A Forrester Total Economic Impact™ Study Prepared For IBM

Total Economic Impact™ Study Of IBM Storwize V7000

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FORRESTER®

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TABLE OF CONTENTS

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Executive Summary

In June 2011, IBM commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) that enterprises may realize by deploying Storwize V7000. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Storwize V7000 on their organizations. Storwize V7000 is a virtualized storage system designed to consolidate block and file workloads into a single storage system for simplicity of management, reduced cost, highly scalable capacity, performance, and high availability.

IBM Storwize V7000 Generates End User And IT Operational Cost Savings

Our interviews and survey with 11 existing customers and subsequent financial analysis found that a composite organization based on the organizations interviewed experienced the risk-adjusted ROI, costs, and benefits shown in Table 1.[1] See Appendix A for a description of the composite organization. (All numbers have been rounded).

Table 1
Composite Organization Three-Year Risk-Adjusted ROI

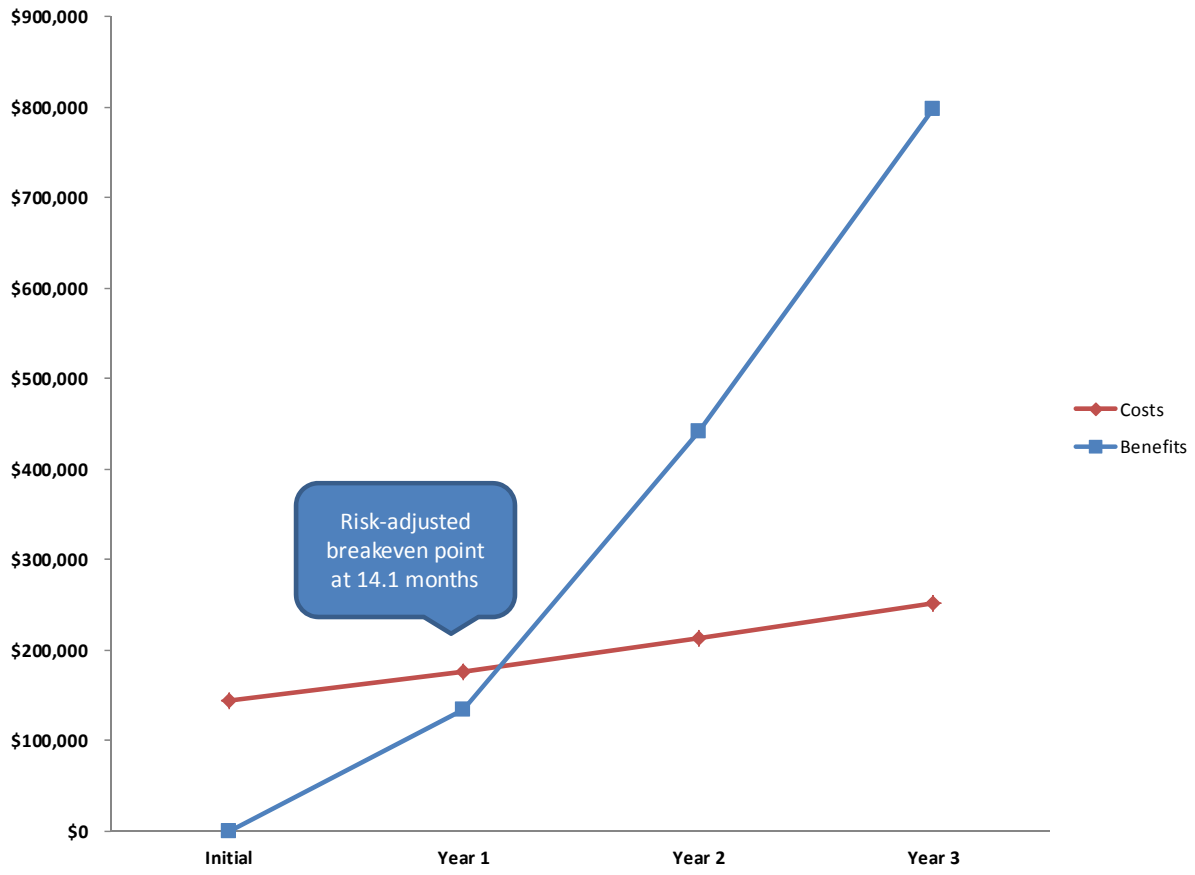
ROI	Payback period	Total benefits (PV)	Total costs (PV)	Net present value
150%	15 months	$631,154	($252,421)	$378,733

Source: Forrester Research, Inc.

- **Benefits.** The composite organization experienced the following benefits that represent those experienced by the interviewed and surveyed companies:
  - **Improved availability by reducing downtime.** This benefit represents the improvement in end user availability when reducing hardware downtime.
  - **Lower provisioning cost.** This benefit represents the reduction in provisioning cost with preinstalled thin provisioning software.
  - **Lower administrative cost per TB of storage.** This benefit represents the reduction in administrative costs of managing storage measured by cost per TB of data.
  - **Simplified application performance tuning.** This benefit represents the reduction in IT effort resulting from simplification in application performance tuning.
  - **Improved speed to get new storage online.** This benefit represents the improvement in time to get new storage in operation.
- **Costs.** The composite organization experienced the following costs:

- **Hardware cost and support fee.** This cost represents the investment in hardware and its related support costs.
- **Software license and maintenance costs.** This cost represents the investment in software licenses and support costs for Storwize V7000 implementation.
- **Internal implementation costs.** This cost represents the internal resources used to support the implementation.
- **Administrative costs.** This cost represents the ongoing administrative effort associated with the deployment of IBM Storwize V7000.

Figure 1
Composite Organization Three-Year Risk-Adjusted ROI



Source: Forrester Research, Inc.

Factors Affecting Benefits And Costs

Table 1 illustrates the risk-adjusted financial results that were achieved by the composite organization. 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:

- **Time to deploy.** The time it takes to test and pilot Storwize V7000 within the environment has an impact on how quickly the benefits of Storwize can be realized.
- **Success of change management.** How quickly an organization can get storage administrators using the new tools and solutions has an impact on the overall costs of the investment.
- **Impact of availability.** The overall benefit of improved availability will depend on the type of supported application as well as the productive value of the type and number of end users.

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 return on investment 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 Storwize V7000.
- 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 customers for the interviews were provided by IBM and an external third-party organization.

TEI Framework And Methodology

Introduction

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ framework for those organizations considering implementing IBM Storwize V7000. 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 Storwize V7000 can have on an organization (see Figure 2). Specifically, we:

- Interviewed IBM marketing/sales/consulting personnel and Forrester analysts to gather data relative to Storwize V7000 and the marketplace for Storwize V7000.
- Received primary data from a combination of in-depth customer interviews as well as a broader survey of customers who are currently using IBM Storwize V7000 to obtain data with respect to costs, benefits, and risks.
- Designed a composite organization based on characteristics of the interviewed organizations (see Appendix A).
- Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the composite organization.

Figure 2
TEI Approach

Source: Forrester Research, Inc.

Forrester employed f our fundamental elements of TEI in modeling IBM Storwize V7000's service:

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 B for additional information on the TEI methodology.

Analysis

Interview Highlights

In-depth interviews were conducted for this study, involving representatives from:

1. A financial services firm in South America with more than 40,000 members and 45 branches that offer financial products and services.

Forrester also surveyed 10 other organizations that are currently using IBM Storwize V7000. These organizations are in the following industries: financial services, telecommunication, manufacturing, government, and energy. These organizations are based in North America, Europe, and Australia and present a combination of public and privately held firms.

The interviews and surveys uncovered the following:

- Organizations needed to upgrade its information management system to cope with the increasing data volumes demand and continue providing an excellent quality of service to its expanding customer base.
- The integration of Storwize V7000 has offered a number of efficiency savings to these organizations' IT infrastructure. Thin provisioning enabled the IT teams to manage the increasing volume of data at a lower cost through better use of disk space. Organizations were able to realize, on average, a reduction of 30% in physical disk space growth while meeting their growing demands with less disruption.
- Organizations noted that Storwize V7000 was able to identify idle storage space and use this space efficiently. Data access and management has enabled these organizations to better understand their customers, analyze customer data in a timely manner, and offer solutions and services that are better aligned with customer demand.

Composite Organization

Based on in-depth interviews with an existing customer provided by IBM and surveys of 10 customers using IBM Storwize V7000, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results represents a midsize organization that is managing about 45 terabytes of data. The organization deployed IBM Storwize V7000 to better manage its growing storage needs.

Framework Assumptions

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

Table 2
Model Assumptions

Ref.	Metric	Calculation	Value
A1	Hours per week		40
A2	Weeks per year		52
A3	Hours per year (M-F, 9-5)		2,080
A5	Average fully loaded salary of storage administrator		$120,000
A6	Fully loaded hourly rate of storage administrator	(A5/A3)	$58
A7	Average fully loaded salary of end user		$100,000
A8	Fully loaded hourly rate of end user	(A7/A3)	$48

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 organization.

Costs

This section describes and lists the costs related to planning, testing, and implementing IBM Storwize V7000 over the three-year period. Cost consumptions are based on detailed interviews with an organization using IBM Storwize V7000 and a survey completed with 10 existing IBM Storwize V7000 customers. All costs are based on list prices and standard vendor discount. These costs do not include any negotiated discounts. The following cost model for the composite organization serves as a framework for other organizations.

Hardware Costs And Support Fee

This category represents 16% of the overall investment in IBM Storwize V7000. It includes hardware costs and related maintenance costs. Readers should note that IBM has a three-year warranty on hardware and that the level of service can be upgraded during the warranty period. The list price for the hardware is $61,288. IBM recommends 39% as a representative discount level for hardware purchased for this investment. The hardware maintenance costs for a three-year agreement is $2,850, and it is paid up front. Table 3 presents the calculation.

Table 3
Hardware Costs And Support Fee

Ref.	Metric	Calculation	Initial
B1	Hardware costs		$61,288
B2	Recommended vendor discount		39%
B3	Hardware maintenance costs		$2,850
Bt	Hardware costs and support fee	B1*(1-B2)+B3	$40,236

Source: Forrester Research, Inc.

Software License And Maintenance Costs

Another component of cost is software licensing and maintenance costs. This category coincidently represents 16% of the overall investment. There are two components to the software costs: base system software and external virtualization software. The list price for each component is $18,000. IBM recommends 20% as a representative vendor discount for software purchased for this investment. The software maintenance costs for Year 1 are included in the initial software licensing cost. The maintenance cost starts in Year 2 and equates to 20% of the software license list price. Table 4 illustrates the calculation.

Table 4
Software License And Maintenance Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Base system software		$18,000			
C2	External virtualization software		$18,000			
C3	Recommended vendor discount		20%			
C4	Software maintenance costs				20%	20%
Ct	Software license and maintenance costs	(C1+C2)*(1-C3)+(C1*C2)*C4	$28,800	$0	$7,200	$7,200

Source: Forrester Research, Inc.

Internal Implementation Costs

The next component of costs is internal implementation costs. It describes the internal resources required to plan and implement IBM Storwize V7000. During this phase, the organization used the equivalent of three full-time resources during two months for planning, testing, and implementation. The organization interviewed also used third-party resources to support implementation. For the composite organization, we estimate a third-party cost of about $20,000. This category represents 32% of the overall investment.

Table 5
Internal Implementation Costs

Ref.	Metric	Calculation	Per period
D1	Number of people		3
D2	Number of months spent on discovery, analysis, and deployment		2
D3	Average fully loaded monthly salary		$10,000
D4	Third-party costs		$20,000
Dt	Internal implementation costs	D1*D2*D3+D4	$80,000

Source: Forrester Research, Inc.

Ongoing Management Costs

The final component of cost is ongoing management costs. This category represents 36% of the overall investment. Based on in-depth interviews with an organization using IBM Storwize V7000, Forrester estimates that three IT staff members (a member of infrastructure team, one from support, and an IT manager) allocate 10% of their time to ongoing management of the IBM Storwize V7000 system. Table 6 shows the calculation.

Table 6
Ongoing Management Cost

Ref.	Metric	Calculation	Per period
E1	Number of people		3
E2	Average fully loaded salary		$120,000
E3	Percent of time allocated		10%
Et	Ongoing management cost	E1*E2*E3	$36,000

Source: Forrester Research, Inc.

Total Costs

Table 7 summarizes costs associated with the implementation of IBM Storwize V7000.

Table 7
Total Costs — Non-Risk-Adjusted

Costs	Initial	Year 1	Year 2	Year 3	Total	PV
Hardware cost and support fee	($40,236)				($40,236)	($40,236)
Software license and maintenance costs	($28,800)		($7,200)	($7,200)	($43,200)	($40,160)
Internal implementation costs	($80,000)				($80,000)	($80,000)
Administrative costs		($36,000)	($36,000)	($36,000)	($108,000)	($89,527)
Total costs	($149,036)	($36,000)	($43,200)	($43,200)	($271,436)	($249,923)

Source: Forrester Research, Inc.

Benefits

The benefits that we had sufficient data to quantify financially were: 1) improved availability by reducing downtime; 2) lower administrative cost per TB of storage; 3) simplified application performance tuning; 4) lower provisioning cost due to preinstalled thin provisioning software; and 5) improved speed to get new storage online. These benefits represent business and IT operating savings that represented a three-year risk-adjusted PV of $631,154. Readers should

note that these benefits represent the values that the interviewed and surveyed organizations received from deployment of IBM Storwize V7000.

Improved Availability By Reducing Downtime

This category represents the reduction in end user downtime resulting from improved availability. Organizations interviewed and surveyed noted that using IBM Storwize V7000 to virtualize their existing storage has enabled them to improve data availability to applications, specifically citing the abilities to: 1) maximize storage space; 2) take advantage of excess space to launch new applications; and 3) move application data between storage resources without having to take the application offline within a virtualized environment. In addition to improvement in end user availability, the organizations were able to maintain a high level of uptime in comparison with the environment prior to deployment of IBM Storwize V7000.

Based on the interviews and surveys, organizations deploying IBM Storwize V7000 were able to realize 29% improvement in application availability compared with the prior environment. For the composite organization, we estimate that the 1,000 end users experienced four downtimes annually and that each downtime lasted about 3 hours. We assume an average fully loaded hourly rate of $48 ($100,000/2080). We also assume that benefits are reduced by 25% in the first year to take into account the time it takes to fully implement the solution. Table 8 illustrates the calculation.

Table 8
Improved Availability By Reducing Downtime

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
F1	Total number of employees		1,000	1,000	1,000
F2	Total annual downtime	Four times per year*3 hours per period	12	12	12
F3	Average fully loaded hourly rate		$48	$48	$48
F4	Reduction in downtime		29%	29%	29%
F5	Percent of benefit realized		75%	100%	100%
Ft	Improved availability	F1*F2*F3*F4*F5	$125,280	$167,040	$167,040

Source: Forrester Research, Inc.

Lower Administrative Cost

In addition to business benefit, there are a number of IT benefits resulting from the implementation of Storwize V7000. The first is a reduction in administrative costs. Customers interviewed and surveyed cited as much as a 25% year over year increase in volume of data stored, which would result in an increase in human resources required to manage storage capacity, applications availability and rollout, and consistent, reliable access to the data to ensure that the

organization met its internal and external SLAs. The interviewees noted that after deployment they were able to shrink the total storage size by as much as 50%. Then they decided to mirror it with very minimal effort. This action allowed the organizations to manage the storage growth with the existing number of staff.

For the composite organization, we estimate that a full-time resource was allocating 50% of his or her time to ongoing administrative tasks. After deployment of Storwize V7000, the organization was able to reduce the cost to administer virtualized storage by 17% per terabyte. While the organization improved overall system efficiency, the benefit didn't occur until Year 2 because there was no incremental increase per terabyte of data in Year 1. Table 9 demonstrates the calculation.

Table 9
Lower Administrative Cost

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
G1	Number of TB increased		0	8	11
G2	Number of workers managing storage		1	1	1
G3	Average fully loaded salary		$120,000	$120,000	$120,000
G4	Average time allocated to storage administration		50%	50%	50%
G5	Reduction in cost to administer storage compared with previous environment on a per TB basis		17%	17%	17%
Gt	Lower administration cost per TB of storage	G1*G2*G3*G4*G5	$0	$81,600	$112,200

Source: Forrester Research, Inc.

Simplified Application Performance Tuning

Another benefit is improvement in application tuning. Customers noted that simplifying ways to move data consistently between applications and storage devices without experiencing application downtime was an important factor when evaluating IBM Storwize V7000. IT organizations use tuning to improve performance if the system is experiencing response time or throughput problems. To improve performance, organizations were required to make additional investment to add more disk storage and CPUs while improving CPU speed and increasing memory. By simplifying tasks related to application performance tuning, Storwize V7000 customers interviewed said that they were able to reduce the cost of tuning performance for applications per terabyte by 10% when compared with their prior environment.

For the composite organization, we estimate that the equivalent of a full-time resource was allocating 50% of his/her time to tasks related to application tuning. To calculate this benefit, we estimate the reduction in cost per terabyte of data increased compared with the environment prior to implementation of IBM Storwize V7000. Table 10 illustrates the calculation.

Table 10
Simplified Application Performance Tuning

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
H1	Number of TB increased		0	8	11
H2	Number of workers managing storage		1	1	1
H3	Average fully loaded salary		$120,000	$120,000	$120,000
H4	Average time allocated to performance tuning		50%	50%	50%
H5	Reduction in cost to perform application tuning compared with your previous environment on a per TB basis		10%	10%	10%
Ht	Simplified application performance tuning	H1*H2*H3*H4*H5	$0	$48,000	$66,000

Source: Forrester Research, Inc.

Lower Provisioning Cost

The Storwize V7000 thin provisioning capability offers the flexibility to make better use of storage space. Organizations interviewed said that their storage administrators can manage the increase in volume of data at a lower cost through better use of disk space and reduced disruption. Organizations interviewed and surveyed for this study said that as a result of thin provisioning capabilities offered they have realized a 10% reduction in provisioning time. We also assume benefits are reduced by 25% in Year 1 to take into account the time it takes to fully implement the solution. Table 11 presents the calculation.

Table 11
Lower Provisioning Cost

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
I1	Number of workers		1	1	1
I2	Annual fully loaded salary per worker		$120,000	$120,000	$120,000
I3	Average time allocated to provisioning prior to deployment		50%	50%	50%
I4	Reduction in provisioning time after deployment		17%	17%	17%
I5	Percent of benefit realized		75%	100%	100%
It	Lower provisioning cost by having preinstalled thin provisioning software	I1*I2*I3*I4*I5	$7,650	$10,200	$10,200

Source: Forrester Research, Inc.

Improved Speed To Get New Storage Online

The last component of benefit is the improvement in time to make storage available. This will improve ability to access information and ultimately support end user activity. Customers interviewed and surveyed said that after implementation of IBM Storwize V7000 they were able to make new storage capacity available 26% faster than with the prior environment. The organization interviewed was only tracking the improvement in IT resources effort to make storage available faster, and that is what we are calculating here. However, we believe that in addition to this benefit there is a user benefit that is not currently being tracked. That is based on users' ability to access data faster to make better business decisions.

Table 12
Improvement In Time-To-Market

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
J1	Number of people		3	3	3
J2	Average time spent (hours)		25	25	25
J3	Average fully loaded hourly rate		$58	$58	$58
J4	Improvement in percent of time to get new storage capacity operational compared with previous environment		26%	26%	26%
J5	Percent of benefit realized		75%	100%	100%
Jt	Improved speed to get new storage online	J1*J2*J3*J4*J5	$848	$1,131	$1,131

Source: Forrester Research, Inc.

Total Benefits

Table 13 summaries the total quantitative benefits associated with implementation of IBM Storwize V7000.

Table 13
Total Benefits — Non-Risk-Adjusted

Benefits	Year 1	Year 2	Year 3	Total	PV
Improved availability/reduced downtime	$125,280	$167,040	$167,040	$459,360	$377,440
Lower administration cost per TB of storage		$81,600	$112,200	$193,800	$151,736
Simplified application performance tuning		$48,000	$66,000	$114,000	$89,256
Lower provisioning cost by having preinstalled thin provisioning software	$7,650	$10,200	$10,200	$28,050	$23,048
Improved speed to get new storage online	$848	$1,131	$1,131	$3,110	$2,556
Total benefit	$133,778	$307,971	$356,571	$798,320	$644,035

Source: Forrester Research, Inc.

Flexibility

As defined by Forrester, flexibility 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 Storwize V7000 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).

If the following metrics are available — the asset value by measuring the benefits (that is, costs avoided or saved, revenue generated, and/or capital saved), the costs to acquire the solution, and the number of years to measure the investment — we can estimate the flexibility option by using the Black-Scholes option pricing model.

Table 14
Flexibility Benefit Framework

Metric	Calculation
Asset value (benefit)	IT or business costs avoided, revenue generated, capital saved
Cost to acquire option	Planning and discovery, subscription, and annual maintenance are examples of costs to consider
Expiration	Time-to-expire (in years)
Flexibility	Black-Scholes option pricing model

Source: Forrester Research, Inc.

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 Storwize V7000 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 Storwize V7000, 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 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 since they represent the expected values considering risk.

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

- The implementation costs could vary based on the internal skill set and competencies.
- The implementation costs could take longer than anticipated due to lack of planning and testing of the solution.

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

- The improvement in administrative effort could vary depending on the prior infrastructure and virtualization effort.
- The amount of excess capacity reclaimed and the level of storage growth reduced could be lower than originally anticipated, leading to reduced storage cost savings.
- The level of downtime reduced could be lower than originally anticipated.

Table 15 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 15
Cost And Benefit Risk Adjustments

Costs	Low	Most likely	High	Mean
Costs risk evaluation	98%	100%	105%	101%
Benefits	**Low**	**Most likely**	**High**	**Mean**
Benefit risk evaluation	98%	100%	105%	101%

Source: Forrester Research, Inc.

Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Financial Summary

The financial results calculated in the Costs and Benefits sections can be used to determine the return on investment, net present value, and payback period for the organization's investment in Storwize V7000. These are shown in Table 16 below.

Table 16
Cash Flow — Non-Risk-Adjusted

Categories	Initial	Year 1	Year 2	Year 3	Total	PV
Costs	($149,036)	($36,000)	($43,200)	($43,200)	($271,436)	($249,922)
Benefits		$133,778	$307,971	$356,571	$798,320	$644,035
Net benefits	($149,036)	$97,778	$264,771	$313,371	$526,885	$394,113
ROI	158%					
Payback period	14 months					

Source: Forrester Research, Inc.

Table 17 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 15 in the Risk section to the cost and benefits numbers in Tables 7 and 13.

Table 17
Cash Flow — Risk-Adjusted

Categories	Initial	Year 1	Year 2	Year 3	Total	PV
Costs	($150,526)	($36,360)	($43,632)	($43,632)	($274,150)	($252,421)
Benefits		$131,103	$301,812	$349,440	$782,354	$631,154
Net benefits	($150,526)	$94,743	$258,180	$305,808	$508,204	$378,733
ROI	150%					
Payback period	15 months					

Source: Forrester Research, Inc.

IBM Storwize V7000: Overview

According to IBM, Storwize V7000 Unified Storage is a virtualized storage system designed to consolidate block and file workloads into a single storage system for simplicity of management, reduced cost, highly scalable capacity, performance, and high availability. IBM Storwize V7000 Unified Storage also offers improved efficiency and flexibility through built-in solid state drive (SSD) optimization, thin provisioning, and non-disruptive migration of data from existing storage. The system can virtualize and reuse existing disk systems.

Appendix A: Composite Organization Description

For this TEI study, based on in-depth interviews with an existing customer provided by IBM and surveys from 10 other customers using IBM Storwize V7000, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results represents a midsize organization that is managing about 45 terabytes of data. The organization deployed IBM Storwize V7000 to better manage its growing storage need.

In purchasing IBM Storwize V7000, the composite company has the following objectives:

- Meet storage growth demand without continuously adding more disk space.
- Improve access to data and improve application performance.
- Reduce ongoing administrative effort to monitor storage.
- Have the ability to make new storage available faster.

For the purpose of the analysis, Forrester assumes that the composite organization has 1,000 end users. The composite organization includes three members of IT (one person from infrastructure, one tasked with storage administration, and an IT manager) involved in the implementation.

Appendix B: Total Economic Impact™ Overview

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

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

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 page 17.