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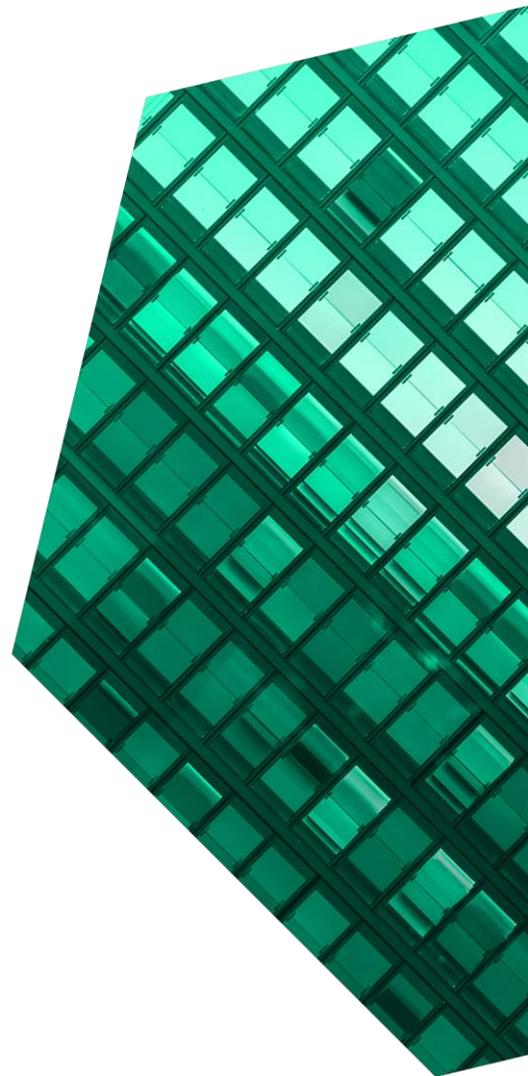
The Total Economic Impact™ Of VMware's VMware Cloud Foundation

Cost Savings and Business Benefits
Enabled By VMware Cloud Foundation

March 2022

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Executive Summary

VMware Cloud Foundation is the hybrid cloud platform for modernizing data centers and deploying modern apps. Integrating all infrastructure components with automation built into the stack, VMware Cloud Foundation provides a turnkey hybrid cloud solution for complex Kubernetes and traditional VM environments.

VMware commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying [VMware Cloud Foundation \(VCF\)](#).¹ The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of VMware Cloud Foundations on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed seven decision-makers with experience using VMware Cloud Foundation. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single [composite organization](#).

Prior to using VMware Cloud Foundation, these interviewees noted how their organizations had migrated approximately 70% of their servers to a virtualized environment, had limited software-defined networking, minimal automation for the deployment of the infrastructure and varying degrees of legacy infrastructure. The lack of automation and interoperability testing in patching cycles lead to prolonged security gaps and patching efforts. These limitations also lead to increased time and effort from the operations teams which could have been spent on higher value activities.

After the investment in VMware Cloud Foundation, the interviewees had migrated close to 90% of servers to a virtualized infrastructure, legacy

KEY STATISTICS



Return on investment (ROI)

171%



Net present value (NPV)

\$6M

infrastructure was reduced, and the company saw productivity and efficiency gains in network operations. In addition to these there were decreased operational costs, improvements in employee experience and a significant overall increase in security posture.

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits include:

- **Security related present value savings of \$4.8M.** The addition of NSX-T significantly reduced the impacts and costs of major breaches by about \$1.3M based on the composite organization. Systems administrators were able to reduce operational time due to security automation within the NSX product, this amounted to a \$1.4M savings. The avoided security appliance purchase for east-west traffic

make up the remaining savings in this benefit category.

- **Ongoing operational costs present value savings of \$2.6M.** When VM compute costs were rationalized the composite organization saw a yearly operational savings of just over \$60K. In addition to this there was a reduction in the size of storage based on the addition of vSAN for a onetime cost savings of \$2.4M.
- **Network operations saw productivity and efficiency gains present value savings of \$1.9M.** In general network operations teams saw a redeployment of approximately 35% of IT staff to other areas. This staff that was previously involved in the day-to-day operations of the infrastructure could now be deployed in other areas to create additional value for the organization. Increases in efficiency were seen through the standardization of the deployment and the value added by automation.

Operational personal efficiency gains



- **Lifecycle management productivity related present value savings of \$0.4M.** Overall, the reduced patching effort was approximately 35% due to automation and interoperability testing was reduced by approximately 75%.

Unquantified benefits. Benefits that are not quantified for this study include:

- **Improvements in employee experience:** Overall there was a noticeable improvement in employee experience and morale with the implementation of VMware Cloud Foundations. This was not something that could be quantified in the short term but statements from interviews during the building of the composite organization revealed that this was a positive outcome that could lead to less employee turnover. This is significant given the current demand for skilled employees within the IT operations space.

Costs. Risk-adjusted PV costs include:

- **Licensing costs had a present value of \$2.5M.** Licensing costs obtained from VMware for the composite organization had a present value of \$2.3M. Once this figure was risk-adjusted for various items such as licensing partner fees the present value cost of the solution was \$2.5M.
- **Implementation and Deployment related costs had a risk-adjusted present value of \$1M.** The majority of these deployment costs were in the first year with these initial costs having a three-year present value of approximately \$0.9M. Fine-tuning of the solution beyond the initial year had a three-year present value of \$265K.

The decision-maker interviews and financial analysis found that the composite organization experiences benefit of \$9.6M over three years versus costs of \$3.6M, adding up to a net present value of \$6.0M and an ROI of 171%.



ROI
171%



BENEFITS PV
\$9.6M

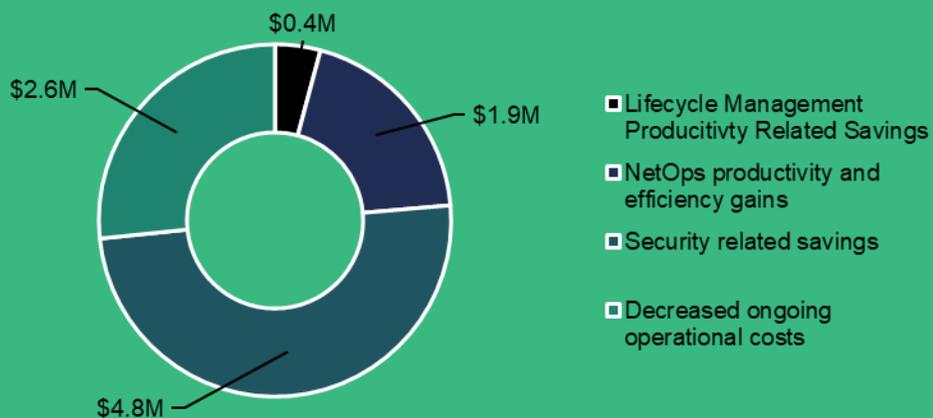


NPV
\$6M

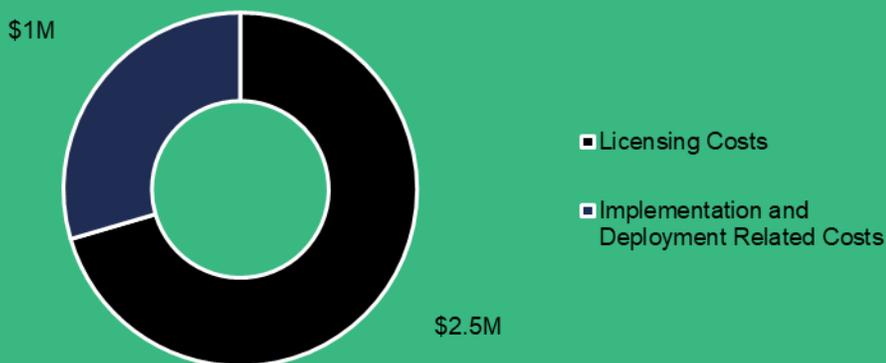


PAYBACK
9 months

Benefits by Category



Costs by Category



TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in the VMware Cloud Foundation.

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 the VMware Cloud Foundation can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by VMware 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 study to determine the appropriateness of an investment in the VMware Cloud Foundations.

VMware 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.

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



DUE DILIGENCE

Interviewed VMware stakeholders and Forrester analysts to gather data relative to the VMware Cloud Foundation.



DECISION-MAKER INTERVIEWS

Interviewed seven decision-makers at organizations using the VMware Cloud Foundation to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' 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 decision-makers.



CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of 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.

The VMware Cloud Foundation Customer Journey

Drivers leading to the VMware Cloud Foundation investment

Interviewed Decision-Makers		
Interviewee	Industry	Region
Lead Enterprise Architect	Managed Service Provider	France
SAN Team Lead	Managed Service Provider	Australia
Lead Virtualization Architect	Government	Sweden
IT Systems Engineer	Financial Services	United States
Team Manager	Financial Services	United States
Information Technology Manager	Manufacturing	United States
Manager, Enterprise Computing and Operations	Manufacturing	United Kingdom

KEY CHALLENGES

Typical installations of VMware Cloud Foundation had a before state where: approximately 70% of the servers were already virtualized, limited software-defined networking, and mixed amounts of legacy infrastructure that there was no plan to virtualize. In addition to these key challenges the installations discussed had limited amounts of automation for deployment and operational purposes. There was considerable time devoted to lifecycle management including patching and interoperability testing.

The interviewees noted how their organizations struggled with common challenges, including:

- Limited use of automation tools to efficiently deploy infrastructure.
- Build standardization using templated gold images for security and ease of deployment
- Use of micro-segmentation for separation and increased security posture.
- Long patching cycles due to interoperability testing and other operational challenges

- High storage costs due to a lack of consolidation
- Lower employee morale and retainment challenges due to menial tasks such as patching

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and a ROI analysis that illustrates the areas financially affected. The composite organization is representative of the seven decision-makers that Forrester interviewed and is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. This global organization earns about \$750M in annual revenue from its business-to-business services. The composite organization has offices in 10 different locations, a strong brand, global operations, and a strong online and offline presence.

Deployment characteristics. The composite organization has operations across ten different sites and provides business services to other businesses. Growth of the composite has been slow but steady so executives were looking for additional efficiencies in IT infrastructure and company operations to increase profit over the long term.

Key assumptions

- **\$750M annual revenue**
- **10K employees**
- **10 Sites**
- **3.5M deployment costs**

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	Lifecycle Management Productivity Related Savings	\$88,988	\$201,308	\$201,308	\$491,603	\$398,513
Btr	NetOps productivity and efficiency gains	\$526,500	\$877,500	\$877,500	\$2,281,500	\$1,863,122
Ctr	Security related savings	\$1,866,085	\$1,916,233	\$1,971,381	\$5,753,700	\$4,761,233
Dtr	Decreased ongoing operational costs	\$2,805,187	\$0	\$0	\$2,805,187	\$2,550,170
	Total benefits (risk-adjusted)	\$5,286,759	\$2,995,041	\$3,050,189	\$11,331,989	\$9,573,038

LIFECYCLE MANAGEMENT PRODUCTIVITY RELATED SAVINGS

In general organizations saw increases in lifecycle management productivity and related savings in the following areas:

- Patching effort decreased by 35%.
- Interoperability effort decreased by 75%
- Decreased overall costs associated with lifecycle management
- Productivity gains associated with lifecycle management
- Decreased operational resources needed to maintain systems

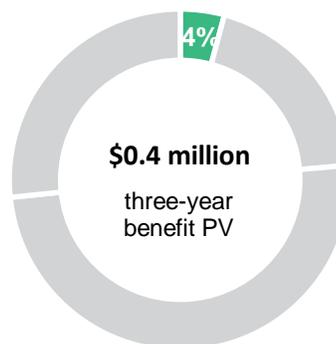
Modeling and assumptions. The lifecycle management productivity related savings were applied to the composite organization and analysis was completed to understand the benefits of VMware Cloud Foundation on the organization. As part of the modeling the following assumptions were made:

- Patching efforts were reduced in year one due to the deployment of the system.

- Upgrade effort reduction in year one was also reduced to zero.

Risks. There were no captured risks related to lifecycle management and productivity related savings that would impact the overall modeling of the solution.

Results. The three-year, total PV of lifecycle management productivity-related savings is \$0.4M



Lifecycle Management Productivity Related Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Patching effort reduction	35%	20%	35%	35%
A2	IT operations FTE hours spent on patching prior state	4160	4160	4160	4160
A3	Interoperability testing reduction	75%	75%	75%	75%
A4	IT operations FTE hours spent on interoperability testing prior state	1000	1000	1000	1000
A5	Upgrade effort reduction	40%	0%	40%	40%
A6	IT operations effort required previously to upgrade, annually	3432	3432	3432	3432
A7	IT operations hourly compensation, fully loaded	\$56.25	\$56.25	\$56.25	\$56.25
At	Lifecycle Management Productivity Related Savings	\$201,308	\$88,988	\$201,308	\$201,308
	Risk adjustment	0%			
Atr	Lifecycle Management Productivity Related Savings (risk-adjusted)	Interviews	\$88,988	\$201,308	\$201,308
Three-year total: \$491,603			Three-year present value: \$398,513		

NETOPS PRODUCTIVITY AND EFFICIENCY GAINS

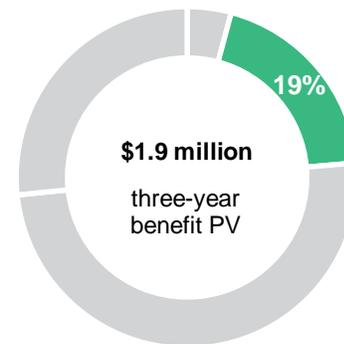
Organizations that were interviewed saw benefits in network operations productivity and efficiency in the following areas:

- Overall, the interviewees saw an increase in efficiency of about 20% starting in year two
- Resource re-deployment to create value in other areas was about 30%, starting in year one
- This meant an overall productivity/efficiency gain of 30% in year one and 50% in year two and three.
- This results in a total efficiency gain of \$525,500 in year one and \$877,500 in year two and three.

Modeling and assumptions. The network operations productivity and efficiency gains were applied to the composite organization and analysis was completed. to understand the benefits from VMware Cloud Foundations on the composite organization. As part of the modeling the following assumptions were made:

- Increases in efficiency are assumed to only occur in year two and three, or after solution deployment.
- Interviews indicated that network operations resource re-deployment could be completed during the deployment of the infrastructure.

- **Risks.** There were no captured risks related to Network Operations productivity and efficiency gains that would impact the overall modeling of the solution.
- **Results.** The three-year, total PV of network operations productivity and efficiency gains is \$1.9M



Network Operations Productivity and Efficiency Gains					
Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Increase in efficiency	Interviews		20%	20%
B2	Resource re-deployment value add	Interviews	30%	30%	30%
B3	Network operations FTE headcount dedicated to virtualization	Interviews	15	15	15
B4	Network operations FTE compensation, fully loaded annually	Interviews	\$117,000	\$117,000	\$117,000
Bt	NetOps productivity and efficiency gains	$(B1+B2)*B3*B4$	\$526,500	\$877,500	\$877,500
	Risk adjustment	0%			
Btr	NetOps productivity and efficiency gains (risk-adjusted)		\$526,500	\$877,500	\$877,500
Three-year total: \$2,281,500			Three-year present value: \$1,863,122		

SECURITY-RELATED SAVINGS

Evidence and data. Organizations that were interviewed saw benefits in security-related savings in the following areas:

- The addition of NSX-T allowed for micro segmentation which when used helps stop east-west proliferation during security events. This increased the interviewees overall security posture.
- The SDDC Manager ensured the application of security patches in a correct manner to help increase security posture.
- The consistency of the architecture and deployment was noted to increase security posture.
- Interviews also noted there was an increase in security and increases in efficiency due to the application of automatic updates.

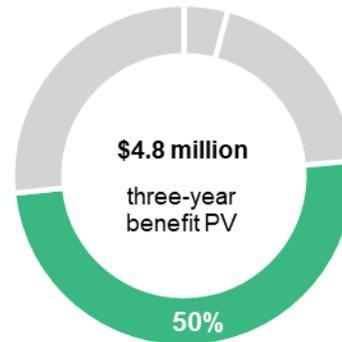
Modeling and assumptions.

The security-related savings were applied to the composite organization and analysis was completed to understand the benefits from VMware Cloud Foundation on the composite organization. As part of the modeling the following assumptions were made:

- Administration related savings increased through all the years with the deployment of NSX-T.
- The cost of major breach data is extrapolated from Forrester Consulting Cost of a Cybersecurity Breach Survey, Q4 2020.
- The use of NSX-T avoids physical and virtual security appliances that would otherwise be necessary.

Risks. There was a slight downward adjustment of risk due to overall increases in security over time through tuning of the systems using micro-segmentation.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of \$4.8M



Security Related Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Cost of major breaches, annual basis	Forrester data	\$1,928,555	\$1,928,555	\$1,928,555
C2	Decrease in breach impact with east-west segmentation	Interviews	33%	33%	33%
C3	Systems admin time savings from IT and security automation (NSX)	NSX Study	\$527,877	\$580,665	\$638,715
C4	Security appliance purchase avoidance for east-west traffic	Existing research	\$800,000	\$800,000	\$800,000
Ct	Security related savings	C1*C2+C3+C4	\$1,964,300	\$2,017,088	\$2,075,138
	Risk adjustment	↓5%			
Ctr	Security related savings (risk-adjusted)		\$1,866,085	\$1,916,233	\$1,971,381
Three-year total: \$ \$5,753,700			Three-year present value: \$4,761,233		

DECREASED ONGOING OPERATIONAL COSTS

Evidence and data. Organizations that were interviewed saw benefits from deploying VMware Cloud Foundation in following areas:

- An overall storage capacity decrease and a one-time costs savings associated with the reduction of these storage units.
- Interviewees observed a reduction in overall usage of compute power.

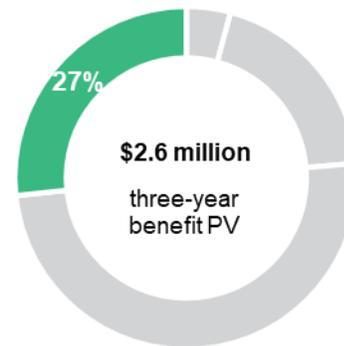
Modeling and assumptions. The decreased ongoing operational costs were applied to the composite organization and an analysis was completed to understand the benefits from VMware Cloud Foundation on the composite organization. As part of the modeling the following three-year assumptions were made:

- Savings from the one-time reduction of storage due to the vSAN led to a costs savings in year one as well as decreases in operational costs throughout the three years.

Risks.

- Forrester attributed a 5% downward risk adjustment due to changes in labor and support costs.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of \$2.6M



Decreased Ongoing Operational Costs					
Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Rationalized VM compute costs		\$60,690	\$60,690	\$60,690
D2	Storage capacity decrease, in petabytes	Interviews	12	12	12
D3	Storage cost savings, SAN spinning arrays	$D3 * \$200/TB * 100 \text{ OTB/PB}$	\$2,400,000	\$0	\$0
D4	Operations labor and support contract decrease	$20\% * (D1 + D3)$	\$492,138	\$481,214	\$481,214
Dt	Decreased ongoing operational costs	$D1 + D3 + D4$	\$2,952,828	\$0	\$0
	Risk adjustment	↓5%			
Dtr	Decreased ongoing operational costs (risk-adjusted)		\$2,805,187	\$0	\$0
Three-year total: \$ \$2,805,187			Three-year present value: \$2,550,170		

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- The improvement in employee morale due to improved employee experience. The Interviewees were sure that this would lead to a lower frequency of employee turnover and improved overall well-being.

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
Etr	Licensing costs	\$2,492,476	\$0	\$0	\$0	\$2,492,476	\$2,492,476
Ftr	Implementation and deployment related costs	\$998,042	\$51,750	\$0	\$0	\$1,049,792	\$1,045,087
	Total costs (risk-adjusted)	\$3,490,518	\$51,750	\$0	\$0	\$3,542,268	\$3,537,563

LICENSING COSTS

Evidence and data. Licensing costs were determined using data from VMware as follows

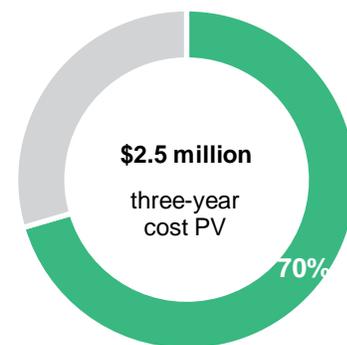
- A composite organization was created from interviews and the total cost of licensing was provided by VMware based on the number of CPUs.

Modeling and assumptions.

- Licensing costs were applied up front. The implementation assumed a three-year perpetual license with some additional discounts as applied to a typical VMware customer.
- All the implementation and deployment related costs were paid for during the first year.

Risks. The risks associated with the build were attributed to costing differences from suppliers.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$2.5M.



Licensing Costs

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
E1	Licensing costs	VMware	\$2,265,888			
Et	Licensing costs	E1	\$2,265,888	\$0	\$0	\$0
	Risk adjustment	↑10%				
Etr	Licensing costs (risk-adjusted)		\$2,492,476	\$0	\$0	\$0
Three-year total: \$2,492,476			Three-year present value: \$2,492,476			

IMPLEMENTATION AND DEPLOYMENT RELATED COSTS

Evidence and data. Overall interviewees experience some initial upfront or year one costs as seen by the following:

- Planning and implementation costs occurred during the initial period.
- Solution fine-tuning costs occurred mainly in the initial year however depending on the complexity of the systems this can also be seen in Year 1.
- In general, most implementation and deployment costs are absorbed in year 1.

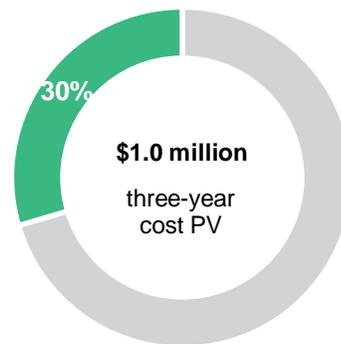
Modeling and assumptions.

- Based on the composite organization the main costs were seen in the professional services bucket which amount to \$0.4M
- Assumptions were made that the costs were typically up-front one-time costs.

Risks. There is significant risk to the implementation and deployment of the VMware Cloud Foundation solution: These risks are dependent on:

- Labor costs and organization's readiness for adopting the solution

Results. To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year, risk-adjusted total PV of \$1.0M.

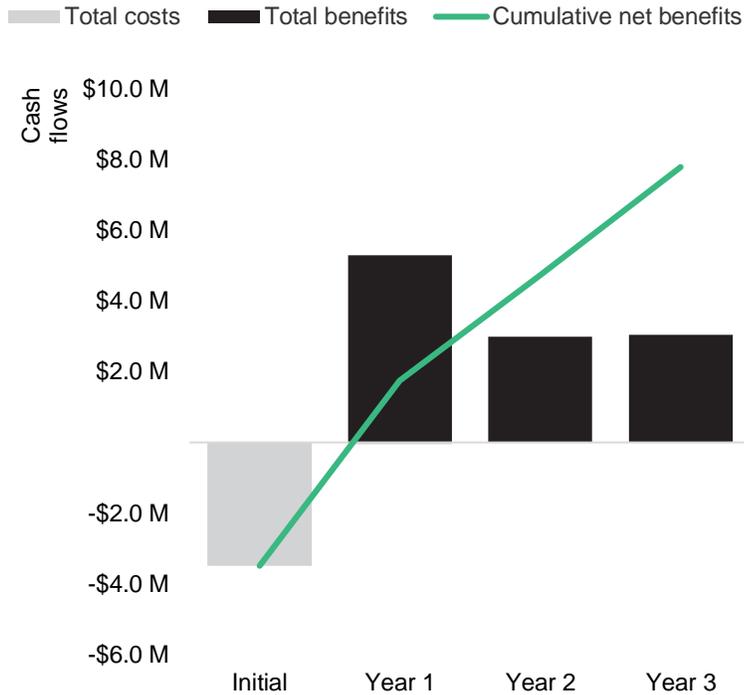


Implementation and Deployment Related Costs						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
F1	Planning and implementation costs	Interviews	\$202,500			
F2	Fine tuning of Solution costs	Interviews	\$225,000	\$45,000	\$0	\$0
F3	Training and change management costs	Interviews	\$40,500	\$0	\$0	\$0
F4	Professional services	VMware data	\$399,863	\$0	\$0	\$0
Ft	Implementation and deployment related costs	F1+F2+F3+F4	\$867,863	\$45,000	\$-	\$-
	Risk adjustment	↑15%				
Ftr	Implementation and deployment related costs (risk-adjusted)		\$998,042	\$51,750	\$0	\$0
Three-year total: \$1,049,792			Three-year present value: \$1,045,087			

Financial Summary

CONSOLIDATED THREE-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 Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$3,490,518)	(\$51,750)	\$0	\$0	(\$3,542,268)	(\$3,537,563)
Total benefits	\$0	\$5,286,759	\$2,995,041	\$3,050,189	\$11,331,989	\$9,573,038
Net benefits	(\$3,490,518)	\$5,235,009	\$2,995,041	\$3,050,189	\$7,789,721	\$6,035,475
ROI						171%
Payback						9.0 months

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.

Appendix B: Endnotes

¹ 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.

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