

Prepared for Microsoft and Novell

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## **The Total Economic Impact™ Of Microsoft And Novell Interoperability Solutions**

Multicompany Study

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## Executive Summary

In Fall of 2009, Microsoft and Novell commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) that enterprises who use choose to use Windows and Linux together in their data center, may realize by standardizing on SUSE as their Linux platform of choice to work with their Windows server environment. In 2006, Microsoft and Novell entered into an agreement focused on improving the interoperability between their respective platforms and bringing tangible benefits to customers who choose to manage a mixed data center environment. Specific areas of improved interoperability included enhanced virtualization support, systems management, document management, and identity management.

In conducting in-depth interviews with six existing customers that had standardized a portion of their data center footprint on both SUSE Linux and Microsoft Windows Server, Forrester found these organizations achieved tangible improvements in operational and capital cost efficiency, IT administration cost savings, increased system availability, as well as higher levels of end user productivity.

### Purpose

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of improving interoperability within the heterogeneous data center utilizing SUSE Linux and Microsoft Windows Server platforms. Forrester's aim is to clearly show all calculations and assumptions used in the analysis. This paper is useful for companies choosing to use Windows and Linux together within an enterprise data center, allowing for potential operational and capital cost advantages.

### Methodology

Microsoft and Novell selected Forrester for this project because of its industry expertise in data center server platforms and Forrester's Total Economic Impact™ (TEI) methodology. TEI not only measures costs and cost reduction (areas that are typically accounted for within IT) but also weighs the enabling value of a technology in increasing the effectiveness of overall business processes.

For this study, Forrester employed four fundamental elements of TEI in modeling the financial impact of interoperability solutions:

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

Given the increased sophistication enterprises have regarding cost analyses related to IT investments, Forrester's TEI methodology serves an extremely useful purpose by providing a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

### Approach

Forrester used a five-step approach for this study:

- Forrester gathered data from existing Forrester research relative to Microsoft and Novell interoperability solutions as well as the data center platform market in general.
- Forrester interviewed Novell and Microsoft product management, marketing, and sales personnel to fully understand the potential (or intended) value proposition of interoperability solutions.
- Forrester conducted a series of in-depth interviews with six organizations currently using Novell SUSE Linux and Microsoft Windows Server platforms within their data centers.
- Forrester constructed a financial model representative of the interviews. This model can be found in the TEI Framework section below.
- Forrester created a composite IT organization based on the interviews and populated the framework using data from the interviews as applied to the composite IT organization. This study illustrates the financial impact of Microsoft and Novell Interoperability solutions by aggregating the findings from the customer interviews and portraying a composite IT organization to illustrate the quantifiable costs and benefits of deploying SUSE as the Linux platform of choice to interoperate with Microsoft Windows Server within the data center.

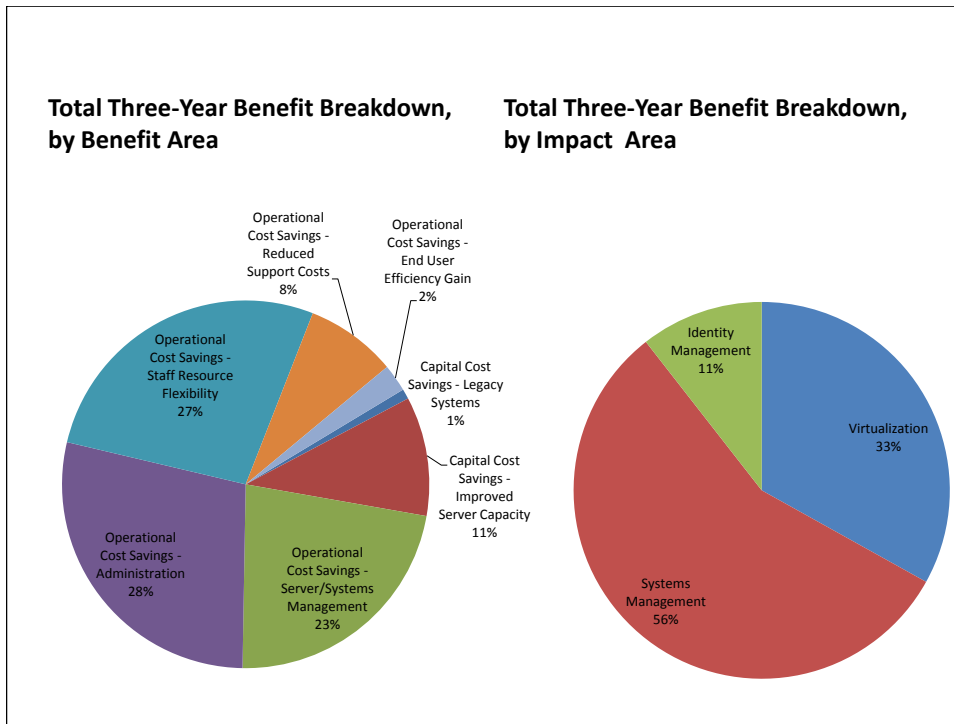
For further discussion of the composite IT organization, please see Appendix A.

## Key Findings

Forrester's study yielded three key findings:

- **ROI.** Based on the interviews with six early adopters of Microsoft and Novell interoperability solutions, Forrester constructed a TEI framework for a composite organization. As seen in Table 1, the ROI for our representative organization is 82%, with a breakeven point (payback period) of 0.9 years after deployment.
- **Benefits.** Benefits included improvements in operational and capital cost efficiency, IT administration cost savings, increased system availability, as well as higher levels of end user productivity.

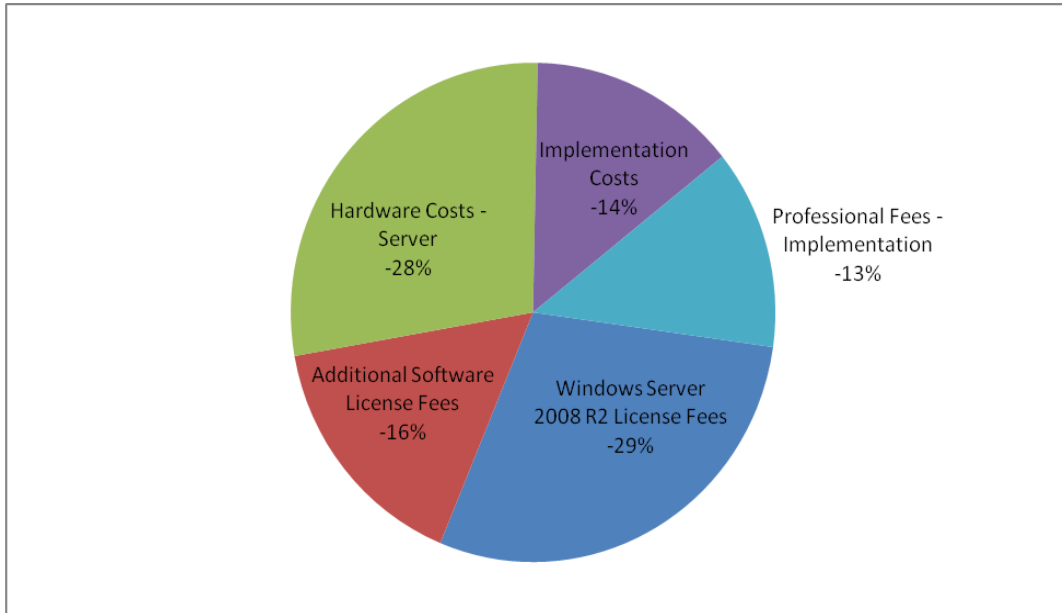
**Figure 1: Total Three-Year Benefit Breakdown**



Source: Forrester Research, Inc.

- Costs.** Costs include software license and maintenance fees as well as the investment in additional SUSE certificates purchased through Microsoft, which are redeemable from Novell for SUSE support. The cost of implementation and external professional fees as well as the cost of training and administration are also built in.

**Figure 2: Total Three-Year Cost Breakdown**



Source: Forrester Research, Inc.

Table 1 illustrates the risk-adjusted cash flow for the composite IT organization based on data and characteristics obtained during the interview process. Forrester risk-adjusts these values to take into account the potential uncertainty that exists in estimating the costs and benefits of a technology investment. The risk-adjusted value is meant to provide a conservative estimate, incorporating any potential risk factors that may later impact the original cost and benefit estimates. For a more in-depth explanation of risk and risk adjustments used in this study, please see the Risk section.

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

Summary financial results	Original estimate	Risk-adjusted
ROI	95%	82%
Payback period (years)	0.8	0.9
Total costs (PV)	(\$346,876)	(\$371,339)
Total benefits (PV)	\$676,018	\$676,018
Total (NPV)	\$329,141	\$304,678
Internal rate of return (IRR)	98%	83%

Source: Forrester Research, Inc.

Interviewed clients represented different industry, geographic segments, and deployment sizes. In general, those companies with a larger number of total servers received higher overall benefits as compared to smaller organizations. These larger companies realized a higher ROI due in part to:

- Greater capital and operational cost savings through higher levels of virtualization of physical servers.
- Increased administration cost savings through greater integration of Windows and Linux support staff.
- Improved end user efficiency savings by having higher system availability impacting a greater number of staff.

## **Disclosures**

The reader should be aware of the following:

- The study is commissioned by Microsoft and Novell and delivered by the Forrester Consulting group.
- Microsoft and Novell 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 Microsoft and Novell.
- Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Microsoft and Novell interoperability solutions.
- This study is not meant to be used as a competitive product analysis.

# Microsoft and Novell Interoperability Solutions: Overview

According to Microsoft and Novell, since the 2006 joint agreements, the two organizations have worked closely to help solve interoperability challenges for customers who choose to use Windows and Linux together in their data centers.

Too often, IT professionals must duplicate efforts or develop workarounds to connect disparate systems within their heterogeneous environments. With multiple operating systems, separate management tools, different skill set requirements, and the limitations of data sharing as defined by workloads, the results can lead to underutilized server resources, poor infrastructure management, inefficient workflows, and higher maintenance costs.

To address these customer challenges, Microsoft and Novell agreed to collaborate on a number of technical projects to improve operational efficiency between their respective technologies. As part of the agreement, Microsoft also purchased SUSE Linux Enterprise Server subscription certificates that Microsoft makes available to its customers, who choose to maintain Linux workloads, as part of a migration program to SUSE Linux Enterprise Server. Customers can redeem these for single or multi-year subscription for upgrades, updates and technical support from Novell.

The companies first sought common ground on intellectual property to bring together disparate business models and pave a way for technical collaboration. Then they developed a multiyear partnership for work pertaining to engineering and standards in the areas of virtualization, systems management, federated identity, and document format interoperability. Microsoft and Novell established an interoperability lab in Cambridge, Massachusetts, for testing and developing these solutions and a joint sales and marketing team to promote and sell the solutions.

Since the partnership was announced in 2006, the companies have engaged in two new areas of engineering: Moonlight, a Silverlight plug-in for Linux and User Interface (UI) Accessibility. The goal of these projects is to give customers greater confidence that their Windows and SUSE Linux Enterprise systems will work better together, provide intellectual property peace of mind, and bridge the gap between proprietary and open source software.

## Analysis

As stated in the Executive Summary, Forrester took a multistep approach to evaluate the impact of implementing interoperability solutions can have on an organization:

- Interviews with Microsoft and Novell product management, marketing, and sales personnel.
- In-depth interviews of six organizations currently using both Microsoft Windows Server and SUSE Linux within their data centers.
- Construction of a common financial framework for the investment in interoperability solutions.
- Construction of a composite IT organization based on characteristics of the interviewed organizations.

## Interview Highlights

***“For us, Interoperability Solutions from Microsoft and Novell allowed us to achieve platform flexibility to meet business demands, while driving cost efficiencies through virtualization and administration.”***

-Manager of Data Center Operations, Microsoft/Novell Client

A total of six interviews were conducted for this study, involving representatives from the following Microsoft and Novell customers that were early adopters of the interoperability solutions:

- A US-based food retailer with 250 stores located throughout the western US. The organization has a single data center location with a combination of Linux, UNIX, and Microsoft Windows Server platforms. The organization has aggressively reduced the number of servers through the use of virtualization.
- A US-based global automotive parts manufacturer with offices located worldwide. The organization manages multiple data centers with a combination of Linux and Microsoft Windows Server platforms.
- A Europe-based provider of infrastructure services to the financial services industry. The organization manages 12 data centers located worldwide with a mixed environment of Microsoft Windows Server-, Linux-, and Unix-based platforms.
- A US-based provider of telecommunication services to the building and construction industry. The organization manages a single data center operation and has realized significant growth of staff and hardware to keep up with business demand.
- A US state government agency with multiple data center and office locations. The organization has a heterogeneous environment of Linux-, Unix-, and Microsoft Windows Server-based platforms within its data center.

- A US-based hardware and software provider with global data center operations. The organization is currently in the process of migrating its existing UNIX environment to Linux subscriptions.

The six in-depth interviews uncovered several key themes, which drove the analysis. These included the ability to:

- **Drive operational cost efficiency within a heterogeneous environment.** For many of the organizations interviewed, their data center environment had grown over time into a mixture of different server platforms. As the number of servers increased, many adopted multiple virtualization solutions per platform to achieve yearly hardware and support cost savings. However, as their heterogeneous environment grew, organizations were looking for a way to further virtualize their environment across platforms, allowing for additional cost efficiencies through management and hardware consolidation.
- **Maintain the flexibility to choose the right platform to meet demand.** While keeping costs down within the heterogeneous environment was critical, many organizations saw a need to maintain platform flexibility. Several organizations noted substantial growth of their Linux and Windows platforms because of business requirements rather than technical limitations. The ability to choose platforms without a significant ramp-up of new hardware and infrastructure costs allowed organizations to quickly respond to changing business needs.
- **Break down staffing silos.** Platform interoperability also allowed interviewed organizations to break down the traditional support silos between Windows and Linux environments. In many cases, organizations had distinct teams to manage and run individual server platforms. As a result, teams could not share managing multiple platforms within data center operations. Having tools that allow organizations to manage disparate systems from a single console improves overall IT administration.
- **Maintain system availability and, ultimately, end user productivity.** How quickly an organization recovers from a support incident has a direct impact on system availability and end user productivity. A noted common side effect of the growth of a heterogeneous data center environment was the difficulty in quickly identifying which vendor to turn to in the event of an incident. Improving Linux and Windows Server interoperability allowed organizations to focus on a clear path for vendor support, reducing the likelihood of going back and forth with multiple external vendors for problem resolution, and ultimately reducing the impact of an incident to end users.

Based on interviews with six existing customers — provided by Novell and Microsoft — Forrester constructed a composite IT organization, referred to in this document as “Limco IT.” Limco IT is part of a US-based global services organization, Limco. Limco IT recently increased its investment in Microsoft Windows Server and standardized on Novell SUSE Linux to take advantage of the interoperability solutions developed by Microsoft and Novell. Prior to this investment, the organization had a heterogeneous server environment of Linux (SUSE and non-SUSE), UNIX, and Windows platforms.

Prior to the investment, Limco IT grew its data center organically: adding servers as needed leveraging Windows, UNIX, and Linux operating platforms. By 2008, the organization manages an environment consisting of physical and virtualized servers that included Windows, multiple Linux

distributions, and Unix. The organization had some experience with virtualization, focused primarily on its Windows environment. To manage the physical and virtualized servers, the organization employed a combination of Windows, Linux, and UNIX administrators with a total full-time equivalent (FTE) count of 10 administrators.

In 2007, Limco IT had an estimated 30% annual server growth spread primarily between Windows and Linux servers. With this increase in servers, the organization also saw a similar increase in staffing of administrators to manage the data center environment.

In late 2008, Limco IT took the opportunity to replace and standardize its legacy Linux footprint with SUSE Linux, giving it an opportunity to take advantage of the interoperability features found between Microsoft and Novell.

## TEI Framework

### *Introduction*

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

### *Representative Organization*

Based on the interviews with the six customers provided by Microsoft and Novell, Forrester constructed a representative IT organization, Limco IT, a TEI framework, and an associated ROI analysis that illustrates the areas impacted financially.

### *Framework Assumptions*

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

**Table 2: General Assumptions**

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

Source: Forrester Research, Inc.

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

In addition to the financial assumptions used to construct the cash flow analysis, Table 3 provides staffing assumptions used within this analysis.

**Table 3: Staffing Assumptions**

Ref.	Metric	Calculation	Value
A1	Hours per week		40
A2	Weeks per year		52
A3	Hours per year (M-F, 9-5)		2,080
A4	Hours per year (24x7)		8,736

Source: Forrester Research, Inc.

## Costs

The impact of cost is accrued in two different areas described below: increasing the investment in Novell SUSE subscription costs and Microsoft Windows Server software costs and the organization's internal preparation and planning costs, which together amount to **\$379,065**.

### *Cost Of Increasing Investment In SUSE Linux And Microsoft Windows Server — \$285,683*

- \$121,433 — Windows Server 2008 R2 licensing (including Software Assurance).
- \$66,750 — additional SUSE Linux support certificates and SQL licenses.
- \$97,500 — incremental hardware required to run platform growth.

### *Internal Preparation And Planning Labor — \$93,382*

As part of increasing the investment in Microsoft and Novell, Limco IT first performed a current baseline assessment of its existing data center management. In addition, the organization piloted and tested the solutions for a period of one month prior to putting the software in production.

**Table 4: Costs — The Representative Organization (Non-Risk-Adjusted)**

Costs	Initial	Year 1	Year 2	Year 3	Total	PV
Windows Server 2008 R2 license fees		(40,478)	(40,478)	(40,478)	(121,433)	(100,662)
Additional software license fees		(22,250)	(22,250)	(22,250)	(66,750)	(55,332)
Hardware costs — server	(97,500)				(97,500)	(97,500)
Implementation costs	(48,382)				(48,382)	(48,382)
Professional fees (implementation)	(45,000)				(45,000)	(45,000)
Total	(\$190,882)	(\$62,728)	(\$62,728)	(\$62,728)	(\$379,065)	(\$346,876)

Source: Forrester Research, Inc.

## Benefits

For the organizations interviewed, benefits for improving interoperability were divided across four separate areas:

- Virtualization.
- Systems management.
- Identity management.
- Document management.

### *Virtualization*

Many of the organizations interviewed see server virtualization as a key part of their overall IT server strategy. However, with the growth of Linux, UNIX, and Windows platforms, organizations were looking to further move as many of their existing workloads as possible from physical servers and move them into a virtualized environment. Without interoperability solutions, organizations were limited by the amount of resources that could be shared between the different platforms.

While virtualization historically has provided tangible gains across the interviewed organizations, the growth of the heterogeneous server environment hampered further savings. The organizations increased their investment in Microsoft Windows Server and standardized on Novell SUSE Linux as a direct result of the interoperability benefits between the two platforms. Windows Server 2008 and SUSE Linux Enterprise virtual servers on either a Windows Server 2008 Hyper-V host or SUSE-based Xen host allow organizations to effectively shift server workload to meet changes in demand. Customers were able to achieve additional benefits of virtualization above and beyond their previous server environment, including consolidation of support subscriptions, reduced hardware costs, and

improved staff efficiency. One organization noted the key benefit of standardizing on SUSE Linux to interoperate with Microsoft Windows Server was to achieve greater savings through virtualization within the data center.

One benefit of increasing virtualization within the data center is the ability to reduce server license, maintenance and support costs. For this analysis, Limco IT replaced existing Linux subscriptions with new SUSE support subscriptions. Specifically, since SUSE support subscriptions cover an unlimited number of virtual guests on a single physical host, the overall support subscription requirement declined. While the cost of additional certificates is accounted for in the investment section, the organization was able to realize a reduction in existing annual subscriptions through consolidation and virtualization.

To calculate this benefit, the model assumes 12 annual subscriptions can be removed as a result of virtualization and consolidation within the Windows and Linux environment. Based on interview data, we assume the cost per subscription is \$250. As a result of the additional virtualization of the environment, the organization can capture 80% of the annual Linux subscriptions replaced by the SUSE Linux platform. This equates to a total three-year cost savings of \$7,200 or \$2,400 per year. Table 5 illustrates the calculation used.

**Table 5: Capital Cost Savings — Legacy Systems**

Ref.	Metric	Calculation	Per period
B1	Number of annual subscriptions		12
B2	Cost per subscription		\$250
B3	Percent captured		80%
Bt	Capital cost savings — legacy Systems	$B1*B2*B3$	\$2,400

Source: Forrester Research, Inc.

In addition to realizing savings through consolidation of support subscriptions, several organizations additionally noted the ability to consolidate server hardware as well. Virtualization allows the organization to improve overall server capacity by dynamically shifting resources between servers, reducing the amount of excess capacity required in any one server platform. Prior to standardizing its Linux workloads on SUSE, Limco IT was not able to achieve full optimization across its Linux and Windows environment.

To calculate this benefit, the impact of additional virtualization allows Limco IT to reduce the number of existing servers by 12. At a cost of \$6,500 per asset, capital costs avoided through virtualization equates to \$78,000. Table 6 illustrates the calculation used.

**Table 6: Capital Cost Savings — Improved Server Capacity**

Ref.	Metric	Calculation	Per period
C1	Number of assets		12
C2	Cost per asset		\$6,500
Ct	Capital cost savings — Improved server capacity	$C1 * C2$	\$78,000

Source: Forrester Research, Inc.

Virtualization also allows Limco IT to reduce the number of resources per server, resulting in annual operational cost savings in the data center. Organizations also noted that the operational savings resulting from virtualization was as significant as, if not more significant than, the potential cost savings and cost avoidance for the investment. Being able to run each other's operating system through a common hypervisor allows the organization to better manage their virtual workloads.

To calculate this benefit, Limco IT previously devoted 40% of its admin staff to managing the Linux server environment. The reduction in server count allowed the organization to reduce the amount of administration time by 30% on average. Assuming the yearly rate per worker to be \$85,000 per year, the total operational cost savings equates to \$61,200. Table 7 illustrates the calculation used.

**Table 7: Operational Cost Savings — Server/Systems Management**

Ref.	Metric	Calculation	Per period
D1	Total admin staff		6
D2	Percent devoted to Linux server management		40%
D3	Percent savings		30%
D4	Yearly rate per worker		\$85,000
Dt	Operational cost savings — Server/systems management	$D1 * D2 * D3 * D4$	\$61,200

Source: Forrester Research, Inc.

### *Systems Management*

While achieving savings through virtualization was a key driver for leveraging the Microsoft and Novell partnership, several organizations noted additional benefits through systems management savings. A recurring theme across interviewed organizations was an increase in siloed support when their data center environment grew. The siloed support structure limited the support teams from managing multiple environments. This created a situation for many organizations where the business demands for platform flexibility were limited by inadequate staff to manage the heterogeneous environment.

By leveraging the technical collaboration between Microsoft and Novell, organizations could improve the overall management of the Linux and Microsoft Windows Server platforms. The integration of SUSE Linux management packs and Microsoft Operations Manager, for example, allow organizations to better manage their existing and future staffing resources of disparate platforms. This includes the ability to manage heterogeneous, distributed platforms through a single management console.

In the case of existing administration, several organizations noted were able to reduce existing administration overhead by pooling resources to manage both Linux and Windows. Organizations were able to either reduce the staff growth or transfer existing employees to more proactive tasks. To calculate this benefit, we conservatively estimate that Limco was able to save one FTE as a result of pooling resources. Assuming a cost of \$85,000, the total yearly cost savings equates to \$85,000. Table 8 illustrates the calculation used.

**Table 8: Operational Cost Savings — Administration**

Ref.	Metric	Calculation	Per period
E1	Number of workers (saved)		1
E2	Yearly rate per worker		\$85,000
Et	Operational cost savings — Administration	$E1 * E2$	\$85,000

Source: Forrester Research, Inc.

In addition to consolidating the number of staff, controlling staff growth was another key factor in adopting interoperability solutions around systems management. Several of the organizations interviewed, noted difficulty in hiring separate staff to manage the Linux and Windows environments. The net impact of this on Limco IT is not only the direct cost of finding additional employees, but also an indirect cost of not having adequate staff to manage the diverse environment.

To calculate this benefit received, Limco IT has historically needed to increase its staff by 20% per year to keep up with the projected data center growth. Limco IT can now allow existing staff to manage both Windows- and Linux-based systems, reducing the need for additional administrators for either Linux or Windows. As a result, the model assumes a 40% savings with the staff growth due to the ability to pool resources to manage both platforms. This equates to an annual cost savings of \$81,600 per year. Table 9 illustrates the calculation used.

**Table 9: Operational Cost Savings — Staff Resource Flexibility**

Ref.	Metric	Calculation	Per period
F1	Current staff		12
F2	Projected staff growth		20%
F3	Annual salary		\$85,000
F4	Percent captured		40%
Ft	Operational cost savings — Staff resource flexibility	$F1 * F2 * F3 * F4$	\$81,600

Source: Forrester Research, Inc.

### *Identity Management*

Many of the interviewed organizations also noted that with the growth of heterogeneous data centers, there was increasing complexity in managing and updating multiple identity structures across multiple platforms. Without the ability to federate identity structures, there was an increased likelihood of record inconsistencies as well as excess time spent reconciling updates across records.

As part of the interoperability effort, Microsoft and Novell have developed strategies to improve the integration between Microsoft Active Directory and Novell eDirectory and other LDAP-compliant directories. For example, both management tools support the WS-Federation protocol allowing for improved administration between the two platforms. The resulting identity management solution allows organizations to utilize a common authentication method for Windows and non-Windows environments. This allows the organization to maintain separate identity stores without having to move or manage duplicate records, while still allowing access with all associated roles and privileges to required company resources.

The model assumes identity management has a direct impact on reducing support costs as well as improved end user efficiency. Having a common authentication method for Windows and non-Windows environments allows the organization to quickly resolve issues associated with auto authentication.

To calculate this benefit, we assume that four help desk staff spend 20% of their time dealing with end user authentication and password reset. Having a single common process speeds the time to resolve issues as well as reduces the overall cost burden. For Limco IT, 200 hours can be saved across the help desk function. The model also assumes 50% of the time can be translated to quantifiable, tangible benefit. This equates to an annual cost savings of \$24,000.

**Table 10: Operational Cost Savings — Reduced Support Costs**

Ref.	Metric	Calculation	Per period
G1	Help desk staff (FTE)		4
G2	Hourly rate per worker		\$60
G3	Number of hours (saved)		200
G4	Percent captured		50%
Gt	Operational cost savings — Reduced support costs	$G1 \cdot G2 \cdot G3 \cdot G4$	\$24,000

Source: Forrester Research, Inc.

Reducing the time to resolve identity issues also has an impact on end users. Across the 400 end users, the model assumes an average of 1.5 hours saved yearly as a result of improving authentication and identity management processes. In addition, the model conservatively estimates that of the 1.5 hours gained, 20% translates to a productive, tangible benefit. As a result, the total annual benefit equates to \$7,200 per year. Table 11 illustrates the calculation used.

**Table 11: Operational Cost Savings — End User Efficiency Gain**

Ref.	Metric	Calculation	Per period
H1	Number of end users		400
H2	Hourly rate per worker		\$60
H3	Number of hours (saved)		1.5
H4	Percent captured		20%
Ht	Operational cost savings — End user efficiency gain	$H1 \cdot H2 \cdot H3 \cdot H4$	\$7,200

Source: Forrester Research, Inc.

### *Document Management*

With the growth of a heterogeneous environment, organizations also noted a challenge in managing multiple file formats across different platforms. Word processing documents, spreadsheets, and presentations created on one platform typically needed to be translated into multiple output types, tying up time to convert and translate documents. One organization noted that previously, it assigned staff to manually convert documents between formats.

Through the interoperability partnership, Microsoft and Novell have created bidirectional translators for word processing documents, spreadsheets, and presentation files between Microsoft Office and OpenOffice.org formats. This allows the possible reduction of the time spent translating documents between the two platforms. Prior to the investment, IT support resources spent valuable time converting and translating documents between the Open XML and Open Document formats.

While several organizations noted the potential value gained from improved document management, Forrester chose not to quantify the value due in part to the difficulty tying document management savings directly to improved Interoperability functionality.

## Total Benefits

Table 12 illustrates the total benefits over three years as a result of Limco IT's interoperability solution adoption. The total PV benefits equate to \$681,780.

**Table 12: Total Benefits**

Benefits	Year 1	Year 2	Year 3	Total	PV
<b><u>Virtualization</u></b>					
Capital cost savings — legacy systems	2,400	2,400	2,400	7,200	5,968
Capital cost savings — improved server capacity	78,000			78,000	70,909
Operational cost savings — server/systems management	61,200	61,200	61,200	183,600	152,195
<b><u>Systems Management</u></b>					
Operational cost savings — administration	63,750	85,000	85,000	233,750	192,064
Operational cost savings — staff resource flexibility	61,200	81,600	81,600	224,400	184,382
<b><u>Identity Management</u></b>					
Operational cost savings — reduced support costs	18,000	24,000	24,000	66,000	54,230
Operational cost savings — end user efficiency gain	5,400	7,200	7,200	19,800	16,269
<b>Total</b>	<b>\$289,950</b>	<b>\$261,400</b>	<b>\$261,400</b>	<b>\$812,750</b>	<b>\$676,018</b>

Source: Forrester Research, Inc.

## Risk

Forrester defines two types of investment risk associated with this analysis: implementation and impact risk. **Implementation risk** is the risk that a proposed technology investment may deviate from original resource requirements needed to implement and integrate the investment, resulting in higher costs than anticipated. **Impact risk** refers to the risk that the business or technology needs of the organization may not be met by the technology investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates. Quantitatively capturing investment risk by directly adjusting the financial estimates results in more meaningful and accurate estimates and a more accurate projection of the ROI.

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

- Installation and testing could demand more time than originally anticipated.
- Having to provide specific functionality to meet business requirements in a timely manner
- Acquisition costs could be higher than originally anticipated for hardware and software.

The following impact risk is identified as part of the analysis:

- The amount of savings may be lower than originally anticipated due to the time it takes to train and move to an increased Microsoft and Novell data center environment.

### *Steps For Measuring Investment Risk*

Risk factors are used in TEI to widen the possible outcomes of the costs and benefits (and resulting savings) associated with a project. 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 estimate. The expected value — the mean of the distribution — is used as the risk-adjusted cost or benefit number. The risk-adjusted costs and benefits are then summed to yield a complete risk-adjusted summary and ROI. In this study, Forrester discovered that engaging with Novell and Microsoft was a relatively low-risk endeavor, as expressed by the interviewed organizations, and applied a nominal risk factor to the benefits to arrive at a risk-adjusted number. Table 13 provides a risk-adjusted breakdown of the costs received. Table 14 provides a risk-adjusted breakdown of the benefits received.

**Table 13: Risk Adjustment, Costs**

<b>Costs</b>	<b>Initial</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Total</b>	<b>PV</b>
Windows Server 2008 R2 license fees		(40,478)	(40,478)	(40,478)	(121,433)	(100,662)
Additional software license fees		(22,250)	(22,250)	(22,250)	(66,750)	(55,332)
Hardware costs — server	(103,399)				(103,399)	(103,399)
Implementation costs	(60,962)				(60,962)	(60,962)
Professional fees — implementation	(50,985)				(50,985)	(50,985)
<b>Total</b>	<b>(\$215,345)</b>	<b>(\$62,728)</b>	<b>(\$62,728)</b>	<b>(\$62,728)</b>	<b>(\$403,528)</b>	<b>(\$371,339)</b>

Source: Forrester Research, Inc.

**Table 14: Risk Adjustment, Benefits**

<b>Benefits</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Total</b>	<b>PV</b>
<b><u>Virtualization</u></b>					
Capital cost savings — legacy systems	2,400	2,400	2,400	7,200	5,968
Capital cost savings — improved server capacity	78,000			78,000	70,909
Operational cost savings — server/systems management	61,200	61,200	61,200	183,600	152,195
<b><u>Systems Management</u></b>					
Operational cost savings — administration	63,750	85,000	85,000	233,750	192,064
Operational cost savings — staff resource flexibility	61,200	81,600	81,600	224,400	184,382
<b><u>Identity Management</u></b>					
Operational cost savings — reduced support costs	18,000	24,000	24,000	66,000	54,230
Operational cost savings — end user efficiency gain	5,400	7,200	7,200	19,800	16,269
<b>Total</b>	<b>\$289,950</b>	<b>\$261,400</b>	<b>\$261,400</b>	<b>\$812,750</b>	<b>\$676,018</b>

Source: Forrester Research, Inc.

## Flexibility

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

The interviewed organizations noted that the use of Microsoft and Novell servers in conjunction with an effective data center management strategy can potentially enable future benefits throughout the organization as a way to break down geographic barriers within a distributed heterogeneous environment.

While Forrester believes that organizations leveraging interoperability solutions can take advantage of these flexibility options, quantification (using the financial industry standard Black-Scholes or the binomial option pricing models) of the additional value associated with these options for this customer would require scenario development and forward-looking analysis that is not available at this time.

The value of flexibility is unique to each organization, and the willingness to measure its value varies from company to company (see Appendix B for additional information regarding the flexibility calculation).

## TEI Framework: Summary

Considering the financial framework constructed above, the results of the Costs, Benefits, Risk, and Flexibility sections using the representative numbers can be used to determine an ROI, NPV, and payback period. Table 15 shows the consolidation of the numbers for Limco IT.

**Table 15: Cash Flow Summary — Risk-Adjusted**

	Initial	Year 1	Year 2	Year 3	Total	NPV
Total costs	(\$215,345)	(\$62,728)	(\$62,728)	(\$62,728)	(\$403,528)	(\$371,339)
Total benefits		\$289,950	\$261,400	\$261,400	\$812,750	\$676,018
Total	(\$215,345)	\$227,223	\$198,673	\$198,673	\$409,222	\$304,678
ROI	82%					
Payback period (years)	0.9					

Source: Forrester Research, Inc.

It is important to note that values used throughout the TEI framework are based on in-depth interviews with six organizations and the resulting composite IT organization built by Forrester. Forrester makes no assumptions as to the potential return that other organizations will receive within their own environment. Forrester strongly advises that readers use their own estimates within the framework provided in this study to determine the expected financial impact of implementing interoperability solutions.

## Study Conclusions

Forrester's in-depth interviews with customers who choose to use both Windows and Linux, and who have standardized those Linux workloads on Novell SUSE, yielded several important observations:

- Based on information collected in interviews with current Microsoft and Novell solutions customers, Forrester found that organizations can realize benefits in the form of improvements in operational and capital cost efficiency, IT administration cost savings, improved system availability, as well as higher levels of end user productivity.
- Of the customers interviewed, several factors contributed to the difference in ROIs. These factors included the level of virtualization prior to the investment, other platforms within the data center, as well as how fully the organization integrates both Linux and Windows teams into a single management structure.

The financial analysis provided in this study illustrates the potential way an organization can evaluate the value proposition of interoperability solutions. Based on information collected in six in-depth customer interviews, Forrester calculated a three-year, risk-adjusted ROI of 82% for the composite organization, with a payback period of 0.9 years. All final estimates are risk-adjusted to incorporate potential uncertainty in the calculation of costs and benefits.

Based on these findings, companies looking to implement interoperability solutions can see cost savings and productivity benefits. Using the TEI framework, many companies may find the potential for a compelling business case to make such an investment.

## Appendix A: Composite IT Organization

Forrester's conclusions were derived in large part from information received in a series of in-depth interviews with executives and personnel at six organizations currently using Microsoft and Novell Interoperability solutions. As each of the interviewed organizations were promised anonymity, Forrester constructed a composite IT organization, a TEI framework, and an associated ROI analysis based on our findings from these Microsoft and Novell customers.

This study illustrates the financial impact of using Microsoft and Novell Interoperability Solutions by aggregating the findings from the customer interviews and portraying a composite IT organization that is achieving value from these solutions. Our composite IT organization "Limco IT" is part of a US-based services firm, "Limco" that provides financial and support services to business and consumer clients. Forrester created this composite company to reflect an organization with the following characteristics:

- \$1 billion in revenue.
- 4,500 employees.
- Located in North America with branch offices in Europe and Asia.
- 120 distributed IT staff, with 10 allocated to data center administration.

Here are the critical success factors, high-level business objectives, and strategies that Limco is hoping to achieve by adopting Microsoft and Novell Interoperability Solutions:

- The organization is experiencing rapid growth of its data center environment fueled by growing business demand.
- The growth has led to an increase the heterogeneity of the environment, with multiple platforms and multiple support teams to manage the environment
- While the organization has adopted virtualization as a strategy, achieving further gains around virtualization is limited due to the heterogenous server environment
- Support within the data center is organized by platform with limited opportunities for support teams to manage multiple platforms

## 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 at an interest rate (the discount rate). The PV of costs and benefits feed into the total net present value of cash flows.

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

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

### *A Note On Cash Flow Tables*

The following is a note on the cash flow tables used in this study (see the Example Table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in Years 1 through 3 are discounted using the discount rate shown in 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.