

A Forrester Total Economic Impact™
Study Commissioned By Dell EMC
July 2017

The Total Economic Impact™ Of Dell EMC Data Center Modernization And Migration Services

Cost Savings And Business Benefits That
Dell EMC's Application-Centric, Patented
Methodology For Data Center
Modernization And Migration Enables

Table Of Contents

Executive Summary	1
Key Findings	1
TEI Framework And Methodology	4
The Data Center Modernization And Migration Services Customer Journey	5
Interviewed Organizations	5
Composite Organization	5
Key Challenges	6
Solution Requirements	6
Project Overview	6
Key Results	7
Financial Analysis	8
Resource Cost Avoidance	8
Accelerated Data Center Operational Cost Savings	10
Optimized Resource Efficiency Gains	10
Reduced Risk Of Unplanned Downtime	11
Improved Agility and Performance	12
Increased Confidence In IT	12
Flexibility	12
Fees to Dell EMC	14
Other Cost Considerations	14
Financial Summary	15
Dell EMC Data Center Modernization and Migration Services: Overview	16
Appendix A: Total Economic Impact	17

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July 2017

Executive Summary

Benefits and costs



Resource cost avoidance:
\$4,850,000



Accelerated operational cost savings:
\$3,325,000



Optimized resource efficiency gains:
\$850,000



Fees to Dell EMC:
\$6,000,000

In the age of the customer, every business is now a digital business. To stay competitive and ahead of changing customer expectations, CIOs must adopt the technology systems and processes that will transform their internal operations to meet the demands of a business moving at hyper speed¹. This requires building agile infrastructures and offloading repeatable and time intensive manual tasks like backup, disaster recovery and service deployment to software and policy-driven automation.

In many instances, these transformations require data center modernization and migration efforts: critical, complex events that can propel a business forward by creating a more flexible, agile, and efficient infrastructure. These transformations, however, can also put the business at risk if firms do not execute well. Dell EMC provides data center modernization and migration services that help its customers navigate these complex events, providing the required rigor and expertise for a successful outcome. Dell EMC commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential ROI that enterprises may realize by deploying its data center modernization and migration services. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the Data Center Modernization and Migration Services on their organizations.

To better understand the associated benefits, costs, and risks of this investment, Forrester interviewed five customers that have completed projects with Dell EMC's Data Center Modernization and Migration Services team. Dell EMC's application-centric approach, experienced team of project managers, and automated tools improved efficiency, reduced risk, and accelerated operational cost savings benefits.

As an alternative to using Dell EMC's Data Center Modernization and Migration Services, the interviewees evaluated executing the migration with in-house resources. After careful consideration, the organizations deemed that executing their own migrations would be too slow, be accompanied by more risk than they were willing to shoulder, and deliver a suboptimal outcome.

Key Findings

Quantified benefits. The following risk-adjusted quantified benefits are representative of those experienced by the companies interviewed:

- › **Avoided resource time contributing to almost \$5 million in cost savings.** The alternative to a Dell EMC-led data center migration was running the project in-house. For the interviewed organizations, this would have required acquiring the equivalent of 10 full-time contractors and keeping them on staff for five years — two years longer than the Dell EMC project required. Leveraging Dell EMC to lead the migration saved hundreds of hours of expensive contractor time.
- › **Accelerated data center operational costs savings of more than \$3 million.** The consolidation and standardization of the data centers in conjunction with the modernization of the technology led to a monthly operating cost savings of \$250,000. Because the organization completed the migration two years faster with Dell EMC than it would have with an in-house solution, it gained 24 months of savings.



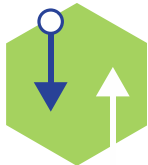
ROI
81%



Benefits PV
\$9 million



NPV
\$4 million



Payback
3.5 years
Six months after project completion

- › **Optimized resource efficiency gains of \$850,000.** Replacing aging technology with modern technology enabled interviewees to grow their virtual environments, install state-of-the-art management tools, and implement infrastructure automation software. Together, these technologies delivered a 20% resource efficiency gain, eliminating countless hours of manual processes, enabling IT to deliver value to the business faster, and freeing up IT admins and managers to focus on more strategic initiatives.

Unquantified benefits. The following benefits were identified but not quantified as part of this analysis:

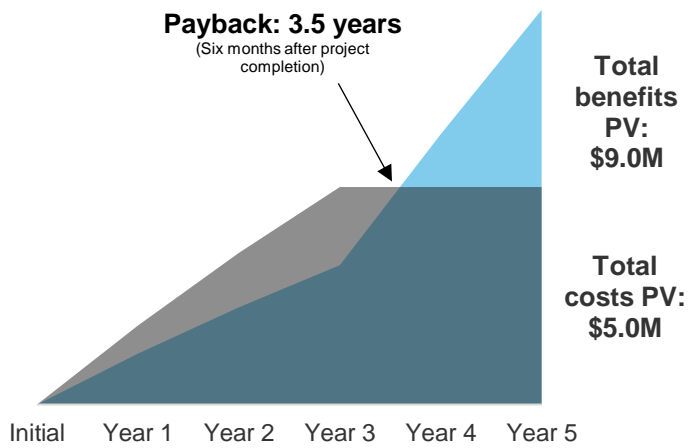
- › **Reduced risk of unplanned downtime.** All data center transformation efforts require some downtime as systems are moved, but those can be planned with minimal disruption to the business. It's the unscheduled downtime occurring when migration events do not go as planned that can severely impact the business. Dell EMC's rigorous planning process reduced this risk, minimizing costly incidents.
- › **Improved agility and performance.** Modernizing the technology, which was heavily influenced by Dell EMC's expertise, improved performance across key systems and applications. Previously, a lack of redundancy would lead to downtime, while aging technology rendered slow performance. As one interviewee said, "By running a more virtual environment with brand new hardware, systems, routers and storage, you get increased performance and fewer problems."
- › **Increased confidence in IT.** Prior to the migration, the relationship between IT and the business was strained. The business was growing, but IT didn't have the resources to keep up: Confidence in IT counterparts was at an all-time low. By partnering with Dell EMC to complete a successful modernization project, during which there were no disruptions to day-to-day operations, IT earned back the business' trust, and with it, its support to tackle additional complex projects in the future.

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

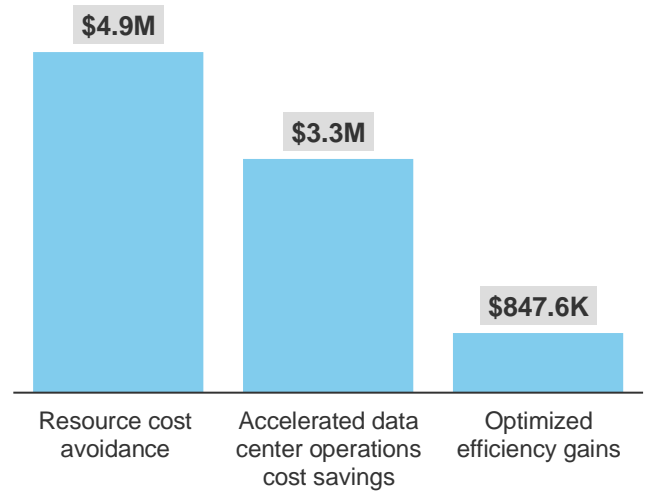
- › **Fees to Dell EMC of \$6,000,000.** The organization paid Dell EMC for an estimated three-year engagement that included project management, discovery, planning, and execution on a fixed bid.
- › **Other cost considerations.** The organization incurred several other costs in support of its migration, such as incremental resource costs to support the Dell EMC project team, new hardware and software, additional professional services, and data center construction fees. These costs would have been incurred whether the organization partnered with Dell EMC or leveraged in-house resources. Because these costs are equal in both scenarios, we excluded them from the analysis.

Forrester's interviews with five existing customers and subsequent financial analysis found that an organization based on these interviewed organizations experienced benefits of \$9,024,860 over five years versus costs of \$4,973,704, adding up to a net present value (NPV) of \$4,051,156 and an ROI of 81%.

Financial summary



Benefits (five-year)



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

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing Dell EMC Data Center Modernization and Migration Services.

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 Data Center Modernization and Migration Services can have on an organization:



DUE DILIGENCE

Interviewed Dell EMC stakeholders and Forrester analysts to gather data relative to Data Center Modernization and Migration Services.



CUSTOMER INTERVIEWS

Interviewed five organizations that partnered with Dell EMC on a data migration effort 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 Data Center Modernization and Migration Services' impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology provides 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 Data Center Modernization and Migration Services.

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.

The Data Center Modernization And Migration Services Customer Journey

BEFORE AND AFTER THE DATA CENTER MODERNIZATION AND MIGRATION PROJECT WITH DELL EMC

Interviewed Organizations

For this study, Forrester conducted five interviews with customers of Dell EMC Data Center Modernization and Migration Services. Interviewed customers included the following:

INDUSTRY	REGION	INTERVIEWEE	SIZE	PROJECT OVERVIEW
Government	Europe	Lead architect	10,000 employees	Consolidated 1,500 servers and 900 applications spread across 12 data centers into one
Financial services	Global	Technical lead	200,000 employees	Consolidated and migrated 7,000 virtual machines (VMs) and 3,000 AIX partitions from three older data centers to two
Security	Global	Data center manager	70,000 employees	Moved from a hosted model to an on-premises data center
Utility	US	Managing director	20,000 employees	Migrated 50 servers, 800 applications, and a mainframe from corporate headquarters to a new standalone location
Research	Global	Senior director	13,000 employees	Consolidated 42 data centers to three, migrating more than 900 applications and increasing virtualization from 28% to 95%

Composite Organization

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

The global, \$20 billion B2C organization employs 24,000 people and serves 6 million customers. Over the past few decades the composite organization invested in significant growth, with both expansions into new markets and acquisitions. Data centers were acquired or built to support specific business units or regional markets without consideration for standardized management. Each operated independently and leveraged different technologies. Over time, managing across these disparate data centers became a challenge. The technology was approaching obsolescence, and the virtualization rate was only 40%. A lack of redundancy was putting the business at risk. IT leaders knew individual patches would not solve the problem — the organization needed a full transformation and modernization to support the business.



Key characteristics:

- Global B2C company
- \$20 billion in annual revenue
- 24,000 employees
- 6 million customers

Key Challenges

Prior to its decision to migrate its data center, and its subsequent decision to select Dell EMC as the partner to lead the migration, the organization experienced:

- › **High costs to operate.** For many years, the organization's strategic focus was on growing its business. It expanded into new markets and acquired companies, gaining or building data centers along the way. Each data center operated with its own set of practices and on its own hardware. Managing across these disparate systems and inconsistent processes was not cost-effective.
- › **Agging technology.** The technology in these disparate data centers wasn't up to modern standards — utilization and virtualization rates were low, automation was nonexistent, and multiple generations of systems were present within the same environment. This not only contributed to high operating costs but also led to many inefficiencies, making it nearly impossible for IT to meet the basic demands of the business.
- › **High risk due to lack of redundancy.** The organization's fast growth and lack of standardization led to a gap in disaster recovery protection. Many applications — including key business systems — had zero redundancy. The risk to the business had become too great to ignore.

Solution Requirements

The organization searched for a partner that would bring knowledge and expertise not only to complete the migration but also, more importantly, to contribute to a transformation that would deliver an optimized data center. In addition, it expected its partner to complete the migration:

- › With greater efficiency, ideally requiring less time and fewer internal resources.
- › With less risk, minimizing the impact to the business.

After an extensive RFP and business case process evaluating multiple vendors, the organization chose Dell EMC based on its reputation and expertise.

Project Overview

Project characteristics. To meet its goals of delivering improved service to the business by upgrading to modern technology, boosting efficiency, and reducing costs, the composite organization embarked on a complex data center transformation project. It expected to replace technology with modern systems, while adding automation and management tools. This required closing all 12 data centers and opening three new state-of-the-art facilities located in key regions around the globe. The composite organization had to transfer assets, redistribute loads, improve utilization, and virtualize its infrastructure. Dell EMC led the entire project: from discovery and planning to execution, including both project and program management. Dell EMC advised on reference architecture, the business case, and road map development.

Alternative scenario. To calculate the benefits of working with Dell EMC, the analysis required an alternative scenario. What would the composite organization have experienced with its data center

“With the old nonstandardized infrastructure, we had a lot of servers that were barely 20% utilized. Our virtualization rate was only around 28%, and very few systems had disaster recovery protection. We needed to completely transform so we could enable the business for the future.”

Senior director, research firm



“Dell EMC is a technology company, so it really understood the underpinnings of what we were trying to do. It was by far the most equipped to support us.”

Managing director, utility company



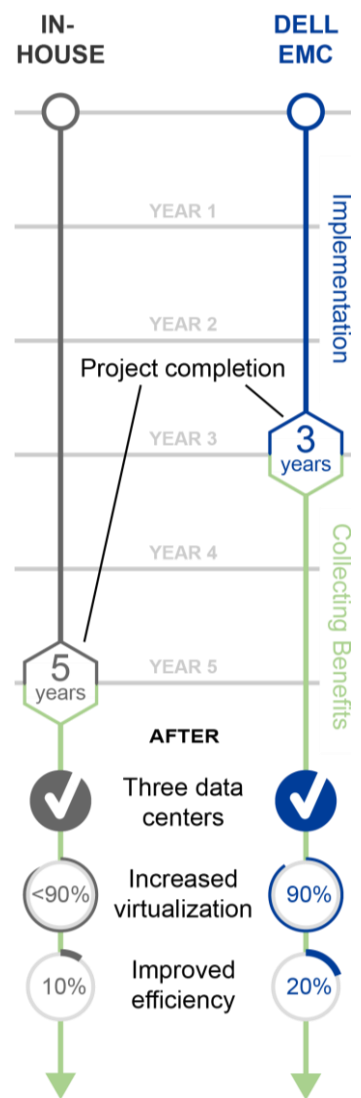
modernization project if it had not worked with Dell EMC? Based on conversations with interviewees, Forrester hypothesized that the alternative scenario would have been a project led with internal resources. In this scenario, the project:

- › **Took longer to complete.** Without Dell EMC's proprietary discovery software, the composite organization would have dedicated twice as much time to discovery and slightly more time on both planning and execution. In total, the composite organization would have dedicated five years to the effort rather than three.
- › **Delivered suboptimal outcomes.** Dell EMC's expertise in the underlying technologies and advice — to not cut corners in hardware and software investments upfront — maximized efficiency and operational cost savings in the end. When the project was completed in-house, without access to these best practices, efficiency gains and operational cost savings were achieved but not at the same level.
- › **Was higher-risk.** Without Dell EMC's rigorous planning process, executing the move would have been accompanied by a higher risk of unplanned downtime.

Key Results

The key results from leveraging Dell EMC's Data Center Modernization and Migration Services include:

- › **A fully optimized transformation of IT operations.** The Dell EMC team led the effort to consolidate 12 disparate data centers into a network of three modern, regional, and standardized data centers. The organization benefited from Dell EMC's technical and process expertise, which led the creation of data centers optimized for efficiency and ready to support the business' growth.
- › **Faster time-to-completion.** Dell EMC completed the project in three years. Without Dell EMC's proprietary discovery software and planning rigor, the project could have taken up to four times longer. Completing the project in less time reduced the strain on internal resources and allowed the organization to realize its efficiency and operational cost savings years sooner.



"The benefit of leveraging Dell EMC was its expertise; what made it successful was its ability to execute on its proven methodologies."

Data center manager, security firm



Financial Analysis

QUANTIFIED BENEFIT AND COST DATA AS APPLIED TO THE COMPOSITE ORGANIZATION

Total Benefits

REF	BENEFIT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	PRESENT VALUE
Atr	Resource cost avoidance	\$1,280,000	\$1,280,000	\$1,280,000	\$1,280,000	\$1,280,000	\$6,400,000	\$4,852,207
Btr	Accelerated cost savings for data center operations	\$0	\$0	\$0	\$2,550,000	\$2,550,000	\$5,100,000	\$3,325,034
Ctr	Optimized resource efficiency gains	\$0	\$0	\$0	\$561,000	\$748,000	\$1,309,000	\$847,620
	Total benefits (risk-adjusted)	\$1,280,000	\$1,280,000	\$1,280,000	\$4,391,000	\$4,578,000	\$12,809,000	\$9,024,860

Resource Cost Avoidance

The assessed alternative to Dell EMC leading the migration effort was running the project in-house, which would have required bringing in contractors to provide expertise to avoid taking IT admins off critical tasks that keep the business running. By using Dell EMC, the composite organization avoided paying these contractors.

Interviewees consistently stated that the length of their data migration projects would have been considerably longer if they had completed the migration on their own without the help of Dell EMC. Conducting the project on their own would have not only led to significant resource requirements but also extended well beyond the three years that Dell EMC required.

- › Interviewees estimated that their projects would have taken between 50% and 400% longer if conducted on their own.
- › Dell EMC uses a proprietary tool that crawls the network looking for connectivity between servers and database systems. Even with this tool, interviewees tapped several internal subject-matter experts (SMEs) across multiple departments to support discovery in areas that included networking, databases, storage, security, operations, and telecommunications to fill gaps and confirm findings. If the interviewees led discovery efforts on their own without the proprietary tool, each SME would have contributed more time to the effort.
- › In the planning phase, interviewees said that several internal stakeholders were assigned to support EMC in designing the move. In a self-led migration, SMEs would have directed rather than supported, working at a slower pace given their lack of previous experience.

The table above shows the total of all benefits across the areas listed below as well as present values (PVs) discounted at 10%. Over five years, the composite organization expects risk-adjusted total benefits to be a PV of more than \$9 million.

The composite organization incurs resource costs throughout the project with or without the support of Dell EMC. Therefore, the model quantifies the incremental resource time that would have been incurred if the composite organization had led the effort on its own. Two factors drive this cost: additional time from contractors and execution over an extended period. For the composite organization, Forrester assumes that:

- › The data center modernization and migration project required three years: roughly a year each for discovery, planning, and execution. The model assumes a conservative 66% — or two-year — increase in time for an in-house project.
- › It would have had to hire or reassign the equivalent of 10 contractors and employ them for five years. Some contracts would contribute migration and modernization expertise, while others would assume day-to-day operations so that internal SMEs could support discovery and planning. Over the course of the project, these contractors would vary as the requirements changed. Some would support on a full-time basis, while others would support on a part-time basis. The total number hired would be higher than 10, but Forrester assumes the sum of all full-time and part-time contracts is 10 full-time equivalents.
- › The average cost to hire a contract full-time is \$160,000 per year.

An organization's ability to achieve these outcomes will vary based on several factors:

- › **Existing resource knowledge and experience.** Given that data center migrations are complex, infrequent events, the model assumes that the composite organization lacks some in-house expertise and will have to acquire it.
- › **Existing complexity of the infrastructure.**
- › **Average cost to hire a contractor.**

To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a five-year risk-adjusted total PV of \$4,852,207.



The composite organization would have required the equivalent of 10 full-time contractors for five years if it had conducted the data center migration on its own.

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.

Resource Cost Avoidance							
REF	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
A1	Number of contractors required		10	10	10	10	10
A2	Average cost per contractor		\$160,000	\$160,000	\$160,000	\$160,000	\$160,000
At	Resource cost avoidance	A1*A2	\$1,600,000	\$1,600,000	\$1,600,000	\$1,600,000	\$1,600,000
	Risk adjustment	↓20%					
Atr	Resource cost avoidance (risk-adjusted)		\$1,280,000	\$1,280,000	\$1,280,000	\$1,280,000	\$1,280,000

Accelerated Data Center Operational Cost Savings

Behind most interviewees' decisions to modernize and migrate their data centers was a desire to reduce monthly operating expenses.

Interviewees suffered from expensive hosted data center fees, underutilized capacity that drained cooling and power supplies, and aging technology that was costly to maintain. Their new data centers benefited from increased virtualization, higher utilization rates, and improved performance. Once they completed their migrations, the interviewed organizations saved between \$160,000 and \$450,000 each month. The sooner they completed their migrations, the sooner they were operating their data centers with less out-of-pocket costs. For the composite organization, Forrester assumes that:

- › Its new data center costs \$250,000 less to operate each month.
- › When it partnered with Dell EMC, it realized these costs savings two years sooner than if it had led its own migration project.

The reduction in operating expenses will vary with:

- › Existing operating expenses, as driven by percent virtualized, capacity utilization, age of the technology, support ratios, level of automation, and efficiency.
- › Anticipated improvements in the data center's operating efficiency.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a five-year risk-adjusted total PV of \$3,325,034.

Accelerated Data Center Operations Cost Savings

REF	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
B1	Monthly cost savings		\$250,000	\$250,000	\$250,000	\$250,000	\$250,000
B2	Months of savings gained due to faster completion		0	0	0	12	12
Bt	Annual accelerated data center operations cost savings	B1*B2	\$0	\$0	\$0	\$3,000,000	\$3,000,000
	Risk adjustment	↓15%					
Btr	Accelerated data center operations cost savings (risk-adjusted)		\$0	\$0	\$0	\$2,550,000	\$2,550,000

Optimized Resource Efficiency Gains

Alongside the goal of reducing costs, interviewees shared a common goal of improving resource efficiency. Replacing aging technology with modern technology enabled them to grow their virtual environments, install state-of-the-art management tools, and implement infrastructure automation software. Together, these technologies replaced countless hours of manual processes, freeing up IT admins and managers to focus on more strategic initiatives. While interviewees believed they would have acquired some efficiencies in a self-led project, they were confident that Dell EMC's experience and expertise led to higher efficiency gains than what they would have achieved on their own. The model assumes that the composite organization:

- › Experienced an initial 15% resource efficiency gain that quickly grew to 20% in the second year, once admins adjusted to the new process. The migration project but would have only delivered a 10% efficiency improvement in efficiency had not partnered with Dell EMC.
- › Experienced this resource efficiency gain across its 40-person infrastructure team.
- › Realized these efficiencies two years earlier than it would have without the support of Dell EMC.
- › Paid an average fully-loaded salary of \$110,000.

Because the model only extrapolated to five years, it calculates the entire 20% efficiency gain for Year 4 and Year 5, given the faster completion rate from working with Dell EMC. If the model extended to Year 6, the benefit would continue but at a reduced incremental gain of 10%. This benefit will vary significantly based on an organization's:

- › Depth of existing inefficiencies.
- › Willingness to adopt the new technology and operating models.
- › Average fully -loaded salaries.
- › Time gained from faster project completion.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a five-year risk-adjusted total PV of \$847,620.



The modern technology saved hours of IT admin time managing the infrastructure and provisioning new machines.

Optimized resource efficiency gain

REF	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
C1	Efficiency gain with Dell EMC-led project					15%	20%
C2	Number of IT admins affected					40	40
C3	Average salary					\$110,000	\$110,000
Ct	Optimized resource efficiency gain	$C1 * C2 * C3$	\$0	\$0	\$0	\$660,000	\$880,000
	Risk adjustment	↓15%					
Ctr	Optimized resource efficiency gain (risk-adjusted)		\$0	\$0	\$0	\$561,000	\$748,000

Reduced Risk Of Unplanned Downtime

Data center migration projects pose a significant risk of unplanned downtime, which can disrupt business operations over an extended period. Mistakes in the planning phase can lead to unforeseen circumstances during execution that delay or halt recovery of systems. While downtime is expected during the execution phase, firms plan for it in advance with plenty of warning that they provide to the business. Mistakes and spontaneous complexities bring unplanned downtime and can have devastating effects on a business.

Fortunately, in the hands of Dell EMC, none of the interviewees experienced any unplanned downtime. While they couldn't articulate what their risk of downtime would have been without the support of Dell



The risk of unplanned downtime during the execution phase was lower with Dell EMC.

EMC, each acknowledged that the risk certainly would have been higher.

Improved Agility and Performance

Dell EMC advised interviewees on the latest technology advancements and systems available. It drew on its expertise and experience, encouraging interviewees to invest in the best solutions available and avoid taking shortcuts. Interviewees that followed Dell EMC's advice not only drove efficiencies in their current infrastructure but also set up a system that allowed them to more easily adopt future technologies. Their new software-defined environments scale up and back, seamlessly extend physical capacity, or redraw virtual allocations to workloads as needed.

Interviewees also saw improved performance across their entire set of applications and systems. The managing director at a utility described the outcome saying: "Availability has increased, and performance is definitely better. We're now running on a more virtual environment so we can stretch resources differently than we did in the past." This agility allows them to more easily integrate new technologies as they become available and adapt to changing business needs.

Increased Confidence In IT

Prior to the data center transformation project, the composite organization's IT team was struggling to meet the demands of the business. Not only did downtime and a lack of redundancy disrupt business operations, but also overextended resources, a lack of modern technology, and inconsistent processes caused IT admins to be slow in executing everyday tasks, such as provisioning a new environment.

A full-scale transformation was a massive undertaking that required buy-in and support from the top of the organization. Budgets were set and promises were made to the business that had to be upheld.

Throughout the project, Dell EMC kept executives informed and onboard by sharing updates on how the program was progressing, what the risks were, and where the project needed additional attention.

With Dell EMC at the helm, interviewees cited on-time and on-budget completion rates, with one interviewee crediting Dell EMC for completing the project within 1.4% of a multimillion-dollar budget. In conjunction with improved availability and efficiency, this gave the business a newfound confidence in IT that it could carry forward to implement new strategic initiatives.

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 leverage Dell EMC's Data Center Modernization and Migration Services and later realize additional uses and business opportunities, including:



Having seen IT successfully complete the complex migration and improve the value it delivered, the business gained confidence in IT's ability to execute additional strategic projects in the future.

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 so.

- › **A comprehensive, documented diagram of the existing infrastructure.** The Dell EMC team used tools and methodologies to develop a deep understanding of the connections and complexities within the existing infrastructure. These insights were documented and could be used to inform future migrations or consolidations with less effort.
- › **Shared expertise and best practices.** Stakeholders worked side-by-side with Dell EMC resources throughout the project, learning why they made certain decisions and how to best execute these migrations. This knowledge stayed within the organization and could be leveraged for future projects.

Flexibility is also quantified as part of a specific project (described in more detail in Appendix A).

Total Costs

REF	COST	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	PRESENT VALUE
Dtr	Fees to Dell EMC	\$2,000,000	\$2,000,000	\$2,000,000	\$0	\$0	\$6,000,000	\$4,973,704
	Total costs (risk-adjusted)	\$2,000,000	\$2,000,000	\$2,000,000	\$0	\$0	\$6,000,000	\$4,973,704

Fees to Dell EMC

Fees to Dell EMC are based on the scope of the migration and the amount of support required by the organization. For this analysis, Forrester assumes the composite organization:

- › Consolidated 12 data centers into three, completing the modernization of technology to deliver an agile network of regional, standardized data centers.
- › Dedicated three years to the project.
- › Leaned on Dell EMC for full project and program management support.
- › Paid Dell EMC \$6 million, spread evenly over three years.

An organization's project fees will vary based on:

- › The size and complexity of the existing infrastructure.
- › The consolidation and modernization required.
- › The amount of time required to complete the project.
- › The resources and expertise in-house that the organization can dedicate to the project.

However, Dell EMC provided accurate estimates for project fees, so these fees have not been adjusted for risk.

Other Cost Considerations

Data center migrations are expensive events that include several other significant costs in addition to outsourcing fees to a partner, such as:

- › Internal SME time.
- › Construction or procurement of a new data center.
- › New hardware and software.
- › Training.
- › Travel.
- › Additional professional services.

This model assumes that each of these costs would have been incurred — in the same amount — whether the composite organization conducted its migration on its own or with the support of Dell EMC. Since the costs are equal in both scenarios, they have been excluded from the analysis. Readers are encouraged to assess the full cost of their data center migration project.

The table above shows the total of all costs, as well as present values (PVs) discounted at 10%. Over five years, the composite organization expects risk-adjusted total costs to be a PV \$4.9 million.



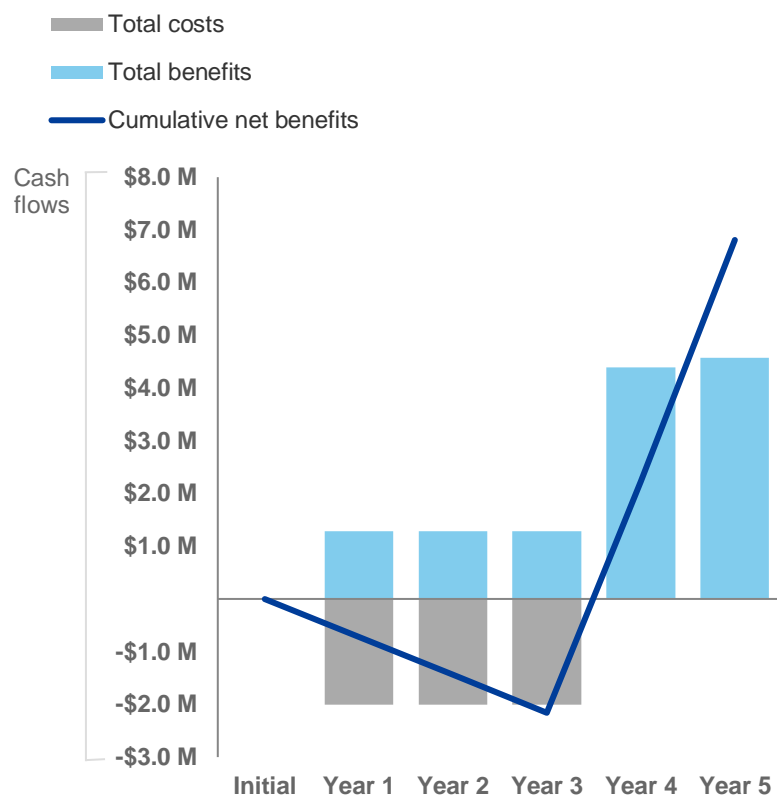
Fees to Dell EMC are fixed, and based on existing knowledge of the infrastructure, in-house experience, and scope of the move.

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.

Financial Summary

CONSOLIDATED FIVE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



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)

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	PRESENT VALUE
Total costs	(\$2,000,000)	(\$2,000,000)	(\$2,000,000)	\$0	\$0	(\$6,000,000)	(\$4,973,704)
Total benefits	\$1,280,000	\$1,280,000	\$1,280,000	\$4,391,000	\$4,578,000	\$12,809,000	\$9,024,860
Net benefits	(\$720,000)	(\$720,000)	(\$720,000)	\$4,391,000	\$4,578,000	\$6,809,000	\$4,051,156
ROI							81%
Payback period							3.5 years <i>Six months after project completion</i>

Dell EMC Data Center Modernization and Migration Services: Overview

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

Dell EMC has delivered successful data center modernization and migration engagements for nearly 20 years. Its unique value comes from a combination of expertise, proven methodology, industry-leading automation tools, and advanced cloud suitability platforms. These factors enable customers to execute projects in the shortest amount of time possible with the lowest risk and greatest efficiency.

The patented application-centric methodology for data center migration consists of four components:

- › **Program management.** Highly experienced project managers work with your team to develop a project charter and work plan, establish a steering committee, and document and communicate a weekly project status. A well-defined change control process is critical to program management success, and Dell EMC works with teams to build and define this process. In addition, its automated dashboards provide real-time visibility into all project activities, improving collaboration across teams.
- › **Discovery and analysis.** Automated tool sets enable us to rapidly discover interdependencies between applications, storage, and servers in environments. This information is critical in determining move groups, schedules, and migration options. It is also essential to determine interdependencies to eliminate risks or unplanned outages. These automated capabilities enable Dell EMC to often shorten the discovery phase from four to six months to four to six weeks. It also uses its cloud suitability platform to assess business requirements for applications and determine optimal placement in varying cloud architectures.
- › **Planning.** Through experience, Dell EMC has learned that a flawless migration execution depends on a robust plan. It uses advanced tools to automate the generation of run-books in a matter of seconds, shortening overall project time and thereby improving staff efficiency. Its patented application-centric methodology enables it to maximize the information provided by interdependencies discovered through tool sets to determine the optimal migration strategy, including bundles and schedule.

The plan also reflects opportunities to modernize data center infrastructure that aligns with long-term infrastructure and application strategies. This can include converged infrastructure platform deployment, virtualization, upgrades to the application environment, streamlining, and automation of ongoing data center operations.

- › **Execution.** With the benefit of a strong migration plan, Dell EMC can execute migrations that include the deployment of migrated applications onto modern cloud infrastructure platforms and associated automation to assure better performance, operational efficiency, and faster implementation of strategic application and infrastructure objectives. Throughout the execution, Dell EMC tracks progress and completion status using automated tools and develops final project runbooks.

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.

ⁱ Source: "Drive Infrastructure Transformation With Service Design," Forrester Research, Inc., July 15, 2016 (<https://www.forrester.com/report/Drive+Infrastructure+Transformation+With+Service+Design/-/E-RES118100#dialog-1498496526076-dialog>).