

# Forrester Consulting

MAKING LEADERS SUCCESSFUL EVERY DAY

Prepared for Vizioncore

September 2008

## **The Total Economic Impact™ Of Vizioncore vRanger Pro**

Project Director: Sadaf Roshan Bellord

FORRESTER®



**Headquarters**

Forrester Research, Inc., 400 Technology Square, Cambridge, MA 02139 USA  
Tel: +1 617.613.6000 • Fax: +1 617.613.5000 • [www.forrester.com](http://www.forrester.com)

## TABLE OF CONTENTS

Executive Summary .....	3
Purpose .....	3
Methodology.....	3
Approach.....	3
Key Findings .....	4
Disclosures.....	5
Vizioncore vRanger Pro: Overview.....	6
Analysis.....	6
Interview Highlights.....	6
TEI Framework .....	8
Costs .....	9
Benefits .....	11
Risk.....	14
Flexibility.....	16
TEI Framework: Summary.....	16
Study Conclusions.....	17
Appendix A: Total Economic Impact™ Overview .....	18
Benefits .....	18
Costs .....	18
Risk.....	18
Flexibility.....	18
Appendix B: Glossary.....	19

© 2008, Forrester Research, Inc. All rights reserved. Forrester, Forrester Wave, RoleView, Technographics, TechRadar, and Total Economic Impact are trademarks of Forrester Research, Inc. All other trademarks are the property of their respective companies. Forrester clients may make one attributed copy or slide of each figure contained herein. Additional reproduction is strictly prohibited. For additional reproduction rights and usage information, go to [www.forrester.com](http://www.forrester.com). Information is based on best available resources. Opinions reflect judgment at the time and are subject to change.

## Executive Summary

In April 2008, Vizioncore commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) that enterprises may realize by deploying vRanger Pro. vRanger Pro is a backup and recovery solution designed specifically for virtual server environments. The solution is agentless and provides image-level backups while virtual machines are still running. Prior to implementation of vRanger Pro, traditional backup and recovery methods proved time consuming and costly. After implementation, Schwan's (a packaged food provider) interviewed for this study, reduced its overall costs for backup and recovery, improved the performance of backups, and reduced the number of failed backup application upgrades. This study illustrates the financial impact of implementing a backup and recovery solution designed for virtual environments.

In conducting in-depth interviews with Schwan's, Forrester found that the organization reduced its backup and recovery operating costs and reduced the number of failed upgrades. The reduction in failures reduced risk exposure. Overall, the organization was also able to improve its time to recovery from two days to near zero.

### Purpose

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of vRanger Pro on their organizations. 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 vRanger Pro.

### Methodology

Vizioncore selected Forrester for this project because of its industry expertise in backup and recovery 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 vRanger Pro:

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

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 A for additional information on the TEI methodology.

### Approach

Forrester used a four-step approach for this study:

1. Forrester gathered data from existing Forrester research relative to IT infrastructure and operations and the backup and recovery market in general.

2. Forrester interviewed Vizioncore’s marketing and sales management to fully understand the potential (or intended) value proposition of vRanger Pro solution.
3. Forrester conducted a series of in-depth interviews with Schwan’s, which is currently using vRanger Pro.
4. Forrester constructed a financial model representative of the interviews. This model can be found in the TEI Framework section below.

## Key Findings

Forrester’s study yielded several key findings:

- **ROI.** Based on the interviews with Schwan’s, Forrester constructed a TEI framework for the organization and the associated ROI analysis illustrating the financial impact areas. As seen in Table 1, the risk-adjusted ROI for the interviewed organization is 210% with a breakeven point after deployment (payback period) of four months.
- **Benefits.** The organization implemented vRanger Pro to replace the traditional backup solutions for its virtual environment. The organization reduced license and maintenance costs associated with its traditional backup, eliminated the engineering effort that resulted from backup and recovery failures and failed upgrades, reduced unexpected downtime, and improved server time to recovery. The present value (PV) of the risk-adjusted total benefits is equal to \$394,710.
- **Costs.** The cost to implement vRanger Pro includes software licensing costs, maintenance costs, hardware costs, and administrative costs. The PV of the risk-adjusted total costs equates to \$127,401. The reader should note that the Vizioncore costs are list prices and do not include any discounts.

Table 1 illustrates the risk-adjusted cash flow for the composite 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. All numbers are rounded.

**Table 1: Composite Company ROI, Risk-Adjusted**

Summary financial results	Original estimate	Risk-adjusted
ROI	213%	210%
Payback period (months)	4	4
Total costs (PV)	(\$127,401)	(\$127,401)
Total benefits (PV)	\$399,194	\$394,710
Total (NPV)	\$271,792	\$267,309

Source: Forrester Research, Inc.

## Disclosures

The reader should be aware of the following:

- The study is commissioned by Vizioncore and delivered by the Forrester Consulting group.
- Vizioncore 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 for the interviews was provided by Vizioncore.
- 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 vRanger Pro.
- This study is not meant to be used as a competitive product analysis.

## Vizioncore vRanger Pro: Overview

vRanger Pro is a backup and recovery solution designed for virtualized environments. Administrators can schedule regular image-level backups of virtual or physical machines while the machine is still running. Images can be stored either locally in a storage area network (SAN) or sent as compressed files over a wide area network (WAN) to remote locations to support disaster recovery preparedness.

In addition, vRanger Pro allows restore of individual files efficiently with an explorer tree through which users can easily identify and "grab" needed files.

## Analysis

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

- Interviews with Vizioncore marketing and sales management.
- In-depth interviews of a consumer package good manufacturer currently using vRanger Pro. The organization provides packaged foods to consumers and institutional cafeterias in the United States and Western Europe.
- Construction of a common financial framework for the implementation of vRanger Pro.

## Interview Highlights

The interviews revealed a number of insights, including:

- One of the catalysts for implementing vRanger Pro was the improvement in system availability and reduction in downtime. The original backup method required the deployment of an agent in every virtual machine and physical server. Data is backed up to either physical tape libraries or virtual tape libraries (VTLs). A key component of the organization's IT infrastructure is Microsoft Message Queuing (MSMQ). MSMQ provides guaranteed message delivery, efficient routing, security, and priority-based messaging between IT systems and is integrated with Active Directory. The traditional backup process was ineffective in this environment. During recovery, the traditional backup process could not recover the system identifier (SID). As a result, hundreds of queues would be disrupted. In addition, the traditional backup process provided file-level recovery but not system recovery. System recovery is critical to disaster recovery. As the organization's virtual environment increased in size (it must now manage hundreds of virtual machines (VMs) and matured, the need for system-level recovery to support disaster recovery and maintaining system availability increased.
- Another advantage of using vRanger Pro for backup and recovery in a virtual environment is that it ensures that all VMs are protected. When a systems administrator provisions a new VM, as long as the new VM is provisioned from within an existing pool, vRanger Pro automatically adds the VM to the existing backup schedule. With traditional backup, the new VM would not be protected until an administrator installed a backup agent in the new VM and then updated backup jobs and schedules.
- In the prior environment, upgrading the backup software application was time consuming and very error-prone. Because there is a limited maintenance window during which to

## The Total Economic Impact™ Of Vizioncore vRanger Pro

---

perform the upgrade, if the upgrade failed, the administrators could not backup the production environment — exposing the organization to risk. In these situations, the organization would have to find another weekend during which to attempt to complete the upgrade; meanwhile administrators could not perform backups. In addition, when the backup upgrade failed, it impacted other projects and forced the organization to delay these projects until the upgrade was successful.

## TEI Framework

### Introduction

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

### Framework Assumptions

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

**Table 2: General Assumptions**

General assumptions	Value
Discount rate	10%
Length of analysis	Three 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 organizations.

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		52
A3	Hours per year (M-F, 9-5)	A1*A2	2,080
A4	Hours per year (24x7)		8,736
A5	IT operation — fully loaded salary		\$100,000
A6	Hourly	A5/A3	\$48

Source: Forrester Research, Inc.

## Costs

This section outlines the investment made by the interviewed customer in vRanger Pro. Costs include software licensing fees, maintenance costs, hardware costs, and administrative costs. Forrester uses list prices for all software licensing, maintenance, and hardware costs.

### *Software Licensing Fees and Annual Maintenance Costs*

vRanger Pro takes a virtual machine and backs it up at the image level. It provides full recovery of that virtual machine without installing agents. In addition, it allows the organization to restore files from a full or a differential-based backup. The vRanger Pro costs per socket on the same physical server.

Software licensing and annual maintenance costs represent 58% of the overall investment. The organization bought 112 licenses at a cost of \$499 per license. The annual maintenance cost is \$100 per license. Tables 4 and 5 illustrate the calculation.

**Table 4: Software Licensing Fees**

Ref.	Metric	Calculation	Per Period	Year 1	Year 2	Year 3
B1	License fees		\$499			
B2	Number of licenses		112			
Bt	Software license fees	B1*B2	\$55,888			

Source: Forrester Research, Inc.

**Table 5: Software Maintenance Costs**

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Maintenance fee		\$0	0	\$100	\$100
C2	Number of licenses		112			
Ct	Software maintenance costs (yearly)	C1*C2	\$0	\$0	\$11,200	\$11,200

Source: Forrester Research, Inc.

### *Hardware Cost*

Hardware cost represents 19% of the overall investment. The organization used two Vizioncore management servers at a cost of \$12,000 per server. The server is a single-processor, dual core machine with a lot of disk space. Each has 12 gigantic 750 gig spinning platters. Each provides six terabytes of backup space in a small form factor. Table 6 presents that calculation.

**Table 6: Hardware Costs**

Ref.	Metric	Calculation	Per Period
D1	Hardware costs		\$12,000
D2	Number of units		2
Dt	Hardware costs	D1*D2	\$24,000

Source: Forrester Research, Inc.

### *Ongoing Administrative Cost*

Administrative cost is the time to backup and maintain Vizioncore for the virtual environment of 570 VMs. The cost represents 23% of the overall investment. Two IT staff members, one full-time and one part-time staff, contribute 10% and 2% of their time, respectively.

We assume that the average annual fully loaded salary of \$100,000 ( $\$125,000 + \$75,000/2$ ) for this calculation. The estimated annual administrative cost is \$12,000 ( $(1*10\% + 1*2\%)*\$100,000$ ). Table 7 illustrates this calculation.

**Table 7: Administrative Costs**

Ref.	Metric	Calculation	Per Period
E1	Number of full time staff (lead architect)		1
E2	Percent of time contributed		10%
E3	Number of part-time staff (backup administrator)		1
E4	Percent of time contributed		2%
E5	Average annual fully-loaded salary		\$100,000
Et	Administrative costs	$(E1*E2 + E3*E4)*E5$	\$12,000

Source: Forrester Research, Inc.

*Total Costs*

Table 8 demonstrates the total costs of implementing vRanger Pro for the interviewed organization.

**Table 8: Total Costs — Non-Risk-Adjusted**

Costs	Initial	Year 1	Year 2	Year 3	Total	Present value
Software license fees	\$55,888				\$55,888	\$55,888
Software maintenance costs (yearly)			\$11,200	\$11,200	\$22,400	\$17,671
Hardware costs	\$24,000				\$24,000	\$24,000
Administrative costs		\$12,000	\$12,000	\$12,000	\$36,000	\$29,842
Total costs	\$79,888	\$12,000	\$23,200	\$23,200	\$138,288	\$127,401

Source: Forrester Research, Inc.

**Benefits**

The next component of the analysis examines the benefits associated with an investment in vRanger Pro. The interviewed customer quantified the following benefits:

1. Licensing and maintenance cost savings.
2. IT staff productivity gain.
3. Improvement in time to server recovery.

This section illustrates the possible ways to quantify the effect of these benefits based on information collected during the interview process.

*Licensing And Maintenance Cost Savings*

The organization replaced its traditional backup method with vRanger Pro, leading to reduction in licensing and maintenance costs savings for new and existing virtual machines. The replacement only affected the virtual environment. The organization continues to use its prior backup method for its physical environment.

To calculate the savings, the organization estimated that from 570 virtual machines, 400 licenses were previously purchased, and the savings was only attributed to the maintenance costs. The remaining 170 licenses were for expected new virtual machine purchases at a cost of \$800 per license. The maintenance cost is estimated at 20% of sales prices (\$800\*20%). Table 9 presents this calculation.

**Table 9: Licensing And Maintenance Cost Savings**

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
F1	Number of existing VMs		400	400	400
F2	Maintenance costs on existing licenses	20%*\$800	\$160	\$160	\$160
F3	Number of new VMs		170	170	170
F4	License cost for new VMs		\$800	\$0	\$0
F5	Maintenance costs on new licenses	20%*\$800	\$0	\$160	\$160
Ft	Direct cost avoidance	$(F1 * F2) + (F3 * (F4 + F5))$	\$200,000	\$91,200	\$91,200

Source: Forrester Research, Inc.

### *IT Staff Productivity Gain*

When it came time to upgrade the traditional backup application, every system engineer was involved. The team would need to schedule the upgrade during an available maintenance window — typically over the weekend. However, the upgrades have failed on multiple occasions, forcing the organization to postpone and delay other projects. While the failed upgrades did not cause production outages, the production environment did not get backed up during these upgrade failures. The organization was therefore exposed to risk of data loss during this timeframe.

By implementing vRanger Pro, the organization eliminated upgrade failures and allowed four engineers to contribute their time to other projects. To calculate this benefit, we estimate that an engineer allocated 40 hours per week and three engineers allocated 20 hours per week for three weeks per year. With a fully-loaded hourly rate of \$60.1 (annual fully loaded salary of \$125,000/2080 hours per year), IT staff productivity gain is \$18,029  $[(1 * 40 + 3 * 20) * 60 * 3]$ . Table 10 presents this calculation.

**Table 10: IT Staff Productivity Gain**

Ref.	Metric	Calculation	Per period
G1	Number of engineers (full-time contribution)		1
G2	Number of engineers (part-time contribution)		3
G3	Hours per weeks contributed (full-time)		40
G4	Hours per week contributed (part-time)		20
G5	Hourly rate per worker	(125000/2080)	\$60
G6	Number of weeks		3
Gt	Incremental output per worker	$(G1*G3+G2*G4)*G5*G6$	\$18,029

Source: Forrester Research, Inc.

### *Improvement In Time To Server Recovery*

As discussed previously, because the organization relies on MSMQ for system-to-system message queuing, it is critical that when a server is restored, it maintains its SID to preserve the queues. This is not the case with original backup methods. In addition, the traditional backup method provided a file-level recovery. Vizioncore's vRanger Pro can maintain SIDs and provides system-level restore.

As the organization's virtual environment matures, the need for system-level recovery increases. The MSMQ infrastructure consists of 12 servers with 100 queues each; these are message queues for anything from credit card transactions to sales orders. Prior to the vRanger Pro implementation, it would take at least two days to update all the queues because SIDs had not been maintained. Two days to recover systems was unacceptable to the business. After the vRanger Pro implementation, the recovery process was nearly instantaneous. To calculate this benefit, we assume a fully-loaded hourly rate of \$60 for every engineer participating in the two-day recovery effort ( $12*60*16*100\%$ ). Table 11 illustrates this calculation.

**Table 11: Improvement In Server Time To Recovery**

Ref.	Metric	Calculation	Per Period
H1	Number of servers		12
H2	Hourly rate per engineer		\$60
H3	Number of hours (saved)		16
H4	Percent captured		100%
Ht	Improvement in server restoration productivity (MS Queue)	$H1*H2*H3*H4$	\$11,520

Source: Forrester Research, Inc.

*Total Benefits*

Table 12 demonstrates the total benefits resulting from the implementation of vRanger Pro for the representative organization.

**Table 12: Total Benefit — Non-Risk-Adjusted**

Benefits	Year 1	Year 2	Year 3	Total	Present value
Licensing and maintenance cost savings	\$200,000	\$91,200	\$91,200	\$382,400	\$325,710
IT staff productivity gain	\$18,029	\$18,029	\$18,029	\$54,087	\$44,835
Improvement in server time to recovery	\$11,520	\$11,520	\$11,520	\$34,560	\$28,649
Total benefits	\$229,549	\$120,749	\$120,749	\$471,047	\$399,194

Source: Forrester Research, Inc.

**Risk**

Risk is the third component within the TEI model; it is used as a filter to capture the uncertainty surrounding different cost and benefit estimates. If a risk-adjusted ROI still demonstrates a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as “realistic” expectations, since they represent the expected values considering risk. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates.

For the purpose of this analysis, Forrester risk-adjusts cost and benefit estimates to better reflect the level of uncertainty that exists for each estimate. 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.

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 the 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 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 result, offers a more accurate projection of the return on investment.

The following *general* management and process risk was considered in this study:

- One of the drivers for implementation of vRanger Pro was the necessity to reduce server recovery from two days to near instantaneous and to eliminate any disruption to the business side. The vendor conducted a proof of concept to confirm recovery capabilities and times.

## The Total Economic Impact™ Of Vizioncore vRanger Pro

The following risk specific to vRanger Pro was considered in this study:

- The product scalability and flexibility to meet various IT environments was considered in the case of an acquisition.
- The product is hardware-independent and hardware costs vary.
- The reduction in IT staff productivity gain could vary.

The following tables show the values used to adjust for uncertainty in cost and benefit estimates. Different cost and benefits estimates have different levels of risk adjustments. Based on the comments from the interviewed customer, we applied risk to all benefit categories to adjust for any uncertainty but only applied risk to the implementation cost categories. Forrester used list prices for all software licensing, maintenance fees, and hardware costs. The implementation cost typically poses the greatest uncertainty. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

**Table 13: Total Costs — Risk-Adjusted**

Costs	Initial	Year 1	Year 2	Year 3	Total	Present value
Software license fees	\$55,888				\$55,888	\$55,888
Software maintenance costs (yearly)			\$11,200	\$11,200	\$22,400	\$17,671
Hardware costs	\$24,000				\$24,000	\$24,000
Administrative costs		\$12,000	\$12,000	\$12,000	\$36,000	\$29,842
<b>Total</b>	<b>\$79,888</b>	<b>\$12,000</b>	<b>\$23,200</b>	<b>\$23,200</b>	<b>\$138,288</b>	<b>\$127,401</b>

Source: Forrester Research, Inc.

**Table 14: Total Benefits — Risk-Adjusted**

Benefits	Year 1	Year 2	Year 3	Total	Present value
Direct cost avoidance	\$200,000	\$91,200	\$91,200	\$382,400	\$325,710
Incremental output per worker	\$16,226	\$16,226	\$16,226	\$48,678	\$40,352
Improvement in server restoration productivity	\$11,520	\$11,520	\$11,520	\$34,560	\$28,649
<b>Total</b>	<b>\$227,746</b>	<b>\$118,946</b>	<b>\$118,946</b>	<b>\$465,638</b>	<b>\$394,710</b>

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).

vRanger Pro includes a VSS driver that utilizes the Microsoft Volume Shadow Copy Service to pause application writes. This feature will enable quiescing of supported databases to provide a consistent file system backup image that can be used to recover the application as well as the image.

## TEI Framework: Summary

Considering the financial framework constructed above, the results of the costs, benefits, risk, and flexibility sections using the representative numbers can be used to determine a return on investment, net present value, and payback period. Tables 15 and 16 present the risk-adjusted value after applying the risk-adjusted method indicated in the risk section.

It is important to note that values used throughout the TEI Framework are based on in-depth interviews with an organization and the resulting composite organization built by Forrester. 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 vRanger Pro.

**Table 15: Summary Financial Non-Risk-Adjusted Cash Flow**

Category	Initial	Year 1	Year 2	Year 3	Total	Present value
Total costs	(\$79,888)	(\$12,000)	(\$23,200)	(\$23,200)	(\$138,288)	(\$127,401)
Total benefits		\$229,549	\$120,749	\$120,749	\$471,047	\$399,194
Total (non-risk-adjusted)	(\$79,888)	\$217,549	\$97,549	\$97,549	\$332,759	\$271,792
Return on investment	213%					
Payback period (months)	4					

Source: Forrester Research, Inc.

**Table 16: Summary Financial Risk-Adjusted Cash Flow**

Category	Initial	Year 1	Year 2	Year 3	Total	Present value
Total costs	(\$79,888)	(\$12,000)	(\$23,200)	(\$23,200)	(\$138,288)	(\$127,401)
Total benefits		\$227,746	\$118,946	\$118,946	\$465,638	\$394,710
Total (risk-adjusted)	(\$79,888)	\$215,746	\$95,746	\$95,746	\$327,350	\$267,309
Return on investment	210%					
Payback period (months)	4					

Source: Forrester Research, Inc.

## Study Conclusions

Based on information collected in interviews with Schwan's, Forrester found that organizations can realize benefits in the form of reduction in licensing and maintenance costs related to the traditional backup method, as well as IT engineer productivity gain, and improvement in server restoration.

The financial analysis provided in this study illustrates the potential way an organization can evaluate the value proposition of vRanger Pro. Based on information collected in a series of in-depth customer interviews, Forrester calculated a three-year risk-adjusted ROI of 210% for the composite organization with a payback period of four months. All final estimates are risk-adjusted to incorporate potential uncertainty in the calculation of costs and 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 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 net present value of cash flows.

**Payback period:** The breakeven point for an investment, or 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. 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.

### **Example Table**

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

Source: Forrester Research, Inc.