The Total Economic Impact™ Of Dell EMC For SAP

Cost Savings And Business Benefits Enabled By Dell EMC All-Flash Storage For SAP

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Project Director:
Dean Davison

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.

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Key Benefits
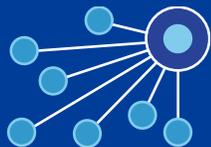
Improved results from business operations:
$4.2 million

Improved staff efficiency for the IT organization:
$1.7 million

Reduced cost of storage system and power for data center:
$1.1 million

Executive Summary

Dell EMC provides advanced storage technologies that enable enterprises to generate value from data while reducing the cost of storage, improving the performance and efficiency of running classic SAP Enterprise Resource Planning (ERP) and SAP Business Warehouse (BW) applications, and migrating with ease to next-generation SAP HANA and S/4HANA.

Dell EMC and Intel commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential ROI enterprises may realize by deploying Dell EMC All-Flash Storage, powered by Intel, like Dell EMC PowerMax powered by Intel® Xeon® Scalable processors, for SAP applications. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Dell EMC storage solutions across their organizations. To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four customers with years of experience using Dell EMC All-Flash Storage for SAP.

Prior to using Dell EMC, the customers used a variety of storage platforms, including older generations of EMC storage. One executive told Forrester during the interviews: "We weren't really running into any technical problems [with our previous storage solution], but we needed to lay the groundwork for the future. By using Dell EMC, we not only reduced the average cost of storage, but prepared ourselves to be able to handle the additional performance needs of a HANA database." Another executive added, "We couldn't go to a cloud option because we had a four terabyte (TB) database and the maximum [at that time] from cloud providers was 2.5 TBs."

After standardizing on Dell EMC storage, the organizations reported a reduction in the average cost of storage itself along with improved efficiency of managing storage, backup, and disaster recovery. Even more importantly, the organizations reported that faster runtimes were able to impact business units. One executive described the impact to his company's ability to be nimbler and iterate on complex decisions about its supply chain: "Our previous APO runtime was 32 hours, so we could only do it on weekends. With the higher performance storage, the runtime dropped to just seven hours, meaning that we could run it overnight. This enabled people in procurement and manufacturing to make more rapid decisions, change plans, anticipate problems, and it significantly impacted company results."

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits totaled $7 million are representative of those experienced by the companies interviewed. The impact on business and customer-facing activities totaled $4.2 million including:

> **Improved efficiency of business operations valued at $2.4 million.** The organization reduced the runtime for supply chain analytics in SAP APO from 32 hours to seven hours, which changed the frequency of analysis, making the company nimbler to change and able to resolve supply chain issues faster.

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ROI
289%

Benefits PV
$7 million

NPV
$5.2 million

Payback
<3 months

› **Avoided errors and inconsistencies of global invoicing processing valued at $990,855.** A second benefit to business operations was that shorter runtimes reduced costly errors in the invoicing process. The ability to complete invoicing and update central company systems was reduced from 24 hours to 10 hours.

› **Reduced wait time for end users to complete compute jobs valued at $844,597.** A third benefit that impacted the business organization was the reduced runtime for many day-to-day tasks. By reducing the runtime by just 15 minutes per day for thousands of users, the financial impact was significant.

In addition, the organizations experienced benefits that impacted staff productivity that totaled $1.7 million, including:

› **Increased speed of development worth over $1.2 million.** The faster storage along with a private cloud configuration improved the efficiency of the development team, which was able to build out new sandbox environments in less time. The quality assurance process was also shortened from ten days to two days.

› **Improved productivity of storage administrators worth $305,747.** PowerMax and XtremIO powered by Intel® Xeon® Scalable processors were simpler to manage and reduced the effort required for storage administrators by 33%, which allowed them to focus on higher value activities rather than day-to-day storage administration.

› **Improved productivity of managing disaster recovery valued at $228,293.** Similarly, the new storage simplified management tasks by the disaster recovery team, primarily because managing failover locations required far less overhead.

The organizations also reduced data center expenses, including storage systems and power/cooling that totaled $1.1 million, including:

› **Reduced cost of continuing to use the previous storage solution of $874,057.** While using the previous solution would have avoided some initial capex costs, modernizing with Dell EMC All-Flash Storage resulted in an average 15% reduction in costs.

› **Reduced cost of power and cooling for data center of $139,512.** While most data center costs are longer term (e.g., reduction in square footage) and did not impact Forrester's three-year financial model. The organization did reduce power consumption by 300,000 watts per year.

Unquantified benefits. The interviewed organizations experienced the following benefits, which are not quantified for this study:

› **Partnered with scholarship and internship programs for the public university customer.** Dell EMC extended its working relationship with the public university customer that we interviewed by creating programs for scholarships and internships outside of the negotiated agreement for technology.

› **Isolated quality assurance from production instances.** The organizations had increased flexibility for creating virtual machines and private clouds and isolating distinct functions that improved quality assurance, in addition to developer productivity.

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Costs. The interviewed organizations experienced the following risk-adjusted PV costs:

› **Cost of Dell EMC storage of $1.8 million for more than 400 gigabytes (GBs) over three years.** The organization paid a capex of $5.00 per GB for an initial 400 GBs and then increased that amount by 20% per year over the three years.

› **Cost to configure and implement storage of $35,700.** The cost included the effort of three employees applying 50% of their time to the project for three months.

Forrester's interviews with four existing customers and subsequent financial analysis found that an organization based on these interviewed organizations experienced benefits of $7 million over three years versus costs of $1.8 million, adding up to a net present value (NPV) of $5.2 million and an ROI of 289%.

Financial Summary
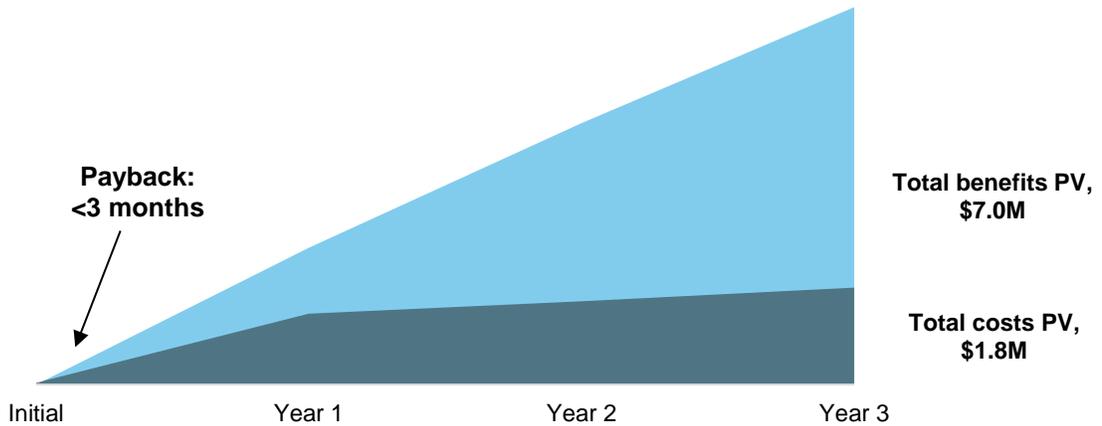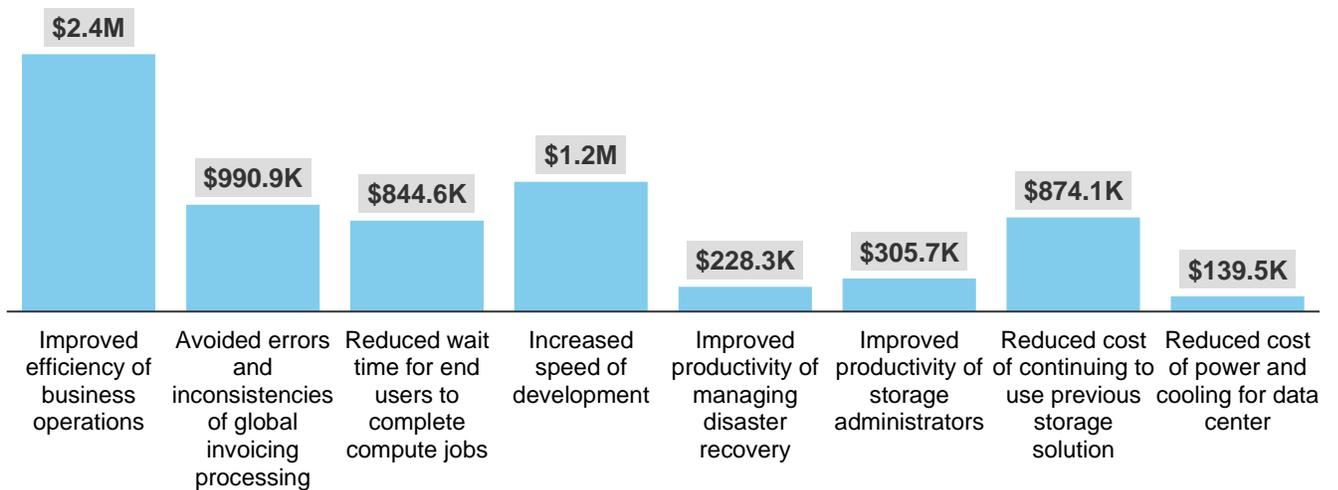
Payback:
<3 months

Total benefits PV,
$7.0M

Total costs PV,
$1.8M

Initial   Year 1   Year 2   Year 3

Benefits (Three-Year)

$2.4M	$990.9K	$844.6K	$1.2M	$228.3K	$305.7K	$874.1K	$139.5K
Improved efficiency of business operations	Avoided errors and inconsistencies of global invoicing processing	Reduced wait time for end users to complete compute jobs	Increased speed of development	Improved productivity of managing disaster recovery	Improved productivity of storage administrators	Reduced cost of continuing to use previous storage solution	Reduced cost of power and cooling for data center

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TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering adopting Dell EMC for SAP.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Dell EMC can have on an organization's SAP operations:

The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

DUE DILIGENCE
Interviewed Dell EMC stakeholders and Forrester analysts to gather data relative to PowerMax and XtremIO powered by Intel® Xeon® Scalable processors.

CUSTOMER INTERVIEWS
Interviewed four organizations using Dell EMC to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION
Designed a composite organization based on characteristics of the interviewed organizations.

FINANCIAL MODEL FRAMEWORK
Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.

CASE STUDY
Employed four fundamental elements of TEI in modeling Dell EMC's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Dell EMC and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Dell EMC for SAP.

Dell EMC reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

Dell EMC provided the customer names for the interviews but did not participate in the interviews.

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The Dell EMC Customer Journey

BEFORE AND AFTER THE DELL EMC INVESTMENT FOR SAP

Interviewed Organizations

For this study, Forrester conducted four interviews with Dell EMC customers with SAP environments. Interviewed customers include the following:

INDUSTRY	INTERVIEWEE	LOCATION	PRIOR CHALLENGES
Public university	Executive director	North America	Wanted to prepare for coming technologies such as SAP HANA.
Sports equipment company	Vice president, information technology	Headquartered in North America with global operations	Struggled with long runtimes for key business processes and shrinking windows of time for making system changes.
Service provider	Director, cloud services	Europe	Received more and more requests from customers for enhanced cloud solutions and robust security capabilities.
Software vendor	Director, cloud infrastructure	North America	Needed the most efficient and cost-effective way to standardize for the internal cloud services being built by the IT organization.

Key Challenges

During interviews, the executives shared key challenges or problems that drove their need for an alternate solution. Those issues included:

› **Compressing the window for system updates or changes.** The sports equipment executive told Forrester: "Our business is increasingly 24/7, 365 days per year. The only maintenance window that we had was Saturday night to Sunday at noon. It became harder and harder to do the necessary work within that window."

› **Pursuing a strategy to standardize on a single technology.** The service provider director said: "We spent two years standardizing our various technologies. At one point we decided, 'All our storage is Dell EMC and we want to keep it that way.' We knew that this would simplify our storage administration, backup, disaster recovery, and our consistency managing various global data centers."

› **Overcoming the limits of cloud providers versus on-premises solutions.** The sports equipment vice president told Forrester: "When we first considered a cloud alternative, the database size was limited to 2.5 terabytes (TBs). Since we had a 4 TB database, cloud simply wasn't an option."

> "Our business is increasingly 24/7, 365 days per year. The only maintenance window that we had was Saturday night to Sunday at noon. It became harder and harder to do the necessary work within that window."
>
> *Vice president, information technology solutions, sports equipment company*

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› **Building a data center around changing business dynamics.** The sports equipment executive said: "Our business goes through cycles of prosperity where we have more cash, but then we will have a few years that are leaner. We chose to invest in an on-premises data center because we could handle the capex, during a flush year, and not be forced to pay higher prices for a cloud solution in years when our business was not operating at the same level."

Key Results

The interviews revealed that key results from the Dell EMC investment to support SAP applications include:

› **Elevated levels of reliability and resilience.** The university director executive told Forrester: "When we first deployed Dell EMC as our storage partner, it elevated our typical level of resilience. In fact, it reset our expectations and in the coming years we have grown to expect the same level of resilience in the products of our other partners. Today, our conversations with Dell EMC focus on emerging services, time-to-market, strategies, cloud interfaces, and real-world problems."

› **Advised through the myriad of technology choices.** The university executive said: "Dell EMC helped us sort through the myriad of technology choices in the market today. The combination of cloud and on-premises alternatives was a challenge for us as a public organization. We didn't have the institutional knowledge to make a good, educated decision."

› **Integrated customer support by Dell EMC.** The service provider executive said: "As a service provider, we have customers with a variety of service tiers within our installed based. Dell EMC is a superb partner and provides great services that allow us to meet service levels to our customers. We highly value Dell EMC's knowledge and ability to help configure the infrastructure for SAP workloads."

› **Improved productivity of information technology and business unit professionals.** The service provider executive told Forrester: "Previously, we had runtimes that would extend into the following day, delaying the work of people when they arrived the next morning. Now the jobs are complete every morning and people can focus on managing daily tasks or growing new business instead of waiting." The sports equipment executive added, "We have seen an average reduction of runtimes of 50% to 60% between the Dell EMC technology and SAP HANA database upgrades."

› **Demonstrated the higher performance with SAP HANA and eased future migration.** The sports equipment executive said: "When we originally looked at storage vendors, the performance difference was minor. They were all competitive. We then decided to test the storage with HANA and then XtremIO from Dell EMC stood out as a better performance and more reliable technology. Choosing Dell EMC simplified our company's migration to SAP HANA."

› **Reduced cost compared to previous storage systems.** The service provider executive told Forrester, "Our cost is sometimes as much as 30% less when we look at compression factors and response times for premium workloads."

> "When we first deployed Dell EMC as our storage partner, it elevated our typical level of resilience. In fact, it reset our expectations and in the coming years we have grown to expect the same level of resilience in the products of our other partners. Today, our conversations with Dell EMC focus on emerging services, time-to-market, strategies, could interfaces, and real-world problems."
>
> *Executive director, public university*

> "When we originally looked at storage vendors, the performance difference was minor. They were all competitive. We then decided to test the storage with HANA and then XtremIO from Dell EMC stood out as a better performance and more reliable technology. Choosing Dell EMC simplified our company's migration to SAP HANA."
>
> *Vice president, information technology solutions, sports equipment company*

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> **Improved performance of disaster recovery.** The university executive said: "The ability to improve our disaster recovery without adding any cost was a substantial benefit. We previously had a DR plan that would make your hair stand up, but we now have a legitimate SAP environment and DR strategy."

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the four companies that Forrester interviewed and is used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer interviews has the following characteristics:

> Uses several SAP modules including Advanced Planner and Optimizer (APO) and ERP Central Component (ECC).

> Starts with 400 TBs of storage installed and grew 20% annually.

> Manages operations globally.

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Analysis Of Benefits

QUANTIFIED BENEFIT DATA AS APPLIED TO THE COMPOSITE

Total Benefits

REF.	BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Improved efficiency of business operations	$960,000	$960,000	$960,000	$2,880,000	$2,387,378
Btr	Avoided errors and inconsistencies of global invoicing processing	$398,438	$398,438	$398,438	$1,195,313	$990,855
Ctr	Reduced wait time for end users to complete compute jobs	$339,625	$339,625	$339,625	$1,018,875	$844,597
Dtr	Increased speed of development	$484,500	$484,500	$484,500	$1,453,500	$1,204,880
Etr	Improved productivity of storage administrators	$73,440	$151,470	$151,470	$376,380	$305,747
Ftr	Improved productivity of managing disaster recovery	$91,800	$91,800	$91,800	$275,400	$228,293
Gtr	Reduced cost of continuing to use previous storage solution	$380,000	$305,900	$367,080	$1,052,980	$874,057
Htr	Reduced cost of power and cooling for data center	$56,100	$56,100	$56,100	$168,300	$139,512
	Total benefits (risk-adjusted)	$2,783,903	$2,787,833	$2,849,013	$8,420,748	$6,975,319

Improved Efficiency Of Business Operations

During interviews, the executives told Forrester about the impact on their business operations. The most significant impact was experienced by a company with global supply chain. With manufacturing facilities in a different part of the world, managing suppliers, shipments, and materials was a major challenge.

Before the upgrade to Dell EMC All-Flash Storage powered by Intel® Xeon® Scalable processors, a single run of SAP APO required 32 hours. This meant that the organization was limited to runs on weekends and holidays and that supply chain decisions were made, for the most part, on a weekly basis.

After upgrading to Dell EMC All-Flash Storage, the system performance improved dramatically, reducing the APO runtime to just seven hours. The shorter runtime allowed the company to run APO every night instead of every weekend, which allowed decision makers in procurement, logistics, and manufacturing facilities to make better and faster decisions. The ability to iterate more rapidly on decisions throughout the supply chain fundamentally changed the company's business and resulted in financial benefits that amounted to $12 million per year.

The organization was careful to point out that while Dell EMC technology enabled the faster iteration, the resulting savings came from subsequent changes in operations and decision making by the business. As a result, Forrester attributes 10% of the benefit to Dell EMC, resulting in a benefit

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of nearly $7 million.

$2.4 million

three-year benefit PV

34%
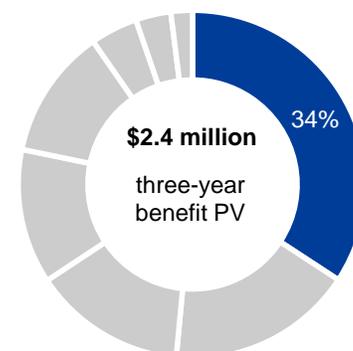
Improved efficiency of business operations: **34%** of total benefits

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of over a million dollars each year.

Because this benefit will apply primarily to the organizations that manage supply chains and have the similar runtime challenges with SAP, Forrester risk-adjusted this benefit downward by 20%, yielding a three-year risk-adjusted total PV of $2.4 million.

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
Improved Efficiency Of Business Operations: Calculation Table					
A1	Improved supply chain management		$12,000,000	$12,000,000	$12,000,000
A2	Percent of improvement attributable to Dell EMC		10%	10%	10%
At	Improved efficiency of business operations	A1*A2	$1,200,000	$1,200,000	$1,200,000
	Risk adjustment	↓20%			
Atr	Improved efficiency of business operations (risk-adjusted)		$960,000	$960,000	$960,000

Avoided Errors And Inconsistencies Of Global Invoicing Processing

Another benefit realized by the business units was an impact on the invoice processing. Specifically, the processing time for the extract, transform, and load (ETL) of invoicing data. One executive detailed: "Our ETL loads were almost taking 24 hours and we were starting to experience mistakes that required staff intervention, which is expensive. The problem had to do with invoicing in different parts of the world (across different time zones). For example, after invoicing in different regions (e.g., Japan then the UK and then the US), the entire company needed to catch up. Our team was getting worried saying, 'I don't know what we can do, when it gets done, it will be one day late. The reports don't have full information.' After our upgrade, the ETL loads for invoicing dropped to 10 hours and we have accurate data."

Because the specific ETL challenge was unique to one company that Forrester interviewed, the benefit realized by readers could vary. To account for this risk, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of $990,855.

$990,855

three-year benefit PV

14%
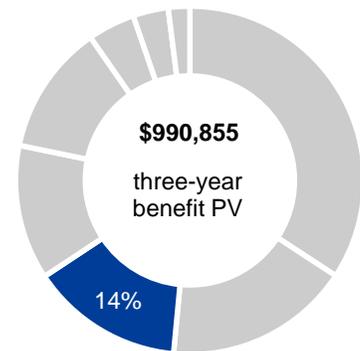
Avoided errors and inconsistencies of global invoicing processing: **14%** of total benefits

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
Avoided Errors And Inconsistencies Of Global Invoicing Processing: Calculation Table					
B1	Cost of errors, mistakes, and rework required		$1,250,000	$1,250,000	$1,250,000
B2	Reduction in cost due to streamlined ETL		75%	75%	75%
B3	Percent of improvement attributable to Dell EMC		50%	50%	50%
Bt	Avoided errors and inconsistencies of global invoicing processing	B1*B2*B3	$468,750	$468,750	$468,750
	Risk adjustment	↓15%			
Btr	Avoided errors and inconsistencies of global invoicing processing (risk-adjusted)		$398,438	$398,438	$398,438

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Reduced Wait Time For End Users To Complete Compute Jobs

Improved storage performance improved the runtime of many other activities across the organization. Specifically, users often found that the runtime of many jobs was reduced significantly, which improved their productivity. Beginning with an organization that has 1,100 employees, Forrester built a model that assumes:

> Ten percent of users were impacted by shorter runtimes.

> The average performance improvement was 15 minutes.

> This calculation alone results in the savings of 27.5 FTEs when computed on an annualized basis.

Similar to earlier benefits, the interviewed executives indicated that productivity gains from the change were enabled by Dell EMC, but that realizing the results required additional changes and management activities. As such, only 20% of the improvement is attributed to Dell EMC. All in all, the impact was $357,000 per year. To account for any risk in variation that readers may experience, Forrester risk-adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of $844,597.

$844,597

12%

three-year benefit PV
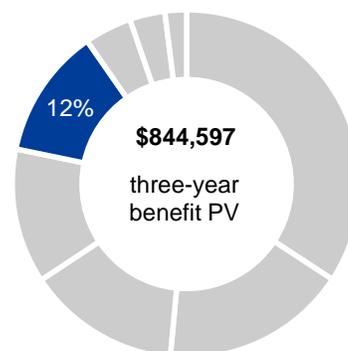
Reduced wait time for end users to complete compute jobs: **12%** of total benefits

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Number of business users		1,100	1,100	1,100
C2	Percentage impacted by slow runtimes every day		10%	10%	10%
C3	Average duration (minutes)		15	15	15
C4	Equivalent full-time employees lost due to excessive runtimes (rounded; one FTE is 2,080 hours per year)		27.5	27.5	27.5
C5	Average burdened salary		$65,000	$65,000	$65,000
C6	Percent of improvement attributable to Dell EMC		20%	20%	20%
Ct	Reduced wait time for end users to complete compute jobs	C4*C5*C6	$357,500	$357,500	$357,500
	Risk adjustment	↓5%			
Ctr	Reduced wait time for end users to complete compute jobs (risk-adjusted)		$339,625	$339,625	$339,625

Reduced Wait Time For End Users To Complete Compute Jobs: Calculation Table

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Increased Speed Of Development

The organizations told Forrester that faster storage improved the productivity of their development teams. One executive said: "The virtualized environment is key for our developers and how we roll out servers. When developers need a new sandbox environment, they had to say, 'Hey, I need a machine.' Now we just roll out a virtual machine on a plane, the developer does their work, and then we kill the virtual machine. Specifically, faster storage improved the cloning for our quality assurance and reduced our turnaround time from 10 days to just two days. I'm pushing them to get down to one day, which probably won't happen, but we are pushing for it."

The impact on developer productivity was an increase of 5%. With a team of 120 developers and at an average burdened salary of $85,000, the impact was $510,000 per year. Forrester believes that this benefit should be shared by most readers. To account for any risk in variation that readers may experience, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of nearly $1.2 million.

$1.2 million

three-year benefit PV

17%
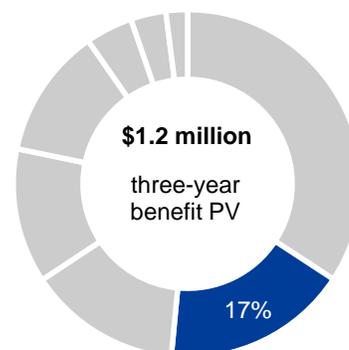
Increased speed of development: **17%** of total benefits

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
Increased Speed Of Development: Calculation Table					
D1	Number of developers		120	120	120
D2	Impact on productivity		5%	5%	5%
D3	Average burdened salary		$85,000	$85,000	$85,000
Dt	Increased speed of development	D1*D2*D3	$510,000	$510,000	$510,000
	Risk adjustment	↓5%			
Dtr	Increased speed of development (risk-adjusted)		$484,500	$484,500	$484,500

Improved Productivity Of Storage Administrators

PowerMax and XtremIO powered by Intel® Xeon® Scalable processors are easier to manage than the traditional storage platforms. The organizations reported that it took fewer FTEs to manage the same capacity. In the model, the organization has a total of six storage administrators whose workload was reduced by 33% using with the new storage systems.

Forrester calculates the first-year benefit at half the improved efficiency as the companies typically run the old and new systems concurrently for about six months. To account for any risk in variation that readers may experience, Forrester adjusted this benefit downward by 10%, yielding a three-year risk adjusted total PV of $305,747.

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Improved Productivity Of Storage Administrators: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
E1	Number of storage admins		6	6	6
E2	Percent of time impacted		16%	33%	33%
E3	Average burdened salary		$85,000	$85,000	$85,000
Et	Improved productivity of storage administrators	E1*E2*E3	$81,600	$168,300	$168,300
	Risk adjustment	↓10%			
Etr	Improved productivity of storage administrators (risk-adjusted)		$73,440	$151,470	$151,470

Improved Productivity Of Managing Disaster Recovery

Similarly, the organization found that the improved storage reduced the workload required to manage disaster recovery. The impact was the equivalent to 1.2 FTEs, saving $102,000 per year. To account for any risk in variation that readers may experience, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of $228,293.

Improved Productivity Of Managing Disaster Recovery: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
F1	Reduced employee effort (FTEs)		1.2	1.2	1.2
F2	Average burdened salary		$85,000	$85,000	$85,000
Ft	Improved productivity of managing disaster recovery	F1*F2	$102,000	$102,000	$102,000
	Risk adjustment	↓10%			
Ftr	Improved productivity of managing disaster recovery (risk-adjusted)		$91,800	$91,800	$91,800

Reduced Cost Of Continuing To Use Previous Storage Solution

The cost of continuing to use the previous storage system would have cost 15% more than the replacement system for a total of $1.3 million. Forrester risk-adjusted this benefit downward by 5% to account for readers who may realize different results. The benefit yielded a three-year risk-adjusted total PV of $874,057.

Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

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REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
	Reduced Cost Of Continuing To Use Previous Storage Solution: Calculation Table				
G1	Avoided cost of previous storage environment		$400,000	$322,000	$386,400
Gt	Reduced cost of continuing to use previous storage solution	=G1	$400,000	$322,000	$386,400
	Risk adjustment	↓5%			
Gtr	Reduced cost of continuing to use previous storage solution (risk-adjusted)		$380,000	$305,900	$367,080

Reduced Cost Of Power And Cooling For Data Center

The new storage system required less square footage in the data center and reduced the cost of power and cooling by 300,000 watts per year.

The executives indicated that they expect they will reduce the size of the data center in the future, but that in the first couple of years, they were tied into leases or other fixed costs that eliminated any immediate reduction in data center real estate.

To account for any risk in variation that readers may experience, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of $139,512.

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
	Reduced Cost Of Power And Cooling For Data Center: Calculation Table				
H1	Reduction in wattage required		550,000	550,000	550,000
H2	Average cost per watt		$0.12	$0.12	$0.12
Ht	Reduced cost of power and cooling for data center	H1*H2	$66,000	$66,000	$66,000
	Risk adjustment	↓15%			
Htr	Reduced cost of power and cooling for data center (risk-adjusted)		$56,100	$56,100	$56,100

Unquantified Benefits

In addition to the benefits outlined above, the interviewed executives shared other benefits that did not have specific financial implications. Specifically, the companies benefited in the following ways:

› **Partnered with scholarship and internship programs.** The public university executive said: "Dell EMC was willing to work with the university to build a partnership that included scholarships and internships for students. It wasn't part of our negotiated agreement, but they were willing to engage in the conversation with the right people at the university."

› **Isolated quality assurance from production instances.** The sports equipment executive described: "Dell EMC enabled an environment where we could add additional instances of ECC integrated with a portal. This allows us to isolate the quality assurance environment specifically for a project. We could not do that before."

Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement S/4HANA and later realize additional uses and business opportunities, including:

› **Building internet-of-things (IoT) strategies.** The service provider executive told Forrester: "We are working with Dell EMC to understand how we can have more data endpoints and leverage Dell EMC to collect, aggregate, and integrate device management beyond just its own technology. We want to manage IoT devices the same way that we manage Dell EMC storage."

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

> Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so.

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Analysis Of Costs

QUANTIFIED COST DATA AS APPLIED TO THE COMPOSITE

Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Itr	Cost of Dell EMC storage	$0	$1,400,000	$280,000	$336,000	$2,016,000	$1,756,574
Jtr	Cost to implement and configure storage	$35,700	$0	$0	$0	$35,700	$35,700
	Total costs (risk-adjusted)	$35,700	$1,400,000	$280,000	$336,000	$2,051,700	$1,792,274

Cost Of Dell EMC Storage

The organization paid Dell EMC a total of nearly $1.8 million over three years for a capacity that began at 400 TBs in Year 1 and grew to 576 TB by Year 3.

Forrester did not risk-adjust this cost, yielding a three-year risk-adjusted total PV of more than $2.5 million.

> The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of over $1.8 million.

Cost Of Dell EMC Storage: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
It	Cost Of Dell EMC Storage			$1,400,000	$280,000	$336,000
	Risk adjustment	↑0%				
Itr	Cost Of Dell EMC Storage (risk-adjusted)			$1,400,000	$280,000	$336,000

Cost To Configure And Implement Storage

The organization employed three employees who spent 50% of their time over three months planning and implementing the storage transition.

To account for any risk in variation that readers may experience in the time required to transition from traditional to modern storage technologies, Forrester adjusted this cost upward by 5%, yielding a three-year risk-adjusted total PV of $35,700.

> Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

Cost To Configure And Implement Storage: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
J1	Three employees at 50% of time for three months		0.4			
J2	Average burdened salary		$85,000			
Jt	Cost to configure and implement storage	J1*J2	$34,000			
	Risk adjustment	↑5%				
Jtr	Cost to configure and implement storage (risk-adjusted)		$35,700			

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Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)

- ■ Total costs
- ■ Total benefits
- ━ Cumulative net benefits
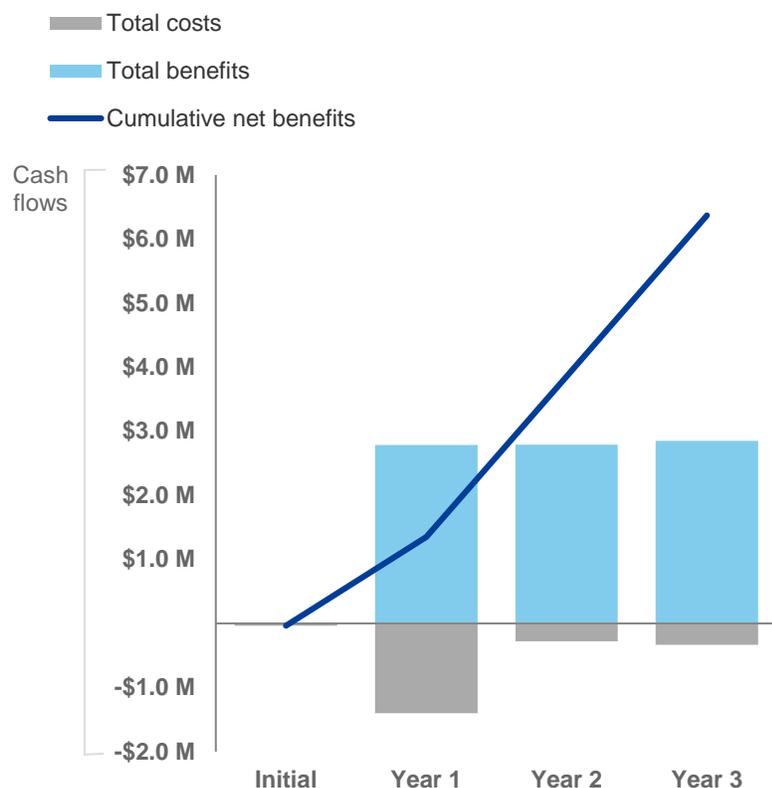
The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	($35,700)	($1,400,000)	($280,000)	($336,000)	($2,051,700)	($1,792,274)
Total benefits	$0	$2,783,903	$2,787,833	$2,849,013	$8,420,748	$6,975,319
Net benefits	($35,700)	$1,383,903	$2,507,833	$2,513,013	$6,369,048	$5,183,045
ROI						289%
Payback period						<3 months

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Forrester Findings: Conclusion

Forrester interviewed four customers using Dell EMC All-Flash Storage for SAP S4/HANA and SAP HANA environments and found that over three years, the customers realized a total of $7 million in benefits that came from:

› Improved business results by $4.2 million. The organizations were able to impact business results by unlocking data capital using Dell EMC All-Flash Storage. Examples shared during interviews included real-time data on SAP S4/HANA and significantly reduced runtimes for business-facing applications.

› Improved staff productivity valued at $1.7 million. Executives told Forrester that they reduced the number of employees required to manage storage systems, backup, and disaster recovery. In each company, employees were able to refocus their efforts on higher value activities.

› Reduced the cost of infrastructure by $1.1 million. The cost of the storage system itself averaged 15% lower with PowerMax and XtremIO storage powered by Intel® Xeon® Scalable processors for the interviewed customers. In addition, customers reported that power consumption in the data centers was 300,000 watts lower per year.

As a result, a composite organization with a baseline of 400 TBs of storage that was growing 20% annually was able to achieve total present value:

› Benefits of $7 million.

› Costs of $1.8 million.

› Net benefits of $5.2 million.

› Return on investment of 289%.

› Payback period of less than three months.

For more information about the products and services discussed in this study, please see http://www.dellemc.com/PowerMax-SAP.

Appendix A: Total Economic Impact

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.

Total Economic Impact Approach

Benefits represent the value delivered to the business by the product. The TEI methodology places 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.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

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.

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.

Return on investment (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.

Discount rate

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.

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.

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