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Total Economic Impact™ Of Perceptive Software's ImageNow

Project Director: Jonathan Lipsitz

Contributor: Lauren Hughes



Headquarters

Forrester Research, Inc., 400 Technology Square, Cambridge, MA 02139 USA
Tel: +1 617/613-6000 • Fax: +1 617/613-5000 • www.forrester.com

TABLE OF CONTENTS

Executive Summary	3
Purpose	3
Methodology.....	3
Approach.....	4
Key Findings	4
Disclosures.....	5
ImageNow: Overview	6
Analysis.....	6
Interview Highlights.....	6
TEI Framework	8
Costs	9
Benefits	14
Risk.....	22
Flexibility.....	25
TEI Framework: Summary.....	25
Study Conclusions.....	27
Appendix A: Composite Organization Description	29
Appendix B: Total Economic Impact Overview	30
Appendix C: Glossary.....	31

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Executive Summary

In October 2007, Perceptive Software commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) that might be realized by enterprises that deploy ImageNow. ImageNow is an enterprise document management solution that makes digital versions of documents available at the appropriate steps in a business process. This study illustrates the financial impact of moving from a filing cabinet and paper-based, manual process to an electronic solution using workflow to route digital versions of documents.

Forrester found through in-depth interviews that four existing customers had achieved significant benefits, some easily measured for this ROI study, and others that are equally valuable but could not be quantified. The benefits fall into the following categories: 1) savings realized by reducing or redeploying employees; 2) increased worker productivity achieved by reducing the time required to find needed documents; 3) print and copy savings attributable to the electronic distribution and storage of documents; 4) space savings resulting from the reduced need to store physical documents; 5) improved customer and employee satisfaction arising from more timely access to information; 6) enhanced ability to disseminate and share information; 7) business transformation and culture shift; and 8) ease of implementation and usability.

The four customers interviewed were able to provide metrics by which the components of the first four benefits could be quantified. Forrester found among the interviewed customers that had deployed ImageNow an anticipated return on investment (ROI) of between 197% and 255%.

Purpose

The purpose of this study is to provide readers with a framework for evaluating the potential financial impact of ImageNow 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 Perceptive Software's ImageNow.

Methodology

Perceptive Software selected Forrester for this project because of its industry expertise in enterprise document management and Total Economic Impact™ (TEI) methodology. TEI not only measures costs and cost reduction (areas typically accounted for within IT), but also weighs the enabling value of a technology with respect to increasing the overall effectiveness of business processes.

For this study, Forrester employed in the modeling of ImageNow four fundamental elements of TEI.

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

Given enterprises' increasing sophistication with regard to 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. See Appendix B for details of the TEI methodology.

Approach

Forrester used a five-step approach for this study.

1. Gather data from existing Forrester research relative to ImageNow and the document/content management solution space.
2. Interview Perceptive Software marketing and sales personnel to fully understand ImageNow's potential (or intended) value proposition.
3. Conduct a series of in-depth interviews with four organizations currently using ImageNow.
4. Construct a financial model representative of the interviews (see the TEI Framework section below).
5. Create a composite organization based on the interviews and populate the framework using data from the interviews as applied to the composite organization.

Key Findings

Forrester's study yielded the following key findings.

- **ROI.** Forrester constructed on the basis of the interviews with the four existing customers a TEI framework for a composite organization (see Appendix A) and performed the associated ROI analysis to illustrate the areas of financial impact. As seen in Table 1, the risk-adjusted ROI for the composite organization is 197%, with a breakeven point (payback period) of thirteen months after deployment.
- **Benefits.** For purposes of the ROI analysis, only benefits associated with employee savings, productivity gains, reduced printing and copying, and reduced physical storage were quantified. The risk-adjusted, present value of the benefits for the composite organization amount to \$6,919,850 over a four-year period.
- **Costs.** Implementing ImageNow can be a small or large undertaking depending on how many departments are to use the solution. The costs enumerated in this study are for a large, complex implementation. Most of the costs are for ImageNow licenses and the employees needed to manage and expand the solution. The risk-adjusted, present value of the costs for the composite organization amount to \$2,330,405 over a four-year period.

Table 1 presents the original and risk-adjusted financial results 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 attends estimating the costs and benefits of a technology investment. The risk-adjusted value is meant to provide a conservative estimation that incorporates any potential risk factors that might later affect the original cost and benefit estimates. For an in-depth explanation of risk and risk adjustment as used in this study, see the Risk section.

Table 1: Composite Company ROI, Original, And Risk-Adjusted

Summary financial results	Unadjusted (best case)	Risk-adjusted
ROI — four-year	255%	197%
Payback (months)	Eight	Thirteen
Total four-year costs (PV)	\$2,201,335	\$2,330,405
Total four-year benefits (PV)	\$7,816,175	\$6,919,850
Total four-year net savings (NPV)	\$5,614,840	\$4,589,445
Internal rate of return (IRR)	259%	208%

Source: Forrester Research, Inc.

Forrester found higher ROIs to be associated with companies that had more users of ImageNow. This results from workloads being reduced by faster business processes and the elimination of some activities altogether. The companies interviewed for this study were variously able to eliminate positions, redeploy employees, avoid additional hires, and reduce headcount (by from 5 to 30 positions) through retirement and attrition.

Interviewed companies that relied heavily on physical documents being passed to multiple users in a business process realized greater benefits including shorter process times, improved ability to readily answer queries, and reduced cost of copying and printing reports. A typical example of a business process that was greatly improved is matching vendor invoices against internal documents that describe the services provided. The process was largely automated, with employees handling only exceptions.

Disclosures

The reader should be aware of the following:

- The study is commissioned by Perceptive Software and delivered by Forrester Consulting.
- Perceptive Software 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 Perceptive Software.
- Forrester makes no assumptions about the potential return on investment that other organizations might realize. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in ImageNow.
- This study is not meant to be used as a competitive product analysis.

ImageNow: Overview

According to Perceptive Software, ImageNow was created as an enterprise document management, imaging and workflow solution to help business workers efficiently capture and organize virtually any document type, then route and retrieve a precise page with a single click from within any business application at the moment it's needed. ImageNow provides organizations in a variety of industries worldwide with instant access to digitized versions of paper and other electronic documents from any existing software application.

ImageNow extends the functionality of business systems by bringing context to unstructured documents including printed documents and electronic objects like emails, faxes, and electronic data feeds. The technology supports simple and seamless integration of ImageNow with existing business applications without writing a single line of code. Deployment time is consequently measured in weeks rather than months or years.

Analysis

As stated in the Executive Summary, Forrester employed a multistep approach to evaluate the effect of implementing ImageNow on an organization.

- Interview Perceptive Software marketing and sales personnel.
- Interview, in-depth, four organizations that are currently using ImageNow.
- Construct a common financial framework for the implementation of ImageNow.
- Construct a composite organization based on characteristics of the interviewed organizations.

Interview Highlights

At the time of the interviews, each of the following interviewed organization was an ImageNow customer:

1. **University of Minnesota.** A large, state-run university with more than 1,000 users of ImageNow including 500 who use it daily.
2. **Illinois Mutual.** A financial services organization with 175 (including 80 full-time) .
3. **Assante Health System.** A not-for-profit healthcare network consisting of multiple hospitals and other healthcare facilities with more than 800 regular and more than 250 full-time users.
4. **Piggly Wiggly Carolina Company.** A regional, 100+ store grocery chain with 40 full-time and 460 part-time users of ImageNow in the corporate offices and grocery stores.

The in-depth interviews with Perceptive Software customers yielded a number of important insights.

- The reason most cited for implementing ImageNow was to streamline poor business processes responsible for long delays and employee frustration. Other reasons given

included a need for improved records retention and disaster recovery capabilities in the event that physical documents were destroyed, and a desire to reduce printing costs.

- Two customers remarked that the ease with which an ImageNow proof of concept (POC) or demo could be completed had helped to close the deal. One interviewee observed that information was “up and running in a demo in 15 minutes.”
- All four of the companies interviewed had taken a phased approach to rolling out ImageNow. Two had completed several POCs as part of the rollout process. On average, the companies completed two to three departments in the first year, and spread out from there. One company reported that it was easy to get additional departments interested in the early days, but required more “selling” to get the remaining ones involved because the need was not as apparent.
- Three customers stated that easy integration with their back-end systems was a major factor in selecting ImageNow, and in the overall success of the project.
- Three of the companies interviewed had no other content management solution in place before implementing ImageNow. These companies moved around vast numbers of physical documents and had numerous filing cabinets and warehouses filled with documents. One company reported having to physically distribute 1,000 pieces of mail each day.
- Companies took different approaches to scanning documents. One set up a central scanning group to handle new documents arriving by mail and back-scan 200,000 files. The remaining companies adopted the more decentralized approach of installing fax machines throughout their organizations.
- Two companies cited as an important benefit of ImageNow improved regulatory compliance (especially with the Health Information Portability and Accountability Act (HIPAA) and information retention regulations).
- End user training was an important component of all four companies' rollouts of ImageNow. User training was conducted by company employees, not ImageNow consultants. Reported one company: “People were scared to death the first couple of days. Training and support reduced the fear.”
- All four customers said their users would not give up ImageNow and go back to the old, manual way of operating. One company stated that “97% of the users would say no way would they go back.” Another maintained that “departments would fight tooth and nail before they would let you take ImageNow away from them.”
- Several of the customers mentioned the quality of support and consulting delivered by the ImageNow team and its helpfulness in getting the product up and running. Observed one customer: “We told ImageNow what we needed and they helped us get there through workflow.” Another customer reported receiving “excellent support from ImageNow.”
- All companies praised ImageNow's ease of implementation and ongoing operation. Ongoing internal support and additional rollout efforts ranged from one part-time person focused purely on technical issues to a team of four dealing with technical support as well as process re-engineering for new implementations.

TEI Framework

Introduction

Forrester used the information provided in the in-depth interviews by the organizations considering implementing ImageNow to construct a TEI framework to identify the costs, benefits, flexibility, and risk factors associated with the investment decision.

Composite Organization

The interviews with the four existing customers provided by Perceptive Software were the basis not only for the TEI framework, but also for Forrester's construction of a composite company and associated ROI analysis that illustrates the areas affected financially. The composite organization Forrester synthesized from these results, a US-based bank with 150 branches and approximately 2,000 employees, has many disparate systems that support various business processes and, prior to implementing ImageNow, operated by moving paper files and reports among the various parts of the organization.

This study illustrates the financial impact of moving from a paper based solution to one that involves converting documents to digital form and using workflow to distribute them throughout the organization. The composite organization implemented ImageNow over a three year period and, in year four of the study, maintained the existing deployment. See Appendix A for details of the composite organization.

Framework Assumptions

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

Table 2: General Assumptions

Ref.	General assumptions	Value
A1	Discount rate	10%
A2	Length of analysis	Four years

Source: Forrester Research, Inc.

Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are encouraged to consult with finance to determine the most appropriate discount rate to use for their organizations.

Table 3 provides salary assumptions used for this analysis. The generic employee represents an average across a wide range of roles in the composite organization.

Table 3: Salary Assumptions

Ref.	Metric	Calculation	Value
B1	Fully burdened salary* per IT employee (Year 1)	[Increases 3% annually]	\$80,000
B4	Fully burdened salary* per generic employee (Year 1)	[Increases 3% annually]	\$50,000

*Includes salary, variable compensation, and all direct benefits (e.g., health insurance)

Source: Forrester Research, Inc.

Several of the cost and benefit calculations are based on the number of ImageNow users shown in Table 4. Users were divided into two categories, full-time and part-time. Full-time users rely on ImageNow throughout the day as they perform their basic duties. An example might be someone in accounts payable who reviews invoices. Part-time users might use ImageNow to access documents a couple of times per day or less. A branch manager who accesses a daily report would be a part-time user.

Users were added as the solution was rolled out to various departments. The timing of the rollout schedule below is based on the type of phased rollout described by the four customers interviewed for the study.

- Initial/Year 1 — Accounts payable pilot, expand to all of accounting and loan administration.
- Year 2 — Mortgage origination and underwriting and customer service.
- Year 3 — Individual branches, human resources, and independent agents and brokers; previous rollouts expanded.

Table 4: User Assumptions

Ref.	Metric	Initial	Year 1	Year 2	Year 3	Year 4	Total
C1	Number of "full-time" users added	60		45	150	0	255
C2	Number of "part-time" users added	65		80	300	0	445

Source: Forrester Research, Inc.

Costs

This section describes the overall costs of implementing and operating ImageNow.

Initial Implementation Costs

The composite organization's IT department had various responsibilities associated with the initial implementation. These included upfront analysis and planning, identifying security implications and solutions, installing necessary hardware, setting up networks, working with ImageNow consultants and attending product training sessions, and configuring back-end systems to work with ImageNow.

In total, two full-time equivalent (FTE) employees spent three months working on the initial implementation. The fully burdened annual salary per IT employee is \$80,000 in the initial period of the study, or approximately \$6,667 per month. The resulting implementation labor cost is equal to two FTEs x \$6,667 per month x 3 months, or \$40,000. This is in line with the amount of effort expended by the four customers interviewed for the study.

Table 5: Initial Implementation Costs, Non-Risk-Adjusted

Ref.	Metric	Calculation	Initial
D1	Number of full-time equivalent (FTE) employees		2
D2	Monthly fully burdened cost	B1 / 12 months	\$6,667
D3	Number of months		3
Dt	Initial implementation costs	D1 * D2 * D3	\$40,000

Note: Calculations in this and all tables might be off by several dollars because of rounding.

Source: Forrester Research, Inc.

Licenses and Maintenance

The ImageNow solution can involve different types of licenses and various add-ons. These options and the timing of implementation are unique to each organization and reflect the problems the organization is trying to solve. Readers should develop a detailed understanding of the various licenses and add-ons and apply this to the needs of their organizations to arrive at potential licensing costs.

The licensing costs described in this study depict a fairly extensive, enterprise-wide deployment. Types and timing of licenses and add-ons are based on the composite organization's description and rollout plan. Owing to the complexity of the pricing model, not all details are described in this study.

There are two basic types of licenses: ImageNow for full-time, power users; WebNow for part-time users. Both types of licenses are based on concurrent users. The assumption that an organization will require one ImageNow license for each full-time user, which is typical, is used in this study. An organization that has shift workers might be able to use one ImageNow license for multiple full-time users. On average, three part-time users can share one WebNow license, which ratio is used for this study. One of the interviewed customers managed to have five part-time users per WebNow license.

Additional modules for ImageNow include capture (e.g., scan, fax) agents for document ingestion, Enterprise Report Management and a Document Management Suite for more complex uses, and various output agents. One or more of the following add-ons were incorporated during years one through three of the study:

- Initial/Year 1 — CaptureNow, ImageNow, Fax Agent, Mail Agent, ImageNow Printer, and iScript.

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- Year 2 — CaptureNow, Report Server, Output Agent — PDF, Output Agent, ERM Department Server, and Document Control Suite.
- Year 3 — CaptureNow, Recognition Agent, and Content Server.

Owing to its size, the composite organization implementation also required a Test Environment license. Smaller deployments can manage without this license.

Maintenance, charged at the time licenses are purchased, is based on 18% of all licenses purchased to date, excluding the Test Environment license. In Year 4, there are only maintenance charges because the composite organization is operating the solution as deployed through Year 3 without additional users or services.

Table 6: License And Maintenance Costs, Non-Risk-Adjusted

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3	Year 4
E1	ImageNow concurrent licenses added	=C1	60		45	150	
E2	WebNow concurrent licenses added	=C2 / 3	22		27	100	
E3	Cost per license		\$1,080		\$1,080	\$1,080	
E4	Total basic license costs	(E1 + E2) * E3	\$88,200		\$77,400	\$270,000	
E5	Additional module licenses		\$22,980		\$68,980	\$41,485	
E6	Test environment license		\$11,649		\$11,649	\$11,649	
E7	Maintenance percentage		18%		18%	18%	18%
E8	Maintenance	(Sum E4 + Sum E5) [through current year] * E7	\$20,012		\$46,361	\$102,428	\$102,428
Et	Licenses and maintenance	E4 + E5 + E6 + E8	\$142,841		\$204,390	\$425,562	\$102,428

Source: Forrester Research, Inc.

Hardware Costs

Because ImageNow uses metadata to locate and retrieve documents stored in the system from their respective repositories, there is not a great need for high end servers or additional storage.

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A typical implementation consists of a production server and testing/staging server. An existing, third server is typically used for disaster recovery and backup of the production server. An additional, larger server was added in Year 2 of the study to host the Record Management Solution. In Year 4, the original servers were replaced based on a typical three-year life cycle. Enough additional storage area network (SAN) space was added in Year 1 to accommodate future ImageNow growth.

In addition to the hardware needed to run the solution, the composite organization added high end scanners to support the centralized scanning facility and several other departments. If a reader's organization uses a more decentralized scanning model, these hardware costs and the CaptureNow license costs will be higher. Most of these potential cost increases, however, are offset by the higher labor costs described in the Centralized Scanning costs section.

Table 7: Hardware Costs, Non-Risk-Adjusted

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3	Year 4
F1	Server cost		\$15,000	\$15,000	\$20,000	\$15,000	\$15,000
F2	Number of servers added		2	0	1	0	2
F3	Additional SAN costs		\$30,000				
F4	Scanner cost		\$1,000	\$1,000	\$1,000	\$1,000	
F5	Number of scanners added		3	1	4	3	
Ft	Hardware costs	$(F1 * F2) + F3 + (F4 * F5)$	\$63,000	\$1,000	\$24,000	\$3,000	\$30,000

Source: Forrester Research, Inc.

Professional Services and Training

Because the ImageNow solution is relatively easy to implement and manage, there is not a great need for professional services compared to other IT implementations. All professional services are provided by ImageNow consultants, and work is typically completed in accordance with a fixed time/fixed price model. Planning, configuration, and implementation consulting comprise the majority of professional services provided.

ImageNow also provides training on how to manage the solution and how to train users. The composite organization received specialized training during the first three years of the study and managed user training in house.

Table 8: Professional Services And Training Costs, Non-Risk-Adjusted

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3	Year 4
G1	Number of consulting hours		160	226	80	245	50
G2	Hourly rate		\$200	\$200	\$200	\$200	\$200
G3	Training		\$2,590		\$6,580	\$5,485	\$0
Gt	Professional service and training	$(G1 * G2) + G3$	\$34,590	\$45,200	\$22,580	\$54,485	\$10,000

Source: Forrester Research, Inc.

Ongoing Operations

The ImageNow solution can be maintained with very few personnel. Among the customers interviewed, the number varied from one part-time individual to a team of four that also worked on process re-engineering. For the composite organization, a team of three individuals maintains the technical solution, works throughout the organization to do process re-engineering and implementation, and provides user training.

Table 9: Professional Services And Training Costs, Non-Risk-Adjusted

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3	Year 4
H1	Number of FTEs			3	3	3	3
H2	Annual fully burdened salary	= B1		\$80,000	\$82,400	\$84,872	\$87,418
Ht	Ongoing operations	$H1 * H2$		\$240,000	\$247,200	\$254,616	\$262,254

Source: Forrester Research, Inc.

Centralized Scanning

The composite organization established a centralized scanning department to deal with incoming mail and back-scanning of files. In Year 3, when the back-scanning operation was completed, the team was reduced by one employee. Additional scanning was undertaken in other departments.

Table 10: Centralized Scanning, Non-Risk-Adjusted

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3	Year 4
I1	Number of FTEs			3	3	2	2
I2	Annual fully burdened salary	= B2		\$50,000	\$51,500	\$53,045	\$54,636
It	Centralized scanning	I1 * I2		\$150,000	\$154,500	\$106,090	\$109,272

Source: Forrester Research, Inc.

Total Costs

Table 11 summarizes the cost to the composite organization of implementing and operating ImageNow.

Table 11: Total Costs Of ImageNow, Non-Risk-Adjusted

Ref.	Costs	Initial	Year 1	Year 2	Year 3	Year 4	Total	Present value
Dt	Initial implementation costs	\$40,000					\$40,000	\$40,000
Et	Licenses and maintenance	\$142,841		\$204,390	\$425,562	\$102,428	\$875,221	\$701,449
Ft	Hardware costs	\$63,000	\$1,000	\$24,000	\$3,000	\$30,000	\$121,000	\$106,488
Gt	Professional service and training	\$34,590	\$45,200	\$22,580	\$54,485	\$10,000	\$166,855	\$142,108
Ht	Ongoing operations		\$240,000	\$247,200	\$254,616	\$262,254	\$1,004,070	\$792,899
It	Centralized scanning		\$150,000	\$154,500	\$106,090	\$109,272	\$519,862	\$418,391
	Total	\$280,431	\$436,200	\$652,670	\$843,753	\$513,954	\$2,727,008	\$2,201,335

Source: Forrester Research, Inc.

Benefits

Because the four interviewed customers sought and realized benefits beyond those quantified in this ROI analysis, the first half of this section details the benefit calculations that go into the ROI analysis, and the second half describes the qualitative benefits not included in the ROI analysis.

The qualitative benefits are in some respects as valuable as the quantitative benefits and should be taken into consideration when analyzing the total return on investment offered by ImageNow.

Employee Savings

By greatly reducing the time taken by information intensive business processes like loan origination, accounts payable reconciliation, and so forth, the composite organization was able to reduce the total number of employees needed. These headcount savings were variously realized through attrition and by eliminating positions and avoiding additional hires.

Employee savings were realized in various departments across the composite organization. Accounting, loan administration, and mortgage benefited most. For the first three years of the study, the “FTEs saved” value used in the calculations might be less than the total headcount saved by the end of that year to reflect the savings over an entire year. These savings are in line with those reported by the four customers interviewed for this study. One customer eliminated 11 positions in the accounts payable department alone.

Table 12: Employee Savings, Non-Risk-Adjusted

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Year 4
J1	Number of FTEs saved		6	15	21	24
J2	Annual fully burdened salary	= B2	\$50,000	\$51,500	\$53,045	\$54,636
Jt	Employee savings	J1 * J2	\$300,000	\$772,500	\$1,113,945	\$1,311,264

Source: Forrester Research, Inc.

To help readers who might be considering deploying ImageNow for a subset of the functional areas and business process solutions included in this study relate the benefits to their organizations, the benefits have been broken out between the various departments of the composite organization. Some of these breakouts are based on specific drivers (e.g., FTEs saved); others are broader approximations that use percentage allocations based on the deployment schedule and findings from the interviews with the four existing customers. A reader should take into consideration how each benefit applies to their own organization, and which specific departments will realize benefits the most based upon unique challenges and opportunities.

Table 13: Employee Savings — Functional Breakout, Non-Risk-Adjusted

Functional Area	Year 1	Year 2	Year 3	Year 4
Accounting (total positions)	\$200,000 4	\$412,000 8	\$477,405 9	\$491,724 9
Loan Administration (total positions)	\$100,000 2	\$206,000 4	\$318,270 6	\$327,816 6
Mortgage (total positions)	\$0 0	\$154,500 3	\$318,270 6	\$382,452 7
Customer Service (total positions)	\$0 0	\$0 0	\$0 0	\$109,272 2
Branches (total positions)	\$0 0	\$0 0	\$0 0	\$0 0
HR (total positions)	\$0 0	\$0 0	\$0 0	\$0 0
Total (total positions)	\$300,000 6	\$772,500 15	\$1,113,945 21	\$1,311,264 24

Note: No benefit was realized in Branches because all users are part-time, e.g. looking up signature cards. HR did not realize a benefit because it is a small department compared to other areas and ImageNow is only used intermittently.

Source: Forrester Research, Inc.

Increased Worker Productivity

Besides eliminating positions, streamlined business processes improve worker productivity, freeing up time to complete additional work. Full-time users of ImageNow realized a 20% time savings. Because part-time users' business processes touch ImageNow only a couple of times per day or less, only a 5% time savings was seen across their workday. Maintained one interviewed customer: "There is no part of the company that has not benefited from productivity gains." Productivity gains enabled the composite organization to meet its growth objectives without incurring additional costs.

Employees for whom time is freed up typically do not use all of it productively. Some might be spent talking with colleagues, surfing the Internet, and in other such non-work related activities. To compensate for this, and for the general ambiguity of productivity benefit calculations, only 65% of the potential productivity gain was realized as a benefit in this study.

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Table 14: Increased Worker Productivity, Non-Risk-Adjusted

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Year 4
K1	Number of "full-time" users	= C1	60	105	255	255
K2	Percent productivity gain		20%	20%	20%	20%
K3	Number of "part-time" users	= C2	65	145	445	445
K4	Percent productivity gain		5%	5%	5%	5%
K5	Annual fully burdened salary	=B2	\$50,000	\$51,500	\$53,045	\$54,636
K6	Percent captured		65%	65%	65%	65%
Kt	Increased worker productivity	$(K1*K2*K5*K6)+(K3*K4*K5*K6)$	\$495,625	\$945,669	\$2,525,605	\$2,601,357

Source: Forrester Research, Inc.

Table 15: Increased Worker Productivity — Functional Breakout, Non-Risk-Adjusted

Functional Area	Year 1	Year 2	Year 3	Year 4
Accounting	\$198,250	\$189,134	\$454,609	\$468,244
(% allocated)	40%	20%	18%	18%
Loan Administration	\$297,375	\$378,268	\$959,730	\$988,515
(% allocated)	60%	40%	38%	38%
Mortgage	\$0	\$330,984	\$833,450	\$858,448
(% allocated)	0%	35%	33%	33%
Customer Service	\$0	\$47,283	\$126,280	\$130,068
(% allocated)	0%	5%	5%	5%
Branches	\$0	\$0	\$126,280	\$130,068
(% allocated)	0%	0%	5%	5%
HR	\$0	\$0	\$25,256	\$26,014
(% allocated)	0%	0%	1%	1%
Total	\$495,625	\$945,669	\$2,525,605	\$2,601,357
(% allocated)	100%	100%	100%	100%

Source: Forrester Research, Inc.

Print and Copy Savings

Working with files, documents, and reports in digital format can save a company substantial printing and copying costs. One interviewee eliminated more than 1.4 million printed pages per year. Another customer eliminated 19 weekly reports being sent to more than 100 locations. Yet another eliminated 700,000 photo copies per year, reduced the number of policy binders printed annually by 30,000, and removed desktop printers and some photocopiers.

The benefit calculation in this study includes only the costs of printing and copying, not the savings associated with reduced printer and photocopier equipment purchases. The per page cost includes paper, toner, and the allocated cost of the equipment. The composite organization avoided significant printing and copying costs by making nearly all management reports available in electronic format, eliminating the printing of mortgage and loan applications for internal use, and sharing documents electronically instead of mailing copies for review.

Table 16: Print and Copy Savings, Non-Risk-Adjusted

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Year 4
L1	Number of pages not printed		300,000	800,000	1,100,000	1,100,000
L2	Number of pages not copied		100,000	600,000	900,000	900,000
L3	Cost per page		\$0.025	\$0.025	\$0.030	\$0.030
Lt	Print and copy savings	$(L1 + L2) * L3$	\$10,000	\$35,000	\$60,000	\$60,000

Source: Forrester Research, Inc.

Table 17: Print and Copy Savings — Functional Breakout, Non-Risk-Adjusted

Functional Area	Year 1	Year 2	Year 3	Year 4
Accounting (total pages)	\$2,500 100,000	\$5,000 200,000	\$6,000 200,000	\$6,000 200,000
Loan Administration (total pages)	\$7,500 300,000	\$12,500 500,000	\$15,000 500,000	\$15,000 500,000
Mortgage (total pages)		\$15,000 600,000	\$18,000 600,000	\$18,000 600,000
Customer Service (total pages)		\$2,500 100,000	\$3,000 100,000	\$3,000 100,000
Branches (total pages)			\$16,500 550,000	\$16,500 550,000
HR (total pages)			\$1,500 50,000	\$1,500 50,000
Total (total pages)	\$10,000 400,000	\$35,000 1,400,000	\$60,000 2,000,000	\$60,000 2,000,000

Source: Forrester Research, Inc.

Storage Space Savings

All of the interviewed customers had a considerable amount of office space set aside for physical document storage. One customer had files going back to the 1880s that were in a state of advanced deterioration, and some also had costs associated with outsourced, offsite storage. Also cited by one customer as a benefit of storing files in electronic format is that there are “no more misplaced files.”

Only the savings associated with reduced office space used as storage is included in this benefit calculation. Space was freed up by the composite organization by back-scanning and destroying old documents and storing new documents and reports exclusively in electronic format. Had this space not been freed up, the composite organization would have had to add office space as the organization grew.

Table 18: Storage Space Savings, Non-Risk-Adjusted

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Year 4
M1	Reduced storage space (square feet)		500	1,500	2,000	2,250
M2	Annual cost per square foot		\$30	\$30	\$30	\$30
Mt	Storage space savings	M1 * M2	\$15,000	\$45,000	\$60,000	\$67,500

Source: Forrester Research, Inc.

Table 19: Storage Space Savings — Functional Breakout, Non-Risk-Adjusted

Functional Area	Year 1	Year 2	Year 3	Year 4
Accounting (% allocated)	\$4,500 30%	\$9,000 20%	\$10,800 18%	\$12,150 18%
Loan Administration (% allocated)	\$10,500 70%	\$18,000 40%	\$22,800 38%	\$25,650 38%
Mortgage (% allocated)	\$0 0%	\$18,000 40%	\$22,800 38%	\$25,650 38%
Customer Service (% allocated)	\$0 0%	\$0 0%	\$0 0%	\$0 0%
Branches (% allocated)	\$0 0%	\$0 0%	\$3,600 6%	\$4,050 6%
HR (% allocated)	\$0 0%	\$0 0%	\$0 0%	\$0 0%
Total (% allocated)	\$15,000 100%	\$45,000 100%	\$60,000 100%	\$67,500 100%

Note: Customer Service did not realize this benefit because this department did not generate significant paper documents prior to ImageNow. HR did not realize this benefit because the department continues to print and file necessary employee files.

Source: Forrester Research, Inc.

Total Quantified Benefits

Table 20 summarizes for the composite organization the total quantified benefits of using ImageNow.

Table 20: Total Quantified Benefits of ImageNow, Non-Risk-Adjusted

Ref.	Benefits	Year 1	Year 2	Year 3	Year 4	Total	Present value
Jt	Employee savings	\$300,000	\$772,500	\$1,113,945	\$1,311,264	\$3,497,709	\$2,643,691
Kt	Increased worker productivity	\$495,625	\$945,669	\$2,525,605	\$2,601,357	\$6,568,255	\$4,906,399
Lt	Print and copy savings	\$10,000	\$35,000	\$60,000	\$60,000	\$165,000	\$124,076
Mt	Storage space savings	\$15,000	\$45,000	\$60,000	\$67,500	\$187,500	\$142,009
	Total	\$820,625	\$1,798,169	\$3,759,550	\$4,040,121	\$10,418,464	\$7,816,175

Source: Forrester Research, Inc.

Table 21: Total Benefits — Functional Breakout, Non-Risk-Adjusted

Functional Area	Year 1	Year 2	Year 3	Year 4	Total
Accounting	\$405,250	\$615,134	\$948,814	\$1,032,754	\$3,001,952
Loan Administration	\$415,375	\$614,768	\$1,315,800	\$1,356,981	\$3,702,924
Mortgage	\$0	\$518,484	\$1,192,520	\$1,339,186	\$3,050,189
Customer Service	\$0	\$49,783	\$129,280	\$133,068	\$312,132
Branches	\$0	\$0	\$146,380	\$150,618	\$296,998
HR	\$0	\$0	\$26,756	\$27,514	\$54,270
Total	\$820,625	\$1,798,169	\$3,759,550	\$4,040,121	\$10,418,464

Source: Forrester Research, Inc.

Qualitative Benefits

Improved Customer And Employee Satisfaction

All of the interviewees described ways in which customer satisfaction had improved since implementing ImageNow. One stated that ImageNow has been “unbelievable for customer service” because the employees can answer customer questions immediately. A customer for which customer satisfaction had been the primary reason for implementing ImageNow, and that had been

able to reduce response times from several days to almost instantaneous, asked rhetorically: "How do you put a price on better customer service?"

ImageNow has also increased employee satisfaction at all four of the companies interviewed. One stated that employees "love the workflow and it has made their lives so much easier," another that employees "love it now and couldn't live without it." At a company that has used ImageNow to make reports available one day earlier, approximately 100 accounting staff no longer have to go into the office on weekends.

Greater Ability To Disseminate And Share Information

The ease with which documents in electronic formats can be disseminated and shared was a contributing factor in several of the quantified benefits. The total benefits, however, go beyond what was quantified. One company stated that it "can proliferate information to so many people so much easier" now, greatly reducing processing times and costs, which is especially important for companies with multiple locations. Another company that maintains that "information is at the fingertips of people from different departments; they have the information at the same time in different locations," explained that this is particularly useful when multiple individuals need to collaborate while looking at the same documents.

One company reported that its decision-making process has been greatly improved because "historical information is at their fingertips"; another averred that "from a management perspective, we can't overstate how helpful ImageNow has been."

Business And Cultural Transformation

All of the companies interviewed had rethought their business and re-engineered business processes as part of the rollout of ImageNow. One company indicated that it had "rethought the entire business as part of rolling out ImageNow"; another characterized the changes as "remarkable," maintaining that ImageNow has "totally transformed" several departments. Getting away from paper based processes and creating a more dynamic working environment has helped one customer's employees to view their roles differently and transformed the company culture.

Ease Of Implementation And Use

All of the interviewees cited ease of implementation, which translates into benefits being realized quickly, as one of the reasons they had chosen ImageNow. One interviewee stated that "benefits were realized right away." Another described a department that "went from chaos to well set up processes instantly," adding that "from the [employees'] point of view there was no change." "So user friendly, a piece of cake," is how another company characterized ImageNow.

Risk

Risk, the third component of the TEI model, is used as a filter to capture the uncertainty surrounding different cost and benefit estimates. A risk-adjusted ROI that still makes a compelling business case raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. Risk-adjusted numbers should be taken as "realistic" expectations because they represent the expected values when risk is taken into account. In general, risk affects costs by raising the original estimates and affects benefits by reducing the original estimates.

Each benefit and cost is assigned a “low,” “medium,” “high,” or “none” risk rating. The following benefits and costs were rated as low, medium, or high risk:

- **Initial implementation costs, low risk.** The duration and scope of the composite organization's initial implementation is in line with what a reader's organization should expect based on the interviews with the four existing customers.
- **Licenses and maintenance costs, medium risk.** As noted in the License and Maintenance cost section, the number of licenses required and add-ons needed to solve specific business problems can vary widely, so there is a likelihood that a reader's organization might incur greater total licensing costs.
- **Hardware costs, low risk.** All of the customers interviewed had the same basic server needs, and that is reflected in the costs for the composite organization. A reader's organization that adopts a more decentralized scanning model will probably have higher scanner hardware costs, but this increase would be offset by a decrease in the manpower cost for a centralized scanning department.
- **Professional services and maintenance, medium risk.** ImageNow professional services are generally delivered according to a fixed price model. A reader's organization that is implementing a greater number of add-ons will have a greater need for implementation and configuration professional services.
- **Ongoing operations costs, low risk.** The number of FTEs required for ongoing operations used in this study (e.g., three) is at the higher end of the range of what a reader's organization should expect and of what was reported by the four customers interviewed.
- **Centralized scanning costs, high risk.** A reader's organization that has an abundance of old documents that need to be scanned might require more employees for this function. The one customer interviewed that had a central scanning department had 10 employees engaged in this activity. The other three interviewees did little to no back-scanning.
- **Employee savings, high risk.** Headcount savings will vary widely from one reader's organization to another. Some may have a policy of not letting employees go, and a smaller rollout of ImageNow would result in fewer positions being eliminated.
- **Increased worker productivity, medium risk.** The productivity gains in this study are in the middle of the range of those reported by the interviewees. Employee productivity is highly dependent on the nature of the work.
- **Print and copy savings, low risk.** All of the companies interviewed for the study reported significant print and/or copy savings.
- **Storage space savings, low risk.** All of the companies interviewed greatly reduced the number of new documents that needed to be stored, and several reported greatly reducing the size of their physical archives.

For the purpose of this analysis, Forrester risk-adjusts cost and benefit estimates to better reflect the level of uncertainty associated with each. 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 these points.

For example, the risk associated with initial implementation costs is defined as “low.” This risk level was chosen because a reader’s organization will most likely not require more internal labor for the initial implementation. The original estimated cost is \$40,000. To calculate the risk-adjusted cost, the “most likely” scenario was set at 100% of cost, the “high” scenario at 110% of cost, and the “low” scenario at 100% of cost. The rounded mean of these three values is 103%. The resulting cost used in the risk-adjusted tables is \$41,200, or 103% of \$40,000.

The following tables show the values used to adjust for uncertainty in cost and benefit estimates. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Table 22: Risk Adjustments To Costs

Ref.	Risk adjustments to costs	Risk Scoring	Low	Most likely	High	Risk adjusted
N1	Initial implementation costs	Low	100%	100%	110%	103%
N2	Licenses and maintenance	Medium	100%	100%	120%	107%
N3	Hardware costs	Low	100%	100%	110%	103%
N4	Professional service and training	Medium	100%	100%	120%	107%
N5	Ongoing operations	Low	100%	100%	110%	103%
N6	Centralized scanning	High	100%	100%	130%	110%

Source: Forrester Research, Inc.

Table 23: Risk Adjustments To Benefits

Ref.	Risk adjustments to benefits	Risk Scoring	Low	Most likely	High	Risk adjusted
O1	Employee savings	High	50%	100%	100%	83%
O2	Increased worker productivity	Medium	70%	100%	103%	91%
O3	Print and copy savings	Low	90%	100%	105%	98%
O4	Storage space savings	Low	90%	100%	105%	98%

Source: Forrester Research, Inc.

Flexibility

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned by a future investment into a further business benefit. Flexibility would also be quantified when evaluated as part of a specific project (as described in detail in Appendix B).

The customers interviewed for this study are all looking at adding additional modules and rollouts to other parts of their organizations. Two customers are investigating Full Text searching, and several indicated a desire to integrate with more back end systems, in one case, to fully integrate with an ERP solution. Two customers expressed a desire to complete additional process re-engineering as ImageNow is deployed in new departments.

The composite organization has several flexibility options. It can continue to roll out to new departments and re-engineer those processes. It can also integrate additional document types and back-end systems. It can implement the following additional plug-ins and services: DataCapture for forms processing and automation; Interact plug-ins to MS Office, MS SharePoint and other casual user applications; and additional EDI integration. Finally, the composite organization can use ImageNow to make electronic documents readily available to outside users (e.g., scanned checks for customers). For the purposes of ROI analysis, these flexibility options were excluded from the calculations.

TEI Framework: Summary

Considering the financial framework constructed above, the results of the Costs, Benefits, and Risks sections can be used to determine a return on investment, net present value, and payback period. Table 24 and Table 25, below, show the risk-adjusted cost and benefit values, applying the risk-adjustment method indicated in the Risks section and the values from Table 22 and Table 23 to the numbers in Table 11 and Table 20, respectively.

TEI™ Of Perceptive Software's ImageNow

Table 24: Risk-Adjusted Costs

Ref.	Costs	Initial	Year 1	Year 2	Year 3	Year 4	Total	Present value
P1	Initial implementation costs	\$41,200					\$41,200	\$41,200
P2	Licenses and maintenance	\$152,840		\$218,697	\$455,351	\$109,598	\$936,487	\$750,551
P3	Hardware costs	\$64,890	\$1,030	\$24,720	\$3,090	\$30,900	\$124,630	\$109,683
P4	Professional service and training	\$37,011	\$48,364	\$24,161	\$58,299	\$10,700	\$178,535	\$152,055
P5	Ongoing operations		\$247,200	\$254,616	\$262,254	\$270,122	\$1,034,192	\$816,686
P6	Centralized scanning		\$165,000	\$169,950	\$116,699	\$120,199	\$571,848	\$460,230
Pt	Total	\$295,942	\$461,594	\$692,144	\$895,694	\$541,519	\$2,886,892	\$2,330,405

Source: Forrester Research, Inc.

Table 25: Risk-Adjusted Benefits

Ref.	Benefits	Year 1	Year 2	Year 3	Year 4	Total	Present value
Q1	Employee savings	\$249,000	\$641,175	\$924,574	\$1,088,349	\$2,903,098	\$2,194,264
Q2	Increased worker productivity	\$451,019	\$860,559	\$2,298,301	\$2,367,234	\$5,977,112	\$4,464,823
Q3	Print and copy savings	\$9,800	\$34,300	\$58,800	\$58,800	\$161,700	\$121,595
Q5	Storage space savings	\$14,700	\$44,100	\$58,800	\$66,150	\$183,750	\$139,169
Qt	Total	\$724,519	\$1,580,134	\$3,340,475	\$3,580,534	\$9,225,661	\$6,919,850

Source: Forrester Research, Inc.

It is important to note that values used throughout the TEI Framework are based on in-depth interviews with four existing ImageNow customers and the resulting composite organization built by Forrester. Forrester makes no assumptions about the potential return that might be realized by other organizations within their environments. Forrester strongly advises that readers use their own estimates within the framework provided in this study to determine the expected financial impact of implementing ImageNow.

Study Conclusions

Forrester's in-depth interviews with four ImageNow customers yielded several important insights.

- Benefits were realized in five general ways:
 1. Lower employee costs in terms of reduced headcount and increased productivity.
 2. Print, copy, and physical storage savings.
 3. Improved user satisfaction among customers and employees.
 4. Better decision making from broader, more timely access to information.
 5. The ability to transform the company through process re-engineering and a cultural shift focused on working faster and better.
- Financial benefits are directly related to the breadth of the ImageNow implementation in terms of the underlying systems and content repositories that are integrated and total number of users.
- There being many variables involved in defining the proper implementation for any organization with respect to add-ons and licenses types, readers applying this study to their organizations are advised to carefully assess their needs.

The financial analysis provided in this study illustrates one way an organization can evaluate the value proposition of Perceptive Software's ImageNow. Based on information collected in four in-depth customer interviews, Forrester calculated a four-year risk-adjusted ROI of 197% for the composite organization with a payback period of thirteen months. All final estimates are risk-adjusted to incorporate potential uncertainty in the calculation of costs and benefits.

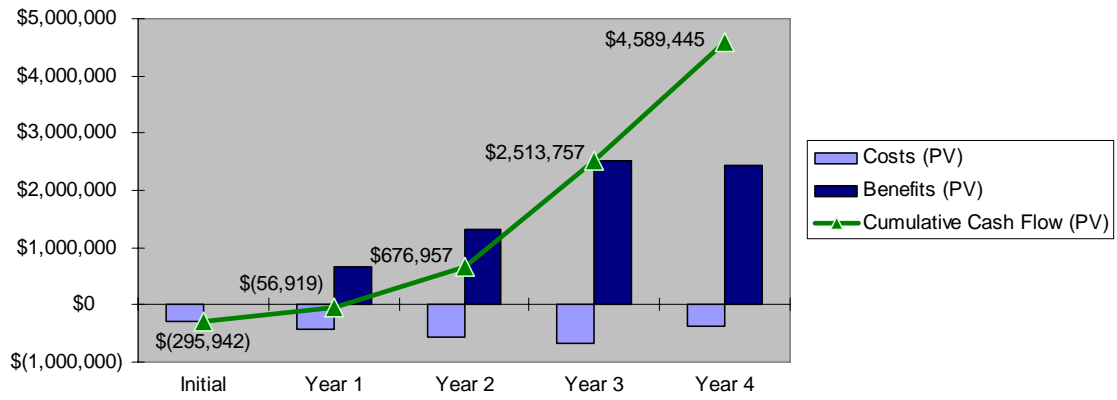
Table 26: ROI, Original And Risk-Adjusted

Summary financial results	Unadjusted (best case)	Risk-adjusted
ROI — four-year	255%	197%
Payback (months)	Eight	Thirteen
Total four-year costs (PV)	\$2,201,335	\$2,330,405
Total four-year benefits (PV)	\$7,816,175	\$6,919,850
Total four-year net savings (NPV)	\$5,614,840	\$4,589,445
Internal rate of return (IRR)	259%	208%

Source: Forrester Research, Inc.

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Chart 1: Summary Financial Results, Risk-Adjusted



Source: Forrester Research, Inc.

Appendix A: Composite Organization Description

For this TEI study, Forrester created a composite organization to illustrate the costs and benefits of using Perceptive Software's ImageNow solution. The composite company is intended to represent a Forbes 2000 retail banking company that provides individuals and companies with banking and investment services. The composite company is based on characteristics of the four interviewed ImageNow customers with respect to size, rollout approach, diversity of users and applications, and overall size of deployment.

The composite company has approximately 2,000 employees and a strong regional presence through 150 branches in a tri-state area. It also sells some of its investment solutions and accepts mortgage and commercial loan applications through independent agents and brokers.

The composite company has many disparate systems that manage various primary business processes like loan origination, collections, bank transaction management, treasury, and so forth as well as typical administrative operations like HR, AP/AR, and marketing, among other functions. Many of these processes feed into one another and require the sharing of vast quantities of information.

Prior to implementing ImageNow, most of this information could not be easily accessed by all users at the appropriate place in their business processes. The composite organization relied on printing, distributing, and storing paper documents. It received each week thousands of pieces of mail that needed to be sorted, catalogued, and distributed to the appropriate employees across many physical locations. Most documents were stored as hard copies in file rooms scattered across the headquarters location and branches, and some documents were stored on shared drives. All of this resulted in business processes that were quite slow and inquiry response times that could extend to a day or more.

The composite company's business plan was to grow by 25% in terms of branches and value of deposits. It realized that its existing business processes could barely support the current business and would definitely not scale to the anticipated growth, even if a lot more bodies were thrown at the problem. The company consequently evaluated several document management and workflow solutions, and decided to implement ImageNow.

The composite company built out a pilot during the "Initial" period, and then rolled out ImageNow across the organization. The rollout plan was as follows:

- Year 1 — Accounts payable pilot, expand to all of accounting and loan administration.
- Year 2 — Mortgage origination and underwriting and customer service.
- Year 3 — Individual branches, human resources, independent agents and brokers, and expand previous rollouts.

To the core ImageNow functionality, the composite organization has added optional modules including Enterprise Report Management, Fax Agent, CaptureNow, Mail Agent, and Recognition Agent.

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. 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 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 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. 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.