

The Total Economic Impact™ Of Cisco Unified Computing System

Cost Savings And Business Benefits
Enabled By Cisco UCS

Table Of Contents

Executive Summary	3
Disclosures	4
TEI Framework And Methodology	6
Analysis	7
Financial Summary	19
Cisco UCS: Overview.....	20
Appendix A: Composite Organization Description	22
Appendix B: Total Economic Impact™ Overview.....	23
Appendix C: Glossary	24
Appendix D: Endnotes.....	24

ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit forrester.com/consulting.

© 2014, Forrester Research, Inc. All rights reserved. Unauthorized reproduction is strictly prohibited. Information is based on best available resources. Opinions reflect judgment at the time and are subject to change. Forrester®, Technographics®, Forrester Wave, RoleView, TechRadar, and Total Economic Impact are trademarks of Forrester Research, Inc. All other trademarks are the property of their respective companies. For additional information, go to www.forrester.com.

Executive Summary

In March 2014, Cisco Systems commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Cisco Unified Computing System (UCS). The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the Cisco UCS on their organizations.

To better understand the benefits, costs, and risks associated with a Cisco UCS implementation, Forrester interviewed several customers with multiple years of experience using Cisco UCS. Cisco Unified Computing System and servers unify computing, networking, management, virtualization, and storage access into a single integrated architecture.

Prior to Cisco UCS, customers were facing IT management and cost challenges in their legacy environments as a result of data and server growth. These customers looked to Cisco UCS to reduce their operational and capital costs as well as increase the scalability of their environment to meet their business objectives. As one chief technology officer stated, “Without having a product like Cisco UCS, we would never have gotten the company off the ground. Our costs would have dramatically increased [without it].” Cost to switch is an important consideration for customers considering Cisco UCS. None of the organizations interviewed had any professional services fees with their implementation of Cisco UCS, and they did not report any significant training costs.

Cisco UCS can help save IT infrastructure costs, improve IT and end user productivity, and deliver faster speed to market for infrastructure projects.

The costs and benefits for a composite organization of 3,000 employees, based on customer interviews, are:

- **Investment costs: \$521,956.**
- **Total cost savings and benefits: \$1,604,680.**

CISCO UCS REDUCES IT ADMINISTRATIVE COSTS AND HARDWARE COSTS

Our interviews with four existing customers and subsequent financial analysis found that a composite organization based on these companies experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1.¹ See Appendix A for a description of the composite organization.

The composite organization three-year analysis achieves benefits of \$2,126,636 versus implementation costs of \$521,956, delivering a positive net present value (NPV) of \$1,604,680.

With Cisco UCS, organizations interviewed improved their IT administration productivity by at least 30%, and the composite organization experienced additional savings in hardware, data center, and disaster recovery costs.

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

Final ROI	Payback period	Total benefits (PV)	Total costs (PV)	Net present value	IT productivity savings
307%	3.3 months	\$2,126,636	\$521,956	\$1,604,680	30% to 50%

Source: Forrester Research, Inc.

› **Benefits.** The composite organization experienced the following benefits that represent those experienced by the interviewed companies. These benefits are all expressed in risk-adjusted, net present value terms:

- **Reduction in ongoing administrative effort.** Organizations reported reduced time and effort in managing the data center, estimating 30% to 50% improved IT productivity, as a result of their Cisco UCS implementation. The composite organization saved the equivalent of two full-time IT engineers, representing \$584,908 in savings.
- **Network port and switch cost reduction.** The simplified structure of UCS also reduces capital expenditure in terms of port and cabling costs, resulting in \$703,462 in savings for the composite organization.
- **Refresh cost avoidance.** By timing the purchase of Cisco UCS with the refresh of fully depreciated hardware, the organization was able to gain \$239,273 as a result of server infrastructure cost avoidance.
- **Power and cooling cost savings.** With Cisco UCS, the composite organization reduced its power and cooling costs by 50%, resulting in \$51,959 in savings.
- **Electrical circuit cost avoidance.** The composite organization reduced its electrical circuit purchases by 40% per year, resulting in cost avoidance savings of \$70,189.
- **Data center space cost savings.** Cisco UCS also enabled the composite organization to consolidate its data center footprint. Space savings associated with implementing a UCS solution resulted in \$38,994 in savings for the composite organization.
- **End user productivity savings.** The composite organization also reduced unplanned downtime with its Cisco UCS implementation, saving end users 5 hours per year, equivalent to \$118,545.
- **Cost avoidance of a disaster recovery solution.** The composite organization also used Cisco UCS in its QA environment as a secondary disaster recovery (DR) solution. This represents \$141,247 in cost avoidance savings for a traditional DR alternative.
- **Faster time-to-market.** Cisco UCS also enabled faster time-to-market for the composite organization's infrastructure projects. At a 75% reduction in project execution time, the financial analysis quantifies this benefit at \$177,971 in savings for the composite organization.

› **Costs.** The composite organization experienced the following costs, expressed in risk-adjusted present value terms:

- **UCS hardware, license, and maintenance fees of \$431,155.** This includes initial UCS investments, subsequent investment in years 1 and 3, as well as ongoing SMARTnet fees.
- **UCS port and switching costs of \$23,302.** This cost represents the investment in switches and ports required to run UCS.
- **Implementation costs of \$67,500.** This category represents the IT staff time allocated to discovery, testing, and deployment of Cisco UCS.
- **Training and professional services costs.** None of the organizations interviewed reported significant training costs with their implementation of Cisco UCS. These organizations also stated that they did not incur any professional services fees in their implementation.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by Cisco and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

- › Forrester makes no assumptions as to the potential return on investment 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 Cisco UCS.
- › The customer names for the interviews were provided by Cisco.
- › Customer interviews were conducted privately by Forrester, Cisco did not participate in any of the interviews, and no customer attribution of quotes or feedback were provided to Cisco.
- › Forrester maintained editorial control over this study and its findings, and did not accept changes to the study that contradicted Forrester's findings or obscured the meaning of the study. Cisco did review this study and provide feedback to Forrester.

TEI Framework And Methodology

INTRODUCTION

From the information provided in the interviews, Forrester has constructed a Total Economic Impact (TEI) framework for those organizations considering implementing Cisco UCS. 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 Cisco UCS can have on an organization (see Figure 2). Specifically, we:

- › Interviewed Cisco marketing and sales personnel, along with Forrester analysts, to gather data relative to Cisco UCS and the marketplace for Cisco UCS.
- › Interviewed four additional organizations currently using Cisco UCS to obtain data with respect to costs, benefits, and risks in addition to the five original organizations interviewed for the August 2011 TEI case study “The Total Economic Impact™ Of The Cisco Unified Computing System” by Sadaf Bellord.
- › Designed a composite organization based on characteristics of the interviewed organizations (see Appendix A).
- › 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 impacted it higher or lower. 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 Cisco UCS’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 B for additional information on the TEI methodology.

FIGURE 2
TEI Approach



Source: Forrester Research, Inc.

Analysis

COMPOSITE ORGANIZATION

For this study, we gathered data from nine interviews with representatives from the following companies, which are Cisco customers based in the US:

- › A global fast food corporation with a network of franchises covering 50 states and over 50 international markets. This organization with two data centers saw huge growth of its eCommerce environment in the past years.
- › A privately owned transportation provider with over \$400 million per year in revenue and 3,000 employees. Cisco UCS was implemented as part of this company's virtualization strategy.
- › A healthcare organization focused on providing low-cost healthcare to low-income individuals with approximately 2,500 employees. It consolidated its data centers to a single footprint and virtualized the majority of its infrastructure.
- › An IT services subsidiary of a public corporation in the medical services industry with over \$700 million in annual revenue and 2,600 employees.
- › A provider of critical communication and compliance solutions. The firm has about 150 employees and 3,500 customers. The firm's innovation and growth has resulted in a number of industry recognitions.
- › A regional medical center that has 400 beds and serves nearly 500,000 outpatients annually.
- › An energy management and conservation organization that was formed in 2008. As a midstage startup, the organization's IT department has to cater to a constantly changing and expanding business environment.
- › A university that serves a growing adult education business online and on campus. The IT department supports 5,000 employees and 55,000 students.
- › An Ivy League university with a large undergraduate and graduate population.

“Being able to scale was critical. Cisco UCS provided the means to quickly meet the needs of the business.”

~Director, IT infrastructure engineering services, healthcare organization

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

- › A US-based medical services provider with a global footprint.
- › 3,000 employees.
- › \$500 million in annual revenue.
- › One data center.

The composite company, also known as *Organization A*, was roughly 40% through a virtualization project when it decided to look at other options for server consolidation. After evaluating multiple vendors and approaches, *Organization A* chose Cisco UCS driven by Cisco's design approach with Unified Fabric, its integrated “one pane of glass” management, and cabling consolidation.

INTERVIEW HIGHLIGHTS

The organizations interviewed all experienced capital and operational savings with their Cisco UCS deployment, with cost reduction and improved scalability as the main factors in their decision to choose Cisco UCS. Other highlights from the interviews include the following:

- › One organization implemented Cisco UCS as an alternative to its legacy environment with complex cabling structure and firmware. With the growth of its eCommerce environment and big data strategy, and a compute footprint growing at 70% per year, it needed to find a solution that gave it operational savings and a strategic advantage in expanding its digital footprint internationally. In the bake-off that was part of the organization's preselection process, one of its employees noted, "The way Cisco has integrated their compute in their networking components allowed us to divide network from compute support. They were the most progressive option tied to the solutions overall."
- › A director of data center operations noted, "We could not have gotten the results from data center consolidation and virtualization without UCS." Data growth and server growth was a primary factor in the organization's decision to virtualize and implement Cisco UCS. Data was growing at an unmanageable rate, from 200 terabytes in 2009 to seven petabytes in 2013. Its cabling and network infrastructure costs were also growing at an average of 20% per year.
- › After considering alternative solutions, one organization chose Cisco UCS because it considered Unified Fabric a better design and "Cisco UCS also made sense with its additional horsepower and elimination of cabling." While the organization was concerned about the complexity and "doing everything in one basket", it noted the skilled Cisco engineering and support it received during its project planning and deployment mitigated its concerns.
- › One organization needed a virtualization strategy as it consolidated about 40 companies and planned for future expansion. When asked why it chose Cisco UCS as part of its strategy, the CTO said, "We didn't know how many ports we would need, or how we were going to grow. With Cisco we could efficiently leverage less connections. This contributed a world of difference to the environment for growing quickly." The CTO was also impressed by how easy Cisco UCS was to configure, with one tool that allowed for complete provisioning (firmware, network continuity, etc.).

Composite Organization

Solution

The composite organization selected Cisco UCS for its ability to provide a cost-effective and scalable solution as well as the strength of its design and capabilities.

"UCS has become the central strategy for everything that we do. It is the platform for what we want to provide moving forward."

~Project manager, large transportation services provider

"We are heavily reliant on Cisco UCS technology. The integration is so seamless and so transparent, it makes sense not to introduce something else. And Cisco UCS continues to keep pace. We're getting denser and denser and we have not retired a single blade."

~CTO, IT services subsidiary of a large medical service enterprise

Benefits

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

- › Reduction in ongoing administrative effort.
- › Network port and switch cost reduction.
- › Refresh cost avoidance.
- › Power and cooling cost savings.
- › Electrical circuit cost avoidance.
- › Data center space cost savings.
- › End user productivity savings.
- › Cost avoidance of a disaster recovery solution.
- › Faster time-to-market.

“[With Cisco UCS], we can easily see who is doing what, where, when, and how on the network. We can now determine the best times to do testing and maintenance windows.”

~CTO, IT services subsidiary of a large medical service enterprise

Another important benefit mentioned by interviewed organizations was an increase in flexibility as a result of their Cisco UCS implementation. This flexibility meant that the IT team was more agile and responsive. They could deploy UCS in step with the development team requirements, ensuring that infrastructure deployment was no longer a roadblock to project delivery.

+ Reduction In Ongoing IT Administrative Effort

All organizations interviewed reported a reduction in IT engineering time and effort for managing the data center as a result of deploying Cisco UCS. One company reported that it was 75% faster to install, manage, and provision hardware with Cisco UCS when compared with its legacy server environment, stating “it used to be a process that involved three teams and several days and now it’s a single person.” Another company reported that Cisco UCS has enabled it to cut its project onboarding time in half. One healthcare organization whose data growth grew from 200 terabytes to 7 petabytes over four years estimated that it has seen and will continue to see savings from 30% to 50% in IT administration time by implementing Cisco UCS. One organization framed these savings in terms of not hiring additional IT staff even when its company size grew by 420%.

With its Cisco UCS implementation, the composite organization significantly reduced its time allocated to repetitive management tasks by 50%. In this analysis, we are only measuring the benefit associated with the UCS implementation and not *Organization A*’s virtualization project. From a headcount perspective, *Organization A* was able to avoid the cost of hiring two additional IT engineers to manage its data and server growth requirements due to Cisco UCS. At an average annual fully loaded compensation of \$120,000 per IT operations FTE, the benefit of reduction in ongoing IT administrative effort is quantified at \$240,000 per year.

Interviewed organizations provided a broad range of IT administration productivity improvements, since there are a variety of outside forces that might also affect this. To compensate, this benefit was risk-adjusted and reduced by 2%. The risk-adjusted benefit was \$235,200. See the section on Risks for more detail.

TABLE 1
Reduction In Ongoing IT Administrative Effort

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Number of IT support staff		2	2	2
A2	Average annual fully loaded compensation		\$120,000	\$120,000	\$120,000
At	Reduction in ongoing administration effort	A1*A2	\$240,000	\$240,000	\$240,000
	Risk adjustment		↓ 2%		
Atr	Improved claims processing (risk-adjusted)		\$235,200	\$235,200	\$235,200

Source: Forrester Research, Inc.

★ Network Port And Switch Cost Reduction

All the organizations reported total cost of ownership (TCO) savings with their implementation of UCS compared with their traditional server environments. A part of this was driven by the fact that UCS's simplified structure eliminated the need to purchase and maintain a large number of IP network ports and FC network ports and associated cabling. The financial model estimates that the composite organization's UCS implementation results in reduced costs of 400 IP networking ports and 400 FC networking ports and associated cabling costs, resulting in \$823,200 in savings. The model assumes that the composite organization is spending \$208 per IP network port, \$900 per FC network port, \$50 cabling cost per port, and an average of \$850 per server port.

This benefit was risk-adjusted and reduced by 6%. The risk-adjusted total benefit resulting from cost reduction of network port, switch, and associated cabling costs was \$773,808.

TABLE 2
Reduction In Network Port And Switches

Ref.	Metric	Calculation	Year 1
B1	Number of IP network ports		400
B2	Port, cable, and switch costs	\$208 + \$50 + \$0	\$258
B3	Number of FC network ports		400
B4	Port, cable, and switch costs	\$900 + \$50 + \$850	\$1,800
Bt	Network port and switches cost reduction (non-risk adjusted)	B1*B2 + B3*B4	\$823,200
	Risk adjustment		↓ 6%
Btr	Network port and switches cost reduction (risk-adjusted)		\$773,808

Source: Forrester Research, Inc.

★ Refresh Cost Avoidance

A number of the organizations interviewed had timed their purchase decision of Cisco UCS with their hardware refresh cycle and shifted their investment budget to replace traditional hardware with Cisco UCS. The composite organization avoided \$280,000 in hardware refresh costs for ancillary environments with its Cisco UCS implementation. This benefit was risk-adjusted and reduced by 6%. The risk-adjusted total benefit was \$263,200.

+ Power And Cooling Cost Savings

Power and cooling costs savings was also one of the benefits reported by several of the organizations interviewed. One organization went from 50 rack-mounted servers to three racks and estimated that it saved \$10,000 per year in power and cooling costs. Another organization estimated that Cisco UCS enabled it to save 40% on its annual power bill. With power and cooling at \$53,300 per year, the composite organization was able to reduce its power and cooling costs by 40%, resulting in \$21,320 in annual savings. This benefit was risk-adjusted and reduced by 2%, resulting in a \$20,894 risk-adjusted total annual benefit.

TABLE 3
Power And Cooling Cost Savings

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
C1	Annual power bill		\$53,300	\$53,300	\$53,300
C2	Percentage saved		40%	40%	40%
Ct	Power and cooling cost savings	C1*C2	\$21,320	\$21,320	\$21,320
	Risk adjustment		↓ 2%		
Ctr	Power and cooling cost savings (risk-adjusted)		\$20,894	\$20,894	\$20,894

Source: Forrester Research, Inc.

+ Electrical Circuit Cost Avoidance

Interviewees estimated their cost to add electrical circuits to support the power demands of the alternative hardware with the same computing power as UCS. Their UCS implementations eliminated the need to purchase additional electrical circuits. *Organization A* would have purchased six electrical circuits per year and estimates that Cisco UCS enabled it to reduce its purchases by 40%. At an annual cost of \$12,000 per circuit, this represents \$86,400 in savings over three years. This benefit was risk-adjusted and reduced by 2%. The risk-adjusted total benefit was \$84,672. See the section on Risks for more detail.

TABLE 4
Electrical Circuit Cost Avoidance

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
D1	Number of 30 AMP circuits purchased per year		6	6	6
D2	Reduction		40%	40%	40%
D3	Annual cost per circuit	$D1 \times D2 \times D3$	\$12,000	\$12,000	\$12,000
Dt	Electrical circuit cost avoidance		\$28,800	\$28,800	\$28,800
	Risk adjustment		↓ 2%		
Dtr	Electrical circuit cost avoidance (risk-adjusted)		\$28,224	\$28,224	\$28,224

Source: Forrester Research, Inc.

+ Data Center Space Cost Savings

Selected organizations interviewed also noted that by reducing the total amount of physical hardware while increasing computing power, they were able to gain cost savings in terms of data center space. Organizations that had implemented virtualization with their UCS deployment noted that while most of the real estate cost savings came from their overall virtualization projects, a percentage of those savings could be attributed to UCS. One organization that had implemented UCS after consolidating its data center footprint noted that UCS enabled it to get more power out of the same space and avoid the cost of expansion in their managed data center. In the financial model, we estimate that the actual space savings associated with implementing Cisco UCS represent four racks saved. Eliminating these four racks resulted in \$16,000 in data center space cost savings per year. After risk-adjustment, this benefit was reduced by 2%. The total risk-adjusted value of this benefit was \$15,680 per year. See the section on Risks for more detail.

TABLE 5
Data Center Space Cost Savings

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
E1	Reduction in the number of racks		4	4	4
E2	Average square footage per server		4	4	4
E3	Average annual cost per square footage	$D1 \times D2 \times D3$	\$1,000	\$1,000	\$1,000
Et	Data center space cost savings		\$16,000	\$16,000	\$16,000
	Risk adjustment		↓ 2%		
Etr	Data center space cost savings (risk-adjusted)		\$15,680	\$15,680	\$15,680

Source: Forrester Research, Inc.

★ End User Productivity Savings

Apart from improved productivity for IT engineers, a Cisco UCS implementation also delivered increased productivity for end users of the organizations we interviewed. When noting the increased transparency and ease of management their organization achieved through Cisco UCS, one CTO stated, “We can easily see who is doing what, where, when, and how on the network. We can now determine the best times to do testing and maintenance windows.” He estimated that the company gained 2 hours a year per employee as a result of its Cisco UCS deployment. One healthcare organization interviewed noted that it is now more proactive in spotting and recognizing issues as a result of Cisco UCS and estimated that this has contributed to a reduction of one to two major outages per year.

Due to the faster time-to-recovery and improved IT management enabled by Cisco UCS, *Organization A* was able to reduce its major outages by one per year. These outages affected approximately 30% of its total staff at an average of 5 hours per outage. The Forrester model estimates that only 50% of that end user time recovered is used for productive work. At an average fully loaded compensation of \$45,000 per end user full-time equivalent (FTE), this results in \$48,678 in productivity savings per year. This benefit was risk-adjusted and reduced by 2%. The total risk-adjusted benefit of end user productivity savings is quantified as \$47,704 per year.

Apart from user productivity, other possible benefit areas affected by reduced outages using Cisco UCS include reduced cost of recovery with a lower Recovery Time Objective (RTO) and cost avoidance of lost revenue. While the organizations interviewed for this study did not quantify these benefits, readers of the study may choose to add these benefit categories to their own evaluation.

TABLE 6
End User Productivity Savings

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
F1	Number of workers		3,000	3,000	3,000
F2	Subset of workers affected		30%	30%	30%
F3	Average fully loaded hourly rate	\$45,000/ 2,080 hours	\$21.63	\$21.63	\$21.63
F4	Number of hours saved		5	5	5
F5	Percent captured		50%	50%	50%
Ft	End user productivity savings	$F1 \times F2 \times F3 \times F4 \times F5$	\$48,678	\$48,678	\$48,678
	Risk adjustment		↓ 2%		
Ftr	End user productivity savings (risk-adjusted)		\$47,704	\$47,704	\$47,704

Source: Forrester Research, Inc.

★ Cost Avoidance Of A Disaster Recovery Solution

One organization interviewed noted that it purchased a new UCS for its QA environment that would also serve as a secondary disaster recovery (DR) environment. When looking at the company’s alternatives, this project manager noted that using UCS was the easiest and lowest-cost DR option.

By using UCS for its QA environment, combined with the purchase of additional replication software for its secondary DR environment, the composite organization was able to save \$200,000 in cost avoidance of a traditional DR solution, which

includes storage and replication. This project was implemented in Year 3 after the organization's initial UCS deployment. The DR cost avoidance savings were risk-adjusted and reduced by 6%, resulting in a \$188,000 total benefit recognized in Year 3 of the implementation.

★ Faster Time-To-Market

One important benefit that emerged from the interviews was that Cisco UCS enabled the IT operations staff at these organizations to deliver projects significantly faster when compared with their legacy environment. The director for infrastructure and operations at one company noted that Cisco UCS enabled the organization to be more iterative in implementing projects and more effective at what it does. Another organization noted that using Cisco UCS accelerated its virtualization process by six months, which saved the time of its seven-person team working on this project. One fast food company also noted that its global expansion could now be accomplished at a faster pace, with Cisco UCS reducing onboarding time from four months to one month. It now "has a leg up on speed to market," and as it expands to additional countries, infrastructure footprint is no longer a gating factor.

With Cisco UCS, *Organization A* was able to set up satellite offices at a faster pace than before to address business needs. Instead of four months, these projects now took one month, representing a 75% reduction in IT operations project implementation time. An average of four FTEs from the system administration and network teams worked on this project. With a pace of one satellite office established per year starting in Year 2, the benefit of faster speed-to-market is quantified at \$120,000 annually. This benefit is risk-adjusted and reduced by 6%. Total risk-adjusted value of this benefit is \$112,800 starting in Year 2.

"We've literally cut our onboarding process in half. In the past, we spent a lot of time on environments, setting up connectivity, managing multiple assets, and now we've cut project implementation time in half with UCS."

~Director for infrastructure and operations, global fast food corporation

TABLE 7
Faster Time-To-Market

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
G1	Average fully loaded hourly rate	\$120,000/ 2,080 hours		\$57.69	\$57.69
G2	Number of workers			4	4
G3	Number of hours saved	3 months		520	520
Gt	Faster time-to-market			\$120,000	\$120,000
	Risk adjustment		↓ 6%		
Gtr	End user productivity savings (risk-adjusted)			\$112,800	\$112,800

Source: Forrester Research, Inc.

Total Benefits

Table 8 shows the total of all benefits across the five 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 \$2.1 million.

TABLE 8
Total Benefits (Risk-Adjusted)

Benefit	Initial	Year 1	Year 2	Year 3	Total	Present Value
Reduction in ongoing administration effort	\$0	\$235,200	\$235,200	\$235,200	\$705,600	\$584,908
Network port and switches cost reduction	\$0	\$773,808	\$0	\$0	\$773,808	\$703,462
Refresh cost avoidance	\$0	\$263,200	\$0	\$0	\$263,200	\$239,273
Power and cooling cost savings	\$0	\$20,894	\$20,894	\$20,894	\$62,681	\$51,959
Electrical circuit cost avoidance	\$0	\$28,224	\$28,224	\$28,224	\$84,672	\$70,189
Data center space cost savings	\$0	\$15,680	\$15,680	\$15,680	\$47,040	\$38,994
End user productivity savings	\$0	\$47,704	\$47,704	\$47,704	\$143,113	\$118,634
Cost avoidance of a DR solution	\$0	\$0	\$0	\$188,000	\$188,000	\$141,247
Faster time-to-market	\$0	\$0	\$112,800	\$112,800	\$225,600	\$177,971
Total benefits	\$0	\$1,384,710	\$460,502	\$648,502	\$2,493,714	\$2,126,636

Source: Forrester Research, Inc.

COSTS

The composite organization experienced a number of costs associated with the Cisco UCS solution:

- › UCS hardware, license, and maintenance fees.
- › UCS port and switching costs.
- › Internal labor implementation costs.

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

💰 UCS Hardware, License, And Maintenance Fees

This category includes license and maintenance costs to buy, deploy, and manage Cisco UCS. Organizations interviewed typically made an initial investment in Cisco UCS followed by a second or third investment for new and upcoming projects. A number of the organizations interviewed timed their investment in UCS with their plan to refresh hardware in their data center.

The composite organization made a two-phase investment in Cisco UCS followed by an investment in Year 3 to set up its secondary disaster recovery environment. To allow for variability in hardware, depending on each organization's environment, this cost was risk-adjusted up by 5%. The risk-adjusted cost of UCS hardware, license, and maintenance fees over the three years was \$252,000. See the section on Risks for more detail.

TABLE 9
UCS Hardware, License, And Maintenance Fees

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
H1	UCS hardware and licenses		\$250,000	\$100,000		\$63,000
H2	Ongoing support (SMARTnet)			\$9,000	\$9,000	\$9,000
Ht	UCS hardware, license and maintenance fees	H1 + H2	\$250,000	\$109,000	\$9,000	\$72,000
	Risk adjustment		↑ 5%			
Hrt	Total software costs (risk-adjusted)		\$262,500	\$114,450	\$9,450	\$75,600

Source: Forrester Research, Inc.

💰 UCS Port And Switching Costs

The first cost component is IP and Fibre Channel ports and related cabling costs. Unlike traditional servers, server ports are built into the UCS design; therefore, there are no additional costs for the server ports. Based on the UCS architecture, the composite organization needs eight IP network ports and eight FC network ports. The total cost for these ports, including associated cabling costs, is \$22,192. Port and switch costs may vary depending on architecture and number of hardware deployed, and this cost is similarly risk-adjusted up by 5%. The risk-adjusted total UCS port and switching costs are \$23,302.

Implementation Costs — Internal Labor

The composite organization enlisted three IT engineers to implement Cisco UCS for approximately 30 servers and 900 virtual machines (VMs). These engineers spent 30% of their time over six months, or 312 man-hours each, for the deployment. At an annual fully loaded compensation of \$120,000, the total internal labor for implementation cost *Organization A* \$54,000. As implementation costs may vary by organization, this cost was risk-adjusted by 25%. The total risk-adjusted cost of the internal labor for the composite organization's Cisco UCS implementation was \$67,500.

Training And Professional Fees

All of the organizations interviewed noted that they did not incur any significant training costs or professional fees in their Cisco UCS implementation. "It's been so intuitive," noted one CTO. One transportation company noted that its engineers "have been able to teach themselves," thus the organization did not require any outside professional services for its Cisco UCS deployment. This creates an indirect cost savings for customers since they can add UCS servers as and when they need them, without the requirement of scheduling a professional services engagement and the associated fees.

Total Costs

Table 10 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 a net present value of \$521,956.

TABLE 10
Total Costs (Risk-Adjusted)

Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
UCS hardware, license and maintenance fees	\$262,500	\$114,450	\$9,450	\$75,600	\$462,000	\$431,155
Port and switching costs	\$23,302	\$0	\$0	\$0	\$23,302	\$23,302
Implementation costs	\$67,500	\$0	\$0	\$0	\$67,500	\$67,500
Total costs	\$353,302	\$114,450	\$9,450	\$75,600	\$552,802	\$521,956

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 Cisco UCS 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 B).

As the enabler, IT is in the business of serving its business users. The ability to take products and services to market faster, better, and cheaper and offer the agility needed for business to deliver benefit is the key to this implementation. The customers interviewed noted that with their investment in UCS, they can increase the number of chassis, blades, or rack quickly and efficiently to support existing and new projects. The created framework allows the organizations interviewed to expand and adjust their environment as necessary to meet business demand. One company discussed how it leveraged Cisco UCS for a controlled operating system migration, essentially making the move a nonevent. Others talked about the improvement in scalability that they now had with their Cisco UCS environment.

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 Cisco UCS 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 Cisco UCS, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

TABLE 11
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Network port and switches cost reduction	↓ 6%
Refresh cost avoidance	↓ 6%
Faster time-to-market	↓ 6%
All other benefit categories	↓ 2%
Costs	Adjustment
Implementation costs — internal labor	↑ 25%
All other cost categories	↑ 5%

Source: Forrester Research, Inc.

Quantitatively capturing investment 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.

The following impact risks that affect benefits are identified as part of this analysis:

- › Customer benefits could vary depending on their infrastructure.
- › There is variability in labor savings that can be captured by operational efficiency.

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

- › The implementation cost will vary with the complexity of each user’s environment, the number of applications, and the degree of integration with other systems.
- › Port and switch costs may vary depending on the architecture and the size of the hardware deployment.
- › Implementation costs could also vary depending on skills available in an organization’s infrastructure and operations team.

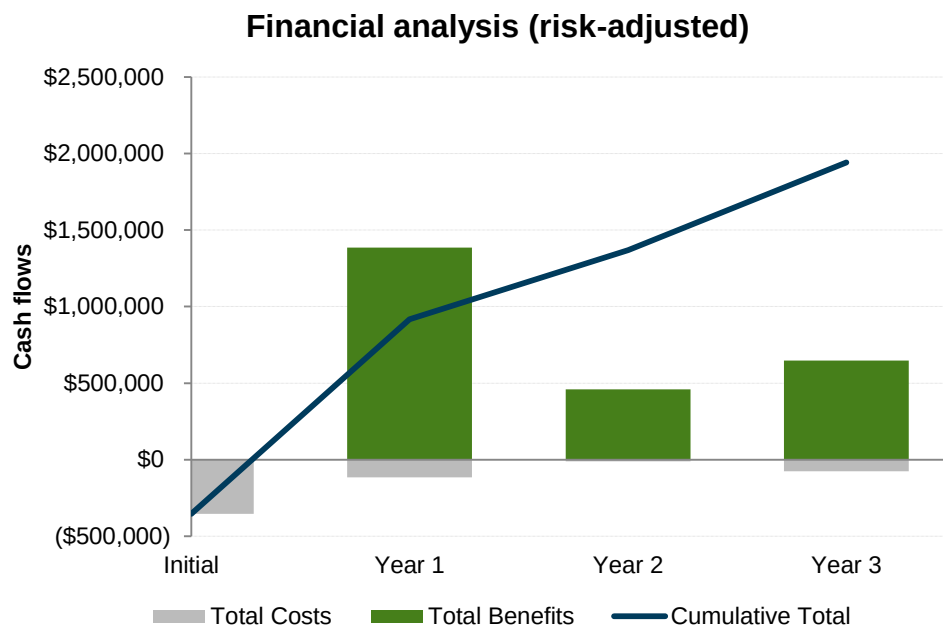
Table 11 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

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 composite organization's investment in Cisco UCS.

Table 12 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 11 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 12
Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	(\$353,302)	(\$114,450)	(\$9,450)	(\$75,600)	(\$552,802)	(\$521,956)
Benefits	\$0	\$1,384,710	\$460,502	\$648,502	\$2,493,714	\$2,126,636
Net benefits	(\$353,302)	\$1,270,260	\$451,052	\$572,902	\$1,940,912	\$1,604,680
ROI	307%					
Payback period	3.3 months					

Source: Forrester Research, Inc.

Cisco UCS: Overview

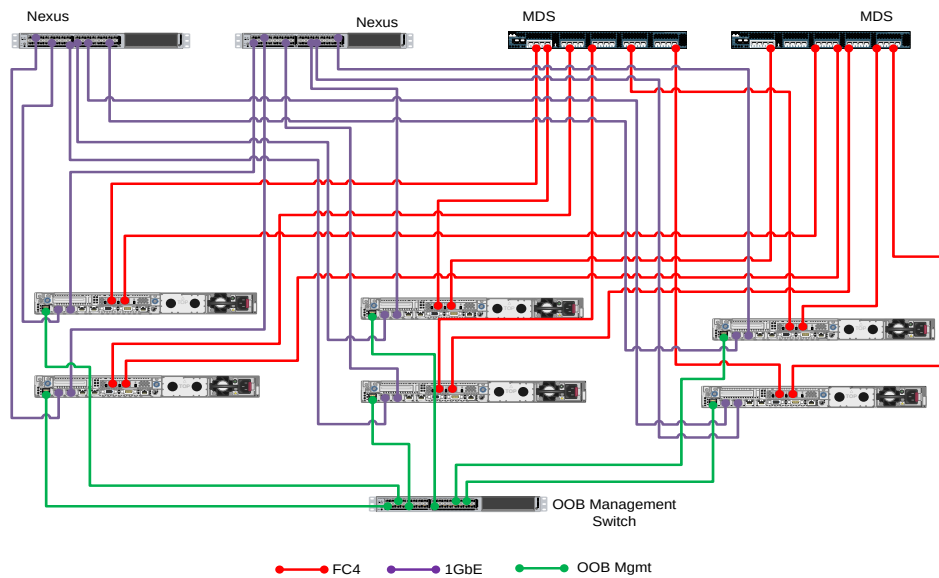
The following information is provided by Cisco. Forrester has not validated any claims and does not endorse Cisco or its offerings.

Cisco UCS unites computing, network, storage access, and virtualization into a cohesive system designed to reduce TCO and increase business agility. The Cisco UCS is built from the following components:

- › **Cisco UCS Manager:** Included with UCS Fabric Interconnects, manage up to 160 blade and rack servers and thousands of Cisco UCS components including multiple blade chassis with a single tool.
- › **Cisco UCS Central:** Cisco UCS Central manages multiple, globally distributed Cisco UCS domains with thousands of servers from a single pane, using Global templates and policies.
- › **Cisco UCS 6200 Series Fabric Interconnects:** line-rate, low-latency, lossless interconnect switches.
- › **Cisco UCS B-Series Blade Servers:** enhanced support for application demands, energy use, and virtualization.
- › **Cisco UCS 5100 Series Blade Server Chassis:** support for up to eight blade servers and up to two Fabric Extenders in a 6-rack unit (RU) enclosure.
- › **Cisco UCS 2200 Series Fabric Extenders:** two per 5100 Series blade chassis, provide unified fabric in the Blade Server Chassis, and up to eight 10 Gbps connections on each Fabric Extender.
- › **Cisco UCS B-Series Network Adapters:** a range of adapters optimized for virtualization, compatibility with existing driver stacks, or efficient, high-performance Ethernet.
- › **Cisco UCS C-Series Rack-Mount Servers:** the benefits of the UCS in a rack-mount form factor that can be fully integrated with UCS Blade servers in UCS Manager domains.
- › **Cisco UCS C-Series Network Adapters:** a choice of four types of PCI Express (PCIe) adapters, including Cisco Virtual Interface Card (VIC).

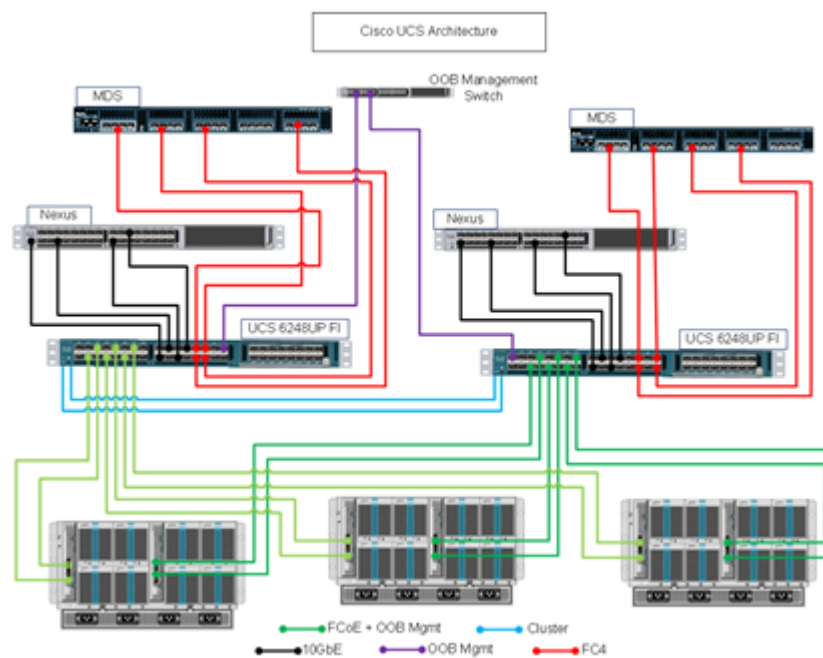
Figures 4 and 5 illustrate the difference between traditional server and networking architecture and Cisco UCS design. The reader should note that adding more UCS blade servers does not necessarily require additional network switches.

FIGURE 4
Existing Traditional Server And Networking Architecture (6-Rack Server Example — 30 Total Cables)



Source: Forrester Research, Inc.

FIGURE 5
Cisco UCS Architecture (24 Blade Server Example — 32 Total Cables; Each Additional Eight Servers Adds Four Cables To The Total Solution Cable Count)



Source: Forrester Research, Inc.

Appendix A: Composite Organization Description

For this TEI study, Forrester has created a composite organization to illustrate the quantifiable benefits and costs of implementing Cisco UCS. The composite company is intended to represent a US-based medical services provider with 3,000 employees and is based on characteristics of the interviewed customers.

The composite organization that Forrester synthesized from these results represents an organization with \$500 million in annual revenue. It is based in the US but also maintains a global footprint. The purchase of Cisco UCS was also aligned with the composite organization's refresh schedule to maximize the investment and reduce migration effort.

In purchasing Cisco UCS, the composite company has the following objectives:

- › Reduce the time and effort associated with ongoing data care management with the aim of limiting IT personnel costs even as the organization is growing at a rapid pace.
- › Reduce costs of cabling and network infrastructure and manage other data center costs such as power and cooling and real estate even as the business requires data growth.
- › Incorporate Cisco UCS as part of its overall virtualization strategy.

For the purpose of the analysis, Forrester assumes that the organization had virtualized 40% of its data center prior to its implementation of UCS.

FRAMEWORK ASSUMPTIONS

Table 4 provides the model assumptions that Forrester used in this analysis.

The discount rate used in the PV and NPV calculations is 10%, and the time horizon used for the financial modeling is three years. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

TABLE 4
Model Assumptions

Ref.	Metric	Calculation	Value
C1	Hours per year (M-F, 9-5)	(52 weeks * 40 hrs/wk)	2,080
C2	Hours per year (24x7)	(364 days * 24 hrs/day)	8,736
C3	IT engineer (annual salary)		\$120,000
C4	Hourly	C3/C1	\$57.69

Source: Forrester Research, Inc.

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, 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 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 (shown in the Framework Assumptions section) 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.

TABLE [EXAMPLE]
Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

Appendix D: Endnotes

¹ Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information on Risks, please see page 23.