The Total Economic Impact™ Of Pure Storage For SaaS Providers

Cost Savings And Business Benefits Attributed To Pure Storage Flash Arrays And Evergreen Storage

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ABOUT FORRESTER CONSULTING

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Executive Summary

Pure Storage commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study to examine the potential return on investment (ROI) that software-as-a-service (SaaS) organizations may realize by taking advantage of Pure Storage FlashArrays and Evergreen Storage Subscriptions. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Pure Storage within their organizations.

To better understand the benefits, costs, and risks associated with an investment in Pure Storage, Forrester conducted in-depth interviews with seven Pure Storage SaaS customers, some of whom had switched from hyperscale cloud infrastructure-as-a-service (IaaS) providers. (There are 24 companies that meet our definition of hyperscale cloud IaaS). For a brief description of the customers, see the Analysis section.

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 repurchasing 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.

Forrester created a composite *Organization* to describe the TEI of Pure Storage and Evergreen Storage. The composite *Organization* is a mid-size SaaS provider ($25M to $32M in annual revenues) in North America. It has been using Pure Storage FlashArray(s) to support its production, test, and development storage needs in the following environments: virtual servers and relational databases. Prior to investing in Pure Storage, the *Organization* had considered several hyperscale IaaS providers and decided on an on-premises Pure Storage solution. The interviewed customers opined that Pure Storage's all-encompassing benefits as outlined in this study were not available in a hyperscale IaaS environment. 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 two FA-400 series FlashArrays purchased by the SaaS *Organization* (a FA-405 and a FA-420). This section also includes the Year 2 upgrade of the initial FA-420 to a FlashArray//M20. This upgrade is a result of the SaaS *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 FlashArray//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 <u>every</u> 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 SaaS *Organization* experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1, when contrasted with an alternative investment in a hyperscale IaaS environment.

The analysis points to risk-adjusted benefits of $2,387,062 over six years versus implementation and operating costs of $775,280, equating to a net present value (NPV) of $1,611,782. The risk-adjusted ROI was a very favorable 208% with a quick eleven-month payback period.

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FIGURE 1

Financial Summary Showing Six-Year Risk-Adjusted Results

ROI: 208%	Benefits PV: $2,387,062	Costs PV: $775,280	NPV: $1,611,782

Source: Forrester Research, Inc. cash flow analysis

Figure 1A

Financial Summary Showing Six-Year Risk-Adjusted Results

Summary	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Present Value
Total Benefits	$581,696	$485,869	$484,303	$703,283	$503,098	$531,649	$3,289,899	$2,387,062
Less Total Costs	$531,384	$184,600	$7,000	$184,600	$7,000	$7,000	$921,584	$775,280
Total	**$50,312**	**$301,269**	**$477,303**	**$518,683**	**$496,098**	**$524,649**	**$2,368,315**	**$1,611,782**
ROI								**208%**
Payback Period (months)								**Eleven months**

Source: Forrester Research, Inc.

THE ADVANTAGES OF PRIVATE CLOUD ENVIRONMENTS USING PURE STORAGE FLASHSTACK (OR PURE STORAGE WITH NON-CISCO COMPUTE)

Note from Forrester Research

Running applications in the cloud today is widespread, yet no technology can rationalize all applications to work effectively in the public cloud. There are many reasons for this, including the fact that many existing applications are written with assumptions that don't fit with the public cloud. As a result, it may be either impossible or economically unwise to move them.

Some additional business considerations:

› Running applications in the cloud is not outsourcing in the classic sense but does entail important business considerations such as an apparent loss of control over applications processing.

› Security and regulatory compliance teams are likely to require a thorough security evaluation to feel comfortable running applications in the cloud. Concerns about security and regulatory compliance are the most frequently cited concerns about public cloud. These concerns are likely to result in a lot of objections but are also susceptible to rapid shifts in perception.

End Forrester Research note

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During the interviews, SaaS customers discussed the topic of private versus public cloud, hyperscale IaaS. Each customer preferred the private cloud environment, which, in some cases, included FlashStack, a converged infrastructure solution from Cisco and Pure Storage. In other cases, customers were using Pure Storage's FlashArrays with non-Cisco compute. In either case, customers preferred the private cloud environment for the following reasons:

› Pure's Evergreen storage works similar to public cloud environments.

› Pure Storage provides significant data reduction and fast, multiple snapshots.

› Running applications in the public cloud involves new vendor relationships, bringing new vendor management implications. These new relationships require care and feeding, which is not always a top priority of growing SaaS companies that are rapidly seeking new capabilities.

› Reports of SaaS companies that have spent more than they expected or reversed course on cloud computing due to escalating costs. This has caused some to question whether public cloud savings exist.

› When an application is run in a public cloud platform, the infrastructure component is outsourced — compute, storage, and network elements, mostly — but SaaS companies are still responsible for the application, its middleware, its data and the final SLA to their customers.

› Per contracts, some customers require their SaaS providers to host data in a private cloud.

› Per customer privacy laws, some customers require data to remain in their geographic region.

THE PURE STORAGE SAAS SOLUTION

For more details on the Pure Storage SaaS customer solution and features of the Evergreen Storage Subscriptions, see Appendices A and B.

Benefit detail summary

The interviewed SaaS customers reported that Pure Storage FlashArrays, when combined with computing and network components and Evergreen Storage Subscriptions, improved the infrastructure operations of their organizations. In addition, the performance benefits of the current model //M series have resulting business benefits that transcend the data center and improve the business operations of the composite SaaS *Organization*. According to the interviewed customers, the total benefits outlined in this study are not available in a hyperscale IaaS environment. 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 — $1,294,223.** 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):

  • Profit saved from reduced customer churn — $364,726.

  • 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 — $1,092,839.** 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):

- Profit saved from reduced customer churn — $317,217.

- 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 them at the present time:

- Interviewed SaaS customers, citing the simplicity of Pure Storage, reported less administrative labor risk using Pure Storage. Previously, legacy disk storage administration was being done by specialized senior administrators, which was a 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 more generalized IT staff.

- Interviewed customers predicted future savings as this dynamic played out, i.e., premiums for specialized administrators could be reduced, saving up to $30,000 annually in salary and benefits per specialist.

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 investment 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 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 solutions.

› 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.

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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 FlashArrays combined with computing and network components and 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 solutions: benefits, costs, flexibility options, and risks.

Forrester took a multistep approach to evaluate the impact that Pure Storage can have on the composite SaaS *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 SaaS customers to obtain data with respect to costs, benefits, flexibility options, and risks.

› Designed a composite *Organization* based on characteristics of the interviewed SaaS 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

| Perform due diligence | > | Conduct customer interviews | > | Design composite organization | > | Construct financial model using TEI framework | > | Write case study |

Source: Forrester Research, Inc.

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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 seven Pure Storage SaaS customer organizations. Below is a brief description of the interviewed customers, each of which was promised anonymity.

› A large US-based business software company that develops, sells, and supports its own online accountancy offerings. It has been using Pure Storage FlashArrays (FlashStack) for over three years in the following environments: Oracle databases, data warehouses, and OLAP business intelligence applications. Forrester spoke with the director of infrastructure engineering.

› A global performance management SaaS company headquartered in the US. It has been using Pure Storage Flash Arrays in four data centers for over one year primarily for Oracle databases and secondarily virtual servers. Forrester interviewed the senior vice president of cloud operations.

› A SaaS provider of e-government solutions based in the US. It has been using Pure Storage FlashStack solutions for about a year to support its virtual servers and SQL Server environments. Forrester spoke with the director of infrastructure.

› A SaaS provider of software systems that support companies' relationships with suppliers. It has been using Pure's FlashArrays for over one year to support is SQL Server environment and virtual servers. Forrester interviewed the vice president of global infrastructure for this study.

› A global provider of financial transaction and payment processing software. It has five Pure Storage FlashStack platforms that it's been using for nine months to support its virtual servers, SQL Server, and VMware environments. Forrester spoke with the data systems manager.

› A human resource management SaaS company based in the US. It has been using Pure Storage FlashArrays for four years to support the following environments: VMware, Oracle databases, and SQL Server databases. The director of cloud services was Forrester's interviewee.

› A US-based SaaS provider of customer experience (CX) solutions that has been using Pure Storage FlashArrays for over two years to support its SQL Server databases. Forrester interviewed the vice president of cloud services and operations.

THE COMPOSITE *ORGANIZATION*

Forrester created a composite *Organization* to describe the TEI of Pure Storage solutions. The composite *Organization* is a mid-size SaaS provider ($25M to $32M in annual revenues) in North America. Prior to investing in Pure Storage, it had considered several hyperscale IaaS providers and decided on an on-premises Pure Storage solution. It has been using Pure Storage FlashArray(s) to support its production and/or test and development storage needs in the following environments: virtual servers and relational databases.

Before its investment in Pure Storage, the performance and resiliency requirements of the *Organization*'s virtualized platforms and enterprise applications were rapidly increasing. This forced the *Organization*'s data center and storage administrators to rethink their storage and compute environments. The *Organization* deemed the public cloud option inadequate for its needs, as it felt Pure Storage's all-encompassing benefits outlined in this study were not available in a hyperscale IaaS environment. It also chose a private cloud for reasons outlined in the section titled The Advantages Of Private Clouds Using Pure Storage FlashStack (Or Pure Storage with Non-Cisco Compute).

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Its choice of 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 Flash Arrays converged with compute and networking plus Evergreen Subscriptions, the interviewed customers, as well as the SaaS *Organization*, had the following simple objectives: Buy their own storage capacity once and upgrade it as needed with no downtime, no data migrations, and no forklift upgrades. Forrester has projected costs and benefits over six years in this study.

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 larger 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 58 TB of capacity.

In Year 4 of our analysis, the *Organization* took advantage of the Pure Storage Evergreen Gold Subscription with another 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 <u>every</u> 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 nondisruptive 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 58 TB of capacity.

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

› **Reduced customer churn.** The *Organization* was losing customers due to infrastructure-related outages. It wanted to stop the churn and lost customer revenue and gross profit.

› **Capex cost reduction.** The *Organization* was adding additional virtual host servers, and storage capacity to circumvent the performance degradation and inefficiencies in its legacy infrastructure. 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.

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›   **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.** The *Organization*'s legacy infrastructure 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.** The *Organization*'s next storage system had to include nondisruptive 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.

BENEFITS OVERVIEW

Though performance and productivity are organizations' main goals when they deploy flash storage, the interviewed SaaS 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 incremental revenue, 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. All told, the interviewed customers decided that the all-encompassing benefits of Pure Storage, as outlined in this study, were not available in a hyperscale IaaS 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 SaaS *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 — With Pure — Profit Saved From Reduced Customer Churn

Interviewed SaaS customers rely heavily on Pure Storage's always-on, high reliability and nondisruptive features for resilient and scalable operations. Prior to investing in Pure Storage, the *Organization* faced repeated storage-related outages, which resulted in customer complaints and subsequent lost revenue and profit due to customer churn. One interviewed customer reported having a global 4-hour outage every month before investing in Pure Storage. This customer had a list of 20 customers that were either in the red or yellow. Today, with Pure Storage, out of the 20 customers, only four are yellow instead of 20 that were red or yellow before.

Before Pure Storage, most of the interviewed customers reported lost revenue as a result of infrastructure-related customer churn. On average, the loss was estimated to be the gross profit associated 1% of revenue. The *Organization*'s Year 1 revenue was $25 million, growing 5% annually. Table 1 calculates the before and after Pure Storage revenue loss. Over the first three years, the *Organization* saves $441,350 in gross profit as a result of Pure Storage high reliability and nondisruptive features.

The labor savings benefits have been risk-adjusted (reduced) by 20% in Table 1 to reflect the variations of churn percent across the interviewed customers. See the section on Risks for more detail.

> *"I used to have a list of 20 complaining customers, of which six were red and the rest yellow. With Pure Storage, when I look at that same list, there's only four yellow. So out of 20, I've got four yellow instead of 20 that were red or yellow."*

~Cloud services director, human resource management software company

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TABLE 1 (YEARS 1, 2, AND 3)
With Pure — Profit Saved From Reduced Customer Churn

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
A1	SaaS *Organization* — annual revenue	5% annual growth	$25,000,000	$26,250,000	$27,562,500	$78,812,500
A2	Before Pure — customer churn due to infrastructure-related outages	1% of revenue	$250,000	$262,500	$275,625	$788,125
A3	Gross profit margin	70%	70%	70%	70%	-
A4	Before Pure — profit lost due to infrastructure-related customer churn	A2*A3	$175,000	$183,750	$192,938	$551,688
A5	With Pure — customer churn due to infrastructure-related outages	0% of revenue	$0	$0	$0	$0
At	With Pure — profit saved from reduced customer churn	A4-A5	$175,000	$183,750	$192,938	$551,688
	Risk adjustment	↓ 20%				
Atr	**With Pure — profit saved from reduced customer churn (risk-adjusted)**	**Atr-20%**	**$140,000**	**$147,000**	**$154,350**	**$441,350**

Source: Forrester Research, Inc.

⊕ 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 devices that represent more potential points of failure. With fewer components to worry about, the interviewed customers told Forrester that Pure Storage FlashArrays overall are easier to maintain than prior infrastructure and have recovery 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 SaaS customers cited the simplicity of deploying (and managing) Pure Storage FlashArrays. None of the customers required or needed professional services or

"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

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.

› **Simplification of storage management tasks.** The *Organization* saves 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 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 savings, i.e., premiums for specialized administrators could be reduced, saving up to $30,000 annually in salary and benefits per specialist..

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 tasks or positions in the *Organization*. See the section on Risks for more detail.

TABLE 2 (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
B1	No professional services or training needed to deploy Pure Storage FlashArrays	Interviews	$30,000	$30,000	$0	$60,000
B2	Simplification of storage management tasks using Pure Storage — FTEs saved	Interviews	1.75	1.75	1.75	-
B3	Annual cost per storage administrator (fully loaded)	Industry average (US)	$140,000	$140,000	$140,000	-
B4	FTE savings due to simplification	B2*B3	$245,000	$245,000	$245,000	$735,000
Bt	Opex cost reduction — simplification of deployment and management tasks savings	B1+B4	$275,000	$275,000	$245,000	$795,000
	Risk adjustment	↓ 15%				
Btr	**Opex cost reduction — simplification of deployment and management tasks savings (risk-adjusted)**	**Bt-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 input/output (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 3 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 3 (YEARS 1, 2, AND 3)

Storage Health Checks — Cost Avoidance Savings

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
C1	Storage health check — legacy hours (quarterly)	Interviews	40	40	40	-
C2	Annual legacy hours (four quarters)	C1*4	160	160	160	-
C3	Hourly cost per storage administrator (fully loaded)	Industry average (US)	$67.30	$67.30	$67.30	-
C4	Cost avoidance benefits of using Pure Storage	C2*C3	$10,768	$10,768	$10,768	$32,304
Ct	Storage health checks — cost avoidance savings	C4	$10,768	$10,768	$10,768	$32,304
	Risk adjustment	↓ 15%				
Ctr	**Storage health checks — cost avoidance savings (risk-adjusted)**	**Ct-15%**	**$9,153**	**$9,153**	**$9,153**	**$27,458**

Source: Forrester Research, Inc.

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

Before 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 infrastructure. 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.

Among other infrastructure updates, 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 legacy storage solution 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 2.0:1 to 4.0:1 for database environments for OLTP and OLAP.

Table 4 outlines the data center rack unit cost savings when using Pure Storage FA-420 and FA-405 FlashArrays compared with legacy 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 rack units that were required to match the same performance provided by Pure Storage FA-420 and FA-405 FlashArrays.

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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 4. See the section on Risks for more detail.

TABLE 4 (YEARS 1, 2, AND 3)

Capital Expense Savings — Rack Unit Costs

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
D1	Monthly cost per data center rack unit	Industry average	$73	$75	$77	-
D2	Total rack units required — legacy storage (15% annual growth)	Interviews	88.54	101.82	117.09	-
D3	Projected total rack unit cost — legacy storage	D1*D2*12	$77,558	$91,635	$108,190	$277,382
D4	Total rack units required — Pure Storage (15% annual growth)	Pure Storage	11.90	13.69	15.74	-
D5	Projected total rack unit cost — Pure Storage	D1*D4*12	$10,428	$12,321	$14,547	$37,295
Dt	Capital expense savings — rack unit costs	D3-D5	$67,130	$79,314	$93,644	$240,087
	Risk adjustment	↓ 10%				
Dtr	**Capital expense savings — rack unit costs (risk-adjusted)**	**Dt-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 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 5). We have risk-adjusted the savings downward by 7% to reflect regional KWH rate differentials.

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TABLE 5 (YEARS 1, 2, AND 3)

Power And Cooling Savings

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
E1	Power and cooling costs — legacy disk	Interviews	$27,947	$32,139	$36,960	$97,045
E2	Power and cooling costs — Pure Storage	Interviews	$4,961	$5,705	$6,561	$17,227
E3	Power and cooling savings with Pure Storage	E1-E2	$22,986	$26,433	$30,399	$79,818
Et	Power and cooling savings	E3	$22,986	$26,433	$30,399	$79,818
	Risk adjustment	↓ 7%				
Etr	**Power and cooling savings (risk-adjusted)**	**Et-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 6):

❯ FlashReduce — data reduction with deduplication, compression, pattern removal, and deep/copy reduction.

❯ FlashProtect — nondisruptive everything, RAID-3D, always-on encryption, quality of service, and 99.9999% availability.

❯ FlashRecover— nondisruptive snapshots, replication, and protection policies.

❯ Extensibility — via open APIs, automation adapters, hybrid cloud connectors, open engine.

Table 6 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 account for the variability of software vendors' discounts.

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TABLE 6 (YEARS 1, 2, AND 3)

Software License And Maintenance — Cost Avoidance Savings

Ref.	Metric	Calc./Source	Year 1	Year 2	Year 3	Total
F1	Real-time analytics software licenses and maintenance	Industry average	$26,500	$0	$0	$26,500
F2	Multipathing software licenses and maintenance	Industry average	$21,000	$0	$0	$21,000
F3	Snapshot and cloning software	Industry average	$34,500	$0	$0	$34,500
F4	Replication software licenses and maintenance	Industry average	$48,000	$0	$0	$48,000
Ft	Software license and maintenance — cost avoidance savings	F1+F2+F3+F4	$130,000	$0	$0	$130,000
	Risk adjustment	↓ 10%				
Ftr	**Software license and maintenance — cost avoidance savings (risk-adjusted)**	Et-10%	**$117,000**	**$0**	**$0**	**$117,000**

Source: Forrester Research, Inc.

Years 1, 2, And 3 — Total Quantified Benefits

Table 7 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 $1,294,223.

TABLE 7 (YEARS 1, 2, AND 3)

Total Quantified Benefits (Risk-Adjusted)

Ref.	Metric	Year 1	Year 2	Year 3	Total	Present Value
Atr	With Pure — profit saved from reduced customer churn	$140,000	$147,000	$154,350	$441,350	$364,726
Btr	Opex cost reduction — simplification of deployment and management tasks savings	$233,750	$233,750	$208,250	$675,750	$562,143
Ctr	Storage health checks — cost avoidance savings	$9,153	$9,153	$9,153	$27,458	$22,762
Dtr	Capital expense savings — rack unit costs	$60,417	$71,383	$84,279	$216,079	$177,238
Etr	Power and cooling savings	$21,377	$24,583	$28,271	$74,231	$60,990
Ftr	Software license and maintenance — cost avoidance savings	$117,000	$0	$0	$117,000	$106,364
Ttr	**Total quantified benefits (risk-adjusted)**	**$581,696**	**$485,869**	**$484,303**	**$1,551,868**	**$1,294,223**

Source: Forrester Research, Inc.

COSTS — YEARS 1, 2, AND 3

⑤ 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* incurred 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 58 TB of capacity at a cost of $165,000. It also included additional Evergreen Gold Subscription costs of $12,600 (co-termed). The total cost of this Year 2 Upgrade Flex upgrade is $177,600 (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 8 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* experienced costs in years 1, 2, and 3 of $722,984 with a present value of $640,898.

TABLE 8

Costs (Years 1, 2, And 3)

Ref.	Metric	Year 1	Year 2	Year 3	Total	Present Value
G1	Planning and deploying Pure Storage	$5,384	$0	$0	$5,384	-
G2	Pure Storage costs — initial FlashArrays	$519,000	$0	$0	$519,000	-
G3	Pure Storage costs — Upgrade Flex Bundles upgrade including maintenance	$0	$177,600	$0	$177,600	-
G4	Professional services and training*	$0	$0	$0	$0	-
G5	Labor associated with ongoing operations	$7,000	$7,000	$7,000	$21,000	-
Gt	Total costs (years 1, 2, and 3)	$531,384	$184,600	$7,000	$722,984	$640,898

*Note: 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* expanded, so at the beginning of Year 4, it took 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 <u>every</u> 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 with 58 TB of capacity.

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

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

⊕ **Years 4, 5, And 6 — With Pure — Profit Saved From Reduced Customer Churn**

Interviewed SaaS customers in years 4, 5 and 6 continue to rely heavily on Pure Storage's always-on, high reliability and nondisruptive everything for resilient and scalable operations. Prior to investing in Pure Storage, the *Organization* faced repeated infrastructure-related outages, which resulted in customer complaints and subsequent lost revenue and profit due to customer churn.

Before Pure Storage, most of the interviewed customers reported lost revenue as a result of infrastructure-related churn issues. On average, the loss was estimated to be the gross profit associated 1% of revenue. The *Organization*'s Year 1 revenue was $25 million, growing 5% annually. Table 9 calculates the before and after Pure Storage revenue loss. In addition to the $441,350 in the first three years (see Table 1), the *Organization* saves $510,918 in gross profit in the last three years as a result of Pure Storage's high reliability and nondisruptive everything.

The labor savings benefits have been risk-adjusted (reduced) by 20% in Table 9 to reflect the variations of churn percent across the interviewed customers. See the section on Risks for more detail.

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TABLE 9 (YEARS 4, 5, AND 6)

With Pure — Profit Saved From Reduced Customer Churn

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
H1	SaaS *Organization* — annual revenue	5% annual growth	$28,940,625	$30,387,656	$31,907,039	$91,235,320
H2	Before Pure — customer churn due to infrastructure-related outages	1% of revenue	$289,406	$303,877	$319,070	$912,353
H3	Gross profit margin	70%	70%	70%	70%	-
H4	Before Pure — profit lost due to infrastructure-related customer churn	H2*H3	$202,584	$212,714	$223,349	$638,647
H5	With Pure — customer churn due to infrastructure-related outages	0% of revenue	$0	$0	$0	$0
Ht	With Pure — profit saved from reduced customer churn	H4-H5	$202,584	$212,714	$223,349	$638,647
	Risk adjustment	20%				$0
Htr	**With Pure — profit saved from reduced customer churn (risk-adjusted)**	**Htr-20%**	**$162,068**	**$170,171**	**$178,679**	**$510,918**

Source: Forrester Research, Inc.

⊕ 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 58 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 nondisruptively upgrade its 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 data recovery operations. At a fully loaded annual cost of

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$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 10 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.

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
TABLE 10 (YEARS 4, 5, AND 6)						
Opex Savings — Simplification Of Management Tasks And Forklift Upgrade Cost Avoidance						
I1	No professional services or training needed to deploy Pure Storage FlashArrays	Interviews	$30,000	$0	$0	$30,000
I2	Traditional storage upgrade cycle cost avoidance	Interviews	$235,000	$0	$0	$235,000
I3	Simplification of storage management tasks using Pure Storage — FTEs saved	Interviews	1.75	1.75	1.75	-
I4	Annual cost per storage administrator (fully loaded)	Industry average (US)	$140,000	$140,000	$140,000	-
I5	FTE savings due to simplification	I3*I4	$245,000	$245,000	$245,000	$735,000
It	Opex savings — simplification of management tasks and forklift upgrade cost avoidance	I1+I2+I5	$510,000	$245,000	$245,000	$1,000,000
	Risk adjustment	↓ 15%				
Itr	**Opex savings — simplification of management tasks and forklift upgrade cost avoidance (risk-adjusted)**	**It-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 can continue to look 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 11 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 11 (YEARS 4, 5, AND 6)

Storage Health Checks — Cost Avoidance Savings

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
J1	Storage health check — legacy hours (quarterly)	Interviews	40	40	40	-
J2	Annual legacy hours (four quarters)	J1*4	160	160	160	-
J3	Hourly cost per storage administrator (fully loaded)	Industry average (US)	$67.30	$67.30	$67.30	-
J4	Cost avoidance benefits of using Pure Storage	J2*J3	$10,768	$10,768	$10,768	$32,304
Jt	Storage health checks — cost avoidance savings	J4	$10,768	$10,768	$10,768	$32,304
	Risk adjustment	↓ 15%				
Jtr	**Storage health checks — cost avoidance savings (risk-adjusted)**	**Jt-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* experienced incremental rack space capital savings.

Table 12 outlines the data center rack unit cost savings after upgrading to FlashArray//Ms and when compared with legacy 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 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%. See the section on Risks for more detail.

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TABLE 12 (YEARS 4, 5, AND 6)

Capital Expense Savings — Rack Unit Costs

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
K1	Monthly cost per data center rack unit	Industry average	$77	$79	$81	-
K2	Total rack units required — legacy storage (15% annual growth)	Interviews	101.82	117.09	134.65	-
K3	Projected total rack unit cost — legacy storage	K1*K2*12	$94,078	$111,000	$130,882	$335,961
K4	Total rack units required — Pure Storage (15% annual growth)	Pure Storage	9.0	10.5	12.0	-
K5	Projected total rack unit cost — Pure Storage	K1*K4*12	$8,316	$9,954	$11,664	$29,934
Kt	Capital expense savings — rack unit costs	K3-K5	$85,762	$101,046	$119,218	$306,027
	Risk adjustment	↓ 10%				
Ktr	**Capital expense savings — rack unit costs (risk-adjusted)**	**Kt-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, assuming a cost per KWH for power of $0.14 and a cost per KWH for cooling of $0.10 (see Table 13). We have risk-adjusted the savings downward by 7% to reflect regional KWH rate differentials.

TABLE 13 (YEARS 4, 5, AND 6)

Power And Cooling Savings

Ref.	Metric	Calc./Source	Year 4	Year 5	Year 6	Total
L1	Power and cooling costs — legacy storage	Interviews	$27,947	$32,139	$36,960	$97,045
L2	Power and cooling costs — Pure Storage	Interviews	$4,961	$5,705	$6,561	$17,227
L3	Power and cooling savings with Pure Storage	L1-L2	$22,986	$26,433	$30,399	$79,818
Lt	Power and cooling savings	L3	$22,986	$26,433	$30,399	$79,818
	Risk adjustment	↓ 7%				
Ltr	**Power and cooling savings (risk-adjusted)**	**Lt-7%**	**$21,377**	**$24,583**	**$28,271**	**$74,231**

Source: Forrester Research, Inc.

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Years 4, 5, And 6 — Total Quantified Benefits

Table 14 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 $1,092,839.

	TABLE 14 (YEARS 4, 5, AND 6)					
	Total Quantified Benefits (Risk-Adjusted)					
Ref.	**Metric**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Present Value**
Htr	With Pure — profit saved from reduced customer churn	$162,068	$170,171	$178,679	$510,918	$317,217
Itr	Opex savings — simplification of management tasks and forklift upgrade cost avoidance	$433,500	$208,250	$208,250	$850,000	$542,945
Jtr	Storage health checks — cost avoidance savings	$9,153	$9,153	$9,153	$27,458	$17,101
Ktr	Capital expense savings — rack unit costs	$77,186	$90,942	$107,296	$275,424	$169,753
Ltr	Power and cooling savings	$21,377	$24,583	$28,271	$74,231	$45,823
Ttr	**Total quantified benefits (risk-adjusted)**	**$703,283**	**$503,098**	**$531,649**	**$1,738,031**	**$1,092,839**

Source: Forrester Research, Inc.

BENEFITS: UNQUANTIFIED

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

› Interviewed SaaS customers, citing the simplicity of Pure Storage, reported less administrative labor risk using Pure Storage. Previously, legacy disk storage administration was being done by specialized 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 more generalized IT staff.

› Interviewed customers predicted future savings as this dynamic played out, i.e., premiums for specialized administrators could be reduced, saving up to $30,000 annually in salary and benefits per specialist.

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 B 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. 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 <u>every</u> 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 58 TB of capacity at a cost of $165,000. It also included additional Evergreen Gold Subscription costs of $12,600 (co-termed). The total cost of this Year 4 Upgrade Flex upgrade is $177,600 (after trade-in credit).

- This includes the renewal of three years' maintenance and support for Array 1 and Array 2.

› **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 15 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 $198,600, with a present value of $134,382.

TABLE 15

Costs — Years 4, 5, And 6

Ref.	Metric	Year 4	Year 5	Year 6	Total	Present Value
M1	Labor to deploy Pure Storage Evergreen upgrade	$0	$0	$0	$0	-
M2	Pure Storage's Free Every Three upgrade: controllers every three years	$177,600	$0	$0	$177,600	-
M3	Professional services and training*	$0	$0	$0	$0	-
M4	Labor associated with ongoing operations	$7,000	$7,000	$7,000	$21,000	-
Mt	Total costs (years 4, 5, and 6)	$184,600	$7,000	$7,000	$198,600	$134,382

*Note: 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 16 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 16
Benefit And Cost Risk Adjustments

Benefit Categories — Years 1, 2, And 3	Adjustment
With Pure — profit saved from reduced customer churn	↓ 20%
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
With Pure — profit saved from reduced customer churn	↓ 20%
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:

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› Although Forrester did not risk-adjust Pure Storage FlashArray and maintenance costs, however 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's six-year projection of benefits in our study.

Table 16 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 SaaS *Organization*'s investment in Pure Storage. Table 1A (repeated from Executive Summary) shows the risk-adjusted costs, benefits, ROI, and NPV.

Figure 1A
Financial Summary Showing Six-Year Risk-Adjusted Results

Summary	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Present Value
Total Benefits	$581,696	$485,869	$484,303	$703,283	$503,098	$531,649	$3,289,899	$2,387,062
Less Total Costs	$531,384	$184,600	$7,000	$184,600	$7,000	$7,000	$921,584	$775,280
Total	**$50,312**	**$301,269**	**$477,303**	**$518,683**	**$496,098**	**$524,649**	**$2,368,315**	**$1,611,782**
ROI								**208%**
Payback Period								**Eleven months**

Source: Forrester Research, Inc.

The ROI was a very favorable 208%. The interviewed customers concluded that the all-encompassing benefits of Pure Storage, as outlined in this study, are not available in a hyperscale IaaS environment.

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 For SaaS Providers: Overview

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

According to Pure Storage, its FlashArrays with converged infrastructure (FlashStack) and Evergreen Storage Subscriptions offers three categories of value for SaaS providers:

1. Advance service levels — expand customer base and reduce customer churn.

    o Always-on – high reliability and nondisruptive everything for resilient and scalable operations.

    o Consistently high performance — <1ms latency across mixed block sizes. Storage quality of service (QoS).

    o Compliance ready — always-on security with data-at-rest encryption, and support for internet protocol version 6 (IPV6), KMIP, Common Criteria, and Federal Information Processing Standard (FIPS).

2. Accelerate time-to-revenue — get new features and products to market faster.

    o Share data, fast and wide — thousands of instant, performance, and capacity-free snapshots for accelerated test/dev/QA and rapid data recovery. Application-integrated and remotely replicable.

    o Automated development operations — (representational state transfer) RESTful application programming interface (API) and software development kits (SDKs) and integrations with a broad array of automation platforms.

3. Achieve operational advantage — optimize IT costs for competitive advantage.

    o Cost advantage — Data reduction and hardware optimization for minimized space, power, cooling.

    o Simplified management — native simplicity and best-in-class converges infrastructure solutions.

    o Evergreen storage — subscription-based access to performance, feature, and density innovations. Evergreen Gold Subscription 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 any workload. The Purity Operating Environment that 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.

Pure Storage FlashStack — a Pure Storage and Cisco pretested and validated design of storage, server, and network components into a single solution.

Evergreen Storage — subscription-based access to performance, feature, and density innovations (see Appendix B).

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Appendix B: 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-like improvements and innovations to keep your storage fresh and modern.

Effortless.

- Always on, always fast.

- Self-managing plug-and-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 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

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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 nondisruptively 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 repurchases for modernization.

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.

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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.

Table 17 provides model assumptions that Forrester used in this analysis.

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FRAMEWORK ASSUMPTIONS

TABLE 17

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.

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