A Forrester Total Economic Impact™ Study Prepared For IBM

The Total Economic Impact Of IBM's Netezza Data Warehouse Appliance With Advanced Analytics

Single Company Analysis

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FORRESTER®

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Executive Summary

Companies around the world adopt data warehousing (DW) appliances in support of business processes to speed information worker queries, reduce the cost of IT analytics infrastructures, and shorten time-to-value in business intelligence (BI) and other decision-support initiatives. However, some IT executives push back at the need for DW appliances, unsure whether this approach offers significant enough benefits at a low enough cost to justify moving away from traditional "roll your own" DW implementations.

In June 2011, IBM commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) enterprises may realize by deploying its Netezza data warehouse appliance with advanced analytics. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the IBM Netezza appliance on their organizations.

IBM Netezza Analytics is an extensible, embedded, advanced analytics software platform delivered with every IBM Netezza appliance. It simplifies the development, deployment, and use of advanced analytics while delivering high performance and scalability. For a more detailed overview about the IBM Netezza solution, please refer to page 24.

IBM Netezza Data Warehouse Appliances Provide Competitive Differentiation Through Faster Analytics While Reducing Capital And Operational Costs

Our interviews with one existing customer, Epsilon, a multichannel marketing services provider, and subsequent financial analysis based on assumptions that Forrester used illustrate the potential ROI from the use of IBM Netezza appliances. Epsilon is one of IBM Netezza's largest partners in the campaign marketing industry. Table 1 illustrates the risk-adjusted ROI, costs, and benefits resulting from this analysis.

Table 1
Three-Year Risk-Adjusted ROI[1]

ROI	Payback period	Total benefits (PV)	Total costs (PV)	Net present value (NPV)
222%	Within 12 months	$4,712,504	$1,464,637	$3,247,867

Source: Forrester Research, Inc.

- **Benefits.** The interviewed organization noted the following benefits for its clients from the use of the IBM Netezza appliances with financial analysis based on cost assumptions that Forrester used:
    - **Capex cost savings.** The organization noted that by switching to IBM Netezza appliances — as compared with expanding their traditional data warehouse environment — it could realize hardware cost savings of more than $750,000 over three years, driven by the ability to consolidate two separate data warehouses down

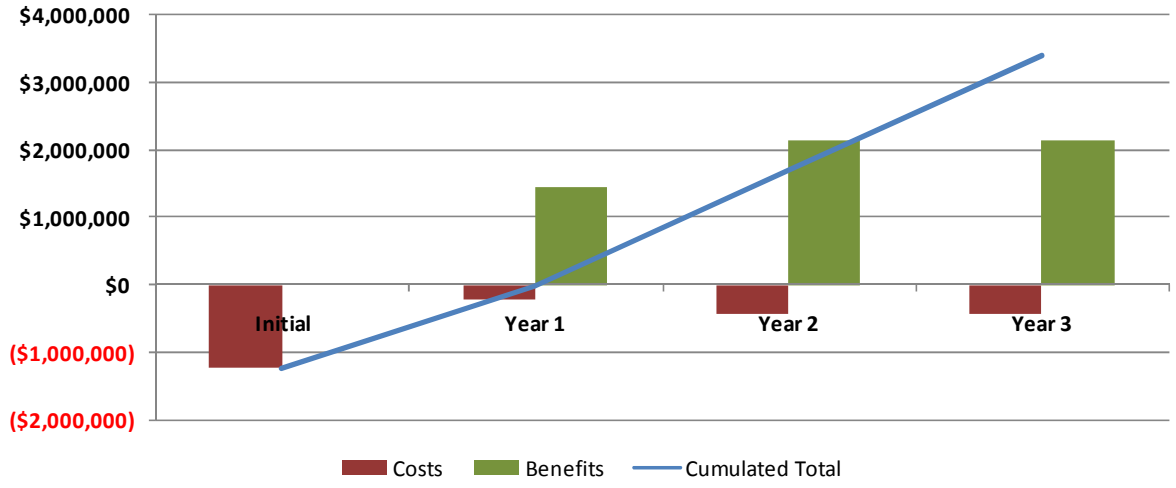
to a single data warehouse and an IBM Netezza appliance. This benefit has a three-year, risk-adjusted present value (PV) of nearly $600,000.

- **Opex cost savings.** The organization noted that by switching to IBM Netezza appliances, it could also realize operational cost savings through consolidation of its existing data warehouse environment due to post-consolidation/migration to DW appliance, fewer database administrators (DBAs), which is due to fewer DW instances and fewer DBAs per instance. This benefit has a three-year, risk-adjusted PV of just under $1.5 million.
- **Revenue lift.** The purchase of IBM Netezza appliances also enables the organization to provide added value to its clients through a strategic shift from large episodic campaigns to frequent, microtargeted campaigns through triggered campaigns. As a result, the organization was able to produce a greater number of campaigns resulting in higher overall conversion. This benefit has a three-year, risk-adjusted PV of $2.54 million.
- **Productivity gains.** The organization noted that IBM Netezza appliances provided end users with the ability to sift through massive data sets in less time and with greater granularity. This has the impact of making the end user marketing staff more productive, shifting resources away from time-consuming data quality control to focusing on campaign strategy and analytics. This resulted in a total three-year, risk-adjusted savings of more than $175,000.

- **Costs.** The organization we interviewed experienced the following costs:
  - **Hardware and maintenance costs.** The hardware and maintenance costs have a three-year, risk-adjusted PV of about $1.5 million.
  - **Planning and implementation costs.** The internal labor costs for planning and implementation have a three-year, risk-adjusted PV of about $30,000.
  - **Administration costs.** The internal labor costs for administration have a three-year, risk-adjusted PV of about $550,000.
  - **Training costs.** Initial training costs have a three-year, risk-adjusted PV of about $5,000.

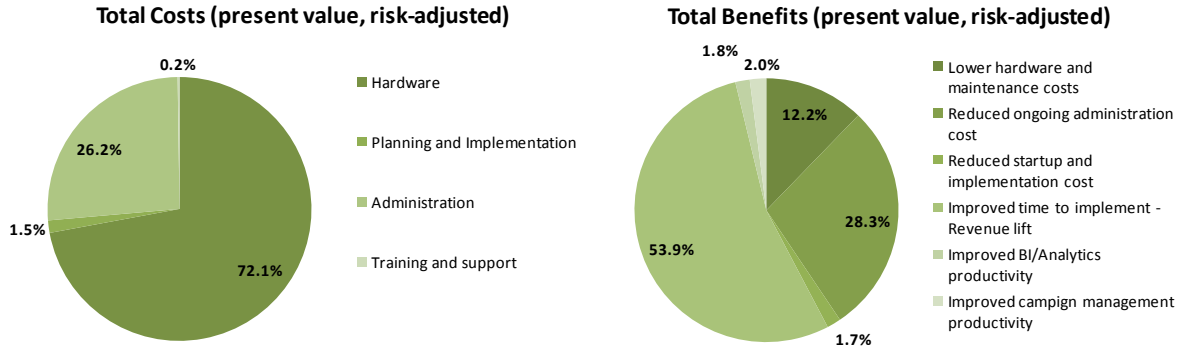
Figure 1 summarizes the yearly and cumulated cash flow, and Figure 2 shows the breakdown of the benefit and cost categories for the organization.

Figure 1
Three-Year, Risk-Adjusted Cash Flow



Source: Forrester Research, Inc.

Figure 2
Three-Year, Risk-Adjusted Costs And Benefits



Source: Forrester Research, Inc.

Factors Affecting Benefits And Costs

Table 1 illustrates the projected risk-adjusted financial results based on cost and benefit assumptions that Forrester used. The risk-adjusted values take into account any potential uncertainty or variance that exists in estimating the costs and benefits, which produces more conservative estimates. The following factors may affect the financial results that an organization may experience:

- **Legacy DW environment.** The level of operational and capital cost savings will depend on the organization's legacy environment and the alternatives compared with investing in IBM Netezza appliances. In this case, the organization migrated two separate data warehouses down to a single data warehouse instance with an IBM Netezza appliance resulting in operational and capital cost savings.
- **Business opportunities.** The level of top-line impact will vary in large part on how the data impacts external initiatives. In the case of the interviewed organization, there was a clear link between the processing of advanced analytics and the ability to roll out external marketing campaigns.
- **Productivity.** The level of productivity increases will depend on the ability of end users individually and in teams to analyze, evaluate, and take more effective action on intelligence delivered and processed through the IBM Netezza appliance.

Disclosures

The reader should be aware of the following:

- The study is commissioned by IBM and delivered by the Forrester Consulting group.
- Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the report to determine the appropriateness of an investment in IBM's Netezza data warehouse appliances with advanced analytics.
- 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.
- The customer names for the interviews were provided by IBM.

TEI Framework And Methodology

Introduction

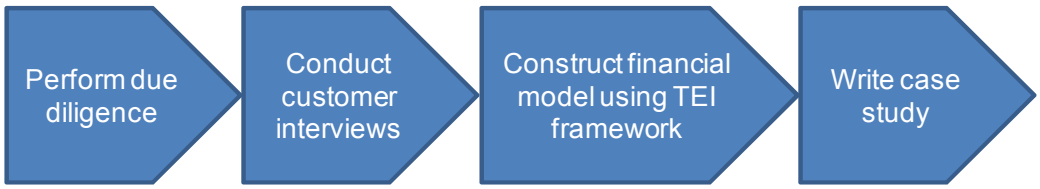
From the background information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) analysis for those organizations considering deployment of IBM's Netezza data warehouse appliance with advanced analytics. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

Approach And Methodology

Forrester took a multistep approach to evaluate the impact that IBM's Netezza appliance can have on an organization (see Figure 2). Specifically, we:

- Interviewed IBM marketing and sales personnel and Forrester analysts to gather data relative to IBM Netezza data warehouse appliance with advanced analytics and the marketplace for data warehouse solutions.
- Interviewed Epsilon, which is currently using an IBM Netezza appliance, to obtain data with respect to costs, benefits, and risks.
- Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data based in part from assumptions derived from the interviews.

Figure 2
TEI Approach



Source: Forrester Research, Inc.

Forrester employed four fundamental elements of TEI in modeling the IBM Netezza appliance:

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

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

Analysis

Interview Highlights

A single organization, Epsilon, was interviewed for this study. Epsilon is a marketing services firm based in the US with offices throughout the globe. Epsilon provides a broad array of data-driven, multichannel marketing solutions that leverage consumer insight to help brands deepen their relationships with customers. Services include strategic consulting, acquisition and customer database technologies, loyalty management, proprietary data, predictive modeling, and a full range of direct and digital agency services, including creative, interactive web design, email deployment, search engine optimization, and direct mail production. In addition, Epsilon is the world's largest permission-based email marketer and IBM Netezza's top marketing services partner.

The interviews uncovered several salient points that were used as the basis for the analysis:

- Epsilon is the world's largest global permission-based email provider with clients across multiple industries. Epsilon has deployed IBM Netezza appliances as the data warehouse platform supporting many of its largest clients since 2003.
- Over three years ago, one of Epsilon's top clients made the decision and needed to integrate its campaign data warehouse into a single product. Epsilon proposed to the client that it consolidate two separate data warehouse instances into a single data warehouse with an IBM Netezza appliance for advanced analytics.
- The case for moving to an IBM Netezza appliance involved a combination of operational and capital cost savings through consolidation as well as the ability to improve the time to process advanced analytics for individual campaigns. The individual campaigns were specifically performing credit scoring analytics across a targeted sample of the US population.
- The cost associated with the investment in an IBM Netezza appliance included the cost of the appliance, annual maintenance, planning, implementation, and training, as well as ongoing cost of administration.
- Epsilon noted that due to the increased performance, the organization could change the way campaigns were created and delivered. The IBM Netezza appliance allowed for not only results to be delivered faster but it also gave the organization deeper granularity within massive data sets. Campaigns could leverage a comprehensive view of the individual across massive data assets: company customer data, credit bureau, demographic/compiled data, partner data, and transactional data. This resulted in more effective campaigns and higher productivity of campaign staff.

Framework Assumptions

Table 2 provides the model assumptions that Forrester used in this analysis.

Table 2
Model Assumptions

Ref.	Metric	Calculation	Value
A1	Working hours per day		8
A2	Working days per year		260
A3	Working hours per year	A1*A2	2,080
A4	Average fully loaded annual salary rate		$166,400
A5	Average fully loaded hourly salary rate	A4/A3	$80

Source: Forrester Research, Inc.

The model assumes that the alternative to investing in the IBM Netezza appliance would have been to run one DW hub (for the data) and an analytical data mart (essentially, a single subject area DW) for the advanced analytics model building, execution, and scoring. The IBM Netezza appliance can be deployed as the analytical data mart or as, in one physical instance, both the DW hub and the analytical data mart (performing both functions through mixed workload management and parallel processing). Forrester estimates the cost of deploying a separate relational database system for this environment equates to $4.75 million over three years. Table 3 illustrates the percent breakdown of cost to support that database across hardware, software, and administration.

Table 3
Cost Of Deploying Legacy Relational Database Systems

Ref.	Type	Percentage of total	Costs
B1	Hardware	45%	$2,137,500
B2	Software	30%	$1,425,000
B3	Administration	25%	$1,187,500
B4	Cost of deploying legacy relational database systems	B1+B2+B3	$4,750,000

Source: Forrester Research, Inc.

The discount rate used in the PV and NPV calculations is 10%, and time horizon used for the financial modeling is three years. Organizations typically use discount rates between 8% and 16% based on their current environment.

Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

Costs

This section describes and lists the projected incremental costs for deploying and using the IBM Netezza appliances over a three-year period. Estimates are based on initial estimates a will vary on an implementation-by-implementation basis.

Technology Costs

The composite organization had to invest in an IBM Netezza appliance. This appliance is deployed next to the existing data warehouse environment. The initial investment of $640,000 includes the hardware costs, related software licenses, and maintenance fees for the first year. For the following years, the composite organization pays an annual maintenance fee of 18% of upfront cost, equating to an annual spend of $115,000.

Please note that we used IBM list prices in this analysis. Readers should ask for a quote to determine what hardware, software, and maintenance costs would be applicable for their particular environments.

Internal Implementation Costs

The internal labor costs for planning, implementation, and project management are indicated in row C2 of Table 4 below. For the interviewed organization, we assumed three people working for about 120 hours each at a fully burdened hourly cost of $80.

Training Fees

In this analysis, we assume that two people from the storage team attend a training course. The total training cost of $4,800 is indicated in row C4 in Table 4 below.

Administrative Costs

Ongoing administrative costs include the labor necessary to support and manage the IBM Netezza appliance on a daily basis. For the purpose of this analysis, the organization will allocate one and one quarter staff time to support and manage the new appliances. Assuming a fully burdened cost of $80 per hour, we can calculate that the total yearly cost of administration and support equates to $208,000.

Total Costs

Table 4 summarizes the incremental costs incurred by the reference organization for deploying and using the IBM Netezza appliances over a three-year period.

Table 4
Total Costs (Non-Risk-Adjusted)

Ref.	Costs	Initial	Year 1	Year 2	Year 3	Total
C1	Technology costs	$640,000	$0	$115,200	$115,200	$870,400
C2	Planning and implementation costs	$28,800	$0	$0	$0	$28,800
C3	Administration costs	$0	$208,000	$208,000	$208,000	$624,000
C4	Training costs	$0	$4,800	$0	$0	$4,800
Ct	Total costs (non-risk-adjusted)	$668,800	$212,800	$323,200	$323,200	$1,528,000

Source: Forrester Research, Inc.

Benefits

This section illustrates the representative benefits from investing in the IBM Netezza appliances as a result of discussions with Epsilon. The benefits described to Forrester included reduced capital and operational costs, improved campaign impact, as well as improved end user productivity through faster data analysis.

IT Capital Cost Savings

As noted in Table 3, Epsilon was faced with the choice of either deploying two data warehouse platforms or deploying a single data warehouse in conjunction with the IBM Netezza appliance. This section illustrates the capital cost savings on not having to deploy one of the two data warehouses. Forrester assumes the cost of hardware for the alternative approach equates to roughly $2.1 million dollars (see B1). Deploying the IBM Netezza platform results in an upfront capital cost reduction of 40% of the total alternative spend realized in the first year of analysis. With upfront capital cost savings, annual maintenance savings for the alternative platform is also included as a result of not having to deploy the second data warehouse. The annual savings in Year 2 and Year 3 equate to $171,000 per year.

Table 5
IT Capital Cost Savings (Non-Risk-Adjusted)

Ref.	Costs	Value/ calculation	Year 1	Year 2	Year 3	Total
D1	System cost — hardware	$2,137,500 (see B1)				
D2	Percent reduction	40%				
D3	Maintenance as a percent of hardware	20%				
D4	Benefit realization		50%	100%	100%	
Dt	Total savings — hardware and maintenance	Year 1: D1*D2*D4 Year 2 and Year 3: D1*D2*D3*D4	$427,500	$171,000	$171,000	$769,500

Source: Forrester Research, Inc.

IT Operational Cost Savings

In addition to the capital cost savings from not having to deploy multiple data warehouses to run the advanced analytics processing, Epsilon also noted the potential operational cost savings from the IBM Netezza appliance investment. This included the reduced administrative costs of not only having to manage multiple relational databases but also the cost avoidance of not having to deploy the second data warehouse.

IT Operational Cost Savings — Reduced Administration Costs

Reduced administration costs represent a piece of the overall cost savings for Epsilon. For this analysis, Forrester assumes a reduction of 60% in the cost of administration by deploying the IBM Netezza appliances in conjunction with a single data warehouse. This is a result of primarily reduced complexity within the environment and reduced hours devoted to changes and updates of two separate data warehouses.

Table 6
Reduced Administration Costs (Non-Risk-Adjusted)

Ref.	Costs	Value/ calculation	Year 1	Year 2	Year 3	Total
E1	System cost — administration	$1,187,500				
E2	Staffing cost	$166,400				
E3	Total administrators (rounded)	E1/E2	7	7	7	
E4	Percent reduction	60%				
E5	Benefit realization		50%	100%	100%	
Et	Total savings — ongoing admin	E2*E3*E4*E5	$349,440	$698,880	$698,880	$1,747,200

Source: Forrester Research, Inc.

IT Operational Cost Savings — Reduced Startup And Implementation Costs

In addition to reduced administration costs, Epsilon also noted reduced startup and implementation costs from not having to manage two separate data warehouses.

Table 7
Reduced Startup And Implementation Costs (Non-Risk-Adjusted)

Ref.	Costs	Value/ calculation	Year 1	Year 2	Year 3	Total
F1	System cost — administration	$1,187,500				
F2	Percentage of administration cost — startup and implementation	15%				
F3	Percent reduction	60%				
F4	Total savings	F1*F2*F3	$106,875			$106,875

Source: Forrester Research, Inc.

Revenue Lift

In addition to the operational and capital cost savings, another key benefit for Epsilon was the ability to process advanced analytics in less time for their customer. A critical component of the value proposition for Epsilon was being able to deliver credit scoring analytics to their customer, ultimately providing their customer with ability to deliver targeted campaigns ahead of their competitors. Prior to the migration, the credit scoring process was time-consuming, often taking up to two days to process the data. In addition, there was no way to provide a comprehensive view of the individual across massive data assets: company customer data, credit bureau, demographic/compiled data, partner data, and transactional data without the need for time-consuming data preparation. The customer noted that data was pulled from the database, scored and analyzed on a third-party application, and then an analytic model had to be loaded back into the database. After the credit scoring process was complete, the end user BI and campaign group would be responsible for identifying the target audience based on changing external factors.

The result in moving to an IBM Netezza data warehouse appliance was the ability to go much deeper in granularity across individual data sets. Company customer data, credit bureau, demographic/compiled data, partner data, and transactional data could be analyzed in-database allowing for greater segmentation and targeting of campaigns. The result is an increase in campaign effectiveness ultimately leading to higher conversion for each campaign.

To calculate this benefit, Forrester conservatively assumes one primary campaign using credit scoring data will be impacted by improved time of delivery of data. Each campaign has a target reach on average of roughly 3 million potential customers. These customers are also being solicited by competing companies and as a result, receiving a campaign promotion immediately after a market change increases the likelihood of conversion and competitive advantage. For the client organization, it meant taking a two-month process and condensing it to two days. The result to the campaign is a 1% increase in conversion as a result of pushing out a campaign ahead of its competitors. Assuming a converted customer's average yearly account balance is $500, and the net margin on that outstanding balance is 10%, the total impact equates to roughly $750,000 in the first year and $1.5 million in Years 2 and 3.

Table 8
Revenue Lift (Non-Risk-Adjusted)

Ref.	Costs	Value/ calculation	Year 1	Year 2	Year 3	Total
G1	Number of primary targeted campaigns	1				
G2	Campaign reach (number of people)	3,000,000				
G3	Increase in conversion through faster deployment	1%				
G4	Average account balance	$500				
G5	Net margin	10%				
G6	Benefit realization		50%	100%	100%	
Gt	Total revenue lift	G1*G2*G3* G4*G5*G6	$ 750,000	$ 1,500,000	$1,500,000	$3,750,000

Source: Forrester Research, Inc.

End User Productivity Gains
Improved time-to-delivery is one area of top-line benefit noted by Epsilon. Another area of benefit is the ability of end users to increase their productivity through faster access of advanced analytics. The organization noted that both BI teams and campaign management were limited in their access prior to the investment in IBM Netezza data warehouse appliances. The users spent most of their time waiting for data, and only a small number of people had access to the database at one time. Improving the speed of delivery of credit score analytics has the effect of increasing their overall contribution to the organization by being able to act on analysis sooner and contribute higher returns to the organization.

End User Productivity Gains — Improved BI/Analytics Productivity

To calculate the end user productivity benefit on staff, we assume with faster delivery of advanced analytics, end users are able to contribute increased value to the organization. Assuming 35% of an employee's time is spent on credit scoring analytic data, that employee contributes a staff rate of return of 25%. The staff rate of return is the added value an employee contributes above and beyond their salary. For example, for every $1 the employee receives in salary, she will contribute an estimated $1.25 to the organization. The ability to decrease the time to process credit scoring data has a positive impact on the staff rate of return, increasing the baseline 35% value by 25%. This results in greater value contributed to the organization by the employee.

Table 9
Improved BI/Analytics Productivity (Non-Risk-Adjusted)

Ref.	Costs	Value/ calculation	Year 1	Year 2	Year 3	Total
H1	Number of staff	15				
H2	Hourly cost per staff	$80				
H3	Percent of time spent on credit scoring analytics	35%				
H4	Staff rate of return	25%				
H5	Improvement in rate of return	20%				
H6	Benefit realization		50%	100%	100%	
H7	Improved BI/analytics productivity	H1*H2*H3*H4*H5*H6*2080	$21,840	$43,680	$43,680	$109,200

Source: Forrester Research, Inc.

End User Productivity Gains — Improved Campaign Management Productivity

The impact of reduced processing time also improves the campaign management staff. The impact is measured in the same way as BI staff; however, we assume a greater share of staff time is impacted by reduced processing time, 50% as compared with 35% in the case of BI staff.

Table 10
Improved Campaign Management Productivity (Non-Risk-Adjusted)

Ref.	Costs	Value/ calculation	Year 1	Year 2	Year 3	Total
I1	Number of staff	12				
I2	Hourly cost per staff	80				
I3	Percent of time spent on campaigns	50%				
I4	Staff rate of return	25%				
I5	Improvement in rate of return	20%				

Ref.	Costs	Value/ calculation	Year 1	Year 2	Year 3	Total
I6	Benefit realization		50%	100%	100%	
I7	Improved campaign management productivity	I1*I2*I3*I4*I5*I6	$24,960	$49,920	$49,920	$124,800

Source: Forrester Research, Inc.

Total Benefits

Table 11 illustrates the total quantified benefits as a result of the investment in IBM Netezza data warehouse appliances.

Table 11

Total Benefits (Non-Risk-Adjusted)

Ref	Metric	Year 1	Year 2	Year 3	Total
J1	Lower hardware and maintenance costs	$427,500	$171,000	$171,000	$769,500
J2	Reduced ongoing administration cost	$349,440	$698,880	$698,880	$1,747,200
J3	Reduced startup and implementation cost	$106,875	-	-	$106,875
J4	Revenue lift	$750,000	$1,500,000	$1,500,000	$3,750,000
J5	Improved BI/analytics productivity	$21,840	$43,680	$43,680	$109,200
J6	Improved campaign management productivity	$24,960	$49,920	$49,920	$124,800
J7	Total benefits (non-risk-adjusted)	$1,680,615	$2,463,480	$2,463,480	$6,607,575

Source: Forrester Research, Inc.

Flexibility

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

While Forrester believes organizations 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, which is not available at this time.

Risk

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

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

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

- Planning, installation, and testing could demand more time than originally anticipated due to the organization's prior experience with appliance-based technology.
- Acquisition costs could be higher than originally anticipated for both based on the level of discount price received from IBM.

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

- The amount of operational and capital cost savings could be lower than anticipated due to the scope and type of alternatives considered.
- The end user and campaign impact could be lower than anticipated due to lower adoption and use of advanced analytics.

Table 12 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates. The TEI model uses a triangular distribution method to calculate risk-adjusted values. To construct the distribution, it is necessary to first estimate the low, most likely, and high values that could occur within the current environment. The risk-adjusted value is the mean of the distribution of those points. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Table 12
Cost And Benefit Risk Adjustments

Costs	Low	Most likely	High	Mean
Hardware costs	95%	100%	120%	105%
Planning and implementation costs	90%	100%	156%	115%
Administration costs	95%	100%	132%	109%
Training costs	95%	100%	132%	109%
Benefits	**Low**	**Most likely**	**High**	**Mean**
Lower hardware and maintenance costs	60%	100%	103%	88%
Reduced ongoing administration cost	80%	100%	102%	94%
Reduced startup and implementation cost	50%	100%	100%	83%
Revenue lift	50%	100%	100%	83%
Improved BI/analytics productivity	80%	100%	102%	94%
Improved campaign management productivity	80%	100%	102%	94%

Source: Forrester Research, Inc.

Financial Summary

The financial results calculated in the Costs and Benefits sections can be used to determine the ROI, NPV, and payback period for the organization's investment in the IBM Netezza data warehouse appliance with advanced analytics. These are shown in Table 13 below.

Table 13
Cash Flow — Non-Risk-Adjusted

	Cash flow — original estimates					
	Initial	Year 1	Year 2	Year 3	Total	PV
Costs	$668,800	$212,800	$323,200	$323,200	$1,528,000	$1,372,187
Benefits	$0	$1,680,615	$2,463,480	$2,463,480	$6,607,575	$5,414,615
Total	($668,800)	$1,467,815	$2,140,280	$2,140,280	$5,079,575	$4,042,428
ROI	295%					
Payback period	Within 12 months					

Source: Forrester Research, Inc.

Table 14 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 12 in the Risk section to the cost and benefits numbers in Tables 4 and 11.

Table 14
Cash Flow — Risk-Adjusted

	Cash flow — risk-adjusted estimates					
	Initial	Year 1	Year 2	Year 3	Total	PV
Costs	$705,216	$231,952	$347,680	$347,680	$1,632,528	$1,464,637
Benefits	$0	$1,461,303	$2,144,841	$2,144,841	$5,750,986	$4,712,504
Total	($705,216)	$1,229,351	$1,797,161	$1,797,161	$4,118,458	$3,247,867
ROI	222%					
Payback period	Within 12 months					

Source: Forrester Research, Inc.

IBM Netezza Data Warehouse Appliance With Advanced Analytics: Overview

According to IBM, every IBM Netezza data warehouse appliance is delivered with IBM Netezza Analytics, an embedded software platform for advanced analytics. It provides the technology infrastructure to support enterprise deployments of parallel, in-database analytics. Support for a variety of popular tools and languages as well as a built-in library of parallelized analytic functions make it simple to move analytic modeling and scoring inside the data warehouse appliance. IBM Netezza Analytics is fully integrated into the IBM Netezza data warehouse asymmetric massively parallel processing (AMPP) architecture enabling data exploration, model building, model diagnostics, and scoring with unprecedented speed. IBM Netezza data warehouse appliance with advanced analytics can process massive data to solve complex problems orders of magnitude faster than typical solutions. The open and flexible advanced analytics platform enables the development and deployment of analytics to drive game-changing results. With IBM Netezza Analytics, parallelized analytics for data preparation, data mining, predictive modeling, and optimization can exploit the IBM Netezza appliance's AMPP architecture to achieve high throughput of advanced analytics on huge data. IBM Netezza Analytics can be extended by creating your own powerful, advanced analytics and embed them into the appliance. Analytic applications, visualization tools, and business intelligence tools can harness the parallelized advanced analytics via a variety of programming methods such as SQL, Java, MapReduce, Python, R, C, C++, and Fortran to deliver powerful, insightful analytics.

The IBM Netezza Analytics platform can be used for:

1. Building and deploying advanced analytic applications.
2. Leveraging parallel analytics via visualization or business intelligence tools.
3. Performing ad hoc analysis especially on huge data or computational intensive problems.

Visualization and business intelligence tools leverage the analytics in the IBM Netezza Analytics platform via SQL for targeted inquiries.

The IBM Netezza appliance implements parallel processing as close to the source of data as possible, and it allows customers to benefit from an open and flexible appliance ready to handle increasing volumes of data. A balanced architecture is key to achieving the best possible price/performance for advanced analytics, and every component of the IBM Netezza appliance architecture is carefully selected and optimized to service data as fast as the physics of the disk allows.

By combining a fast data warehouse with high-performance embedded analytics into a single platform, IBM has reduced the need for data movement and enabled advanced analytics on large data sets.

Appendix A: Total Economic Impact™ Overview

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

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

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.

Risk

Risk measures 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 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 enterprise wide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point 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 respective 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 at an interest rate (the discount rate). The PV of costs and benefits feed into the total net present value of cash flows.

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

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

A Note On Cash Flow Tables

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

Table [Example]

Example Table

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

Source: Forrester Research, Inc.

Appendix C: Related Forrester Research

"The ROI Of Data Warehousing Appliances: Benefits, Costs, And Risks," Forrester Research, Inc., November 10, 2010

Appendix D: 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 on Risk, please see page24.