

A Forrester Total Economic
Impact™ Study
Commissioned By Cisco And
Nimble Storage

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The Total Economic Impact™ Of The SmartStack Integrated Infrastructure Solution

Cost Savings And Business Benefits
Attributed To The SmartStack
Integrated Infrastructure Solution

FORRESTER®

Table Of Contents

Executive Summary	3
Disclosures	5
TEI Framework And Methodology	6
Analysis	7
Financial Summary	17
Appendix A: About The SmartStack Integrated Infrastructure Solution.....	18
Appendix B: Total Economic Impact™ Overview.....	20
Appendix C: Glossary.....	21

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Executive Summary

Cisco and Nimble Storage commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study to examine the potential return on investment (ROI) organizations may realize by deploying the SmartStack integrated infrastructure solution. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the SmartStack solution within their organizations.

To better understand the benefits, costs, and risks associated with an investment in the SmartStack integrated infrastructure solution, Forrester conducted in-depth interviews with four SmartStack customers. For a brief description of each customer, see the Analysis section. SmartStack is a joint converged infrastructure solution developed by Cisco and Nimble Storage.

It comprises Cisco unified computing system (UCS) Integrated Infrastructure and Nimble Storage All-Flash and Adaptive Flash storage arrays. Cisco UCS Integrated Infrastructure consists of the Cisco UCS, Cisco Nexus switches, Cisco UCS Director Management and orchestration software. For more details on the SmartStack integrated infrastructure solution, see Appendix A.

For this TEI study, Forrester has created a composite *Organization* to illustrate the quantifiable benefits and costs of investing in the SmartStack integrated infrastructure solution. The *Organization* is a \$1 billion-plus multinational manufacturer and service provider headquartered in North America with operations in Europe and Asia. Prior to investing in Nimble Storage's and Cisco's SmartStack integrated infrastructure solution, it was challenged by the need to keep pace with the annual 30% growth in its overall compute and storage requirements. For more information, see the section titled: The Composite *Organization*.

THE SMARTSTACK INTEGRATED INFRASTRUCTURE SOLUTION PROVIDES SIGNIFICANT LABOR AND OPERATIONAL COST SAVINGS

Our interviews and subsequent financial analysis found that the composite *Organization* experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1 for the SmartStack integrated infrastructure solution.

The analysis points to risk-adjusted benefits of \$589,320 over three years versus implementation and operating costs of \$194,915, equating to a net present value (NPV) of \$394,405. The risk-adjusted ROI was a very favorable 202%, and the payback period was a quick six months.

Quantified Benefit Categories Of The SmartStack Integrated Infrastructure Solution

(Risk- and present value-adjusted over three years)

The total benefits of \$589,320 are as follows:

- Total opex labor savings — \$155,180.
- Future labor savings — attrition — \$33,133.
- Infrastructure cost avoidance savings — \$385,200.
- Power and cooling savings — \$15,808.

FIGURE 1

Financial Summary Showing Three-Year Risk-Adjusted Results — SmartStack Integrated Infrastructure Solution

ROI:
202%

Benefits PV:
\$589,320

Costs PV:
\$194,915

NPV:
\$394,405

Source: Forrester Research, Inc.

The following are the benefits quantified in this case study:

› **Total benefits associated with the SmartStack integrated infrastructure solution — \$589,320.** The *Organization* experienced the following benefits (risk- and present value-adjusted) over three years (further detailed in the Benefits: Quantified section):

- Total opex labor savings — \$155,180.
- Future labor savings — attrition — \$33,133.
- Infrastructure cost avoidance savings — \$385,200.
- Power and cooling savings — \$15,808.

The interviewed customers identified the following *additional* benefits of using the SmartStack integrated infrastructure solution but were not able to quantify the benefits at the present time:

- According to the one customer, Nimble Storage InfoSight aggregates data in a central place. There's a proactive and predictive nature to Infosight. For example, on several occasions the customer has woken to see an email that indicated there was an incident and that the incident was closed before the customer ever had to get involved. On the rare occurrence when a Nimble drive does fail, the replacement drive is in the customer's mailroom before it even knows something has gone wrong. In addition, the customer does not have to rely on already overworked IT staff to design and produce storage reports; Infosight is very easy to use. With its previous legacy compute and storage infrastructure, the customer would log in to several overly complex applications to see the same data that Infosight captures today. Infosight's data can help predict future storage needs, which makes budgeting easier.
- For their legacy environments, interviewed customers highlighted a level of complexity around business continuity processes. It was a challenge to make sure there were enough skilled administrators to manage the various compute, storage, and network environments. SmartStack has helped blur the lines between the server team, the network team, and the storage team. Individual administrators can do everything now, whereas in the legacy environment, specialization within each silo was a higher-risk proposition.
- › Each interviewed customer commented on the partnership it has with its Nimble Storage account manager and the relaxed but trusted relationship. One customer commented: "My account representative has gone from just another sales guy to a trusted advisor."

The following are the costs quantified in this case study:

• **Costs associated with the SmartStack integrated infrastructure solution — \$194,915.** The *Organization* experienced the following costs (present value-adjusted) over three years (further detailed in the Costs section):

- Labor costs for the vendor selection process — \$4,500.
- Labor to plan and deploy the SmartStack integrated infrastructure solution — \$30,000.
- SmartStack integrated infrastructure solution costs — \$141,018.
- Cisco UCS training — \$10,000.
- Ongoing administrative labor — \$19,397.

If the risk-adjusted ROI and NPV of costs and benefits still demonstrate a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as "realistic" expectations, as they represent the expected values considering risk. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by Cisco and Nimble Storage 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 study to determine the appropriateness of an investment in the SmartStack integrated infrastructure solution.
- › Cisco and Nimble Storage reviewed and provided feedback to Forrester, but Forrester maintained editorial control over the study and its findings and did not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- › The interviewed customers' names were provided by Cisco and Nimble Storage. Cisco and Nimble Storage did not participate in the interviews.

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 investing in the SmartStack integrated infrastructure solution. The objective of the framework is to identify the benefits, costs, flexibility, and risk factors that affect the investment decision.

APPROACH AND METHODOLOGY

Forrester employed four fundamental elements of TEI in modeling the SmartStack integrated infrastructure solution: benefits, costs, flexibility, and risks.

Forrester took a multistep approach to evaluate the impact that the SmartStack integrated infrastructure solution can have on the composite *Organization* (see Figure 2). Specifically, we:

- › Interviewed Cisco and Nimble Storage marketing, sales, and product management personnel to better understand the value proposition for the SmartStack integrated infrastructure solution.
- › Conducted in-depth interviews with each of the four customers to obtain data with respect to costs, benefits, flexibility, and risks.
- › Designed a composite *Organization* based on characteristics of the interviewed customers.
- › 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.
- › Risk-adjusted the financial model based on minor issues and concerns the customers raised in the interviews. Risk adjustment is a key part of the TEI methodology. While the interviewed customers provided cost and benefit estimates, some categories included future projections or a broad range of responses, or had a number of internal or external forces that might have raised costs or lowered benefits. For that reason, each benefit has been risk-adjusted and is detailed in the Benefits: Quantified section.

Given the increasing sophistication that enterprises have regarding ROI analyses related to technology 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

INTERVIEWED CUSTOMERS

Forrester derived its conclusions in large part from information received in a series of in-depth interviews we conducted with personnel at four SmartStack customers, each of which had been using the SmartStack integrated infrastructure solution for at least 12 months. The following is a brief description of the interviewed customers, each of which was promised anonymity:

- › A North American oil and natural gas acquisition, exploitation, and exploration company. It has been using SmartStack for 18 months for a variety of workloads, including virtual desktop infrastructure (VDI), server virtualization, and enterprise applications and databases. It has future plans to add big data applications to SmartStack. Forrester interviewed the director of IT infrastructure.
- › A data analytics company and provider of credit information to the APAC markets. It has been using SmartStack for 18 months for the following workloads: VDI, server virtualization, Microsoft applications, and the Red Hat Linux server. Forrester interviewed the general manager of IT.
- › A logistics and supply chain management company specializing in materials, packaging, and logistics. It has been using SmartStack for 12 months for its server virtualization and VMware workloads. Forrester interviewed the lead systems architect.
- › A US construction engineering company specializing in highway and road design and environmental services. It has been using SmartStack for 19 months for the following workloads: server virtualization, VDI, Microsoft Exchange, SQL Server, and computer-aided design (CAD) software. Forrester interviewed the CIO of the organization.

THE COMPOSITE ORGANIZATION

For this study, we have created a composite *Organization* to help illustrate the quantifiable benefits and cost savings that can be achieved using Nimble Storage's and Cisco's SmartStack integrated infrastructure solution. This *Organization* is based on a combination of attributes and feedback collected from customers interviewed within the scope of this study. The *Organization* is a \$1 billion-plus multinational manufacturer and service provider headquartered in North America with operations in Europe and Asia. Prior to investing in Nimble Storage's and Cisco's SmartStack integrated infrastructure solution, it was challenged by the need to keep pace with the annual 30% growth in its overall compute and storage requirements.

After an extensive review process evaluating several vendors, the *Organization* selected the SmartStack integrated infrastructure solution, as it believed the solution could satisfy the following business goals and objectives:

- › **Reduce costs.** Reduce the time and money spent on managing its servers and storage.
- › **Support business needs.** Create a more flexible and agile server and storage infrastructure to respond to the business needs faster.
- › **Reduce risk.** Reduce risk with pre-validated SmartStack workload configurations and cooperative vendor support.
- › **Reduce energy consumption.** Consolidate data center servers and storage, saving in power and cooling costs. SmartStack provides consistency with known capacity, floor space, and power requirements.
- › **Reduce time-to-market.** Deploy new applications and workloads in minutes; deployments took days for its legacy infrastructure to complete.

The *Organization* was using the following workloads on its SmartStack integrated infrastructure solution:

- › **Server virtualization.** The SmartStack integrated infrastructure solution enables the *Organization* to deploy a single platform for all of its virtualized workloads. It can add virtual machines (VMs) to its virtualized server network and manage storage as just another aspect of the virtualized environment.
- › **Desktop virtualization.** The Predictive Flash platform delivers a VDI experience that delivers absolute performance, scale without disruption, and simplified operations.
- › **Enterprise applications and databases.** The Predictive Flash Platform has consolidated databases, improved response times, and accelerated application development projects.

“SmartStack has helped blur the lines between the server team, the network team and the storage team. Individual SmartStack administrators can do everything now, whereas in the legacy environment specialization within each silo was a higher risk proposition.”

~ Director of IT infrastructure, Anonymous

BENEFITS: QUANTIFIED

+ Operational Labor Savings

According to the interviewed customers, the investment in the SmartStack integrated infrastructure solution resulted in labor and time savings in the following areas and tasks:

- › The ability for UCS Director to update the hardware, meaning the firmware is centrally done. Each interviewed customer reported the ability to update switches and fabric. After the initial infrastructure is deployed, Cisco UCS Director is used to deploy and manage additional infrastructure stacks. After Cisco UCS service profiles are set up, they can be used for faster and simpler deployment of new infrastructure. This unified management helps lower operational labor costs by automating routine tasks, freeing administrators from the constraints of labor-intensive manual configuration and management.
- › The ability to start small and scale over time, with no more overprovisioning time and effort needed.
- › The ability to scale compute, capacity, or storage performance independently, as needed.
- › The ability to grow nondisruptively, with no data migration or user interruptions.
- › The ability for IT staff to consolidate more workloads onto fewer servers using less storage, so there's fewer components to buy and manage, saving labor hours.

Based on customer interviews, our *Organization* was able to save one-half a full-time equivalent (FTE) with SmartStack. The legacy environment required 22 hours a week to support; with SmartStack, only 2 hours per week are required to perform the above tasks. At an average fully loaded cost of \$75 per hour, the *Organization* was able to save \$78,000 per year (20 hours * 52 weeks * \$75 = \$78,000 per year). After risk-adjustments, the savings were \$62,400 per year, or \$187,200 over our three-year analysis.

The labor savings have been risk-adjusted (reduced) by 20% in Table 1, to take into account the variability of time savings among the interviewed customers and the *Organization's* ability to reallocate the newly available 20 hours to other value-added tasks. See the section on Risks for more detail.

TABLE 1
Total Opex Labor Savings Associated With SmartStack

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
A1	Ongoing labor associated with legacy infrastructure	Hours per week	22	22	22	
A2	Ongoing labor associated with SmartStack	Hours per week	2	2	2	
A3	Hours saved per week using SmartStack	A1 - A2	20	20	20	
A4	Hours saved per year	A3 * 52 weeks	1,040	1,040	1,040	
A5	Cost per hour	\$75 per hour	\$75	\$75	\$75	
At	Total opex labor savings associated with SmartStack	A4 * A5	\$78,000	\$78,000	\$78,000	\$234,000
	Risk adjustment	↓ 20%				
Atr	Total opex labor savings associated with SmartStack (risk-adjusted)	At - 20%	\$62,400	\$62,400	\$62,400	\$187,200

Source: Forrester Research, Inc.

+ Future Labor Savings — Attrition

Interviewed customers predicted future attrition savings, i.e., future replacements of IT administrators could be more junior than predecessors due to the simplicity of SmartStack, saving up to \$30,000 annually in salary and benefits per administrator. Forrester assumed the attrition labor savings benefit would begin in Year 2. To be conservative, these labor savings have been risk-adjusted (reduced) by 30% in Table 2 to reflect variations in IT administrator attrition rates, resulting in a total risk-adjusted benefit of \$42,000. See the section on Risks for more detail.

TABLE 2
Future Labor Savings With SmartStack – Attrition

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
B1	Cost of IT administrator — legacy infrastructure	Interviews	\$156,000	\$156,000	\$156,000	
B2	Cost of more junior administrator — simplicity of SmartStack	Interviews	-	\$126,000	\$126,000	
B3	Labor savings with SmartStack	B1 - B2	-	\$30,000	\$30,000	\$60,000
	Risk adjustment	↓ 30%				
Btr	Future labor savings with SmartStack — attrition (risk-adjusted)	Bt - 30%	-	\$21,000	\$21,000	\$42,000

Source: Forrester Research, Inc.

+ Infrastructure Cost Avoidance Savings With SmartStack

Interviewed customers were faced with a potential forklift upgrade of their four- to five-year-old legacy infrastructure. As with these customers, our *Organization* was not able to expand the existing compute and storage to accommodate growth. Drives were failing frequently, resulting in outages and downtime; there was unnecessary complexity in the infrastructure; and performance was deteriorating. Two of the interviewed customers had gotten quotes to upgrade (forklift) their legacy infrastructure and instead chose the less expensive SmartStack option. The costs of SmartStack have been included in the Costs section of this study, and we present the cost avoidance benefits here. The average savings from the two interviewed customers was \$428,000, and this included vendor selection activities, implementation labor, servers, storage, networking, and maintenance. Not included are power and cooling savings (see Table 4) and labor savings (see Tables 1 and 2).

To be conservative, the infrastructure benefits have been risk-adjusted (reduced) by 10% in Table 3. See the section on Risks for more detail.

TABLE 3
Infrastructure Cost Avoidance Savings With SmartStack

Ref.	Metric	Calc./ Source	Initial	Year 1	Year 2	Year 3	Total
C1	Infrastructure cost avoidance savings with SmartStack	Interviews	\$428,000	\$0	\$0	\$0	\$428,000
Ct	Labor to plan and deploy the SmartStack integrated infrastructure solution	C1	\$428,000	\$0	\$0	\$0	\$428,000
	Risk adjustment	↓ 10%					
Ctr	Infrastructure cost avoidance savings with SmartStack (risk-adjusted)	Ct - 10%	\$385,200	0	0	0	\$385,200

Source: Forrester Research, Inc.

+ Power And Cooling Savings With SmartStack

The interviewed customers estimated significant power and cooling savings when it replaced its legacy compute and storage infrastructure with SmartStack. With SmartStack, customers could consolidate more workloads onto fewer servers using less storage, shrinking the data center footprint and associated power and cooling costs. The data reduction capabilities of Nimble Storage also contributed to the cost savings.

Its power and cooling savings totaled \$19,070 (risk-adjusted) over three years and assumed a cost per KWH for power of \$0.14 and a cost per KWH for cooling of \$0.10 (see Table 4). We have risk-adjusted the savings downward by 7% to reflect regional KWH rate differentials.

TABLE 4
Power And Cooling Savings With SmartStack

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
D1	Power and cooling costs — legacy compute and storage infrastructure	Interviews/ research	\$9,316	\$9,316	\$9,316	\$27,947
D2	Power and cooling costs — SmartStack	Interviews/ research	\$2,481	\$2,481	\$2,481	\$7,442
Dt	Power and cooling savings	D1 - D2	\$6,835	\$6,835	\$6,835	\$20,505
	Risk adjustment	↓ 7%				
Dtr	Power and cooling savings (risk-adjusted)	Dt - 7%	\$6,357	\$6,357	\$6,357	\$19,070

Source: Forrester Research, Inc.

+ Total Quantified Benefits

Table 5 shows the total of all benefits as well as present values (PVs) discounted at 10%. Over three years, the *Organization* expects risk-adjusted total benefits to be a PV of \$589,320.

TABLE 5
Total Quantified Benefits Associated With The SmartStack Integrated Infrastructure Solution

Ref.	Metric	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Total opex labor savings associated with SmartStack	\$0	\$62,400	\$62,400	\$62,400	\$187,200	\$155,180
Btr	Future labor savings with SmartStack — attrition	\$0	\$0	\$21,000	\$21,000	\$42,000	\$33,133
Ctr	Infrastructure cost avoidance savings with SmartStack	\$385,200	\$0	\$0	\$0	\$385,200	\$385,200
Dtr	Power and cooling savings with SmartStack	\$0	\$6,357	\$6,357	\$6,357	\$19,070	\$15,808
	Total benefits (risk-adjusted)	\$385,200	\$68,757	\$89,757	\$89,757	\$633,470	\$589,320

Source: Forrester Research, Inc.

“My account representative has gone from just another sales guy to a trusted advisor.”

~ General manager IT services, Anonymous

BENEFITS: UNQUANTIFIED

The interviewed customers identified the following *additional* benefits of using the SmartStack integrated infrastructure solution but were not able to quantify the benefits at the present time:

- › According to the one customer, Nimble Storage InfoSight aggregates data in a central place. There's a proactive and predictive nature to Infosight. For example, on several occasions the customer has woken to see an email that indicated there was an incident and that the incident was closed before the customer ever had to get involved. On the rare occurrence when a Nimble drive does fail, the replacement drive is in the customer's mailroom before it even knows something has gone wrong. In addition, the customer does not have to rely on already overworked IT staff to design and produce storage reports; InfoSight is very easy to use. With its previous legacy compute and storage infrastructure, the customer would log in to several overly complex applications to see the same data that InfoSight captures today. Infosight's data can help predict future storage needs, which makes budgeting easier.
- › For their legacy environments, interviewed customers highlighted a level of complexity around business continuity processes. It was a challenge to make sure there were enough skilled administrators to manage the various compute, storage, and network environments. SmartStack has helped blur the lines between the server team, the network team, and the storage team. Individual SmartStack administrators can do everything now, whereas in the legacy environment, specialization within each silo was a higher-risk proposition.
- › Each interviewed customer commented on the partnership it has with its Nimble Storage account manager and the relaxed but trusted relationship. One customer commented: "My account representative has gone from just another sales guy to a trusted advisor."

FLEXIBILITY OPTION BENEFITS

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 (or option) to engage in future initiatives and benefits but not the obligation to do so.

Forrester asked each interviewed customer the following question: "Now that you have invested in SmartStack, what other features or functionality can your organization take advantage of?" The following represents the future options available to the *Organization*, or any the SmartStack customer:

- › According to Nimble Storage, InfoSight is an analytics and storage management engine that is designed to keep Nimble Storage arrays running in peak condition. InfoSight monitors all Nimble Storage assets collectively, from the cloud, analyzing billions of data points every day to build complete insight into overall storage health. It enables a completely automated support model, with more than 90% of customer support cases opened automatically and no customer interaction needed. InfoSight also provides intelligent performance modeling at the virtual machine, host, and network levels; actionable capacity forecasting for future needs; and comprehensive dashboard views.
- › According to the one customer, InfoSight aggregates data in a central place. There's a proactive and predictive nature to Infosight. For example, on several occasions the customer has woken to see an email that indicated there was an incident and that the incident was closed before the customer ever had to get involved. On the rare occurrence when a Nimble drive does fail, the replacement drive is in the customer's mailroom before it even knows something has gone wrong.
- › This customer also does not have to rely on already overworked IT staff to design and produce storage reports; InfoSight is very easy to use. With its previous legacy compute and storage infrastructure, the customer would log in to several overly complex applications to see the same data that InfoSight captures today. Infosight's data can help predict future storage needs, which makes budgeting easier.

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. For the purpose of this analysis, we have assumed that the *Organization* sees value in being able to take future

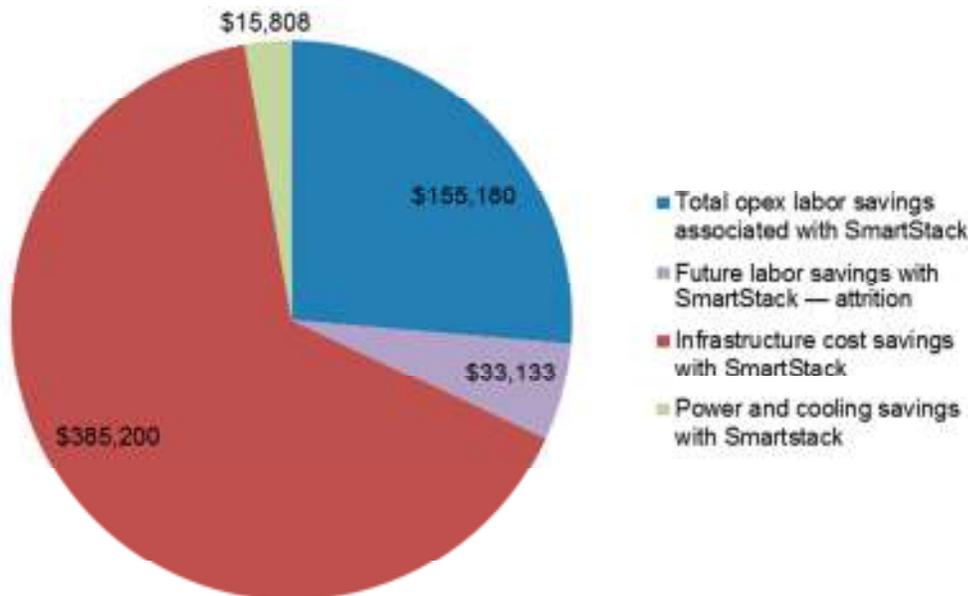
advantage of the above InfoSight features and functionality. The customer was not able to quantify the value of InfoSight, so Forrester will not quantify the benefit. The value of the flexibility option is based on the Black-Scholes Option Pricing model. (For information regarding the flexibility calculation, please see Appendix B.)

“Based on customer interviews, our Organization was able to save one-half full-time equivalent (FTE) with SmartStack. The legacy environment required 22 hours a week to support; with SmartStack only 2 hours per week are required to perform administrative tasks.”

~ Forrester Consulting

FIGURE 3
Quantified Benefits Of SmartStack

Benefits by Category (risk-adjusted)



Source: Forrester Research, Inc.

COSTS

The *Organization* incurred costs in the following categories associated with the SmartStack integrated infrastructure solution.

⑤ Due Diligence And Assessment Labor Costs For Vendor Selection Process — \$4,500

The labor associated with The *Organization's* vendor selection process totaled 60 man-hours over a three-week period and involved project managers; storage, server, and network administrators; and business unit staff. Tasks included determining the *Organization's* requirements, reviewing vendor proposals, and participating in vendor presentations. At an average fully loaded cost of \$75 per hour, the vendor selection process costs totaled \$4,500 (60 hours * \$75 = \$4,500).

⑤ Labor To Plan And Deploy The SmartStack Integrated Infrastructure Solution — \$30,000

The internal labor associated with planning and deploying SmartStack involved four staff members spending half their time over five weeks, totaling 400 hours. Staff included storage, server, and network administrators and a technical analyst. The cost associated with planning and deploying SmartStack was \$30,000 (400 hours * \$75 = \$30,000) as an initial investment period expense.

⑤ SmartStack Integrated Infrastructure Solution Costs — \$141,018

The SmartStack fees include the following components:

- › Cisco — two Nexus 9k switches.
- › Cisco — UCS Mini chassis with two embedded Fabric Interconnects.
- › Cisco — three Blade Servers.
- › Cisco — support 24x7x20S for 12 months.
- › Nimble — Adaptive Flash array controller.
- › Nimble — networking PCI-1GTX2.
- › Nimble — capacity HEAD-HDD 48TB.
- › Nimble — cache HEAD-FLC-2T.
- › Nimble — 4-hour response time — support service for three years.

⑤ Cisco — UCS Training — Engineering and Administration — \$10,000

The IT administrators took two Cisco training courses in UCS engineering and administration.

⑤ Ongoing Administrative Labor For The SmartStack Integrated Infrastructure Solution — \$23,400

This includes ongoing labor to operate and maintain SmartStack components and integration points. Interviewed customers averaged 2 hours per week for ongoing administrative tasks (2 hours * 52 weeks * \$75 = \$7,800 annually or \$23,400 over three years).

Table 6 shows the total costs of the SmartStack integrated infrastructure solution as well as associated present values discounted at 10%, over three years. Forrester chose not to risk-adjust costs because the *Organization* received fixed price quotes for SmartStack, and other costs are actual average costs incurred by the interviewed customers. The *Organization's* total costs for SmartStack were \$198,918, with a present value of \$194,915.

TABLE 6
Total Costs Associated With The SmartStack Integrated Infrastructure Solution

Ref.	Metric	Initial	Year 1	Year 2	Year 3	Total	Present Value
E1	Labor costs for vendor selection process	\$4,500	\$0	\$0	\$0	\$4,500	\$4,500
E2	Labor to plan and deploy the SmartStack integrated infrastructure solution	\$30,000	\$0	\$0	\$0	\$30,000	\$30,000
E3	SmartStack integrated infrastructure solution costs	\$131,018	0\$	\$0	\$0	\$131,018	\$141,018
E4	Cisco UCS training	\$10,000	\$0	\$0	\$0	\$10,000	\$10,000
E4	Ongoing administrative labor	\$0	\$7,800	\$7,800	\$7,800	\$23,400	\$19,397
Et	Total costs associated with the SmartStack integrated infrastructure solution	\$175,518	\$7,800	\$7,800	\$7,800	\$198,918	\$194,915

Source: Forrester Research, Inc.

For the *Organization*, the SmartStack integrated infrastructure solution fees reflected the average discount provided to similarly sized customers in the July 2016 timeframe.

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 SmartStack 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 customer may not be met by the investment in SmartStack, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

While the interviewed customers provided cost and benefit estimates, some categories included future projections or a range of responses, or had a number of internal or external forces that might have raised or lowered costs and benefits. However, the interviewed customers had an average of 12 months’ experience with SmartStack. For that reason, each benefit has been conservatively risk-adjusted downward as detailed in the Benefits: Quantified section. See Table 7 for a summary of risk adjustments by benefit category.

Note: Forrester chose not to risk-adjust costs because the *Organization* had received fixed price quotes for the SmartStack fees.

TABLE 7
Benefit And Cost Risk Adjustments

Benefit Categories	Adjustment
Total opex labor savings associated with SmartStack	↓ 20%
Future labor savings with SmartStack — attrition	↓ 30%
Infrastructure cost avoidance savings with SmartStack	↓ 10%
Power and cooling savings with SmartStack	↓ 7%
Costs	
(Costs were not risk-adjusted)	↑ 0%

Source: Forrester Research, Inc.

Highlighting risk by adjusting the benefits produces 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 implementation risk that could affect costs is identified as part of this analysis:

- › Although Forrester did not risk-adjust SmartStack fees, other organizations’ costs may vary due to different levels of users and variable discounts from Cisco and Nimble Storage partners.

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

- › The opex labor savings have been risk-adjusted (reduced) by 20% in Table 1 to take into account the variability of time savings among interviewed customers, along with the *Organization’s* ability to quickly reallocate the newly available 20 hours to other value-added tasks.
- › The future labor savings in Table 2 have been risk-adjusted (reduced) by 30% to reflect variations in IT administrator attrition rates.
- › To be conservative, the infrastructure cost avoidance benefits have been risk-adjusted (reduced) by 10% in Table 3.
- › We have risk-adjusted the power and cooling savings downward by 7% to reflect regional KWH rate differentials in Table 4.

Table 7 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates. The TEI model uses a triangular distribution method to calculate risk-adjusted values. To construct the distribution, it is necessary to first estimate the low, most likely, and high values that could occur within the current environment. The risk-adjusted value is the mean of the distribution of those points. 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 *Organization's* investment in the SmartStack integrated infrastructure solution.

Table 8 shows the risk-adjusted ROI, NPV, and payback period values for SmartStack. The cost and benefit values are from summary Tables 5 and 6.

TABLE 8

Cash Flow — The SmartStack Integrated Infrastructure Solution (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$175,518)	(\$7,800)	(\$7,800)	(\$7,800)	(\$198,918)	(\$194,915)
Total benefits	\$385,200	\$68,757	\$89,757	\$89,757	\$633,470	\$589,320
Net benefits	\$209,682	\$60,957	\$81,957	\$81,957	\$434,552	\$394,405
ROI						202%
Payback period						six months

Source: Forrester Research, Inc.

The ROI for the SmartStack integrated infrastructure solution was a very favorable 202%, and the payback period was a quick six months.

If risk-adjusted costs, benefits, and ROI still demonstrate a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as “realistic” expectations, as they represent the expected values considering risk. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

Appendix A: About The SmartStack Integrated Infrastructure Solution

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

SMARTSTACK — INTEGRATED INFRASTRUCTURE SOLUTIONS FROM CISCO AND NIMBLE STORAGE

SmartStack is an integrated infrastructure solution by Cisco and Nimble Storage that combines the Cisco UCS integrated infrastructure with Nimble All-Flash and Adaptive Flash storage arrays. SmartStack leverages the power of a predictive infrastructure to increase performance and availability and drive down costs across all data center workloads and geographic locations. To solve customer problems quickly, SmartStack provides pretested and prevalidated solutions over a diverse and growing set of workloads, including:

- › Desktop virtualization (or VDI).
- › Server virtualization and private cloud.
- › Desktop and server virtualization (combined).
- › Business-critical applications.
- › Oracle database and applications.
- › SAP Hana.

Cisco and Nimble Storage have developed validated architectures to help customers quickly deploy infrastructure with less risk. All computing, network, storage, and desktop and server virtualization components work together out of the box. Deployments are simple and fast with the help of:

- › Cisco stateless server provisioning with UCS Manager.
- › Each virtualization vendor's management suite.
- › Nimble Storage's wizard-based provisioning.

RECIPE FOR SUCCESS

Enterprises large and small need flexible and cost-effective ways to deploy business-critical applications. SmartStack offers performance with Cisco UCS servers and Nimble Adaptive Flash storage arrays, providing enterprise performance with a fraction of the footprint of traditional storage solutions. SmartStack deployments designed by Cisco and Nimble Storage offer customers the ability to:

Accelerate Their Business

Nimble and Cisco provide prevalidated and pretested Cisco Validated Designs and reference architectures for SmartStack integrated infrastructure solutions over a broad range of critical business applications and workloads, including:

- › Enterprise applications from vendors, such as Oracle, SAP, and Microsoft.
- › Emerging applications, such as big data and analytics applications.
- › Desktop virtualization.
- › Server virtualization.

Drive Down Costs

SmartStack is modular; purchase exactly what you need today and easily scale computing resources, storage performance, and storage capacity independently and nondisruptively as your business needs change. This capability:

- › Lowers initial capital expenditures (capex), because there's no need to pay to overprovision the infrastructure.
- › Saves operating expenses (opex), because there's no need to house, power, cool, and manage resources not being used.

Deliver Optimal Performance And Availability

SmartStack supports all applications and workloads in one integrated infrastructure solution. This solution can eliminate the complexities of siloed architectures and reduce cost while optimizing application performance.

SmartStack manages through a single pane using Cisco UCS Director, which provides infrastructure orchestration and management for all SmartStack components.

SmartStack lowers total costs through Cisco SingleConnect technology. It allows for significantly fewer network components, cables, and management points than traditional integrated infrastructure.

SmartStack promotes peak health through proactive monitoring with the Nimble Storage InfoSight cloud-based analytics platform.

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 technology 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 of 10% 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	Calc./Source	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.