

A Forrester Total Economic
Impact™ Study
Commissioned By
SUSE

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October 2014

The Total Economic Impact™ Of SUSE Linux Enterprise

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Executive Summary

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

To better understand the benefits, costs, and risks, Forrester interviewed four customers using SUSE Linux Enterprise. The companies wanted to migrate away from proprietary UNIX systems and standardize on x86 servers to reduce the cost of acquiring and maintaining servers. Each of the companies that Forrester interviewed planned and migrated from UNIX to SUSE Linux Enterprise, retrained system administrators, and realized a significant decrease in capital expenditures.

Each of the four organizations standardized on less expensive server technologies and realized reductions in capital expenditures that ranged from 40% to 90% of the previous UNIX servers being purchased. Adopting hardware standards gives the organizations flexibility to purchase hardware from different vendors, take advantage of special incentives such as short-term discounts, reduce the time from order to delivery, and carry an inventory of servers in anticipation of changing business demands. Along with hardware standardization, the organization improved average application performance and eased the organization's transition to leveraging cloud solutions. In the words of one director, "Our response time to changing business needs was reduced from months to just minutes."

SUSE Linux Enterprise eliminates the need to purchase proprietary UNIX servers and instead fill data centers with commodity platforms.

The benefits of migrating to SUSE for a composite organization with 3,000 servers are:

- **Reduced CAPEX by 80%: \$20,520,000.**
- **Reduced maintenance fees: \$9,234,000.**
- **Increase responsiveness to changing business needs — "our response time was reduced from months to minutes."**

SUSE REDUCES CAPITAL EXPENDITURES FOR SERVERS BY 80%

Forrester's interviews with four existing customers and subsequent financial analysis found that a composite organization based on these interviews realized the risk-adjusted ROI, benefits, and costs shown in Figure 1. The composite organization realized benefits of more than \$23.4 million versus costs of nearly \$15 million, adding up to a net present value (NPV) of more than \$8.3 million. The most significant savings for the composite organization come from the reduced capital expense of purchasing commodity rather than proprietary servers, with a reduced CAPEX of 80% for each new server purchased.

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

Return on investment:
55%

Payback period:
8.5 months

Reduction in CAPEX:
80%

Total NPV benefit:
\$8.3 million

Source: Forrester Research, Inc.

- › **Benefits.** The composite organization realized the following risk-adjusted benefits that represent those experienced by the interviewed companies:
 - **Reduced capital expenditures for servers.** Standardizing on x86 servers reduced capital expenditures for the composite organization by 80% for a total risk-adjusted savings of \$6.4 million per year and, over three years, more than \$19.4 million.
 - **Reduced maintenance costs for servers.** The cost for hardware maintenance that is based on purchasing lower-priced servers totals more than \$2.9 million per year and \$8.7 million over three years.
- › **Costs.** The composite organization experienced the following risk-adjusted costs:
 - **Cost of SUSE Linux Enterprise.** At an average price of \$1,499 per premium socket, the cost for SUSE Linux Enterprise for 3,000 servers totals more than \$13.6 million over three years.
 - **Internal labor to architect and transition to SUSE Linux Enterprise.** The indirect cost for the internal team of 18 employees who worked to architect and implement the transition from UNIX to SUSE totals more than \$2.2 million.
 - **Training and education for system administrators.** The cost for 60 system administrators to undergo five days of training initially and two days of training in Year 1 totals more than \$1.5 million.
 - **Cost of professional services.** Hiring outside professionals to augment the internal team for specialty insight and planning for a total of 90 days at \$1,200 per day totals \$113,400.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by SUSE 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 SUSE.
- › SUSE 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.
- › SUSE provided the customer names for the interviews 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 SUSE Linux Enterprise. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

APPROACH AND METHODOLOGY

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

- › Interviewed SUSE marketing and sales leaders, along with Forrester analysts, to gather data relative to SUSE and the marketplace for SUSE.
- › Interviewed four organizations currently using SUSE to obtain data with respect to costs, benefits, and risks.
- › Designed a composite organization based on characteristics of the interviewed organizations.
- › Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the composite organization.
- › Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted in interviews. Risk adjustment is a key part of the TEI methodology. While interviewed organizations 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 SUSE services: benefits, costs, flexibility, and risks.

Given the increasing sophistication that enterprises have regarding return on investment (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

COMPOSITE ORGANIZATION

For this study, Forrester conducted a total of four interviews with representatives from the following companies, which are SUSE customers:

- › **National government agency in Europe.** With more than 100,000 employees and 2,000 branch locations, this agency provides services to citizens across the country. The agency has more than 5,000 servers, 900 terabytes of storage, and more than 100 applications with dedicated databases.
- › **International bank headquartered in Asia.** The bank has more than 10,000 branches located across the globe. The technical division maintains 2,000 to 3,000 servers, 300 terabytes of data, and more than 200 applications.
- › **Global energy company based in Europe.** This energy company has operations in nearly 80 countries and employs more than 75,000 people around the globe. The company currently has 5,000 servers, 8 petabytes of storage, and 400 enterprise applications.
- › **Global automobile parts distributor headquartered in North America.** The organization has more than 200 servers running its suite of SAP applications and another 1,000 servers with more than 2 petabytes of storage.

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas affected financially. The composite organization that Forrester synthesized from these results represents an organization with:

- › 3,000 physical and virtual servers that are managed across the globe and via different cloud service providers. All cloud services are integrated into a private cloud that is managed by the organization.
- › 1 petabyte of data. Fifty percent of the data is considered high-end storage and is actively used in databases. The remaining data is located on lower-speed disks and is primarily archival data.
- › 100 employees who architect, plan, and manage the servers, storage, databases, and middleware. This group of employees also handles operational processes such as capacity planning. The average ratio for system administrators is 60 to 1, meaning that each system administrator manages 60 servers.
- › 150 applications with active databases, but the primary enterprise applications (e.g., finance) are SAP products. The organization is standardized on SAP solutions as much as possible.

“Our savings in servers is amazing. Our savings is a 1 to 6 ratio, which means that we used to have six servers, [but] now we can cover it using one server.”

~Director of technology, international bank

INTERVIEW HIGHLIGHTS

Before SUSE, the composite organization decided to change its infrastructure and standardize on a common technology platform. The organization chose to avoid using proprietary UNIX platforms and migrate to standard x86 hardware systems using SUSE Linux Enterprise.

Situation

The composite organization was facing:

- › Rising costs in capital expenditures for servers and in operating expenses to manage and support servers.
- › Increasing complexity of hiring staff required to maintain the UNIX systems from various hardware vendors.
- › Preparing to leverage cloud solutions by standardizing the organization's server environment.

Solution

In order to standardize on the x86 hardware platform, the organization needed to replace UNIX with another operating system that was certified for x86 systems. The organization replaced UNIX with SUSE Linux Enterprise because the organization also uses SAP products and "SAP is particularly focused on SUSE as an operating system platform," said the director of IT infrastructure and capacity planning at a global energy company.

Results

The interviews revealed that the composite organization:

- › **Reduced the capital expenditures for servers by 80%.** The cost per server was 80% lower than the equivalent hardware from UNIX providers. In addition, some of the interviewed companies also made significant reductions in the number of servers required to handle the processing workload.
- › **Lowered operational costs for maintenance agreements.** Less expensive servers also result in lower maintenance costs. When a company is using 3,000 servers, the savings in maintenance costs becomes significant.
- › **Reduce the time to respond to changing business requirements from months to minutes.** Because the composite organization is able to procure servers in a few days rather than weeks, and also has the ability to anticipate business needs by keeping a handful of extra servers in stock, it has assets available more quickly. In addition, using standard server templates, cloud services, and virtual servers enables the IT organization to literally respond in minutes when business needs justify the effort.

"We had to be faster to provide solutions to our business in less time. Standardization allowed us to reduce this time. Shrinking the time-to-market is the main goal that we have achieved."

~IT director, global energy provider

BENEFITS

The composite organization experienced a number of quantified benefits in this case study. The organization:

- › Reduced capital expenditures for servers.
- › Reduced maintenance costs for servers.

+ Reduced Capital Expenditures For Servers

The composite organization began purchasing standard x86 servers and reduced its capital expenditures by 80% compared with the cost of equivalent UNIX servers. The level of savings realized by the companies that Forrester interviewed ranged from 40% to 90%. The difference in capital expenditure savings depended on how executives defined “commodity” server. Some companies purchased the least expensive servers available while others purchased servers that were less expensive but still with premium levels of redundancy or reliability.

In addition, some companies reported an increase in the number of servers while other companies reported significant declines in the number of servers deployed. In this study, Forrester assumed that the number of servers remains level as the company grows and server efficiency improves. Readers must adapt the number of servers to match their infrastructure strategy, deployment of virtual servers, and adoption of cloud infrastructure to derive the correct impact to their organization.

For the composite organization, the company purchased (including replacements, upgrades, etc.) 600 servers annually at a savings of \$11,400 per server (see Table 1). This resulted in an annual savings of more than \$6.8 million that totals more than \$20.5 million over three years.

During Forrester’s interviews, customers realized similar levels of savings by standardizing on x86 systems and adopting SUSE Linux Enterprise. To compensate, this benefit was risk-adjusted and reduced by 5%. The risk-adjusted total benefit of reduced CAPEX for servers over the three years was more than \$19.4 million. See the section on Risks for more detail.

TABLE 1
Reduced Capital Expenditures For Servers

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Total servers installed		3,000	3,000	3,000
A2	Annual servers replaced or upgraded	A1*20%	600	600	600
A3	Cost per UNIX server		\$14,250	\$14,250	\$14,250
A4	Cost per x86 server		\$2,850	\$2,850	\$2,850
A5	Savings per server	A3-A4	\$11,400	\$11,400	\$11,400
At	Reduced capital expenditures for servers	A2*A5	\$6,840,000	\$6,840,000	\$6,840,000
	Risk adjustment		↓ 5%		
Atr	Reduced capital expenditures for servers (risk-adjusted)		\$6,498,000	\$6,498,000	\$6,498,000

Source: Forrester Research, Inc.

★ Reduced Maintenance Costs For Servers

In addition to the capital expenditure for hardware, the composite organization pays maintenance fees to the hardware vendor for warranty replacements, telephone support, and similar routine assistance. While the fees for maintenance range from 2% to 20% of the original asset purchase price, Forrester uses a 9% rate to calculate the maintenance costs for this study, resulting in annual savings of more than \$3 million per year for a total of more than \$9.2 million over three years.

Because the maintenance cost is derived from the original purchase price of a server, Forrester uses the same risk percentage for maintenance as for the server and risk-adjusts the benefit down by 5%. The result is an annual risk-adjusted cost of more than \$2.9 million per year and more than \$8.7 million over three years.

TABLE 2
Reduced Maintenance Costs For Servers

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Total servers installed		3,000	3,000	3,000
B2	Annual maintenance cost for UNIX server	A3*9%	\$1,283	\$1,283	\$1,283
B3	Annual maintenance cost for x86 server	A4*9%	\$257	\$257	\$257
Bt	Reduced maintenance costs for servers	B1*(B2-B3)	\$3,078,000	\$3,078,000	\$3,078,000
	Risk adjustment		↓ 5%		
Btr	Reduced maintenance costs for servers (risk-adjusted)		\$2,924,100	\$2,924,100	\$2,924,100

Source: Forrester Research, Inc.

★ Unquantifiable Benefits

In addition to the benefits quantified in the previous section, Forrester documented additional benefits that cannot be quantified. The benefits include:

- › **Improved response time to changing business needs.** The ability of the IT organization to deploy servers, including virtual servers, using standard architectures, configuration templates, and by providing a single point of contact literally changed the response time to business needs “from months to minutes” for the global energy company.
- › **Increased ability to hire and retain system administrators.** The composite organization has better access to system administrators, and the professionals are less expensive than UNIX professionals. Although the interviewed companies reported better access to system administrators, the organization has not quantified the value of this benefit.
- › **Enhanced disaster recovery and business continuity.** The IT director at the global banking company told Forrester, “We saw improvements in disaster recovery and the continuity of business, as the Linux platform is very stable. We were able to architect this from a design perspective and adopt a higher-level disaster control system.”

Total Benefits

Table 4 shows the total of all benefits across the areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than \$23.4 million.

TABLE 3
Total Benefits (Risk-Adjusted)

Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Reduced capital expenditures for servers	\$6,498,000	\$6,498,000	\$6,498,000	\$19,494,000	\$16,159,564
Btr	Reduced maintenance costs for servers	\$2,924,100	\$2,924,100	\$2,924,100	\$8,772,300	\$7,271,804
	Total benefits	\$9,422,100	\$9,422,100	\$9,422,100	\$28,266,300	\$23,431,368

Source: Forrester Research, Inc.

COSTS

The composite organization experienced a number of costs associated with SUSE Linux Enterprise:

- › License fees for SUSE Linux Enterprise.
- › Internal labor to architect and transition to SUSE Linux Enterprise.
- › Training and education for system administrators.
- › Cost of professional services.

💰 License Fees For SUSE Linux Enterprise

Using an average price of \$1,499 per premium socket, Forrester calculates the price based on 3,000 servers for the composite organization. The cost totals more than \$4.4 million per year (see Table 4).

Because SUSE has standard pricing and the interviewed companies experienced similar costs, Forrester risk-adjusts the cost up by 1%, resulting in a risk-adjusted cost each year of more than \$4.5 million and a three-year total of more than \$13.6 million.

TABLE 4
License Fees For SUSE Linux Enterprise

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Total servers installed			3,000	3,000	3,000
C2	License fees for SUSE Linux Enterprise per premium socket			\$1,499	\$1,499	\$1,499
Ct	License fees for SUSE Linux Enterprise	C1*C2		\$4,497,000	\$4,497,000	\$4,497,000
	Risk adjustment	↑ 1%				
Ctr	License fees for SUSE Linux Enterprise (risk-adjusted)			\$4,541,970	\$4,541,970	\$4,541,970

Source: Forrester Research, Inc.

Internal Labor To Architect And Transition To SUSE Linux Enterprise

Although Forrester created a three-year model, the time for planning and implementing the migration from UNIX to SUSE Linux Enterprise ranged from two years to five years among the interviewed companies. For the purpose of creating a financial model, Forrester assumes that a team of 18 individuals spent 50% of their time for two years planning and implementing the transition. The total labor cost for this team totals \$1.08 million initially and through Year 1 (see Table 5).

Because readers may require a different amount of planning for their organization, Forrester risk-adjusts this cost up by 5%. The risk-adjusted cost of labor to architect, configure, and implement SUSE Linux Enterprise is \$1,134,000.

TABLE 5
Internal Labor To Architect And Transition To SUSE Linux Enterprise

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Number of FTEs involved		18	18		
D2	Average burdened salary		\$120,000	\$120,000		
	Percent of time on planning		50%	50%		
Dt	Internal labor to architect and transition to SUSE Linux Enterprise	$D1 * D2 * D3$	\$1,080,000	\$1,080,000		
	Risk adjustment	↑ 5%				
Dtr	Internal labor to architect and transition to SUSE Linux Enterprise (risk-adjusted)		\$1,134,000	\$1,134,000		

Source: Forrester Research, Inc.

📌 Training And Education For System Administrators

Based on the interviews, training is a key component when migrating from UNIX to SUSE Linux Enterprise. The composite company has 60 system administrators who required five days of training during the initial transition period. In addition, each system administrator needed an additional two days of training during the first year. The average cost for training is \$3,500 per day, resulting in a total training cost of \$1.47 million. Because the level of training may differ for other companies, Forrester risk-adjusts the cost up by 5%, resulting in a risk-adjusted cost of \$1,543,500.

TABLE 6
Training And Education For System Administrators

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Number of system administrators		60	60		
E2	Number of training days needed		5	2		
E3	Cost per day of training		\$3,500	\$3,500		
Et	Training and education for system administrators	$E1 * E2 * E3$	\$1,050,000	\$420,000		
	Risk adjustment	↑ 5%				
Etr	Training and education for system administrators (risk-adjusted)		\$1,102,500	\$441,000		

Source: Forrester Research, Inc.

📌 Cost Of Professional Services

During the transition from UNIX to SUSE Linux Enterprise, the organization engaged consultants for advice, architecture, and specific technical questions. In total, the organization hired professionals for 90 days at an average rate of \$1,200 per day for a total cost of \$108,000. Forrester risk-adjusts the cost up by 5%, resulting in a risk-adjusted cost over the three years of \$113,400.

TABLE 7
Cost Of Professional Services

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
F1	Number of consulting days		90			
F2	Average cost per day		\$1,200			
Ft	Cost of professional services	$F1 * F2$	\$108,000			
	Risk adjustment	↑ 5%				
Ftr	Cost of professional services (risk-adjusted)		\$113,400			

Source: Forrester Research, Inc.

Total Costs

Table 8 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the composite organization expects costs to total more than \$17.5 million.

TABLE 8
Total Costs (Risk-Adjusted)

Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Ctr	License fees for SUSE Linux Enterprise	\$0	\$4,541,970	\$4,541,970	\$4,541,970	\$13,625,910	\$11,295,207
Dtr	Internal labor to architect and transition to SUSE Linux Enterprise	\$1,134,000	\$1,134,000	\$0	\$0	\$2,268,000	\$2,164,909
Etr	Training and education for system administrators	\$1,102,500	\$441,000	\$0	\$0	\$1,543,500	\$1,503,409
Ftr	Cost of professional services	\$113,400	\$0	\$0	\$0	\$113,400	\$113,400
	Total costs	\$2,349,900	\$6,116,970	\$4,541,970	\$4,541,970	\$17,550,810	\$15,076,925

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. This provides an organization with the “right” or the ability to engage in future initiatives but not the obligation to do so. There are multiple scenarios in which a customer might choose to implement SUSE and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

- › **SUSE Manager.** SUSE Manager is an effective tool that reduces a number of manual activities for system administrators. “We fluidly shift people from hardware to manage middleware and databases,” said the IT director at a national government agency.
- › **Open source community.** The IT director at the banking company told Forrester, “From the user’s perspective, SUSE Linux Enterprise is a wonderful platform because it is a fully open source platform, which means that more solutions are available to clients. We benefit from the open source community and culture from SUSE Linux. Because of the open source culture, our products are updated faster and the quality is better because they come from a community. The other users also help us know how to better get value out of the products.”

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 SUSE 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 SUSE, 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 9
Benefit And Cost Risk Adjustments

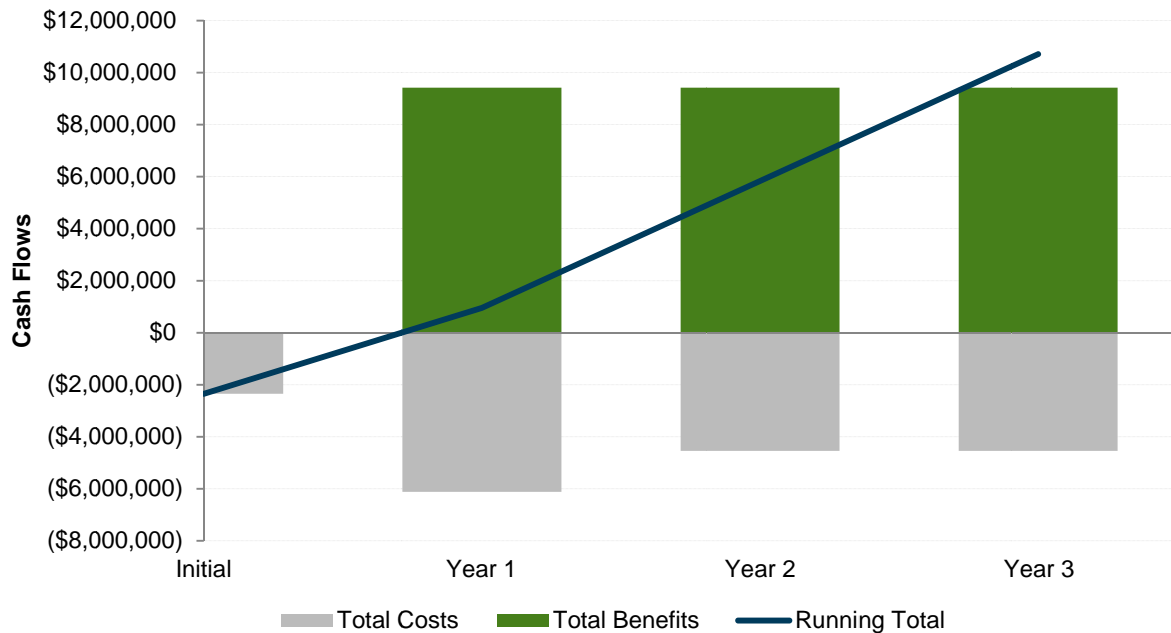
Benefits	Adjustment
Reduced capital expenditures for servers	↓ 5%
Reduced maintenance costs for servers	↓ 5%
Costs	Adjustment
License fees for SUSE Linux Enterprise	↑ 1%
Internal labor to architect and transition to SUSE Linux Enterprise	↑ 5%
Training and education for system administrators	↑ 5%
Cost of professional services	↑ 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 SUSE. Table 10 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 9 in the Risks section to the unadjusted results in each relevant Costs and Benefits section.

FIGURE 3
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 10
Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	(\$2,349,900)	(\$6,116,970)	(\$4,541,970)	(\$4,541,970)	(\$17,550,810)	(\$15,076,925)
Benefits	\$0	\$9,422,100	\$9,422,100	\$9,422,100	\$28,266,300	\$23,431,368
Net benefits	(\$2,349,900)	\$3,305,130	\$4,880,130	\$4,880,130	\$10,715,490	\$8,354,443
ROI						55%
Payback period						8.5 months

Source: Forrester Research, Inc.

SUSE: Overview

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

A pioneer in open source software, SUSE provides reliable, interoperable Linux and cloud infrastructure solutions that give enterprises greater control and flexibility. With more than 20 years of engineering excellence, exceptional service and an unrivaled partner ecosystem we help thousands of customers manage complexity, reduce cost and confidently deliver mission-critical services across physical, virtual and cloud environments. Whether they want to migrate from UNIX to Linux, slash downtime, build a private cloud, expand to a public cloud and more, we deliver the smarter innovation they need to succeed—today and tomorrow. For more information, visit www.suse.com.

Appendix A: Total Economic Impact™ Overview

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

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

Appendix B: 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 for 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

Source: Forrester Research, Inc.