

A Forrester Total Economic  
Impact™ Study  
Commissioned By  
Citrix

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# The Total Economic Impact™ Of Citrix XenApp

Cost Savings And Business Benefits  
Enabled By Using Citrix XenApp

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### ABOUT FORRESTER CONSULTING

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## Executive Summary

Citrix commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) that enterprises may realize by deploying XenApp. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of XenApp on their organizations. Citrix XenApp helps organizations simplify the secure delivery of applications to users with disparate devices, locations, and even companies.

To better understand the benefits, costs, and risks associated with XenApp, Forrester interviewed an existing customer with multiple years of experience using XenApp. The organization manufactures and distributes physical products that are used globally in the shipping and transportation industry.

Prior to XenApp, the customer supported 10,000 users of SAP applications. The population of users needed to access SAP from increasingly mobile devices with various operating systems and browser versions. Keeping each device compatible with application server requirements became an onerous and expensive challenge. The IT manager told Forrester, “We didn’t see any value by having all of these GUIs installed locally on all of these devices when we could just have the GUI delivered via Citrix XenApp.”

“XenApp allows us to support applications to users across all kinds of devices, making the central IT organization more device agnostic. It also allows remote access that would otherwise require other software to be installed locally: VPN, for example,” the IT manager said. By using XenApp, the organization was able to avoid more than 30,000 desktop maintenance hours to update and maintain the client-side application configuration for the SAP users. Over three years, the savings to update and maintain user devices reached more than \$1.6 million.

**Citrix XenApp can help reduce the costs of providing access to enterprise applications, lower license costs for legacy apps, and improve secure access for third-party providers.**

**The benefits for the organization that Forrester interviewed are:**

- **Avoided cost of maintaining personal devices: \$1.6 million.**
- **Reduced costs of providing access to legacy applications: \$1.2 million.**
- **Avoided cost of providing VPN access for outsourcer: \$410,400.**

### CITRIX XENAPP REDUCES DESKTOP SUPPORT COSTS BY \$1.7 MILLION

Forrester’s interview with a XenApp customer found that the organization experienced the results shown in Figure 1. The financial analysis shows that the organization benefited from avoided costs of more than \$2.6 million compared with incurred costs of more than \$1.1 million. The final results are a net present value (NPV) of more than \$1.5 million.

**FIGURE 1**  
Financial Summary Showing Three-Year Risk-Adjusted Results



Source: Forrester Research, Inc.

- › **Benefits.** The organization experienced the following risk-adjusted benefits:
- **Reduced cost of enabling access to enterprise applications.** By delivering key enterprise applications via XenApp instead of installing applications on every desktop, the organization avoided thousands of hours maintaining and updating individual devices, saving more than \$1.6 million over three years.
  - **Consolidating licenses for legacy applications.** Prior to XenApp, the organization paid for licenses to enable many users to access to hundreds of legacy applications even though the users only occasionally used the apps. Via XenApp, the organization was able to only purchase licenses for the concurrent users for each app. The reduced cost totaled more than \$1.2 million over three years.
  - **Secure third-party access to enterprise systems.** The organization uses third parties, such as partners and contractors, to provide critical business functions, which requires critical system access. Rather than provide 800 simultaneous VPN connections and the required security policy administration, the organization uses XenApp to provide access to only the necessary applications, which results in a savings of \$410,400 over three years.
- › **Costs.** The organization experienced the following risk-adjusted costs:
- **Cost of XenApp.** The organization began with 300 licenses but expanded to 1,285 licenses by the end of the third year. In addition, it purchased three Citrix NetScaler appliances. The organization paid an annual maintenance cost of 22% on the XenApp licenses and NetScaler devices, entitling it to technical support and access to newer software releases. The cost over three years totaled more than \$1.1 million.
  - **Cost to implement XenApp.** Architecting and implementing Citrix XenApp required a team of three people for about six months, which resulted in an indirect cost of \$189,000.

## Disclosures

The reader should be aware of the following:

- › The study is commissioned by Citrix and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.
- › Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Citrix XenApp.
- › Citrix 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.
- › Citrix provided the customer names for the interview but did not participate in the interviews.

## TEI Framework And Methodology

### INTRODUCTION

From the information provided in the interviews, Forrester constructed a Total Economic Impact (TEI) framework for those organizations considering implementing Citrix XenApp. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision, to help organizations understand how to take advantage of specific benefits, reduce costs, and improve the overall business goals of winning, serving, and retaining customers.

### APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that Citrix XenApp can have on an organization (see Figure 2). Specifically, we:

- › Interviewed Citrix marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to XenApp and the marketplace for XenApp.
- › Interviewed an organization currently using Citrix XenApp to obtain data with respect to costs, benefits, and risks.
- › Constructed a financial model representative of the interview using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interview.
- › Risk-adjusted the financial model based on issues and concerns the interviewed organization highlighted in the interview. Risk adjustment is a key part of the TEI methodology. While the interviewed organization provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling Citrix XenApp's service: benefits, costs, flexibility, and risks.

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

**FIGURE 2**  
**TEI Approach**



Source: Forrester Research, Inc.

## Analysis

### INTERVIEW HIGHLIGHTS

Forrester interviewed an organization that manufactures and distributes physical products that are used in the shipping and transportation industry.

#### Situation

Prior to using Citrix XenApp, the organization was struggling to:

- › Keep personal computers updated with software, including operating systems, native business applications, and browser versions.
- › Support users who wanted to securely access enterprise applications using mobile devices.
- › Maintain licenses for hundreds of legacy applications that were each used by a small number of users.
- › Provide access to enterprise financial systems for 800 employees of a third-party contractor without compromising company security or customer data.

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*“In the past, we would go through a very painful upgrade process for devices.”*

~ IT director, interviewed company

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#### Solution

The organization implemented Citrix XenApp for three distinct use cases: 1) delivering SAP to 7,000 users across the enterprise; 2) supporting hundreds of legacy applications; and 3) providing access to outsourced employees who require access to enterprise systems. Because of the unique use cases of this company, the organization required only 1,285 perpetual, concurrent licenses to support 7,000 users, which is an unusually low ratio of licenses to users. Citrix normally recommends concurrent licenses for 80% of named users, but this organization operated at only 15%.

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*“There was no reason to keep a local copy of SAP installed on personal devices.”*

~ IT director, interviewed organization

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#### Results

The interview revealed that using Citrix XenApp:

- › **Lowered the maintenance costs for individual devices.** The organization successfully migrated most of its 10,000 users from native applications to XenApp and avoided the cost of maintaining, updating, and repairing the same number of personal computers. By accessing enterprise applications using Citrix XenApp, the organization was easily able to allow employees to access applications with mobile devices, which are a growing demand for the information technology leaders.
- › **Reduced the number of licenses required to maintain access to hundreds of legacy applications.** The organization has hundreds of legacy applications that are business critical yet only have a limited set of users. By using XenApp, the organization reduced the cost for licenses to legacy applications.
- › **Enabled outsourcing providers to securely access enterprise systems.** The organization outsources much of its finance operations, which requires access by hundreds of third-party contractors. Using XenApp enables the organization to allow secure remote access without managing the security profiles of the hundreds of external employees.

## BENEFITS

The organization was able to reduce costs in three ways:

- › Enabling access to enterprise applications.
- › Consolidating licenses for legacy applications.
- › Providing secure access for third-party providers.



### Reduced Cost Of Enabling Access To Enterprise Applications

The organization had a total of 10,000 users who required access to its enterprisewide implementation of SAP. Each year, the organization migrated a portion of users away from using client applications to Citrix XenApp. The organization told Forrester that on average, each device running native clients required 3 hours of configuration or updates to the operating system and browsers, just to repair user errors. By the end of three years, 7,000 of the 10,000 users had been migrated to XenApp, which resulted in an avoided cost of more than 30,000 hours to provide maintenance and updates. At a cost per hour of \$45, the savings over three years totaled more than \$1.8 million.

Forrester risk-adjusted this benefit downward by 10% to account for the number of users running native client applications and for the relatively high cost of maintaining end user devices. The risk-adjusted benefit totaled more than \$1.6 million over three years.

**TABLE 1**  
**Reduced Cost Of Enabling Access To Enterprise Applications**

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Users migrated from native client app to XenApp each year		2,000	2,500	2,500
A2	Cumulative users migrated		2,000	4,500	7,000
A3	Avoided hours updating and maintaining native application environment	A2 * 3 hours	6,000	13,500	21,000
A4	Average cost per hour for desktop maintenance services	\$45/hour	\$45	\$45	\$45
At	Reduced cost of enabling access to enterprise applications hosted on XenApp	A3*A4	\$270,000	\$607,500	\$945,000
	Risk adjustment		↓ 10%		
Atr	Reduced cost of enabling access to enterprise applications hosted on XenApp (risk-adjusted)		\$243,000	\$546,750	\$850,500

Source: Forrester Research, Inc.



### Consolidating Licenses For Legacy Applications

A secondary benefit realized by the organization is access to hundreds of legacy applications that are used periodically by a small number of users. Rather than providing licenses to the entire population of users, the organization is able to negotiate and pay only for a smaller number of concurrent licenses.

Over the three years, the organization reduced its number of legacy applications from 100 in Year 1 to 75 in Year 2 and 50 in Year 3. With an average license savings of \$6,000 per application, the total savings over three years was more than \$1.3 million.

Because other organizations will have different numbers of legacy applications with varying license costs, Forrester risk-adjusted this benefit down by 10%, resulting in a risk-adjusted, three-year savings of more than \$1.2 million. See the section on Risks for more detail.

**TABLE 2**  
**Consolidating Licenses For Legacy Applications**

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Number of legacy applications supported		100	75	50
B2	Average avoided licensing cost per legacy application		\$6,000	\$6,000	\$6,000
Bt	Consolidating licenses for legacy applications	B1*B2	\$600,000	\$450,000	\$300,000
	Risk adjustment		↓ 10%		
Btr	Consolidating licenses for legacy applications (risk-adjusted)		\$540,000	\$405,000	\$270,000

Source: Forrester Research, Inc.





### Reduced Cost Of Providing Secure Access For Third-Party Providers

The organization outsources a significant amount of its finance operations, which requires access to enterprise systems for the provider. Without using Citrix XenApp to give the outsourcer access, the organization would need to implement and maintain 800 simultaneous VPN connections and manage the security policies that would be required when giving a third party access to company data. The cost of providing the VPN connections and managing the security policies totals \$456,000 over three years. Although not quantified in this study, the potential liability of security breaches can cost millions to remediate in today's market.

Forrester risk-adjusted this benefit down by 10% to account for the likelihood that readers have also outsourced primary functions of their company. This resulted in a risk-adjusted, three-year total benefit of \$410,400.

**TABLE 3**  
Reduced Cost Of Providing Access For Third-Party Providers

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	VPN equipment license		\$60,000			
C2	VPN equipment maintenance	C1 * 20%		\$12,000	\$12,000	\$12,000
C3	½ full-time equivalent (FTE) to manage VPN	½ * \$120,000		\$60,000	\$60,000	\$60,000
C4	½ FTE to manage security	½ * \$120,000		\$60,000	\$60,000	\$60,000
Ct	Reduced cost of providing access for third-party providers	C1+C2+C3+C4		\$132,000	\$132,000	\$132,000
	Risk adjustment		↓ 10%			
Ctr	Reduced cost of providing access for third-party providers (risk-adjusted)		\$54,000	\$118,800	\$118,800	\$118,800

Source: Forrester Research, Inc.



### Total Benefits

Table 4 shows the total of all benefits as well as associated present values, discounted at 10%. Over three years, the organization expects all benefits to total a net present value of more than \$2.6 million.

**TABLE 4**  
**Total Benefits (Risk-Adjusted)**

Ref.	Benefit	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Reduced cost of enabling access to enterprise applications	\$0	\$243,000	\$546,750	\$850,500	\$1,640,250	\$1,311,762
Btr	Consolidating licenses for legacy applications	\$0	\$540,000	\$405,000	\$270,000	\$1,215,000	\$1,028,475
Ctr	Reduced cost of providing access for third-party providers	\$54,000	\$118,800	\$118,800	\$118,800	\$410,400	\$349,438
	<b>Total benefits</b>	<b>\$54,000</b>	<b>\$901,800</b>	<b>\$1,070,550</b>	<b>\$1,239,300</b>	<b>\$3,265,650</b>	<b>\$2,689,675</b>

Source: Forrester Research, Inc.

## COSTS

The organization experienced a number of costs associated with Citrix XenApp:

- › Cost of XenApp.
- › Cost to implement XenApp.

These represent the mix of internal and external costs experienced by the organization for initial planning, implementation, and ongoing maintenance associated with the solution.



### Cost Of XenApp

The organization deployed a XenApp environment with an initial 300 users and added 375 users until it capped out after three years with 1,285 licenses. The XenApp license cost \$400 per user per year, and the organization also purchased NetScaler hardware that cost \$50,000 per device. The cost over three years totaled \$910,200.

Customers that implement virtual environments often incur extra costs that this particular customer did not report to Forrester. These costs include image management, application testing, network upgrades, or storage that can alter the overall cost of the environment.

Forrester risk-adjusted this cost upward by 15%. Purchasing 1,285 licenses to support more than 10,000 users is unusually low. Citrix told Forrester that the average company purchases licenses for 80% of the users who use the XenApp implementation. The risk-adjusted total over three years was \$1,046,730.

**TABLE 5**  
**Cost Of Citrix XenApp**

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	XenApp perpetual licenses purchased		300	375	375	185
D2	XenApp license costs	D1 * \$400	\$120,000	\$150,000	\$150,000	\$74,000
D3	XenApp maintenance on cumulative previous-year licenses	D2 * 22% (cumulative previous years)		\$26,400	\$59,400	\$92,400
D4	NetScaler devices purchased		\$100,000	\$50,000		
D5	NetScaler maintenance	D4 * 22% (cumulative previous years)		\$22,000	\$33,000	\$33,000
Dt	Cost of XenApp	D2+D3+D4+D5	\$220,000	\$248,400	\$242,400	\$199,400
	Risk adjustment		↑ 15%			
Dtr	Cost of XenApp (risk-adjusted)		\$253,000	\$285,660	\$278,760	\$229,310

Source: Forrester Research, Inc.



### Cost To Implement XenApp

To architect and implement XenApp with all relevant applications required a team of three people who worked on the project for six months, which totaled \$180,000 in indirect costs. Forrester risk-adjusted this cost upward by 5% to account for the possible variation in the implementation cost, which resulted in a final risk-adjusted cost of \$189,000.

**TABLE 6**  
Cost To Implement XenApp

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Number of FTEs involved in XenApp implementation		3			
E2	Average burdened salary of enterprise architects		\$120,000			
E3	Years required	6 months	0.5			
Et	Cost to implement XenApp		\$180,000	\$0	\$0	\$0
	Risk adjustment		↑ 5%			
Etr	Cost to implement XenApp (risk-adjusted)		\$189,000	\$0	\$0	\$0

Source: Forrester Research, Inc.

### Total Costs

Table 7 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the organization expects total costs to total a net present value of a little more than \$1.1 million.

**TABLE 7**  
Total Costs (Risk-Adjusted)

Ref.	Benefit	Initial	Year 1	Year 2	Year 3	Total	Present Value
Dtr	Cost of XenApp	\$253,000	\$285,660	\$278,760	\$229,310	\$1,046,730	\$915,355
Etr	Cost to implement XenApp	\$189,000	\$0	\$0	\$0	\$189,000	\$189,000
	<b>Total costs</b>	<b>\$442,000</b>	<b>\$285,660</b>	<b>\$278,760</b>	<b>\$229,310</b>	<b>\$1,235,730</b>	<b>\$1,104,355</b>

Source: Forrester Research, Inc.

## RISKS

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

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

Table 8 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

**TABLE 8**  
**Benefit And Cost Risk Adjustments**

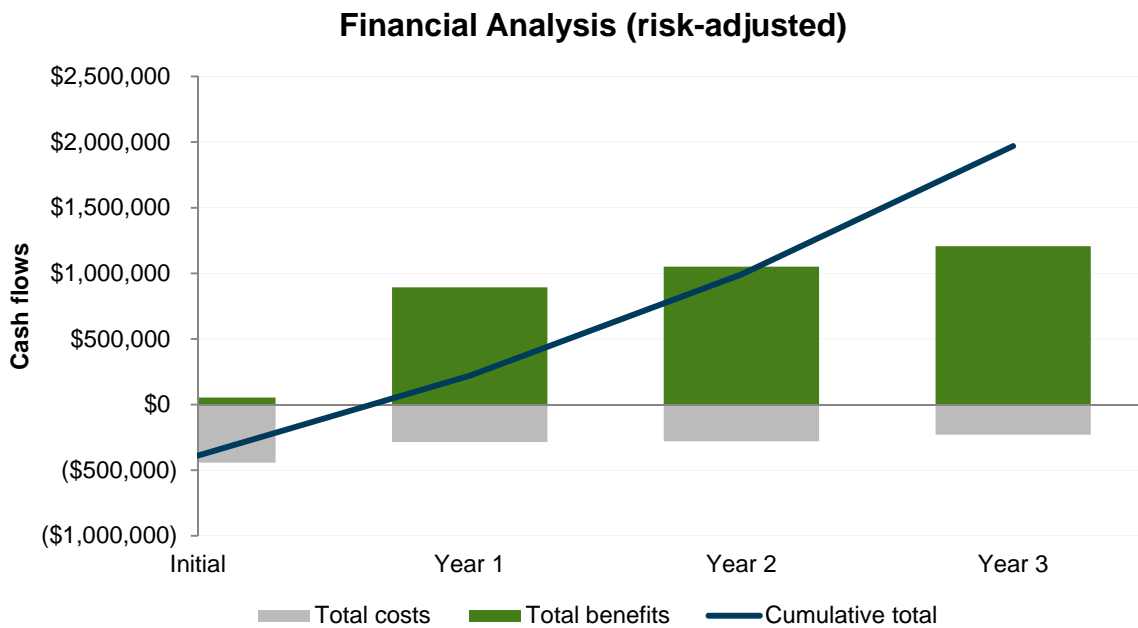
<b>Benefits</b>	<b>Adjustment</b>
Reduced cost of enabling access to enterprise applications	↓ 10%
Consolidating licenses for legacy applications	↓ 10%
Reduced cost of providing access for third-party providers	↓ 10%
<b>Costs</b>	<b>Adjustment</b>
Cost of XenApp	↑ 15%
Cost to implement XenApp	↑ 5%

Source: Forrester Research, Inc.

## Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the organization's investment in XenApp. Table 9 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 8 in the Risks section to the unadjusted results in each relevant cost and benefit section.

**FIGURE 3**  
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

**TABLE 9**  
Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	(\$442,000)	(\$285,660)	(\$278,760)	(\$229,310)	(\$1,235,730)	(\$1,104,355)
Benefits	\$54,000	\$901,800	\$1,070,550	\$1,239,300	\$3,265,650	\$2,689,675
Net benefits	(\$388,000)	\$616,140	\$791,790	\$1,009,990	\$2,029,920	\$1,585,320
ROI						144%
Payback period						7.6 months

Source: Forrester Research, Inc.

## Citrix XenApp: Overview

The following information is provided by Citrix. Forrester has not validated any claims and does not endorse Citrix or its offerings.

### **XENAPP DELIVERS WINDOWS BUSINESS APPLICATIONS TO ANY DEVICE WHILE ENHANCING DATA SECURITY, REDUCING COSTS, AND EMPOWERING USER PRODUCTIVITY**

XenApp is a leading solution for application and desktop delivery, with over 100 million users worldwide. XenApp enables secure, remote access to Windows applications and server desktops from any device, over any network. Applications and desktops are secured in the data center to protect sensitive information and enhance corporate security. XenApp now enables employees to access Linux virtual desktops side-by-side with Windows resources for a complete workspace experience.

#### **WHY XENAPP?**

##### *Adaptive To Changing Business Needs*

XenApp can address a broad range of use cases by delivering a full desktop or just applications based on an individual employee's role or device. A rich set of capabilities and flexible architecture enable IT to be more agile in a rapidly changing workplace.

##### *Secure By Design*

The only industry solution to be Common Criteria certified and native FIPS 140-2 compliant, XenApp reduces the risk of data loss and prevents unwanted intrusions by securely delivering access to business applications on demand to any user, based on location- and device-specific features and security configurations.

##### *High-Definition Experience (HDX) From Any Device*

HDX technology delivers a high-definition user experience on any device. HDX ensures that employees have a native-like experience wherever they are, even when network connections are less than ideal.

#### **HOW XENAPP HELPS**

##### *Mobilize Windows, Linux, Web, and SaaS Applications*

XenApp empowers employees with mobile access to applications hosted on Windows and Linux operating systems for use on any device, anywhere.

##### *Secure Contractor, Partner, And Remote Employee Access*

XenApp offers granular access control, advanced system monitoring, and an inherently secure architecture by providing remote access to Windows apps and desktops secured in the data center.

##### *Deliver Design And Engineering Applications To Any Device*

XenApp securely delivers real-time, remote access to centralized design resources, providing high-end designers and engineers access to 3D professional graphics applications on any device.

##### *Reduce Cost And Complexity Of Application And Desktop Management*

XenApp is an industry-proven solution for improving operational efficiencies, reducing costs, and streamlining app management. It allows employees to securely access sensitive corporate resources from a variety of devices.

##### *Enable Bring Your Own Device (BYOD) In The Enterprise*

XenApp enables IT to deliver on-demand apps and desktops to any device, making it easy for IT to securely enable enterprise BYOD initiatives.

Learn more at [www.citrix.com/xenapp](http://www.citrix.com/xenapp).

## 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. TEI assists technology vendors in winning, serving, and retaining customers.

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

### BENEFITS

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often, product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

### COSTS

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

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

### RISKS

Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections and 2) the likelihood that the estimates will be measured and tracked over time. TEI risk factors are based on a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the risk factor around each cost and benefit.

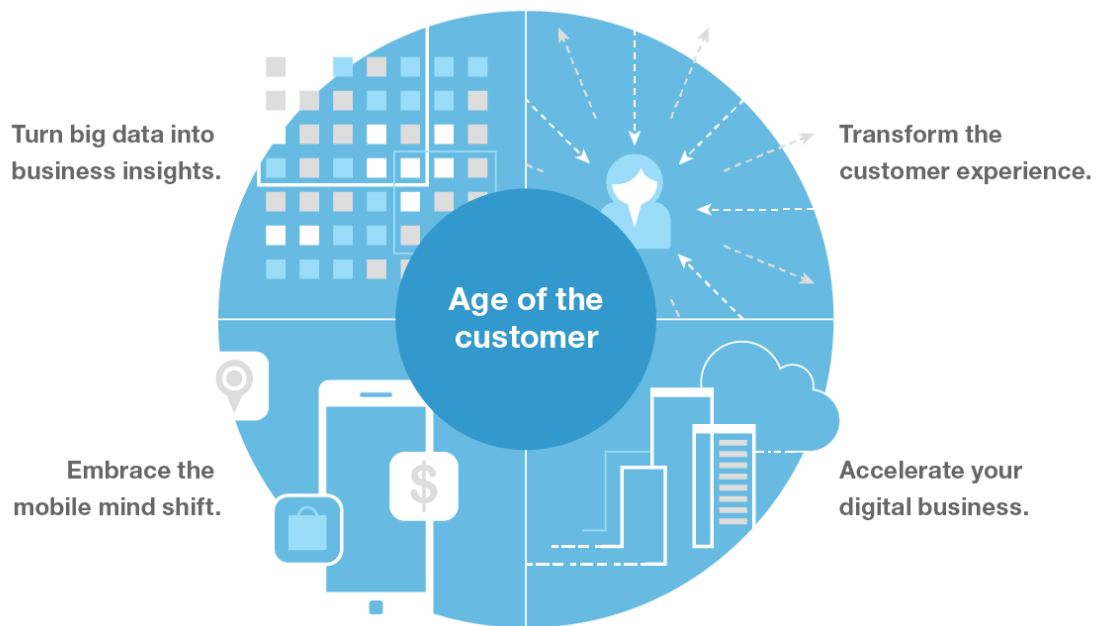


## Appendix B: Forrester And The Age Of The Customer

Your technology-empowered customers now know more than you do about your products and services, pricing, and reputation. Your competitors can copy or undermine the moves you take to compete. The only way to win, serve, and retain customers is to become customer-obsessed.

A customer-obsessed enterprise focuses its strategy, energy, and budget on processes that enhance knowledge of and engagement with customers and prioritizes these over maintaining traditional competitive barriers.

**CMOs and CIOs must work together to create this companywide transformation.**



Forrester has a four-part blueprint for strategy in the age of the customer, including the following imperatives to help establish new competitive advantages:



Transform the customer experience to gain sustainable competitive advantage.



Accelerate your digital business with new technology strategies that fuel business growth.



Embrace the mobile mind shift by giving customers what they want, when they want it.



Turn (big) data into business insights through innovative analytics.

## Appendix C: Glossary

**Discount rate:** The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organizations to determine the most appropriate discount rate to use in their own environment.

**Net present value (NPV):** The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

**Present value (PV):** The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.

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

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

### A NOTE ON CASH FLOW TABLES

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

Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

TABLE [EXAMPLE]

Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
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Source: Forrester Research, Inc.