per user.

TABLE 9
Total Costs (Risk-Adjusted)

Cost category	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Present Value
Software	(\$800,000)	(\$500,000)	(\$500,000)	(\$600,000)	(\$750,000)	(\$750,000)	(\$3,900,000)	(\$3,096,509)
Hardware	(\$280,000)	(\$280,000)	(\$205,000)	(\$205,000)	(\$80,000)	(\$80,000)	(\$1,130,000)	(\$962,301)
Internal support/change management	\$0	(\$405,000)	(\$125,000)	(\$125,000)	(\$125,000)	(\$125,000)	(\$905,000)	(\$728,394)
Total costs (risk-adjusted)	(\$1,080,000)	(\$1,185,000)	(\$830,000)	(\$930,000)	(\$955,000)	(\$955,000)	(\$5,935,000)	(\$4,787,204)

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 InfoSphere Information Integration and Governance 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).

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

Table 10 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

TABLE 10
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Benefit/variable 1	↓ 5%
Benefit/variable 2	↓ 5%
Costs	Adjustment
Cost/variable 1	↑ 5%
Cost/variable 1	↑ 5%

Source: Forrester Research, Inc.

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.

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

- › Change management may take longer than anticipated due to the complexity of the data governance environment.
- › The gains from standardization may be lower than anticipated due to lower savings from reducing nonenterprise licenses.
- › Productivity and efficiency savings may be lower than anticipated due to slower implementation of a common platform.

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

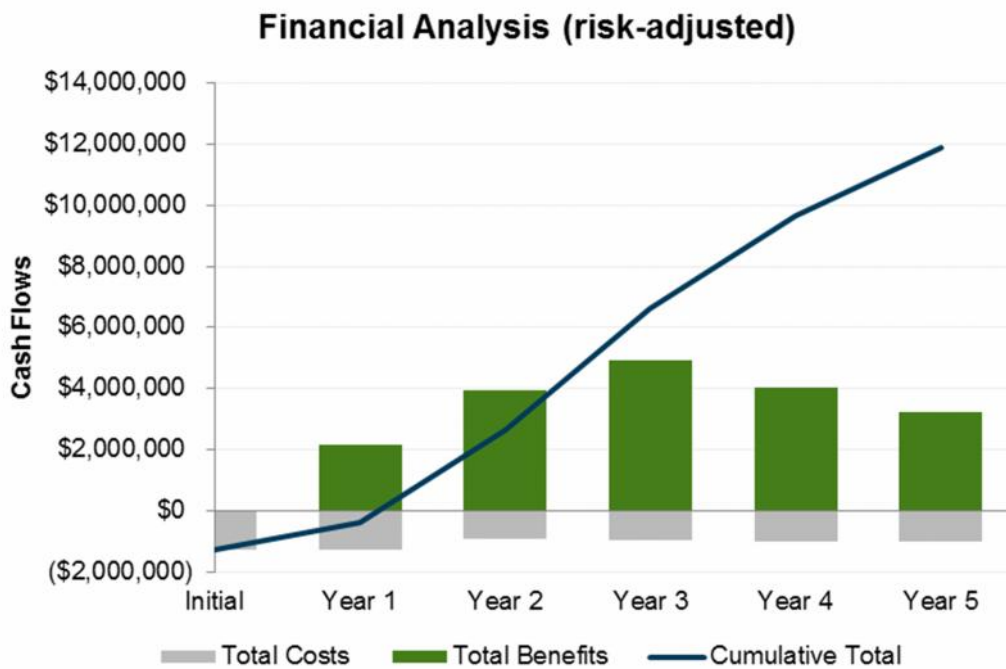
- › The cost to implement new tools and solutions may be more expensive due to lack of available resources.
- › The time to implement may be slower due to the delays in getting business buy-in for an enterprisewide initiative.

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 Information Integration and Governance.

Table 11 and Figure 7 below show the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 10 in the Risks section to the unadjusted results in each relevant cost and benefit section. The representative organization saw the biggest benefit in Year 3 due to the time it took to standardize across individual business units. In Year 3, the organization was able to leverage a cross-enterprise big data initiative, allowing it to realize a significant one-time benefit.

FIGURE 7
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 11
Cash Flow: Risk-Adjusted

Cash Flow Analysis (Risk-Adjusted Estimates)

Summary	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Present Value
Total costs	(\$1,280,000)	(\$1,275,000)	(\$920,000)	(\$970,000)	(\$995,000)	(\$995,000)	(\$6,435,000)	(\$5,225,612)
Total benefits	\$0	\$2,206,068	\$3,979,704	\$4,993,448	\$4,102,076	\$3,298,156	\$18,579,452	\$13,895,848
Total	(\$1,280,000)	\$931,068	\$3,059,704	\$4,023,448	\$3,107,076	\$2,303,156	\$12,144,452	\$8,670,236
ROI								166%
Payback period (months)								13.4

Source: Forrester Research, Inc.

IBM InfoSphere Information Integration And Governance: Overview

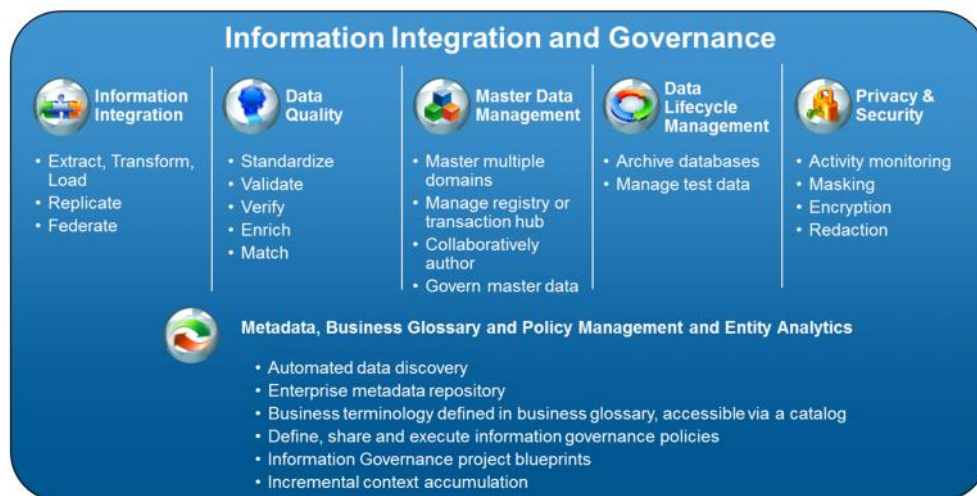
The following information is provided by IBM. Forrester has not validated any claims and does not endorse IBM or its offerings.

As a critical element of Watson Foundations, the IBM big data and analytics platform, IBM InfoSphere Information Integration and Governance (IIG) provides market-leading functionality to handle the challenges of big data. InfoSphere IIG provides optimal scalability and performance for massive data volumes, agile and right-sized integration and governance for the increasing velocity of data, and support and protection for a wide variety of data types and big data systems. InfoSphere IIG helps make big data and analytics projects successful by delivering business users the confidence to act on insight.

InfoSphere capabilities include:

- › Metadata, business glossary, and policy management: Define metadata, business terminology, and governance policies with IBM InfoSphere Information Governance Catalog.
- › Data integration: Handle all integration requirements, including batch data transformation and movement (InfoSphere Information Server), real-time replication (InfoSphere Data Replication), and data federation (InfoSphere Federation Server).
- › Data quality: Parse, standardize, validate, and match enterprise data with IBM InfoSphere Information Server for Data Quality.
- › Master data management: Act on a trusted view of customers, products, suppliers, locations, and accounts with InfoSphere MDM.
- › Data life-cycle management: Manage the data life cycle from test data creation through retirement and archiving with IBM InfoSphere Optim™.
- › Data security and privacy: Continuously monitor data access and protect repositories from data breaches, and support compliance with IBM InfoSphere Guardium®. Ensure that sensitive data is masked and protected with InfoSphere Optim.

InfoSphere Information Integration & Governance Capabilities



Appendix A: Representative Organization Description

For this TEI study, Forrester has created a representative organization to illustrate the quantifiable benefits and costs of implementing Information Integration and Governance solutions as part of increasing data maturity. The representative company is intended to represent a North American-headquartered health services organization with 16,000 employees located across 20 global locations and is based on characteristics of the interviewed customers.

In adopting IBM IIG solutions as a standard platform for data governance, the representative company has the following objectives:

- › Better control and manage information assets across the data life cycle.
- › Better understand the potential exposure and risks of inadequate controls of information.
- › Better integration across systems.
- › Reduced cost and improved efficiency with archiving, test data management, and data privacy and integration.
- › Better able to adapt and change to increasing business demands.

FRAMEWORK ASSUMPTIONS

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

The discount rate used in the PV and NPV calculations is [x%] and time horizon used for the financial modeling is [x] 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 X
Model Assumptions

Ref.	Metric	Calculation	Value
C1	Hours per week		40
C2	Weeks per year		52
C3	Hours per year (M-F, 9-5)		2,080
C4	Hours per year (24x7)		8,736
C5	[insert job]		\$100,000
C6	Hourly	(C5/C3)	\$48

Source: Forrester Research, Inc.

Appendix B: 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 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 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. 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.

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

Appendix E: Endnotes

¹ Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information see the section on Risks.