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Prepared for IBM

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The Total Economic Impact™ Of IBM InfoSphere Foundation Tools Single-Company Analysis

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The Total Economic Impact™ Of IBM InfoSphere Foundation Tools

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Executive Summary

In June 2009, IBM commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) that enterprises can realize by deploying IBM InfoSphere Foundation Tools as part of their overall information architecture strategy. InfoSphere Foundation Tools help organizations discover, design, and govern trusted information over time. These tools are created to work in a heterogeneous IT environment and with a wide range of projects such as business intelligence, enterprise data warehousing, and master data management. InfoSphere Foundation Tools deliver leading technology on data discovery and understanding, data modeling and mapping, business rule specification management, data stewardship, business vocabulary management, lineage of information, and metadata management.

This study illustrates the financial impact of adopting IBM InfoSphere Foundation Tools including InfoSphere Information Analyzer, InfoSphere Metadata Workbench, and InfoSphere Business Glossary. For this analysis, Forrester examines the impact of InfoSphere Foundation Tools on both IT and business processes within a US-based global chemical and petroleum organization.

In conducting in-depth interviews with the organization, Forrester found that the use of InfoSphere Foundation Tools allows the organization to:

- Create a greater understanding of the impact of change.
- Reduce complexity in managing and sharing common business terminology.
- Reduce cost of data consolidation.
- Improve business agility and data quality

In addition, as the organization increases the usage of InfoSphere Foundation Tools, it expects to see additional benefits in improving the data accuracy and quality throughout its information architecture.

Purpose

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of InfoSphere Foundation Tools as part of an overall data integration strategy in relation to an organization's existing IT investments. Forrester's aim is to clearly show all calculations and assumptions used in the analysis. Readers should use this study to better understand and communicate a business case for investing in IBM InfoSphere Foundation Tools.

Methodology

IBM selected Forrester for this project because of its industry expertise in data integration technologies and Forrester's Total Economic Impact™ (TEI) methodology. TEI not only measures costs and cost reduction (areas that are typically accounted for within IT) but also weighs the enabling value of a technology in increasing the effectiveness of overall business processes.

For this study, Forrester employed four fundamental elements of TEI in modeling the adoption of InfoSphere Foundation Tools within the chemical and petroleum organization:

1. Costs and cost reduction.

2. Benefits to the entire organization.
3. Flexibility.
4. Risk.

Given the increasing sophistication that enterprises have regarding cost analyses related to IT investments, Forrester's TEI methodology serves an extremely useful purpose by providing a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

Approach

Forrester used a 5-step approach for this study.

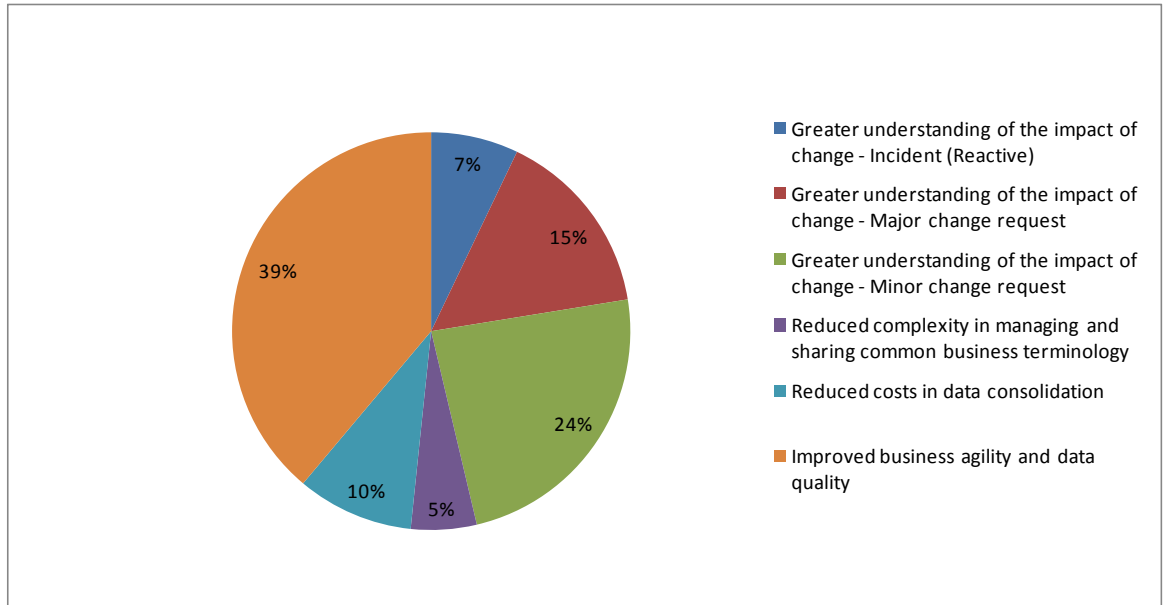
1. Forrester gathered data from existing Forrester research relative to IBM InfoSphere Foundation Tools and the data integration market in general.
2. Forrester interviewed IBM InfoSphere Foundation Tools product management, marketing, and sales personnel to fully understand the potential (or intended) value proposition of IBM InfoSphere Foundation Tools.
3. Forrester conducted a series of in-depth interviews with a global chemical and petroleum organization currently using IBM InfoSphere Foundation Tools.
4. Forrester constructed a financial model representative of the interviews. This model can be found in the TEI Framework section below.
5. Forrester created a composite organization based on the interviews and populated the framework using data from the interviews as applied to the composite organization.

Key Findings

Forrester's study yielded three key findings:

- **ROI.** Based on the interviews with the chemical and petroleum customer, Forrester constructed a TEI framework (see Appendix A) and the associated ROI analysis illustrating the financial impact areas. As seen in Table 1 and Figure 1, the ROI for our composite company is 132% with a breakeven point (payback period) of 1.23 years after deployment.
- **Benefits.** Benefits of deploying IBM InfoSphere Foundation Tools include:
 - Greater understanding of the impact of change.
 - Reduced complexity in managing and sharing common business terminology.
 - Reduced costs in data consolidation.
 - Improved business agility and data quality.

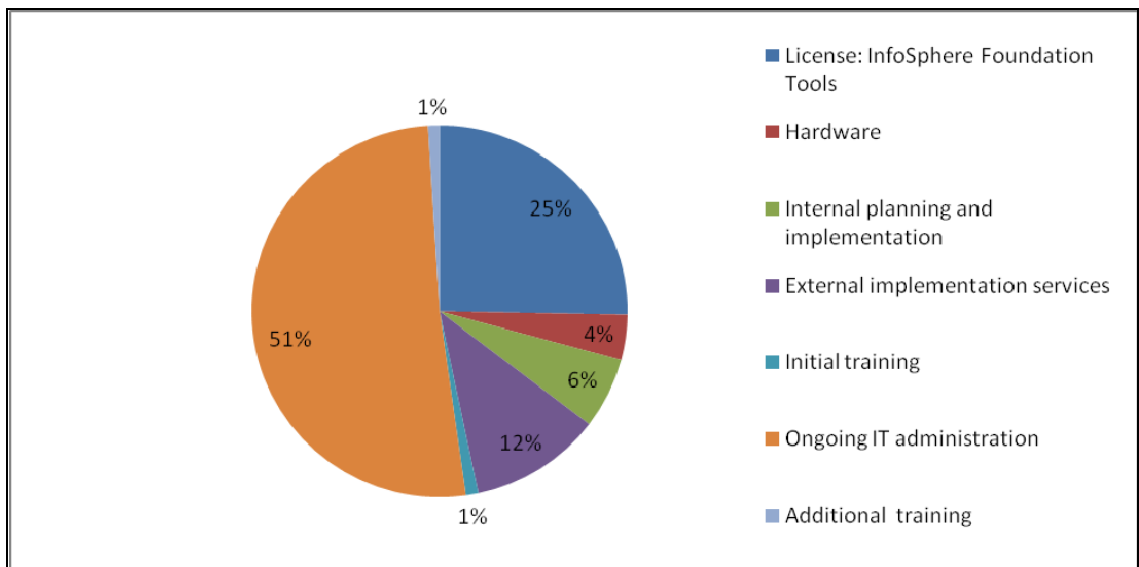
Figure 1: Total Five-Year Benefit Breakdown



Source: Forrester Research, Inc.

- Costs.** Costs of InfoSphere Foundation Tools included the costs of product licenses and maintenance, hardware, ongoing administration costs, as well as costs of initial implementation and training.

Figure 2: Total Five-Year Cost Breakdown



Source: Forrester Research, Inc.

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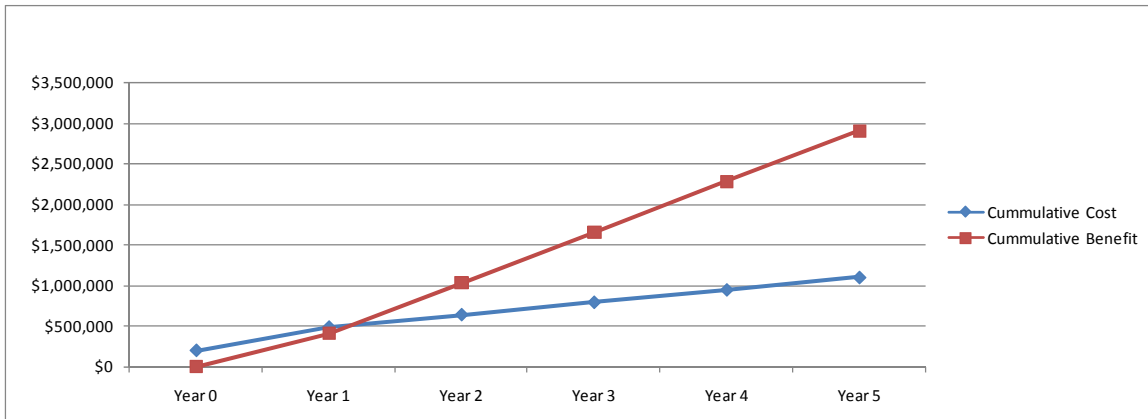
Table 1 illustrates the risk-adjusted cash flow for the organization, based on data and characteristics obtained during the interview process. Forrester risk-adjusts these values to take into account the potential uncertainty that exists in estimating the costs and benefits of a technology investment. The risk-adjusted value is meant to provide a conservative estimation, incorporating any potential risk factors that may later impact the original cost and benefit estimates. For a more in-depth explanation of risk and risk adjustments used in this study, please see the Risk section.

Table 1: Composite Company ROI, Risk-Adjusted

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total	NPV
Total costs	\$200,400	\$299,700	\$159,225	\$159,225	\$159,225	\$159,225	\$1,137,000	\$966,209
Total benefits		\$396,653	\$611,191	\$611,191	\$611,191	\$611,191	\$2,841,416	\$2,241,661
Total	(\$200,400)	\$96,953	\$451,966	\$451,966	\$451,966	\$451,966	\$1,704,416	\$1,275,454
ROI	132%							
Payback period (years)	1.23							

Source: Forrester Research, Inc.

Figure 3: Composite Company Cumulative Cost Versus Benefit



Source: Forrester Research, Inc.

Forrester found that the primary drivers associated with the ROI at the representative organization were the amount of data integration, the number and level of experience of the development staff, as well as the complexity of the business processes that feed directly into business applications.

Disclosures

The reader should be aware of the following:

- The study is commissioned by IBM and delivered by the Forrester Consulting group.

- IBM reviewed and provided feedback to Forrester, but Forrester maintained editorial control over the study and its findings and did not accept changes to the study that contradicted Forrester's findings or obscured the meaning of the study.
- The customer names for the interviews were provided by IBM.
- Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that the readers should use their own estimates within the framework provided in the report to determine the appropriateness of an investment in IBM InfoSphere Foundation Tools.
- This study is not meant to be used as a competitive product analysis.

IBM InfoSphere Foundation Tools: Overview

The InfoSphere Foundation Tools are a unique industry-leading offering, which allows companies to discover their disparate data spread across heterogeneous systems, design trusted information structures for business optimization, and govern it as business information over time. The InfoSphere Foundation Tools combine discovery and understanding, data modeling and mapping, creation of business rule specifications, data stewardship, business vocabulary management, lineage of information, and metadata management, all with a shared repository. The InfoSphere Foundation Tools work with any data integration, business intelligence, or data warehouse tools or in conjunction with the comprehensive IBM InfoSphere Information Server for complete end-to-end data integration processing.

The InfoSphere Foundation Tools consist of tightly integrated components that work in any heterogeneous environment to deliver these 5 key steps toward business optimization:

1. **Capture and create shared business vocabulary.** Create a shared, enterprisewide common vocabulary to streamline the communication between the business and IT. This is vital to ensuring that business and technical users fully understand the meaning of critical enterprise assets and are empowered to make decisions, quickly and with confidence.
2. **Analyze enterprise data sources.** Understand your enterprise data sources including their structure, content, cross-relationships and quality. Existing documentation may be out-of-date and must be validated to ensure accuracy, consistency, and completeness. Performing this analysis early, and on an ongoing basis, ensures that downstream integration processes are designed to perform more efficiently and with less error.
3. **Design and optimize data models.** Create or optimize your target data model for your specific project requirements, such as a data mart or an enterprisewide data warehouse. The IBM Industry Models may be utilized as an add-on to InfoSphere Foundation Tools to accelerate this process, leveraging IBM's years of industry experience.
4. **Define source-to-target transformation rules.** Leverage the information learned when analyzing the enterprise data source systems, along with the new data models and business definitions, to create specific transformation rules. These transformation rules describe how to process data taken from the source systems into a consumable format for the target applications.
5. **Govern and audit over time.** Implement a repeatable process to govern information quality over time. This process includes defining a common enterprise glossary; creating

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documentation for historical auditing purposes; applying approved naming conventions and data-quality auditing rules to key areas; providing visibility and traceability of information back to its source systems; providing the ability to view the history and origin of information; and promoting data stewardship.

Analysis

As stated in the Executive Summary, Forrester took a multistep approach to evaluate the impact that implementing InfoSphere Foundation Tools can have on an organization:

- Interviews with IBM product management, marketing, and sales personnel.
- In-depth interviews of a leading worldwide global chemical and petroleum organization, with locations in North America, Latin America, Western Europe, Africa, and Asia, currently using InfoSphere Foundation Tools including InfoSphere Information Analyzer, InfoSphere Metadata Workbench, and InfoSphere Business Glossary.
- Construction of a common financial framework for the implementation of InfoSphere Foundation Tools.
- Construction of a composite organization based in part on characteristics of the interviewed organization.

Interview Highlights

The interviews uncovered a number of characteristics about this customer and its strategy to cut costs and create new market opportunity using IBM InfoSphere Foundation Tools:

- In 2005, the organization was looking to standardize its supply-chain information architecture around the existing IBM InfoSphere DataStage solution and other hand-coded systems.
- In addition to close alignment with global production processes, the organization was challenged to have access to trusted information to manage its downstream initiatives, such as marketing, trading, and transportations, more effectively across multiple sites around the globe.
- Prior to the investment in InfoSphere Foundation Tools, the process of understanding the impact to change from different sources was undocumented and ad hoc. The organization's source systems consisted of SAP and legacy applications. Information from these sources was transformed and sent to an integrated hub and used by other supply chain solutions (product scheduling, refinery scheduling and blending, demand forecasting and planning and optimization). Additionally, the information was sent to reporting systems — an operational reporting system and a business analytics system. The reports showed visibility to production data, supply and inventory, historical transaction and trading information, price and demand forecasting, as well as segment data and geographic-specific information. Any change to the source systems that would impact this information could result in lost business opportunities, such as a late shipment, loss of demand to competitors, or cost of transportation to incorrect locations. Hence, the organization's understanding of the impact of a change to sources of data was critical.
- While the immediate benefit to the organization was to understand and mitigate the complexity of change, the organization saw additional benefits from implementing InfoSphere Foundation Tools. These benefits centered around the trust and confidence that organizations' business users received in order to optimize their current operations.
- A key success of the implementation of InfoSphere Foundation Tools was the creation of specific IT key performance indicators (KPIs) within the overall information management

architecture, allowing the organization to track and measure progress of data quality. KPIs followed six key dimensions: completeness, timeliness, integrity, consistency, accuracy, and validity. Examples include demand forecast lead time accuracy, actual to plan for marketing and sales, inventory and exchange balances.

- In addition, InfoSphere Foundation Tools helped the organization streamline the collaboration between the IT and business groups.
- Furthermore, the organization pointed out the value of the unified metadata platform shared among InfoSphere Foundation Tools. Prior to the investment in InfoSphere Foundation Tools, the organization had purchased a point solution from another vendor for data profiling. To leverage the findings from the data profiling tool in its daily operations, the organization had to manually integrate that information with the rest of its environment. Seeing the benefits of a unified metadata repository, shared among these tools, the organization decided to replace that solution with InfoSphere Information Analyzer. This reduced the need for manual consolidation and integration of different data elements and its foreseeable costs.
- In addition to the quantified benefits associated with the initial implementation, the organization also realized the flexibility of the InfoSphere Foundation Tools platform to drive other benefits in the future. These benefits include improving the accuracy and data-quality use in the analytical platform, improving the accuracy of credit scoring of partners, better managing vendor purchase order information, reducing the number of sourcing vendors across global contracts, providing additional visibility into the overall ownership of partner organizations, as well as improving the visibility and granularity of individual product specifications.

TEI Framework

Introduction

From the information provided in the in-depth interviews, Forrester has constructed a TEI framework for those organizations considering implementation of IBM InfoSphere Foundation Tools. The objective of the framework is to identify the cost, benefit, risk, and flexibility factors that affect the investment decision.

Framework Assumptions

Table 2 lists the discount rate used in the present value (PV) and net present value (NPV) calculations and the time horizon used for the financial modeling.

Table 2: General Assumptions

Ref.	General assumptions	Value
	Discount rate	10%
	Length of analysis	Five years

Source: Forrester Research, Inc.

Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their finance department to determine the most appropriate discount rate to use within their own organization.

In addition to the financial assumptions used to construct the cash flow analysis, Table 3 provides salary assumptions used within this analysis.

Table 3: Salary Assumptions

Ref.	Metric	Calculation	Value
A1	Hours per week		40
A2	Weeks per year		50
A3	Hours per year (M-F, 9-5)		2,000
A4	Hours per year (24x7)		8,736
A5	Hourly salary – Ongoing administration		\$40
A6	Hourly salary – Planning and implementation		\$60

Source: Forrester Research, Inc.

Costs

Costs around IBM InfoSphere Foundation Tools for the interviewed organization include cost of software, hardware, maintenance, implementation, and ongoing administration. The actual cost of the solution will vary depending on the size of the development staff as well as the level of data integration undertaken by the organization. Based on the discussions with the interviewed customer, the cost of platform hardware is incorporated into the cost of implementation.

License And Maintenance Cost

The cost of licensing represents a portion of the overall investment cost of the solution. License costs are priced according to the number of processor cores, the processor technology, as well as client licenses. Based on interviews with the representative organization, the total five year license and maintenance cost equates to \$270,000. Based on the interviews with the representative organization, we calculate the annual software maintenance cost as 20% of the cost of license. This would have been enough to cover the cost of the production and development environment.

Initial Training Cost

The cost to train the individual stakeholders on the new IBM InfoSphere Foundation Tools platform was another cost cited by the interviewed organization. Prior to implementing IBM InfoSphere Foundation Tools, the majority of the developers had been trained on the legacy platform, and the organization had made an investment to retrain the developers on the IBM InfoSphere Foundation Tools platform. The cost per developer includes the formal cost of training, the lost productivity from participating in the training session, as well as the indirect cost of informal training. Table 4 illustrates the total training cost.

Table 4: Initial Training Cost

Ref.	Description	Calculation	Value
C1	Internal IT training		10,000

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C2	Total cost		\$10,000
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Source: Forrester Research, Inc.

Hardware Cost

The organization noted that it did have to allocate hardware resources for the use of InfoSphere Foundation Tools. While the costs are relatively minor and will depend on the size and sources of data, organizations should consider the allocated cost as part of the overall investment. For this analysis, the organization leveraged the hardware already used for DataStage infrastructure but made an incremental investment of \$25,000 in hardware assets with a 15% annual maintenance. Table 5 illustrates the equation used.

Table 5: Hardware Cost

Ref.	Description	Calculation	Value
D1	Incremental hardware spend		\$25,000
D2	Maintenance percentage	15%	
D3	Total annual maintenance		\$3,750

Source: Forrester Research, Inc.

Planning and Implementation Cost

The cost to implement includes the cost of internal resources to plan and deploy as well as an external third party to aid in planning and implementation of the InfoSphere Foundation Tools. The organization indicated that it invested roughly \$60,000 in internal efforts for the implementation. Internal staff consisted of a mix of junior and senior staff. In addition, the organization also estimated an investment equating to roughly \$110,000 for external services. The organization noted it was willing to pay a premium associated with external services in order to reduce the possible risks of delivery. Of the total implementation costs, roughly 20% of the cost was devoted to strategy and planning, while 80% was devoted to actual implementation and testing of the solution. Tables 6 and 7 illustrate the total implementation cost.

Table 6: Internal Planning and Implementation Cost

Ref.	Description	Calculation	Value
E1	Fully burdened hourly salary		\$60
E2	Implementation hours		1,000
E3	Total cost		\$60,000

Source: Forrester Research, Inc.

Table 7: External Implementation Services

Ref.	Description	Calculation	Value
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F1	Fully burdened hourly salary		\$200
F2	Implementation hours		550
F3	Total cost		\$110,000

Source: Forrester Research, Inc.

Ongoing IT Administration Cost

In addition to initial implementation costs, Forrester takes into account the ongoing administration costs, including IT labor, necessary to support and manage data integration. For the purpose of this analysis, the organization allocates on average 1.5 FTE's to handle the increasing level of data integration. Assuming a fully burdened cost of \$80,000 for junior support per year, the total yearly cost of administration and support equates to \$120,000. Table 8 illustrates the equation used.

Table 8: Ongoing IT Administration

Ref.	Description	Calculation	Value
G1	Fully burdened average salary		\$80,000
G2	Increase in full-time employee (FTE) resources		1.5
G3	Total cost		\$120,000

Source: Forrester Research, Inc.

Additional Training Cost

The model also takes into consideration the investment of roughly \$10,000 after the initial implementation period for additional training. This cost ensures that the organization develops additional training materials for end users – beyond the IT staff that were trained initially – to guide the bigger user community.

Total Costs

Table 9 illustrates the total incremental costs of the IBM platform for the interviewed organization.

Table 9: Total Cost

	Initial cost	Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
License: InfoSphere Foundation Tools	\$75,000	\$75,000	\$30,000	\$30,000	\$30,000	\$30,000	\$270,000	\$236,448
Hardware	\$25,000	\$0	\$3,750	\$3,750	\$3,750	\$3,750	\$40,000	\$36,500
Internal planning and implementation	\$30,000	\$30,000				\$0	\$60,000	\$57,778
External implementation services	\$55,000	\$55,000				\$0	\$110,000	\$105,926
Initial training	\$10,000					\$0	\$10,000	\$10,000
Ongoing IT administration	\$0	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$600,000	\$479,125

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Additional training	\$0	\$10,000					\$10,000	\$9,259
Total cost	\$195,000	\$290,000	\$153,750	\$153,750	\$153,750	\$153,750	\$1,100,000	\$935,036

Source: Forrester Research, Inc.

Benefits

The second component of this analysis looks at the potential benefits associated with an organization investing in the IBM InfoSphere Foundation Tools.

Create A Greater Understanding Of The Impact Of Change

One of the key benefit areas cited by the representative organization around the investment in InfoSphere Foundation Tools was the ability to understand the full impact of making a change within the data integration environment. For example, if the organization needed to make a change in its SAP source, it needed to understand how that change would impact the downstream supply-chain system. A lower supply of goods will impact the current inventory available for ordering, can lag shipment schedules, and can result in millions of dollars of lost revenue opportunity. Without an understanding of the effect of a change in the integration process, the organization can experience a ripple effect of data inconsistencies across the supply-chain system.

Within the InfoSphere Foundation Tools, the organization noted the importance of InfoSphere Metadata Workbench in understanding the impact of change across the data integration process. In particular, the unique characteristics of InfoSphere Metadata Workbench in providing lineage and auditing allowed the organization to improve cost efficiency that had to otherwise be done manually. This tool allowed the organization to have better visibility into all of the components of its supply-chain and scheduling systems. With InfoSphere Metadata Workbench, the organization reduced the risk of making a change before the change was made. This improved flexibility in reacting to changing requirements and reduced the cost of managing change.

We measure the impact of this benefit by categorizing changes into three different groups: an incidental or reactive change, a minor change request, and a major change request. Prior to the investment in InfoSphere Foundation Tools, the level of effort to complete a change ranged from an incident (3 hours to resolve) to a major change request (9 hours to resolve). According to the organization, 50% of the incidental changes were avoided by the use of InfoSphere Foundation Tools, and the other 50% did not require identification of data dependency. In the same manner, 60% of the impact of both minor and major changes was reduced as a result of using InfoSphere Foundation Tools.

InfoSphere Foundation Tools increased the awareness of the impact of making a change and reduced the time to uncover dependencies. As a result, InfoSphere Foundations Tools improves the cost efficiency of making specific changes by between 40% and 50%. Tables 10 through 12 illustrate the calculations used.

Table 10: Greater Understanding Of Impacts Of Change — Incidental (Reactive)

Ref.	Description	Calculation	Value
H1	Total number of incidents (per month)		75
H2	Percentage impacted through the use of InfoSphere Foundation Tools		50%
H3	Average resolution time — incident		3

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	(hours)		
H4	Cost per hour		\$80
H5	Percentage reduction in time		40%
H6	Annual savings	$H1*12*H2*H3*H4*H5$	\$43,200

Source: Forrester Research, Inc.

Table 11: Greater Understanding Of Impacts Of Change — Minor Change Request

Ref	Description	Calculation	Value
I1	Total number of change requests (per month)		120
I2	Percentage of minor change requests (out of 120 total change requests)		70%
I3	Percentage impacted directly by InfoSphere Foundation tools		60%
I4	Average resolution time (hours): minor change request		6
I5	Cost per hour		\$80
I6	Percentage reduction in time		50%
I7	Annual savings	$I1*I2*I3*I4*I5*I6$	\$145,152

Source: Forrester Research, Inc.

Table 12: Greater Understanding Of Impact To Change — Major Change Request

Ref	Description	Calculation	Value
J1	Total number of change requests (per month)		120
J2	Percentage of major change requests (out of 120 total change requests)		30%
J3	Percentage impacted directly by InfoSphere Foundation Tools		60%
J4	Average resolution time: major change request		9
J5	Cost per hour		\$80
J6	Percentage reduction in time		50%
J7	Annual savings	$J1*12*J3*J4*J5*J6$	\$93,312

Source: Forrester Research, Inc.

Reduce Complexity In Managing And Sharing Common Business Terminology

In addition to understanding the complexity and impact of making changes in a data integration process, the representative organization also indicated the importance of InfoSphere Foundation Tools in reducing the time and effort to manage and document common business terminology. The organization noted that prior to the investment in InfoSphere Foundation Tools it maintained business metadata in Excel spreadsheets. Keeping these spreadsheets up-to-date and reflective of the current state of the business was costly and still left business and IT with different interpretations of data.

The organization cited the use of InfoSphere Business Glossary as a key component in allowing the organization to manage document complexity within its environment. Specific KPIs are documented through the use of InfoSphere Business Glossary, whereas KPI information was stored without a standardized process before. Documenting these KPIs in InfoSphere Business Glossary helps business and IT have a shared understanding of the environment. Furthermore, the ease of use of this tool makes its exposure to business users very simple, and therefore the organization is planning to have its governance committees involved in the quarterly checkpoints.

We measure the impact of this benefit by specifically focusing on the improved process efficiency of managing and documenting information within different data integration projects. Prior to the investment in InfoSphere Foundation Tools, the process of documenting and communicating KPIs across the organization was time-consuming and prone to multiple interactions across individual subject-matter experts, business and data analysts, as well as IT architects. This information was kept in different documents, which made it hard to maintain. With the use of InfoSphere Business Glossary, the representative organization reduced the overall cost of administration and management of business metadata and KPIs and the overhead associated with educating users about these terms and their relationship to the underlying technical assets. Tables 13 illustrates the different metrics used to drive these benefits

Table 13: Reduced Complexity In Managing and Sharing Common Business Terminology

Ref	Description	Calculation	Value
K1	Total senior FTE		3
K2	Percentage of time spent		30%
K3	Annual salary		\$120,000
K4	Estimated reduction		30%
K5	Total savings	$K1 * K2 * K3 * K4$	\$32,400

Source: Forrester Research, Inc.

Reduce The Cost Of Data Consolidation

Another benefit cited by the interviewed organization was related to the value of the unified metadata repository shared among these tools. The cited organization kept its operational reporting system and business intelligence (BI) analytics systems separate. On an ongoing basis and to measure the quality of their KPIs, they needed to assess, analyze and compare the data and its quality between these two systems.

Information about the operations and the current view of the business and its transactional integrity is kept in the operational reporting system. The snapshots and performance data are recorded in the BI analytics system. The organization needed the data to match between these systems in

order to measure their performance against their plans. Prior to investing in InfoSphere Foundation Tools, the organization was using a profiling tool from another vendor to compare the statistics between these two systems. The data reconciliation of these data sets was handled through hand-coded solutions. This was not a scalable option.

With the investment in InfoSphere Foundation Tools, and specifically InfoSphere Information Analyzer, the organization was able to leverage the shared metadata repository to automatically reconcile the data analysis results and statistics between the two systems. Replacing the point solution with InfoSphere Information Analyzer reduced the organization’s development cycles in reconciling the data between the two different environments. Table 14 illustrates the impact of this benefit.

Table 14: Reduced Cost Of Data Consolidation Through A Unified Data Management Environment

Ref.	Description	Calculation	Value
L1	Total senior FTEs		4
L2	Percentage of time spent for data quality synchronization associated with multiple sources of data		30%
L3	Annual salary		\$120,000
L4	Estimated reduction		40%
L5	Total savings	$L1 * L2 * L3 * L4$	\$57,600

Source: Forrester Research, Inc.

Improve Business Agility And Data Quality

The representative organization indicated that the greatest perceived benefit of InfoSphere Foundation Tools was related to improving business agility of the enterprise by increasing the access to trusted, consistent, and high quality data. The organization implemented a set of KPIs that empowered IT to respond to requests from individual business stakeholders quicker and with more confidence. As a result, the organization spent less time in reconciling different sources of data manually and spent more time in improving the time to deliver projects with higher levels of data quality.

The organization cited the use of all three tools, InfoSphere Information Analyzer, InfoSphere Business Glossary, and InfoSphere Metadata Workbench, in improving data accuracy and ultimately shortening the time to deliver data integration projects. For example, the “Objective vs. Schedule vs. Actual” KPI measures the average time that an inventory is usable in a location and compares that with a seasonal target. This KPI can help the organization assess if certain regions tend to constantly be in a low or high level of supply. Based on these trends, the organization can improve the efficiency of its supply-chain management.

In this case, InfoSphere Business Glossary provides a common understanding and meaning of business terms, giving the user community trust and confidence to use these metrics in business decisions. InfoSphere Information Analyzer helps the organization assess and compare the history of regional inventory to targets. This can indicate if certain regions are meeting or missing their targets. InfoSphere Metadata Workbench helps the organization trace and see the sources of information and the transformations involved. This provides a level of trust and confidence in data accuracy.

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To calculate this benefit, the model takes into consideration the organization's improvement in data accuracy from 67% to 95% through the use of InfoSphere Foundation Tools as well as IBM InfoSphere DataStage solution. Table 15 illustrates the calculations.

Table 15: Improved Business Agility And Data Quality

Ref.	Description	Calculation	Value
M1	Average measure of data accuracy: pre-investment		67%
M2	Average measure of data accuracy: post-investment		95%
M3	Estimated data impacted by InfoSphere Foundation Tools		10%
M4	Estimated value: ROI (millions)		\$45
M5	Length of analysis (years)		5
M6	Total savings	$(M4/M5)*M3*(M2-M1)*1,000,000$	\$252,000

Source: Forrester Research, Inc.

Total Benefits

Table 16 illustrates the total five-year benefits as a result of the migration to the IBM InfoSphere Foundation Tools platform. The total PV benefits equate to roughly \$2.3 million. Forrester reduced the IT benefits by 25% in Year 1 to take into account the overhead of implementation time. Similarly, Forrester reduced the Business benefits by 50% in year 1 to take into account the added time it takes for the business to act on and realize changes from increases in trusted data. Starting year 2, both these benefits are fully captured at 100% of their value.

Table 16: Total Benefits

	Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
Greater understanding of the impact of change: incident (reactive)	\$32,400	\$43,200	\$43,200	\$43,200	\$43,200	\$205,200	\$162,485
Greater understanding of the impact of change: major change request	\$69,984	\$93,312	\$93,312	\$93,312	\$93,312	\$443,232	\$350,968
Greater understanding of the impact of change: minor change request	\$108,864	\$145,152	\$145,152	\$145,152	\$145,152	\$689,472	\$545,950
Reduced complexity in managing and sharing common business terminology	\$24,300	\$32,400	\$32,400	\$32,400	\$32,400	\$153,900	\$121,864
Reduced costs in data consolidation	\$43,200	\$57,600	\$57,600	\$57,600	\$57,600	\$273,600	\$216,647

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Improved business agility and data quality	\$126,000	\$252,000	\$252,000	\$252,000	\$252,000	\$1,134,000	\$889,496
Total benefits	\$404,748	\$623,664	\$623,664	\$623,664	\$623,664	\$2,899,404	\$2,287,410

Source: Forrester Research, Inc.

Risk

Forrester defines two types of investment risk associated with this analysis: implementation and impact risk. **Implementation risk** is the risk that a proposed technology investment may deviate from original resource requirements needed to implement and integrate the investment, 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 technology investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates. Quantitatively capturing investment risk by directly adjusting the financial estimates results in more meaningful and accurate estimates and a more accurate projection of the ROI.

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

- Installation and testing could demand more time than originally anticipated.
- Acquisition costs could be higher than originally anticipated for hardware and software.

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

- The amount of development savings may be lower than originally anticipated due to the time it takes to train and move to an integrated environment.
- Timeliness of having to provide specific functionality to meet business requirements exists.

Steps For Measuring Investment Risk

Risk factors are used in TEI to widen the possible outcomes of the costs and benefits (and resulting savings) associated with a project. 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 estimate. The expected value — the mean of the distribution — is used as the risk-adjusted cost or benefit number. The risk-adjusted costs and benefits are then summed to yield a complete risk-adjusted summary and ROI. In this study, Forrester discovered that engaging with IBM was a relatively low-risk endeavor, as expressed by the interviewed organizations, and applied a risk factor of 100% to the costs and 98% to the benefits to arrive at a risk-adjusted number. Table 17 provides a risk-adjusted breakdown of the costs received. Table 18 provides a risk-adjusted breakdown of the benefits received.

Table 17: Total Cost, Risk Adjusted

	Initial Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
License: InfoSphere	\$78,000	\$78,000	\$30,600	\$30,600	\$30,600	\$30,600	\$278,400	\$244,066
Hardware	\$25,500	\$0	\$3,825	\$3,825	\$3,825	\$3,825	\$40,800	\$37,230
Implementation	\$30,600	\$30,600	\$0	\$0	\$0	\$0	\$61,200	\$58,933

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services: internal								
Implementation services: external	\$56,100	\$56,100	\$0	\$0	\$0	\$0	\$112,200	\$108,044
Implementation services; training	\$10,200	\$0	\$0	\$0	\$0	\$0	\$10,200	\$10,200
Ongoing support: internal staff	\$0	\$124,800	\$124,800	\$124,800	\$124,800	\$124,800	\$624,000	\$498,290
Ongoing support: training	\$0	\$10,200	\$0	\$0	\$0	\$0	\$10,200	\$9,444
Total cost	\$200,400	\$299,700	\$159,225	\$159,225	\$159,225	\$159,225	\$1,137,000	\$966,207

Source: Forrester Research, Inc.

Table 18: Total Benefit, Risk Adjusted

	Year 1	Year 2	Year 3	Year 4	Year 5	Total	PV
Greater understanding of the impact of change: incident (reactive)	\$31,752	\$42,336	\$42,336	\$42,336	\$42,336	\$201,096	\$159,235
Greater understanding of the impact of change: major change request	\$68,584	\$91,446	\$91,446	\$91,446	\$91,446	\$434,367	\$343,948
Greater understanding of the impact of change: minor change request	\$106,687	\$142,249	\$142,249	\$142,249	\$142,249	\$675,683	\$535,031
Reduced complexity in managing and sharing common business terminology	\$23,814	\$31,752	\$31,752	\$31,752	\$31,752	\$150,822	\$119,427
Reduced costs in data consolidation	\$42,336	\$56,448	\$56,448	\$56,448	\$56,448	\$268,128	\$212,314
Improved business agility and data quality	\$123,480	\$246,960	\$246,960	\$246,960	\$246,960	\$1,111,320	\$871,706
Total benefits	\$396,653	\$611,191	\$611,191	\$611,191	\$611,191	\$2,841,416	\$2,241,661

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

The interviewed organization noted that the use of the IBM InfoSphere Foundation Tools platform in conjunction with an effective master data management strategy can potentially enable future benefits throughout the organization as a way to break down geographic barriers around existing operational data.

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While Forrester believes that organizations purchasing IBM InfoSphere Foundation Tools and using an effective master data management strategy in combination can take advantage of these flexibility options, quantification (using the financial industry standard Black-Scholes or the binomial option pricing models) of the additional value associated with these options for this customer would require scenario development and forward-looking analysis that is not available at this time.

The representative organization also noted that it plans to use the InfoSphere Information Analyzer rules analysis capability for greater validation and trending of KPIs over time. As mentioned in the Benefits section of this report, the organization implemented a set of KPIs to measure the quality of its operations and to improve its business agility. Although today InfoSphere Information Analyzer helps the organization with data analysis, and comparison features to measure KPIs against preset targets, the organization is planning to use the automated features of InfoSphere Information Analyzer, released in May 2009, to trend and monitor the quality of data against business rules and predefined conditions on an ongoing basis.

The value of flexibility is unique to each organization, and the willingness to measure its value varies from company to company (see Appendix A for additional information regarding the flexibility calculation).

TEI Framework: Summary

Considering the financial framework constructed above, the results of the Costs, Benefits, Flexibility, and Risk sections using the representative numbers can be used to determine ROI, NPV, and payback period. Table 19 shows the consolidation of the numbers for the composite organization.

Table 19: Cash Flow Summary — Non-Risk-Adjusted

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total	NPV
Total costs	\$195,000	\$290,000	\$153,750	\$153,750	\$153,750	\$153,750	\$1,100,000	\$935,036
Total benefits		\$404,748	\$623,664	\$623,664	\$623,664	\$623,664	\$2,899,404	\$2,287,410
Total	(\$195,000)	\$114,748	\$469,914	\$469,914	\$469,914	\$469,914	\$1,799,404	\$1,352,374
ROI	145%							
Payback period (years)	1.17							

Source: Forrester Research, Inc.

Table 20 below shows the risk-adjusted values, applying the risk-adjustment method indicated in the Risks section and the values from Tables 17 and 18.

Table 20: Cash Flow Summary — Risk-Adjusted

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total	NPV
Total costs	\$200,400	\$299,700	\$159,225	\$159,225	\$159,225	\$159,225	\$1,137,000	\$966,207
Total benefits		\$396,653	\$611,191	\$611,191	\$611,191	\$611,191	\$2,841,416	\$2,241,661
Total	(\$200,400)	\$96,953	\$451,966	\$451,966	\$451,966	\$451,966	\$1,704,416	\$1,275,454
ROI	132%							

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Payback period (years)	1.23								
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Source: Forrester Research, Inc.

It is important to note that values used throughout the TEI framework are based on in-depth interviews with a single organization. Forrester makes no assumptions as to the potential return that other organizations will receive within their own environment. Forrester strongly advises that readers use their own estimates within the framework provided in this study to determine the expected financial impact of implementing IBM InfoSphere Foundation Tools.

Study Conclusions

Based on information collected in interviews with a current IBM InfoSphere Foundation Tools customer, Forrester found that organizations can realize benefits in the form of improved development efficiency within their current environment as well as faster time to benefit from their development projects.

The financial analysis provided in this study illustrates the potential way that an organization can evaluate the value proposition of IBM InfoSphere Foundation Tools. Based on information collected during the in-depth customer interviews, Forrester calculated a five-year risk-adjusted ROI of 132% for the composite organization with a payback period of 1.23 years. All final estimates are risk-adjusted to incorporate potential uncertainty in the calculation of costs and benefits.

Based on these findings, companies looking to implement IBM InfoSphere Foundation Tools can see cost savings and productivity benefits. Using the TEI framework, many companies may find the potential for a compelling business case to make such an investment.

Appendix A: Total Economic Impact™ Overview

Total Economic Impact (TEI) 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, risks, and flexibility. For the purpose of this analysis, the impact of flexibility was not quantified.

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 forms 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.

Risk

Risk measures the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: the likelihood that the cost and benefit estimates will meet the original projections and 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.

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 in time. However, having the ability to capture that benefit has a present value that can be estimated. The flexibility component of TEI captures that value.

Appendix B: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Although the Federal Reserve Bank sets a discount rate, companies often set 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 organization 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 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. It 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 Table 2 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 and are the sum of the initial investment and the discounted cash flows in each year.

Example Table

Ref.	Category	Calculation	Initial cost	Year 1	Year 2	Year 3	Total

Source: Forrester Research, Inc.