

A Forrester Total Economic
Impact™ Study
Commissioned By Pure Storage

Project Director:
Bob Cormier
Vice President And
Principal Consultant

April 2017

The Total Economic Impact™ Of Pure Storage Evergreen Storage Subscriptions

Cost Savings And Business Benefits
Attributed To The Pure Storage
Evergreen Storage Subscriptions

Table Of Contents

Executive Summary	1
Disclosures	3
TEI Framework And Methodology	4
Analysis	5
Financial Summary	21
Appendix A: Pure Storage Evergreen Storage Subscriptions: Overview	22
Appendix B: Examples Of Business Benefits - Pure Storage FlashArrays	24
Appendix C: Total Economic Impact™ Overview	25
Appendix D: Glossary	26

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.

© 2017, 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 late 2016, Pure Storage commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study to examine the potential return on investment (ROI) organizations may realize by taking advantage of Pure Storage Evergreen Storage Subscriptions. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Evergreen Storage Subscriptions, especially the Gold Subscription, within their organizations.

To better understand the benefits, costs, and risks associated with an investment in Pure Storage, Forrester conducted in-depth interviews with Pure Storage customers. For a brief description of the customers, see the Analysis section.

Forrester created a composite *Organization* to describe the TEI of Pure Storage. The composite *Organization* is a North American, midmarket (\$250 million to \$2.5 billion) manufacturer, distributor, and service provider. It has been using Pure Storage for three years to support its storage needs in the following environments: virtual servers, virtual desktops (VDI), and SQL Server database. Forrester has projected costs and benefits over six years in this study. For more information, see the section titled: The Composite *Organization*.

Important reader note: There are two distinct chronological sections of this case study:

1. Years 1, 2, and 3 present the costs and benefits of the initial FA-400 series FlashArrays purchased by the *Organization*. This section also includes the Year 2 upgrade of the initial FA-420 to a FlashArray//M20. This upgrade is a result of the *Organization* taking advantage of Pure's Upgrade Flex controller bundles, part of its Evergreen Gold Subscription.
2. Years 4, 5, and 6 include the costs and benefits of upgrading the initial FA-405 to //M20 series FlashArrays, taking advantage of Pure's Free Every Three program, also part of its Evergreen Gold Subscription. Any Pure customer can receive a next generation (or latest upgrade) controller upgrade every three years when it renews its Evergreen Gold Subscription, for example at the beginning of years 4, 7 and so on.

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

The analysis points to risk-adjusted benefits of \$1,705,119 over six years versus implementation and operating costs of \$721,476, equating to a net present value (NPV) of \$983,643. The risk-adjusted ROI was a very favorable 136%.

Upgrade Highlights: Pure Storage Evergreen Gold Subscription

- **Free Every Three — Keep your array performance, scale, and features modern across generations, without downtime or performance disruptions, and without re-purchasing any TBs. Free Every Three includes upgraded controllers with every three-year Evergreen Gold Subscription renewal.**
- **Upgrade Flex Controllers — Upgrade your array performance as you expand. Purchase a qualifying capacity pack and get trade-in credit for your old controllers toward upgraded controllers.**

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

ROI:
136%

Benefits PV:
\$1,705,119

Costs PV:
\$721,476

NPV:
\$983,643

Source: Forrester Research, Inc.

PURE STORAGE'S EVERGREEN STORAGE SUBSCRIPTIONS PROVIDE SIGNIFICANT CAPITAL AND OPERATIONAL COST SAVINGS

According to Pure Storage, it offers an innovative storage ownership model called Evergreen Storage. It is available from Pure exclusively via subscriptions which they call Evergreen Storage Subscriptions. Their standard subscription, Evergreen Gold, offers subscription-based value across all-inclusive software, controllers, media, maintenance, and white glove support. All upgrades and enhancements, even across platform generations, are delivered non-disruptively, meaning without downtime or performance impact. Evergreen Gold allows customers to keep expanding, upgrading, and modernizing without rebuying the TBs they already own. The FlashArray//M series (and the previous FlashArray FA-400 series) are enterprise-class all-flash storage solutions designed to consolidate virtually any workload. The Purity Operating Environment which powers each array is built from the ground up for flash. Purity is provided at no additional cost with every FlashArray and runs consistently across the entire FlashArray hardware family. For more details on the Pure Storage solution and other features of the Evergreen Storage Subscriptions, see Appendix A.

The interviewed customers reported that Pure Storage FlashArrays greatly improved the infrastructure operations of their organizations. In addition, the performance benefits of the previous model Pure Storage FlashArray FA400 series and the current model //M series have resulting business benefits that transcend the data center and improve business operations of the composite *Organization*. The following are the benefits quantified in this case study:

› **Total years 1, 2, and 3 benefits associated with initial FlashArrays and the Evergreen Gold Subscription Upgrade Flex program — \$929,497.** The *Organization* experienced the following benefits (risk- and present value-adjusted), which are further detailed in the section titled Benefits: Quantified — Initial FlashArrays And Pure Evergreen's Upgrade Flex Program (Years 1, 2, And 3):

- Opex cost reduction — simplification of deployment and management tasks savings — \$562,143.
- Storage health checks — cost avoidance savings — \$22,762.
- Capital expense savings — rack unit costs — \$177,238.
- Power and cooling savings — \$60,990.
- Software license and maintenance — cost avoidance savings — \$106,364.

› **Total years 4, 5, and 6 benefits including Pure Evergreen Gold Subscription Free Every Three program — \$775,622.** The *Organization* experienced the following benefits (risk- and present value-adjusted), which are further detailed in the section titled Benefits: Quantified — Including Evergreen Gold's Free Every Three Program (Years 4, 5, And 6):

- Opex savings — simplification of management tasks and forklift upgrade cost avoidance — \$542,945.
- Storage health checks — cost avoidance savings — \$17,101.
- Capital expense savings — rack unit costs — \$169,753.
- Power and cooling savings — \$45,823.

› **Benefits: unquantified.** The interviewed customers identified the following additional benefits of using Pure Storage but were not able to quantify the benefits at the present time:

- Interviewed customers, citing the simplicity of Pure Storage, reported less administrative labor risk using Pure Storage. Previously, legacy disk storage administration was being done by full-time senior administrators, which was viewed as higher risk in the case of sickness or departures. Contrast that with the administration of Pure Storage, which due to its simplicity can be done part-time and shared across several less experienced IT staff.

- Interviewed customers predicted future attrition savings, i.e., future replacements of storage administrators could be more junior than predecessors due to the simplicity of Pure Storage, saving up to \$30,000 annually in salary and benefits per administrator.

If the risk-adjusted NPV of costs and benefits still demonstrates 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.

Over the years of interviewing many Pure Storage customers Forrester has captured several examples of incremental business benefits associated with migrating from legacy disk storage to Pure Storage FlashArrays. We’ve highlight these examples in Appendix B: Examples of Business Benefits - Pure Storage FlashArrays. We include these business benefits to underscore that a faster, more agile IT infrastructure can have benefits beyond operational savings.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by Pure 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 Pure Storage Evergreen Subscriptions.
- › Pure 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 Pure Storage. Pure 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 taking advantage of Pure Storage Evergreen Storage Subscriptions. The objective of the framework is to identify the benefits, costs, and risk factors that affect the investment decision.

APPROACH AND METHODOLOGY

Forrester employed four fundamental elements of TEI in modeling Pure Storage Evergreen Storage Subscriptions: benefits, costs, and risks.

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

- › Interviewed Pure Storage marketing, sales, and product management personnel to better understand the value proposition for Pure Storage.
- › Conducted in-depth interviews with Pure Storage customers to obtain data with respect to costs, benefits, 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 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 or lowered costs and benefits. For that reason, each benefit has been risk-adjusted and is detailed in the Benefits: Quantified sections.

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 C 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 executives and personnel at Pure Storage customer organizations. As part of its overall research, Forrester has interviewed 14 Pure Storage customers over the past four years. This case study is based on all 14 interviews, with special emphasis on the four most recently interviewed customers, each of which was promised anonymity:

- › A large US university with about 14,000 students. It is using Pure Storage FlashArrays for the following workloads: virtual servers, virtual desktops (VDI), and Oracle and SQL Server databases. It took advantage of the Evergreen Gold Subscription when it upgraded and added capacity to its existing FA-400 series FlashArrays, investing in two FlashArray//M20s. Forrester interviewed the university's system architect.
- › A beer brewing company located on the west coast of the US. It is using Pure Storage FlashArrays for the following workloads: virtual servers, VDI, and SQL Server databases. It took advantage of the Evergreen Gold Subscription when it migrated from its original FA-400 series to a FlashArray//M10. Forrester interviewed the manager of information systems.
- › A security software company with offices in the US, Europe, and Asia Pacific. It is using Pure Storage FlashArrays to support virtual servers and Microsoft iSCSI Initiator. It upgraded from a FlashArray//M20 to two FlashArray//M50s, taking advantage of the Evergreen Gold Subscription Upgrade Flex offering. Forrester interviewed the senior director of IT.
- › A large advertising company with operations in the United States, Canada, and Puerto Rico. It uses Pure Storage FlashArrays for the following workloads: virtual servers, SQL Server databases, and unstructured data. It took advantage of the Evergreen Gold Subscription Free Every Three upgrade program when it migrated from its original FA-420 to a FlashArray//M50 about a year ago. It has near-term plans to upgrade again to a FlashArray//M70. Forrester interviewed the director of communications and services.

THE COMPOSITE ORGANIZATION

The composite *Organization* is a North American, midmarket (\$250 million to \$2.5 billion) manufacturer, distributor, and service provider. It has been using Pure Storage to support its storage needs in the following environments: virtual servers, virtual desktops (VDI), and SQL Server database.

Previous to its investment in Pure Storage, the performance and resiliency requirements of the *Organization's* virtualization platforms and enterprise applications were rapidly increasing. This forced the *Organization's* data center and storage administrators to rethink their storage environments with a goal of accelerating the technology transition from hard drives to flash-based storage.

Its investment in Pure Storage was prompted by Pure's Smart Storage capabilities, including Pure Storage's Evergreen Storage Subscriptions, which enables customers to receive Pure's next-generation flash technology as it becomes available. With its investment in the Pure Storage Evergreen Subscriptions, the interviewed customers, as well as the *Organization*, had the following simple objectives: Buy storage capacity once and upgrade it as needed with no downtime, no data migrations, and no forklift upgrades.

The *Organization's* original investment in Year 1 included two Pure Storage FA-400 Series FlashArrays, as follows:

- › Array 1: FA-420 — 23 TB FlashArray with three-year Evergreen Gold Subscription (maintenance, hardware and software subscriptions and white-glove support).
- › Array 2: FA-405 — 5.5 TB FlashArray with three-year Evergreen Gold Subscription (maintenance, hardware and software subscriptions and white-glove support).

The storage needs of the *Organization* expanded quickly, so at the beginning of Year 2 of our analysis, it took advantage of the Pure Storage Evergreen Gold Subscription with an upgrade to the Pure Storage FlashArray//M series using the following included program(s):

- › **Upgrade Flex Controller Bundles.** Upgrade array performance as the *Organization* expands at any time with trade-in credit for existing controllers.
 - The *Organization* can get performance and capacity upgrades by purchasing a qualifying capacity pack, and get list-price trade-in credit toward upgraded controllers.
 - In Year 2, the *Organization* upgraded its original FA-420 (Array 1) to FlashArray//M20 with 43 TB of capacity.

In Year 4 of our analysis, the *Organization* took advantage of the Pure Storage Evergreen Gold Subscription with an upgrade to Pure Storage FlashArray//M series using the following included program(s):

- › **Free Every Three: free controllers every three years.**
 - The *Organization* can receive a next generation (or latest upgrade) controller upgrade every three years when it renews its Evergreen Gold Subscription, for example at the beginning of years 4, 7 and so on. It must purchase an additional three years of Gold Subscription to qualify for the included controller upgrade. Combined with Pure's non-disruptive upgrades, Evergreen Gold's Free Every Three program will keep the *Organization's* enterprise applications running on the latest Pure Storage hardware and software with no downtime or loss of performance.
 - In Year 4, the *Organization* upgraded its FA-405 to FlashArray//M20 with 15 TB of capacity.

The *Organization* anticipates that Pure's Evergreen Storage Subscription allows it continued success in satisfying the following additional business challenges, goals, and objectives:

- › **Capex cost reduction.** The *Organization* was adding additional virtual host servers, VDIs, and storage capacity to circumvent the performance degradation and inefficiencies in its legacy storage area network (SAN). The goal was to find a new solution to support the *Organization's* growing virtual environment at a lower overall capital cost while dramatically improving the performance of the environment.
- › **Opex cost reduction.** The *Organization* wanted to reduce costs for power and cooling and the following administrative tasks: deploying initial storage, growing and shrinking volumes, monitoring capacity and performance, managing hosts and host groups, and managing snapshots.
- › **Simplicity.** Storage administration must be simpler than the *Organization's* legacy environment for both implementation and ongoing administration.
- › **Latency.** The *Organization* needed predictable sub-millisecond latency for its applications. Its legacy storage had unacceptably high latency, ranging from 12 milliseconds to 25 milliseconds.
- › **Performance and scalability.** Its legacy mechanical spinning disk storage was becoming increasingly slow and unable to keep up with growing performance demands. It was hoping to future-proof its virtualized storage environments with Pure Storage.
- › **Resiliency.** Its next storage system had to include non-disruptive upgrades for capacity expansion, controller upgrades, and software updates, as well as meet data-at-rest encryption requirements for patient data, all without any performance degradation.

“Not only am I happy with the performance of Pure Storage, [but] every Pure employee I meet seems very much invested in my success.”

~Director of communications and services, large advertising company

BENEFITS OVERVIEW

Though performance and productivity are the main goals that organizations have when they deploy flash storage, the interviewed customers found economic validation for their investment in a variety of ways. This is a key point to keep in mind since some of the customers Forrester interviewed found great value in specific areas, such as rack space and power savings. Other customers found that these benefits were relatively insignificant compared with other benefits, such as the operational expense savings and the ease of use of Pure Storage's Purity Operating Environment.

BENEFITS: QUANTIFIED — INITIAL FLASHARRAYS AND UPGRADE FLEX PROGRAM (YEARS 1, 2, AND 3)

Quantifying the benefits of the Pure Storage Evergreen Storage Subscriptions begins with the *Organization's* initial investment in Pure Storage FlashArrays. The following are benefits the *Organization* achieved *prior* to taking advantage of the upgrade offerings in the Evergreen Gold Subscription.

⊕ Years 1, 2, And 3 — Opex Cost Reduction — Simplification Of Upgrade And Management Tasks Savings

In Year 1, the *Organization's original investment* included two Pure Storage FA-400 Series arrays as follows:

- › Array 1: FA-420 — 23 TB FlashArray and includes three-year Premium Support (4-hour onsite hardware replacement).
- › Array 2: FA-405 — 5.5 TB FlashArray and includes three-year Premium Support (4-hour onsite hardware replacement).

A small amount of flash capacity can handle the performance load of dozens of drives that represent more potential points of failure within a disk array. With fewer components to worry about, the interviewed customers told Forrester that Pure Storage FlashArrays overall are easier to maintain than hard disks and have fewer redundant array of independent disks (RAID) rebuild operations, which typically lead to performance degradation, downtime, and administrative labor to remedy.

The opex savings came from the following two categories:

- › **No professional services or training needed to deploy Pure Storage FlashArrays.** Interviewed customers cited the simplicity of deploying (and managing) Pure Storage FlashArrays. None of the customers required or needed professional services or formal training to deploy the Pure Storage Flash Arrays. In Year 1, the *Organization* saved \$30,000 in professional services and training cost avoidance, representing costs associated with a comparable initial deployment of hard disk storage. In Year 2, when the *Organization* took advantage of the Evergreen Gold Upgrade Flex Controller bundles and upgraded its original FA-420 (Array 1) to FlashArray//M20, it once again avoided the cost of professional services and training. For both years 1 and 2, the *Organization* saved \$30,000, for a total of \$60,000.
- › **Simplification of storage management tasks.** The *Organization* is able to save 1.75 full-time equivalents (FTEs) with Pure Storage due to the simplicity of the following tasks: growing and shrinking volumes, monitoring capacity and performance, managing hosts and host groups, managing snapshots, and having fewer RAID rebuild operations. Most of these tasks are unnecessary or managed automatically in the Pure environment. At a fully loaded annual cost of \$140,000 (senior storage administrator), the *Organization* saves 1.75 FTEs, or \$245,000 per year, and \$735,000 over three years. Although attrition savings were not quantified for this study, interviewed customers predicted attrition savings, i.e., future replacements of storage administrators could be more junior than predecessors due to the simplicity of Pure Storage, saving up to \$30,000 annually in salary and benefits per administrator.

The labor savings benefits have been risk-adjusted (reduced) by 15% in Table 1 to reflect how long it may take to redeploy administrators to other tasks or positions in the *Organization*. See the section on Risks for more detail.

TABLE 1 (YEARS 1, 2, AND 3)

Opex Cost Reduction — Simplification Of Deployment And Management Tasks Savings

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
A1	No professional services or training needed to deploy Pure Storage FlashArrays	Interviews	\$30,000	\$30,000	\$0	\$60,000
A2	Simplification of storage management tasks using Pure Storage — FTEs saved	Interviews	1.75	1.75	1.75	-
A3	Annual cost per storage administrator (fully loaded)	Industry average (US)	\$140,000	\$140,000	\$140,000	-
A4	FTE savings due to simplification	A2*A3	\$245,000	\$245,000	\$245,000	\$735,000
At	Total simplification of deployment and management tasks savings	A1+A4	\$275,000	\$275,000	\$245,000	\$795,000
	Risk adjustment	↓ 15%				
Atr	Total (risk-adjusted)	At-15%	\$233,750	\$233,750	\$208,250	\$675,750

Source: Forrester Research, Inc.

+ Years 1, 2, And 3 — Storage Health Checks — Cost Avoidance Savings

The *Organization* used to do lengthy health checks on the legacy storage environment, capturing seven days' worth of I/O and latency data and analyzing it. This health check process took 40 hours every quarter (160 hours annually). With Pure Storage, storage administrators can check the SaaS-delivered and mobile-friendly Pure1 management and support dashboard and see current status data on I/O and latency, eliminating the quarterly health check process. At a fully loaded annual cost of \$140,000 (\$67.30 hourly), the total annual savings was \$10,768 (160 hours * \$67.30), or \$32,304 over three years.

The labor savings benefits have been risk-adjusted (reduced) by 15% in Table 2 to reflect how long it may take to redeploy administrators to other value-added tasks in the *Organization*. See the section on Risks for more detail.

TABLE 2 (YEARS 1, 2, AND 3)
Storage Health Checks — Cost Avoidance Savings

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
B1	Storage health check — legacy hours (quarterly)	Interviews	40	40	40	-
B2	Annual legacy hours (four quarters)	B1*4	160	160	160	-
B3	Hourly cost per storage administrator (fully loaded)	Industry average (US)	\$67.30	\$67.30	\$67.30	-
B4	Cost avoidance benefits of using Pure Storage	B2*B3	\$10,768	\$10,768	\$10,768	\$32,304
Bt	Total storage health checks — cost avoidance savings	B4	\$10,768	\$10,768	\$10,768	\$32,304
	Risk adjustment	↓ 15%				
Btr	Total (risk-adjusted)	Bt-15%	\$9,153	\$9,153	\$9,153	\$27,458

Source: Forrester Research, Inc.

+ Years 1, 2, And 3 — Capital Expense Savings — Rack Unit Costs

Previous to investing in Pure Storage, the *Organization* had been adding additional virtual host servers and storage capacity to circumvent the performance degradation and inefficiencies in its legacy SAN. The goal was to find a new solution to support the *Organization's* growing virtual environment at a lower overall capital cost and without sacrificing performance.

The *Organization* replaced its legacy storage arrays with the following Pure Storage solutions:

- › Array 1: FA-420 — 23 TB FlashArray.
- › Array 2: FA-405 — 5.5 TB FlashArray.

Interviewed customers reported that Pure Storage FlashArrays were less costly on a dollar/GB useable capacity basis than the average cost of performance disk. The use case is contrasted with a traditional Fibre Channel 15K SAN array and also takes Pure Storage's deduplication and compression features into account. Pure Storage customers told Forrester that depending on the use case, they could boost storage efficiency with primary storage deduplication and/or compression. The interviewed customers reported the following data reduction results:

- › A range of 4.0:1 to 6.5:1 for virtual server environments, including VMware or Hyper-V, and consolidated virtual server environments with mixed applications.
- › A range of 10:1 to 13:1 for virtual desktop (VDI), both persistent and nonpersistent.
- › A range of 2.0:1 to 4.0:1 for database environments for OLTP and OLAP.

Table 3 outlines the data center rack unit cost savings when using Pure Storage FA-420 and FA-405 FlashArrays when compared with legacy disk storage. Some of the assumptions include a 15% annual growth in storage requirements, an average \$75 per month cost per data center rack unit (RU), and total legacy disk rack units that were required to match the same performance provided by Pure Storage FA-420 and FA-405 FlashArrays.

Capital expense savings were variable among the interviewed customers based on volume and other discounts provided by Pure Storage. Due to this variability, this benefit was risk-adjusted (reduced) by 10% in Table 3. See the section on Risks for more detail.

TABLE 3 (YEARS 1, 2, AND 3)
Capital Expense Savings — Rack Unit Costs

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
C1	Monthly cost per data center rack unit	Industry average	\$73	\$75	\$77	-
C2	Total rack units required — legacy storage (15% annual growth)	Interviews	88.54	101.82	117.09	-
C3	Projected total rack unit cost — legacy storage	C1*C2*12	\$77,558	\$91,635	\$108,190	\$277,382
C4	Total rack units required — Pure Storage (15% annual growth)	Pure Storage	11.90	13.69	15.74	-
C5	Projected total rack unit cost — Pure Storage	C1*C4*12	\$10,428	\$12,321	\$14,547	\$37,295
Ct	Total capital expense savings — rack unit costs	C3-C5	\$67,130	\$79,314	\$93,644	\$240,087
	Risk adjustment	↓ 10%				
Ctr	Total (risk-adjusted)	Ct-10%	\$60,417	\$71,383	\$84,279	\$216,079

Source: Forrester Research, Inc.

★ Years 1, 2, And 3 — Power And Cooling Savings

Interviewed customers reported significant power and cooling savings when they replaced legacy disk storage with Pure Storage FlashArrays. For the *Organization*, power and cooling savings totaled \$74,231 over three years and assume 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 (YEARS 1, 2, AND 3)
Power And Cooling Savings

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
D1	Power and cooling costs — legacy disk	Interviews	\$27,947	\$32,139	\$36,960	\$97,045
D2	Power and cooling costs — Pure Storage	Interviews	\$4,961	\$5,705	\$6,561	\$17,227
D3	Power and cooling savings with Pure Storage	D1-D2	\$22,986	\$26,433	\$30,399	\$79,818
Dt	Total power and cooling savings	D3	\$22,986	\$26,433	\$30,399	\$79,818
	Risk adjustment	↓ 7%				
Dtr	Total (risk-adjusted)	Dt-7%	\$21,377	\$24,583	\$28,271	\$74,231

Source: Forrester Research, Inc.

★ Years 1, 2, And 3 — Software License And Maintenance — Cost Avoidance Savings

The Pure Storage Purity Operating Environment provides the following capabilities at no additional cost, saving interviewed customers software license and maintenance costs (see Table 5):

- › FlashReduce — data reduction with deduplication, compression, pattern removal, and deep/copy reduction.
- › FlashProtect — non-disruptive everything, RAID-3D, always-on encryption, quality of service and 99.9999% availability.
- › FlashRecover— non-disruptive snapshots, replication, and protection policies.
- › Extensibility — via open APIs, automation adapters, hybrid cloud connectors, open engine.

Table 5 lists the four software applications that can be avoided by using the Pure Storage Purity Operating Environment and FlashArray FA-400 Series. We have risk-adjusted the cost avoidance savings downward by 10% to take into account the variability of software vendors' discounts.

TABLE 5 (YEARS 1, 2, AND 3)
Software License And Maintenance — Cost Avoidance Savings

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
E1	Real-time analytics software licenses and maintenance	Industry average	\$26,500	\$0	\$0	\$26,500
E2	Multipathing software licenses and maintenance	Industry average	\$21,000	\$0	\$0	\$21,000
E3	Snapshot and cloning software	Industry average	\$34,500	\$0	\$0	\$34,500
E4	Replication software licenses and maintenance	Industry average	\$48,000	\$0	\$0	\$48,000
Et	Total software license and maintenance cost avoidance savings	E1+E2+E3+E4	\$130,000	\$0	\$0	\$130,000
	Risk adjustment	↓ 10%				
Etr	Total (risk-adjusted)	Et-10%	\$117,000	\$0	\$0	\$117,000

Source: Forrester Research, Inc.

Years 1, 2, And 3 — Total Quantified Benefits

Table 6 shows the total benefits in years 1, 2, and 3 associated with the initial Pure Storage FlashArrays and the Flex Upgrade Bundle, as well as present values (PVs) discounted at 10%. Over three years, the *Organization* expects risk-adjusted total benefits to be a PV of \$929,497.

TABLE 6 (YEARS 1, 2, AND 3)
Total Quantified Benefits (Risk-Adjusted)

Ref.	Metric	Year 1	Year 2	Year 3	Total	Present Value
Atr	Opex cost reduction — simplification of deployment and management tasks savings	\$233,750	\$233,750	\$208,250	\$675,750	\$562,143
Btr	Storage health checks — cost avoidance savings	\$9,153	\$9,153	\$9,153	\$27,458	\$22,762
Ctr	Capital expense savings — rack unit costs	\$60,417	\$71,383	\$84,279	\$216,079	\$177,238
Dtr	Power and cooling savings	\$21,377	\$24,583	\$28,271	\$74,231	\$60,990
Etr	Software license and maintenance — cost avoidance savings	\$117,000	\$0	\$0	\$117,000	\$106,364
Ttr	Total quantified benefits (risk-adjusted)	\$441,696	\$338,869	\$329,953	\$1,110,518	\$929,497

Source: Forrester Research, Inc.

COSTS — YEARS 1, 2, AND 3

💰 Costs — Years 1, 2, And 3

The *Organization* incurred costs in the following categories associated with Pure Storage initial FlashArrays and the Upgrade Flex controller bundle:

- › **Planning and deploying Pure Storage.** The internal labor associated with planning and deploying the initial FA400 series Pure Storage FlashArray solutions totaled 80 hours across three IT staff (server administrator, storage administrator, and network administrator). The average fully loaded cost per IT staff is \$140,000 (\$67.30 hourly), for a total labor cost of \$5,384 (80 hours*\$67.30) as a Year 1 expense.
- › **Pure Storage initial FlashArrays costs.** The *Organization* will incur the following Pure Storage costs totaling \$519,000 in the beginning of Year 1 (see Appendix A for more information about Pure Storage). These costs represent Pure Storage's average selling prices as of Year 1:
 - FA-420 — 28 TB FlashArray and includes three-year Premium Support (4-hour onsite hardware replacement).
 - FA-405 — 5.5 TB FlashArray and includes three-year Premium Support (4-hour onsite hardware replacement).
- › **Upgrade Flex controller upgrade.** The *Organization* upgraded its array performance as its storage needs expanded, with trade-in credit for existing controllers.
 - In Year 2, the *Organization* took advantage of Pure's Upgrade Flex bundles and upgraded the original FA-420 (Array 1) to FlashArray//M20 with 43 TB of capacity at a cost of \$121,600, which included an additional 20 TB plus a controller upgrade. It also included additional Evergreen Gold Subscription costs of \$12,600 (co-terminated). The total cost of this Year 2 Upgrade Flex upgrade is \$134,200 (after trade-in credit).
- › **Professional services and training.** The customers reported that deploying Pure Storage FlashArrays did not require any vendor or partner professional services or training costs. Therefore, there are zero dollars associated with this cost category. Forrester has captured this cost avoidance in the section titled Benefits: Quantified — Initial FlashArrays and the Upgrade Flex Program (Years 1, 2, And 3).

› **Labor associated with ongoing operations.** The *Organization* requires a storage administrator to spend an average of 2 hours per week maintaining and enhancing the Pure Storage FlashArrays. At an average fully loaded cost per hour of \$67.30, the total cost for ongoing operations is \$7,000 annually, or \$21,000 over years 1, 2, and 3.

Table 7 shows the total costs as well as associated present values discounted at 10%, over the first three years of our analysis. Forrester chose not to risk-adjust costs because the *Organization* received fixed price quotes for Pure Storage products and services. The *Organization* expects costs in years 1, 2, and 3 to total \$679,584 with a present value of \$605,030.

TABLE 7
Costs (Years 1, 2, And 3)

Ref.	Metric	Year 1	Year 2	Year 3	Total	Present Value
F1	Planning and deploying Pure Storage	\$5,384	\$0	\$0	\$5,384	-
F2	Pure Storage costs — initial FlashArrays	\$519,000	\$0	\$0	\$519,000	-
F3	Pure Storage costs — Upgrade Flex Bundles upgrade including maintenance	\$0	\$134,200	\$0	\$134,200	-
F4	Professional services and training*	\$0	\$0	\$0	\$0	-
F5	Labor associated with ongoing operations	\$7,000	\$7,000	\$7,000	\$21,000	-
Ft	Total costs (years 1, 2, and 3)	\$531,384	\$141,200	\$7,000	\$679,584	\$605,030

*(No professional services or training was required by the interviewed customers to deploy and use Pure Storage FlashArrays)

Source: Forrester Research, Inc.

EVERGREEN STORAGE SUBSCRIPTION PROGRAM DESCRIPTION — FREE EVERY THREE

The storage needs of the *Organization* have expanded, so at the beginning of Year 4 it will take advantage of the Pure Storage Evergreen Subscription with an upgrade to Pure Storage FlashArray//M series using the following program:

› Free Every Three: free next generation (or latest upgrade) controllers every three years.

- The *Organization* can receive a next generation (or latest upgrade) controller upgrade every three years when it renews its Evergreen Gold Subscription, for example at the beginning of years 4, 7 and so on. It must purchase an additional three years of Evergreen Gold Subscription to qualify for the controller upgrade. Combined with Pure's non-disruptive controller upgrades,
- In Year 4, the *Organization* upgraded its FA-405 to FlashArray//M20 with 15 TB of capacity.

For more information about the Pure Storage Evergreen Storage Subscriptions, see Appendix A.

BENEFITS: QUANTIFIED — INCLUDING PURE STORAGE'S FREE EVERY THREE PROGRAM (YEARS 4, 5, AND 6)

+ Years 4, 5, And 6 — Opex Savings — Simplification Of Management Tasks And Forklift Upgrade Cost Avoidance

In Year 4, the *Organization* upgraded its FA-405 (Array 2) to FlashArray//M20 with 15 TB of capacity. The opex savings in years 4 through 6 come from the following three categories:

- › **No professional services or training needed to upgrade Pure Storage FlashArrays via Evergreen Storage Subscriptions.** Interviewed customers cited the simplicity of upgrading (and managing) Pure Storage FlashArrays. None of the customers required or needed professional services or formal training to deploy the Pure Storage Flash Arrays. In Year 4, the *Organization* saved \$30,000 in professional services and training cost avoidance, representing costs associated with a comparable initial upgrade of hard disk storage.
- › **Traditional storage forklift upgrade cycle cost avoidance.** According to interviewed customers, Pure Storage provides the ability to non-disruptively upgrade their storage systems to the latest versions of storage technology. This defers the normal forklift upgrade cycle of four to five years to a much longer cycle. Therefore, the *Organization* avoids the usual costs associated with the following: migration planning and execution labor, labor to redesign the new array, and hiring professional services firms to help with migration. In addition, it avoids the total costs of maintaining two storage systems over an average six-month upgrade and migration period, along with the associated data center costs (cabling and power cooling) and downtime window planning associated with migrating the data. Even if the data is migrated over high-performance local area networks such as Fibre Channel (FC), it could take days to migrate all the data. Interviewed customers estimated that with Pure Storage, they avoid the costs of a traditional forklift upgrade as described above, saving an average of \$235,000 in the year of the upgrade (Year 4).
- › **Simplification of storage management tasks.** The *Organization* continues to save 1.75 FTEs with Pure Storage due to the simplicity of the following tasks: growing and shrinking volumes, monitoring capacity and performance, managing hosts and host groups, managing snapshots, and having fewer RAID rebuild operations. At a fully loaded annual cost of \$140,000 (senior storage administrator), the *Organization* continues to save 1.75 FTEs, or \$245,000 per year, or \$735,000 in years 4 through 6.

The labor savings benefits have been risk-adjusted (reduced) by 15% in Table 8 to reflect how long it may take to redeploy administrators to other tasks or positions in the *Organization*. See the section on Risks for more detail.

TABLE 8 (YEARS 4, 5, AND 6)

Opex Savings — Simplification Of Management Tasks And Forklift Upgrade Cost Avoidance

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
G1	No professional services or training needed to deploy Pure Storage FlashArrays	Interviews	\$30,000	\$0	\$0	\$30,000
G2	Traditional storage upgrade cycle cost avoidance	Interviews	\$235,000	\$0	\$0	\$235,000
G3	Simplification of storage management tasks using Pure Storage — FTEs saved	Interviews	1.75	1.75	1.75	-
G4	Annual cost per storage administrator (fully loaded)	Industry average (US)	\$140,000	\$140,000	\$140,000	-
G5	FTE savings due to simplification	G3*G4	\$245,000	\$245,000	\$245,000	\$735,000
Gt	Opex savings — simplification of management tasks and forklift upgrade cost avoidance	G1+G2+G5	\$510,000	\$245,000	\$245,000	\$1,000,000
	Risk adjustment	↓ 15%				
Gtr	Total (risk-adjusted)	Gt-15%	\$433,500	\$208,250	\$208,250	\$850,000

Source: Forrester Research, Inc.

+ Years 4, 5, And 6 — Storage Health Checks — Cost Avoidance Savings

The *Organization* used to do lengthy health checks on the legacy storage environment, capturing seven days' worth of I/O and latency data and analyzing it. This health check process took 40 hours every quarter (160 hours annually). With Pure Storage, the storage administrator is able to continue looking at the Purity Operating Environment dashboard and immediately see current status data on I/O and latency, eliminating the quarterly health check process. At a fully loaded annual cost of \$140,000 (\$67.30 hourly), the total annual savings was \$10,768 (160 hours * \$67.30), or \$32,304 over three years.

The labor savings benefits have been risk-adjusted (reduced) by 15% in Table 9 to reflect how long it may take to redeploy administrators to other value-added tasks in the *Organization*. See the section on Risks for more detail.

TABLE 9 (YEARS 4, 5, AND 6)
Storage Health Checks — Cost Avoidance Savings

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
H1	Storage health check — legacy hours (quarterly)	Interviews	40	40	40	-
H2	Annual legacy hours (four quarters)	H1*4	160	160	160	-
H3	Hourly cost per storage administrator (fully loaded)	Industry average (US)	\$67.30	\$67.30	\$67.30	-
H4	Cost avoidance benefits of using Pure Storage	H2*H3	\$10,768	\$10,768	\$10,768	\$32,304
Ht	Storage health checks — cost avoidance savings	H4	\$10,768	\$10,768	\$10,768	\$32,304
	Risk adjustment	↓ 15%				
Htr	Total (risk-adjusted)	Ht-15%	\$9,153	\$9,153	\$9,153	\$27,458

Source: Forrester Research, Inc.

+ Years 4, 5, And 6 — Capital Expense Savings — Rack Unit Costs

With the Evergreen Storage Subscription upgrade to FlashArray//Ms, the *Organization* is experiencing incremental rack space capital savings.

Table 10 outlines the data center rack unit cost savings after upgrading to FlashArray//Ms and when compared with legacy disk storage. Some of the assumptions include a 15% annual growth in storage requirements, an average \$79 per month cost per data center rack unit (RU), and total legacy disk rack units that were required to match the same performance provided by the Pure Storage FlashArray//Ms.

Capital expense savings were variable among the interviewed customers based on volume and other discounts provided by Pure Storage. Due to this variability, this benefit was risk-adjusted (reduced) by 10% in Table 3. See the section on Risks for more detail.

TABLE 10 (YEARS 4, 5, AND 6)
Capital Expense Savings — Rack Unit Costs

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
I1	Monthly cost per data center rack unit	Industry average	\$77	\$79	\$81	-
I2	Total rack units required — legacy storage (15% annual growth)	Interviews	101.82	117.09	134.65	-
I3	Projected total rack unit cost — legacy storage	I1*I2*12	\$94,078	\$111,000	\$130,882	\$335,961
I4	Total rack units required — Pure Storage (15% annual growth)	Pure Storage	9.0	10.5	12.0	-
I5	Projected total rack unit cost — Pure Storage	I1*I4*12	\$8,316	\$9,954	\$11,664	\$29,934
It	Total capital expense savings — rack unit costs	I3-I5	\$85,762	\$101,046	\$119,218	\$306,027
	Risk adjustment	↓ 10%				
Itr	Total (risk-adjusted)	It-10%	\$77,186	\$90,942	\$107,296	\$275,424

Source: Forrester Research, Inc.

★ Years 4, 5, And 6 — Power And Cooling Savings

Interviewed customers reported continued power and cooling savings when they upgraded via Evergreen Storage Subscriptions. Forrester assumes the power and cooling savings stays the same in years 4, 5, and 6 with the upgraded FlashArrays, as no customer was able to quantify the savings of moving from FA400 series to //M series FlashArrays. For the *Organization*, power and cooling savings totaled \$74,231 over years 4, 5, and 6 and assume a cost per KWH for power of \$0.14 and a cost per KWH for cooling of \$0.10 (see Table 11). We have risk-adjusted the savings downward by 7% to reflect regional KWH rate differentials.

TABLE 11 (YEARS 4, 5, AND 6)
Power And Cooling Savings

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
J1	Power and cooling costs — legacy disk	Interviews	\$27,947	\$32,139	\$36,960	\$97,045
J2	Power and cooling costs — Pure Storage	Interviews	\$4,961	\$5,705	\$6,561	\$17,227
J3	Power and cooling savings with Pure Storage	J1-J2	\$22,986	\$26,433	\$30,399	\$79,818
Jt	Total power and cooling savings	J3	\$22,986	\$26,433	\$30,399	\$79,818
	Risk adjustment	↓ 7%				
Jtr	Total (risk-adjusted)	Jt-7%	\$21,377	\$24,583	\$28,271	\$74,231

Source: Forrester Research, Inc.

Years 4, 5, And 6 — Total Quantified Benefits

Table 12 shows the total benefits in years 4, 5, and 6, as well as present values (PVs) discounted at 10%. Over years 4, 5, and 6, the *Organization* expects risk-adjusted total benefits to be a PV of \$775,622.

TABLE 12 (YEARS 4, 5, AND 6)
Total Quantified Benefits (Risk-Adjusted)

Ref.	Metric	Year 4	Year 5	Year 6	Total	Present Value
Gtr	Opex savings — simplification of management tasks and forklift upgrade cost avoidance	\$433,500	\$208,250	\$208,250	\$850,000	\$542,945
Htr	Storage health checks — cost avoidance savings	\$9,153	\$9,153	\$9,153	\$27,458	\$17,101
Itr	Capital expense savings — rack unit costs	\$77,186	\$90,942	\$107,296	\$275,424	\$169,753
Jtr	Power and cooling savings	\$21,377	\$24,583	\$28,271	\$74,231	\$45,823
Ttr	Total quantified benefits (risk-adjusted)	\$541,216	\$332,927	\$352,970	\$1,227,113	\$775,622

Source: Forrester Research, Inc.

BENEFITS: UNQUANTIFIED

The interviewed customers identified the following additional benefits of using Pure Storage but were not able to quantify the benefits at the present time:

- › Interviewed customers, citing the simplicity of Pure Storage, reported less administrative labor risk using Pure Storage. Previously, legacy disk storage administration was being done by only one or two senior administrators, which was viewed as higher risk in the case of sickness or departures. Contrast that with the administration of Pure Storage, which can be shared across several less experienced IT staff due to its simplicity.
- › Interviewed customers predicted future attrition savings, i.e., future replacements of storage administrators could be more junior than predecessors due to the simplicity of Pure Storage, saving up to \$30,000 annually in salary and benefits per administrator.

COSTS — YEARS 4, 5, AND 6

💰 Costs (Years 4, 5, And 6)

The *Organization* incurred costs in the following categories associated with a Pure Storage Evergreen Storage Gold Subscription upgrade (see Appendix A for more information about the Pure Storage Evergreen Storage Subscriptions):

- › **Deploying Pure Storage upgrades.** The interviewed customers reported that upgrading Pure Storage FlashArrays did not require any internal labor or vendor or partner professional services or training costs. Therefore, there are zero dollars associated with this cost category. Forrester has captured this cost avoidance savings in the section titled Benefits: Quantified — Including Pure Evergreen's Free Every Three Program (Years 4, 5, And 6).
- › **Pure Storage's Free Every Three program: free next generation (or latest upgrade) controllers every three years.**

- The *Organization* can receive a next generation (or latest upgrade) controller upgrade every three years when it renews its Evergreen™ Gold Subscription, for example at the beginning of years 4, 7 and so on. It must purchase an additional three years of Evergreen Gold Subscription to qualify for the controller upgrade.
- In Year 4, the *Organization* upgraded its FA-405 to FlashArray//M20 (Array 2) with 15 TB of capacity at a total cost of \$151,340. This includes the renewal of three years' maintenance and support for Array 1 and Array 2, and the purchase of an additional 10 TB shelf in Array 2 and 10 TB of additional storage.

› **Professional services and training.** The interviewed customers reported that upgrading Pure Storage FlashArrays did not require any vendor or partner professional services or training costs. Therefore, there are zero dollars associated with this cost category (Forrester has captured this cost avoidance savings in the section titled Benefits: Quantified — Including Pure Storage's Free Every Three program (Years 4, 5, And 6).

› **Labor associated with ongoing operations.** The *Organization* requires a storage administrator to spend an average of 2 hours per week maintaining and enhancing the Pure Storage FlashArrays. At an average fully loaded cost per hour of \$67.30, the total cost for ongoing operations is \$7,000 annually, or \$21,000 over years 4, 5, and 6.

Table 13 shows the total of all costs associated with the Free Every Three upgrade, as well as present values discounted at 10%, over years 4, 5, and 6. Forrester chose not to risk-adjust costs because the *Organization* received fixed price quotes for Pure Storage products and services. The *Organization* expects year 4, 5, and 6 costs to total \$172,340, with a present value of \$116,446.

TABLE 13
Costs — Years 4, 5, And 6

Ref.	Metric	Year 4	Year 5	Year 6	Total	Present Value
K1	Labor to deploy Pure Storage Evergreen upgrade	\$0	\$0	\$0	\$0	-
K2	Pure Storage's Free Every Three upgrade: controllers every three years	\$151,340	\$0	\$0	\$151,340	-
K3	Professional services and training*	\$0	0	0	\$0	-
K4	Labor associated with ongoing operations	7,000	7,000	7,000	\$21,000	-
Kt	Total costs (years 4, 5, and 6)	\$158,340	\$7,000	\$7,000	\$172,340	\$116,446

*(No professional services or training was required by the interviewed customers to deploy and use Pure Storage FlashArrays)

Source: Forrester Research, Inc.

RISKS

Forrester defines two types of risk associated with this analysis: "implementation risk" and "impact risk." Implementation risk is the risk that a proposed investment in Pure Storage 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 Pure Storage, 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 broad range of responses, or had a number of internal or external forces that might have raised or lowered costs and benefits. For

that reason, each benefit has been risk-adjusted and is detailed in the Benefits: Quantified section. See Table 14 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 Pure Storage fees.

TABLE 14
Benefit And Cost Risk Adjustments

Benefit Categories — Years 1, 2, And 3	Adjustment
Opex cost reduction — simplification of deployment and management tasks savings	↓ 15%
Storage health checks — cost avoidance savings	↓ 15%
Capital expense savings — rack unit costs	↓ 10%
Power and cooling savings	↓ 7%
Software license and maintenance — cost avoidance savings	↓ 10%
Benefit Categories — Years 4, 5, And 6	Adjustment
Opex savings — simplification of management tasks and forklift upgrade cost avoidance	↓ 15%
Storage health checks — cost avoidance savings	↓ 15%
Capital expense savings — rack unit costs	↓ 10%
Power and cooling savings	↓ 7%
Cost Categories	Adjustment
Costs — years 1, 2, and 3	↑ 0%
Costs — years 4, 5, and 6	↑ 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 Pure Storage FlashArray and maintenance costs, other organizations’ costs may vary due to variable discounts.

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

- › Interviewed customers had an average of 30 months' experience with Pure Storage FlashArrays; therefore, there's some risk associated with Forrester projecting six years of benefits in our study.

Table 14 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 and NPV for the *Organization's* investment in Pure Storage. Table 15 shows the risk-adjusted costs, benefits ROI, and NPV.

TABLE 15
Cash Flow — Risk Adjusted

Ref.	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Present Value
Total costs	(\$531,384)	(\$141,200)	(\$7,000)	(\$158,340)	(\$7,000)	(\$7,000)	(\$851,924)	(\$721,476)
Total benefits	\$441,696	\$338,869	\$329,953	\$541,216	\$332,927	\$352,970	\$2,337,631	\$1,705,119
Total	(\$89,688)	\$197,669	\$322,953	\$382,876	\$325,927	\$345,970	\$1,485,707	\$983,643
ROI								136%

Source: Forrester Research, Inc.

The ROI was a very favorable 136%. 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: Pure Storage Evergreen Storage Subscriptions: Overview

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

Pure Storage delivers an experience that is uniquely Effortless, Efficient, and Evergreen. Effortless is a lot better than easy — so organizations can focus on innovation rather than administration. Imagine the efficiency of consolidating all workloads and getting data services without compromise, in 10 times less space. And Pure Storage is Evergreen, delivering software-as-a-service (SaaS)-like improvements and innovations to keep your storage fresh and modern.

› Effortless.

- Always on, always fast.
- Self-managing plug-n-play.
- Cloud connected — management, analytics, support, and protection.

Effortless starts with reliability, with storage that is always on, always fast, and always secure. Imagine getting six nines or better availability, inclusive of maintenance and upgrades. An effortless experience is a lot better than just an easy one. It can only happen when an organization completely eradicates all manners of complexity and tasks designed to manage that complexity — cruft that's built up in the storage experience for 20-plus years.

In addition to the Purity Operating Environment and its always on, always fast simplicity, Pure Storage also offers Pure1, a SaaS-based and mobile-friendly management and support environment without extra cost. Pure1 capabilities include global monitoring and reporting, performance analytics, replication monitoring, and predictive analytics to optimize infrastructure and plan for future purchases or expansions. This included capability further simplifies management tasks.

› Efficient.

- Consolidate everything on 10 times less.
- Employ zero-compromise data services — data reduction, encryption, quality of service (QoS), snapshots, replication, and migration.
- Use a fully automatable open platform.

Efficiency is about collapsing storage tiers and consolidating all data, whether block or file, structured or unstructured, into efficient all-flash storage that takes up 10 times less space, power, and cooling. Efficiency also means that customers get all the benefits of Pure's data services, all the time, with no tradeoffs. Efficiency is fully automatable and extensible, so IT can deliver agility equal to or better than any public cloud, all under the customer's control.

› Evergreen.

- Buy once, stay modern.
- Harness rapid software and flash innovation.
- Get an all-inclusive subscription model.

Evergreen Storage Subscriptions deliver continuous improvements and innovations to keep storage fresh and modern. It's the best of the SaaS model — in the data center. Evergreen Storage is about applying a cloud-like approach to storage that lives on-premises, enabling customers to subscribe to a storage experience that keeps getting better with age. Imagine buying storage once and upgrading it as needed, all without any disruption, and without rebuying any TBs already owned. Through Pure's Evergreen Storage Gold and Silver Subscriptions customers can frequently harness rapid software, hardware, and flash innovation — annually or even faster — with no need to wait for a four- to five-year refresh.

Pure's Evergreen Gold Subscription is the standard offering, delivering a subscription to Pure's complete set of ever-improving capabilities across software, hardware, white-glove support, and maintenance. With Evergreen Gold, customers

get the full benefit of a SaaS-like model but tailored for on-premises storage, and with better economics for routine modernization as compared to Evergreen Silver.

Pure's Evergreen Silver Subscription is a value offering geared for smaller organizations, delivering the same subscription to software, white-glove support, and maintenance as Evergreen Gold, but omitting the subscription to hardware. Because all Pure Storage arrays are engineered to be Evergreen, Evergreen Silver customers can still purchase hardware upgrades a la carte and deploy them non-disruptively as needed.

Evergreen Storage Subscriptions provide a differentiated alternative to typical storage industry support-centric offerings which focus on basic warranties and support, as well as continual hardware and software re-purchases for modernization.

Appendix B: Examples Of Business Benefits - Pure Storage FlashArrays

Over the years of interviewing many Pure Storage customers Forrester has captured several examples of incremental business benefits associated with migrating from legacy disk storage to Pure Storage FlashArrays. Here are some of the examples:

- › A faster overnight refresh of its data mart using Pure Storage FlashArrays. There was a need to shrink that overnight window so its Asia offices could run reports during their business hours. The refresh window was reduced from over 3 hours (legacy storage) to 82 minutes with Pure Storage.
- › Payroll for one company running 250 transactions at a time when it used to be 30 at a time, an eightfold improvement.
- › Large SQL jobs running in seven days with Pure Storage and taking one month with legacy disk storage.
- › Online analytical processing (OLAP) cube data array analysis used for faster time-to-market was a 36-hour operation with legacy disk storage; with Pure Storage it takes only 90 minutes.
- › Faster product development and cycles, for example, cloning an Oracle database in 30 seconds instead of 5 minutes.
- › Ability to have four times the number of users on a system to help drive more business.

The common theme was that Pure Storage is “faster,” than legacy disk storage. Forrester will further describe a business benefit associated with faster time-to-market for product development and incremental gross profit.

The company in our example routinely develops new products. Since investing in Pure Storage, product development employees’ productivity has improved significantly. Previously, the legacy disk storage was seen as the key bottleneck that slowed down the product development processes.

In its product development environments, the enhanced performance of Pure Storage reduced product development and software compile times, allowing employees’ hours of additional productive time in their workday. In these business intelligence use cases, Pure Storage is the catalyst that accelerates analytics processing, giving the company access to faster insights to its product development activities. The reduction of processing time also allows teams to run more reports and test and refine multiple theories before making key business decisions on new products.

In this example the company, it is now able develop new products faster than with previous legacy storage solutions — on average, two and a half months faster. There are two resulting benefits:

- › The companies seven-person development team is now able to complete work on two more new products each year.
- › Faster time-to-market results in an incremental two and a half months of revenue and gross profit for each new product initiated by the company.

Appendix C: 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 D: 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 6 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	Calc./Source	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

FRAMEWORK ASSUMPTIONS

Table 16 provides the model assumptions that Forrester used in this analysis.

TABLE 16
Model And Case Study Assumptions

Ref.	Metric	Calc./Source	Value
L1	Annual cost per storage administrator (fully loaded)	US industry average	\$140,000
L2	Annual cost per server administrator (fully loaded)	US industry average	\$140,000
L3	Annual cost per network administrator (fully loaded)	US industry average	\$140,000
L4	Hourly cost per administrator (fully loaded)	US industry average	\$67.30

Source: Forrester Research, Inc.

The discount rate used in the PV and NPV calculations is 10%, and the time horizon used for the financial modeling is six 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.