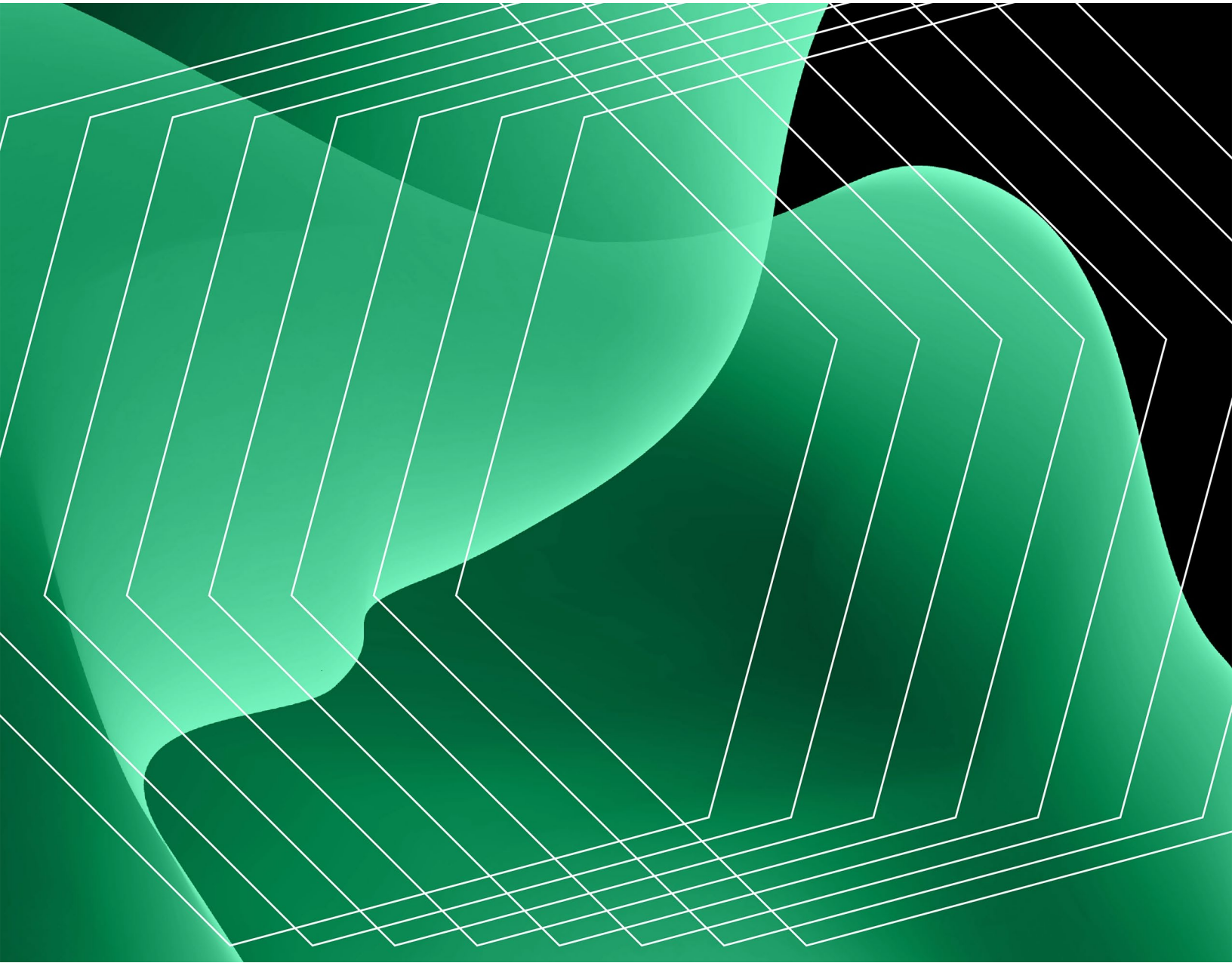
FORRESTER®

The Total Economic Impact™ Of Microsoft Azure VMware Solution

Cost Savings And Business Benefits Enabled By Azure VMware Solution

A Forrester Total Economic ImpactTM Study
Commissioned By Microsoft, April 2024



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ABOUT FORRESTER CONSULTING

Forrester provides independent and objective research-based consulting to help leaders deliver key outcomes. Fueled by our customer-obsessed research, Forrester's seasoned consultants partner with leaders to execute their specific priorities using a unique engagement model that ensures lasting impact. For more information, visit forrester.com/consulting.

Executive Summary

Most organizations agree on two points. First, transitioning to the cloud offers numerous advantages, including reduced operating costs, enhanced productivity, and improved performance. Second, despite these benefits, the process of migrating to the cloud can be complex and challenging. When VMware workloads are involved, Azure VMware Solution greatly simplifies the migration.

Microsoft's Azure VMware Solution is a service delivered via Azure that redeploys and extends organizations' enterprise workloads based around VMware to Microsoft Azure, which allows them to maintain existing investments and personnel while reaping the elasticity, infrastructure cost savings, productivity savings, and performance benefits of the cloud.

Microsoft commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment.

To better understand the benefits, costs, and risks associated with this investment, Forrester conducted in-depth interviews with four representatives who have extensive experience using Azure VMware Solution. For this study's purposes, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization.

Interviewees said that prior to using Azure VMware Solution, their organizations were at a tipping point. The costs of managing the organizations' preexisting hardware were overwhelming their IT departments, and end users and customers needed better performance, availability, and features. However, none of these organizations were poised to fully rearchitect or migrate their VMware workloads because they lacked the time, personnel, and resources they needed.

Microsoft's Azure VMware Solution enabled the organizations to redeploy specific workloads to the cloud without disrupting existing workflows or services. Without the costly, time-consuming migration normally required with cloud deployment, the organizations reported benefits around better performance, flexibility, and savings in productivity and cost of maintenance.

KEY FINDINGS

Quantified benefits. Three-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **Increased application performance and availability, reducing downtime by up to 80%.** Moving workloads to Azure VMware Solutions enables the composite organization to avoid downtime by improving reliability. Leveraging Microsoft's infrastructure, expertise, and resources to provide a better user experience for both internal and external users. This results in a risk-adjusted, three-year benefit of $4.0 million for the composite organization.
- **90% of server refreshes and purchases (including overprovisioning and Extended Security Updates) avoided.** The composite organization realizes significant savings on its data center costs as it moves VMware workloads to the cloud with Microsoft Azure VMware Solution. The composite realizes a 90% reduction in server refreshes and purchases after migration, and by Year 3, it decommissions 75% of its existing servers by moving to the cloud. In addition, AVS includes free Extended Security Updates (ESUs), so this adds up to a risk-adjusted, three-year total of $5.1 million in savings.

> "When you're doing machine learning, you need enormous CPU power, huge processors, and lots of memory. If we hadn't used Azure VMware Solution to work in the cloud, we would have had to buy very powerful, very expensive machines to do the machine learning processes, and we wouldn't even use them most of the time."
>
> ASSISTANT DIRECTOR, DEVELOPMENT DEPARTMENT, GOVERNMENT

- **Avoided administrator reskilling and workload converting.** By simply moving workloads onto Microsoft AVS rather than fully converting legacy workloads to Azure and retraining system administrators, the composite organization saves a risk-adjusted $1.2 million in avoided training and labor.
- **Infrastructure maintenance labor costs reduced by 18%.** The move away from on-premises operations frees up a significant amount of time that administrators previously spent performing updates, provisioning workloads, and maintaining infrastructure. This saves the composite organization a risk-adjusted, three-year total of over $317,000.

Unquantified benefits. Benefits that provide value for the composite organization but are not quantified for this study include:

- **Broader access to the Microsoft Azure Services ecosystem.** Working with Microsoft Azure VMware Solution provides the composite organization with a potential jumping off point to easily engage with other services in the Azure ecosystem. The organization plans to use these services as it works to modernize its applications in the cloud.
- **Improved disaster recovery and business resiliency.** Improved stability and performance from Microsoft AVS provide the organization with better overall resiliency and faster disaster recovery.

Costs. Three-year, risk-adjusted PV costs for the composite organization include:

- **$3,500 in fees per Azure node per month.** The composite organization pays a monthly fee of $3,500 per Azure node it has in place. By Year 3, the organization has 12 nodes in place, which results in a three-year, risk-adjusted cost of $1.08 million.
- **Implementation fees and labor costs.** The composite organization pays for third-party partner services during implementation, and it has a subset of its IT team spend half of its time on implementation for six months. This results in a risk-adjusted, three-year total implementation cost of $1.58 million.

The representative interviews and financial analysis found that a composite organization experiences benefits of $10.59 million over three years versus costs of $2.66 million, adding up to a net present value (NPV) of $7.93 million and an ROI of 298%.

Return on investment (ROI)

298%

Benefits PV

$10.59M

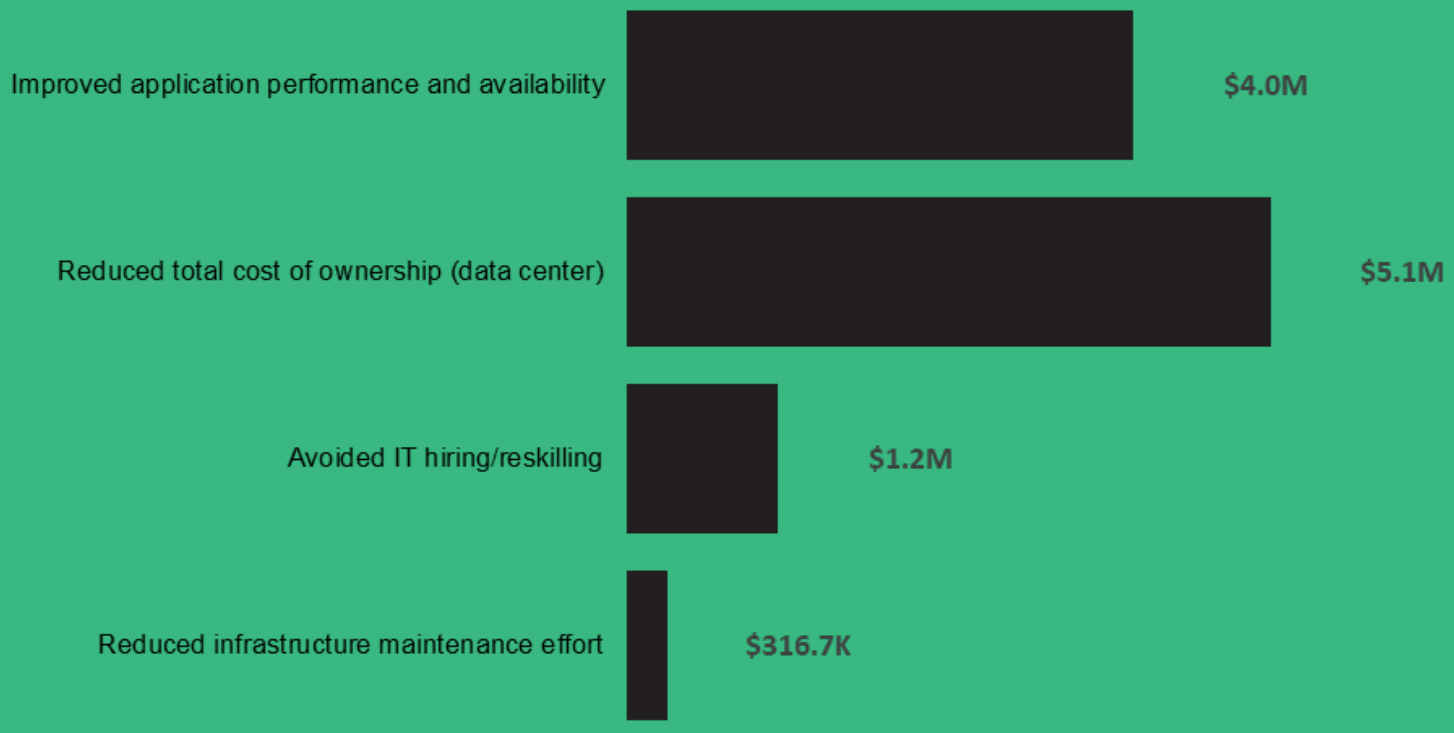
Net present value (NPV)

$7.93M

Payback

<6 months

Benefits (Three-Year)



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 Azure VMware Solution.

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 Azure VMware Solution can have on an organization.

DISCLOSURES
Readers should be aware of the following:

This study is commissioned by Microsoft 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 Azure VMware Solution.

Microsoft 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.

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

Due Diligence
Interviewed Microsoft stakeholders and Forrester analysts to gather data relative to Azure VMware Solution.

Interviews
Interviewed four representatives at organizations in healthcare, technology, manufacturing, and government using Azure VMware Solution to obtain data about 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 interviewees.

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 Microsoft Azure VMware Solution Customer Journey

Drivers leading to the Azure VMware Solution investment

Interviews			
Role	**Industry**	**HQ Region**	**Revenue**
Assistant director, development department	Government	Europe	N/A
Executive director, technology delivery	Healthcare	North America	$54B
Senior director, IT operations	Technology	North America	$2B
Director of global IT services	Manufacturing	Europe	$22B

KEY CHALLENGES

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

- **Need to quickly and efficiently move to the cloud.** Many of the interviewees stressed how their organizations needed to move vital workloads to the cloud to enable the business to survive in the future. They also emphasized how impossible moving to the cloud in this comprehensive manner would be with their limited staff and budgets.

> "We were approaching the economic lifetime of the equipment and we had to decide quickly. Are we going to buy yet another set of equipment, or move to the cloud? We didn't have time to convert everything to PaaS [platform-as-a-service] applications, and we knew some applications were too old to convert. We needed a solution to easily lift and shift both our central and local applications into a cloud environment, and we chose Azure VMware Solution."
>
> DIRECTOR OF GLOBAL IT SERVICES, MANUFACTURING

- **Increases in requirements for infrastructure**. Growing organizations resulted in expanded, more intense demand on VMware workloads. The only way to manage this demand with primarily on-premises capacity was to provision and build the environment for peak demand. This caused excess costs in unused capacity.
- **Limited personnel capacity**. In addition to lacking the infrastructure needed to maintain solid performance, interviewees told Forrester that their organizations lacked IT personnel with the required skills to modernize their applications for a platform-as-a-service (PaaS) environment. As a result, the process of fully migrating to the cloud would require either reskilling existing employees or hiring new employees that they simply could not afford.
- **Need for better availability and performance**. As other organizations began moving to the cloud, the interviewees reported that their organizations were increasingly under pressure from end users and customers to match their levels of availability and performance for VMware workloads.

INVESTMENT OBJECTIVES

The interviewees' organizations searched for a solution that could:

- Allow organizations to maintain existing VMware infrastructure and personnel.
- Avoid expensive rearchitecting.
- Use flexible, on-demand capacity inherent to cloud.
- Allow for a fast migration to the cloud, with the option for steady, gradual modernization once the shift was completed.

> "Using standardized IT platforms for core business processes is critical to us. When we migrated our VMware workloads to the cloud at the corporate level, we didn't want to put them on a different platform from our plants and offices around the world. With Azure VMware Solution, we got the benefits of the cloud while still maintaining VMware as our standard platform."
>
> DIRECTOR OF GLOBAL IT SERVICES, MANUFACTURING

COMPOSITE ORGANIZATION

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

Description of composite. The composite organization is a global organization based in North America with 10,000 employees and $5 billion in annual revenue. It has 15 IT system administrators maintaining its VMware workloads upon initial implementation.

Deployment characteristics. The organization uses Microsoft's Azure VMware Solution to migrate and extend its existing VMware environment, which allows it to quickly realize cloud benefits without having to make new infrastructure or personnel investments.

Key Assumptions

$5 billion in annual revenue

10,000 employees

15 IT system administrators

12 Azure VMware Solution nodes by Year 3

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 application performance and availability	$1,050,000	$1,500,000	$2,400,000	$4,950,000	$3,997,370
Btr	Reduced total cost of ownership (data center)	$1,495,575	$2,037,450	$2,714,794	$6,247,819	$5,083,121
Ctr	Avoided IT hiring/reskilling	$1,008,000	$336,000	$0	$1,344,000	$1,194,050
Dtr	Reduced infrastructure maintenance effort	$78,342	$134,300	$179,067	$391,709	$316,747
	Total benefits (risk-adjusted)	$3,631,917	$4,007,750	$5,293,861	$12,933,528	$10,591,288

IMPROVED APPLICATION PERFORMANCE AND AVAILABILITY

Evidence and data. One of the biggest benefits to the interviewees' organizations was the increased stability and availability provided by running workloads on Microsoft's Azure VMware Solution.

- Microsoft Azure VMware Solution allowed the organizations to realize these savings by using the increased capacity of the Cloud to improve stability, performance, and reliability. This helped them avoid the system failures that would occur when on-premises infrastructure could not keep up with demand.
- The executive director, technology delivery for the healthcare organization explained how downtime caused by their prior environment had severe costs to their business. "We have agreements with clients that [make it so] every time we're down, we're actually subject to fines. Some of those fines are [several] million dollars."
- The assistant director in the development department of a government agency recalled: "Before we were always worried [and asking]: 'Will the network work? Will it be attacked? Can we stay connected to 20,000 census-takers in the field?

Can we make three million queries to the database if it's an on-premises server?' In the cloud with Azure VMware Solution, we don't worry about any of this."

> "We have increased our resiliency with AVS. We used to have a few Priority 1 incidents each year during open enrollment. So far this year, we haven't hit a single Priority 1 incident."
>
> EXECUTIVE DIRECTOR, TECHNOLOGY DELIVERY, HEALTHCARE

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Before the shift to the cloud via Azure VMware Solution, the composite organization has 12 high-priority, or P1, downtime incidents per year.
- Each incident lasts an average of 2 hours.
- Each hour of downtime costs the composite organization $300,000.
- Moving to AVS enables an annual 35% reduction in P1 incidents.

Risks. Factors that could impact the size of this benefit for organizations include:

- Number of P1 incidents per year prior to Microsoft Azure VMware Solution.
- Cost of downtime to an organization.
- Degree to which moving to AVS can reduce downtime.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $5.0 million.

80%

Reduced frequency and duration of major outages

Improved Application Performance And Availability					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	Number of Priority 1 incidents per year	Interviews	10	10	10
A2	Average hourly cost of unplanned downtime	Composite	$250,000	$250,000	$250,000
A3	Average incident duration (hours)	Interviews	1.5	1.5	1.5
A4	Projected cost of P1 outages	A1*A2*A3	$3,750,000	$3,750,000	$3,750,000
A5	Annual reduction attributable to AVS move	Interviews	35%	50%	80%
At	Improved application performance and availability	A4*A5	$1,312,500	$1,875,000	$3,000,000
	Risk adjustment	↓20%			
Atr	Improved application performance and availability (risk-adjusted)		$1,050,000	$1,500,000	$2,400,000
	Three-year total: $4,950,000			**Three-year present value: $3,997,370**	

REDUCED TOTAL COST OF OWNERSHIP (DATA CENTER)

Evidence and data. Before working with Microsoft Azure VMware Solution, the interviewees' organizations had to rely almost solely on costly, hard-to-maintain physical infrastructure. Redeploying their VMware workloads on Azure allowed them to stop overprovisioning for peak demand, as the cloud environment allowed them to scale up and down as needed. The avoidance of infrastructure refreshes and the decommissioning of servers resulting from moving VMware workloads also allowed the organizations to eliminate any previous hardware, software, Extended Security Update, power, and cooling costs.

- The senior director of IT operations for the technology organization told Forrester: "After we did AVS, we began rapidly shutting down our physical data

centers. … We have been able to avoid the costs of upgrades and renewals on our environmental systems."

- The executive director of technology delivery for the healthcare organization told Forrester: "[We were able to free up] in excess of 60% to 70% of our data center capacity. We have moved pretty much every single microservice."
- The director of global IT services in manufacturing reported: "We had two data centers — a production data center and a disaster recovery data center — and they were colocated, so we were paying a monthly fee for the rental, the electricity, the cooling, and the management of the equipment. That disappeared when we migrated, along with the need to manage a storage system and a wide area network provider because all of that happens in the cloud."

> "We're trying to use as much cloud as we can. It's very convenient, and it's cheaper for us. We can scale based on our needs, which is practically impossible for an on-premises data center."
>
> ASSISTANT DIRECTOR, DEVELOPMENT DEPARTMENT, GOVERNMENT

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- The composite organization starts with 300 on-premises servers and spends $25,500 per server on software and maintenance.
- The starting cost for each server in physical infrastructure is $14,875 a year, and the cost of each server's software and Extended Security Updates (ESUs) is $10,625 a year.
- The composite organization runs on a five-year refresh cycle.

- Microsoft Azure VMware Solution enables the composite organization to avoid 90% of server refresh purchases.
- Microsoft Azure VMware Solution enables the organization to decommission 30% of its existing servers in Year 1, 50% in Year 2, and 75% in Year 3.

Risks. Factors that could impact the size of this benefit for organizations include:

- Number of servers and cost to maintain each server.
- Rate of replacement dictated by refresh cycle.
- Degree to which Microsoft Azure VMware Solution is able to avoid server purchases and decommission existing servers.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $5.1 million.

90%

Server costs (including ESUs) avoided after migration to Azure VMware Solution

"We anticipated a certain workload and based the capacity on that. [However,] because of another project, we required more capacity. By just activating a couple of additional nodes in Azure, AVS instantly gave us new capacity. That would have taken three to six months and a big capex justification if we had needed to expand our on-premises data center."

DIRECTOR OF GLOBAL IT SERVICES, MANUFACTURING

Reduced Total Cost Of Ownership (Data Center)					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
B1	Cost per server (physical infrastructure)	Forrester assumption	$14,875	$14,875	$14,875
B2	Cost per server (software and ESUs)	Forrester assumption	$10,625	$10,625	$10,625
B3	Total cost per server	B1+B2	$25,500	$25,500	$25,500
B4	Total number of on-premises servers	Composite	300	300	300
B5	Refresh cycle	5 years	20%	20%	20%
B6	Total number of on-premises servers purchased/refreshed annually (to overprovision)	B4*B5	60	60	60
B7	Percentage of server refreshes/purchases avoidable once migrated to Azure VMware solution	Interviews	90%	90%	90%
B8	Subtotal: Avoided infrastructure purchases/refreshes	B1*B6*B7	$803,250	$803,250	$803,250
B9	Servers decommissioned annually with migration to Azure VMware solution	Interviews	30%	50%	75%
B10	Subtotal: Avoided ESUs from decommissioned infrastructure	B2*B4*B9	$956,250	$1,593,750	$2,390,625
Bt	Reduced total cost of ownership (data center)	B8+B10	$1,759,500	$2,397,000	$3,193,875
	Risk adjustment	↓15%			
Btr	Reduced total cost of ownership (data center) (risk-adjusted)		$1,495,575	$2,037,450	$2,714,794
	Three-year total: $6, 247,819			**Three-year present value: $5,083,121**	

AVOIDED IT HIRING/RESKILLING

Evidence and data. Interviewees told Forrester that their organizations had a choice: spend enormous amounts of time training existing system administrators to convert legacy workloads and spend even more time actually performing this conversion or avoid the need for both altogether with Microsoft Azure VMware Solution.

- Microsoft Azure VMware Solution helped the organizations by letting administrators continue to use VMware natively. This eliminated the need for training on new solutions. As a result, the use of Azure VMware Solution to move to the cloud protected these organizations' previous investments in hiring and growing the skill base of their IT teams. It also allowed them to get even more value out of that investment on an ongoing basis.

- The interviewees' organizations did not need to spend time converting workloads to new formats. In addition to the labor savings that represents, it also had a significant impact on migration project timelines. For many interviewees, this was an important factor in their organization's decision to use Azure VMware Solution, since they had hard deadlines for migration completion.

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- The composite organization has 15 system administrators.
- It would take 30% of the organization's IT staff time to train on reskilling in Year 1. It would also take 50% of the team's time (divided to be 30% in Year 1 and 20% in Year 2) to convert legacy workloads for Azure. Both these costs are completely avoided with Microsoft AVS.
- In Year 1, this helps the composite organization avoid adding nine people to its IT headcount. It avoids hiring three additional IT staff in Year 2.

Risks. Factors that could impact the size of this benefit for organizations include:

- Number of system administrators.
- Time required to reskill and convert legacy workloads.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $1.2 million.

Avoided IT Hiring/Reskilling					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
C1	IT team members dedicated to VMware workloads	Composite	15	15	15
C2	Time required to reskill	Interviews	30%	0%	0%
C3	Time required to convert legacy workloads for Azure native	Interviews	30%	20%	0%
C4	Additional IT headcount required (rounded)	Composite	9	3	0
C5	Average fully burdened system administrator salary	TEI standard	$140,000	$140,000	0
Ct	Avoided IT hiring/reskilling	((C1*C2)+ (C1*C3))*C5	$1,260,000	$420,000	$0
		↓20%			
Ctr	Avoided IT hiring/reskilling (risk-adjusted)		$1,008,000	$336,000	$0
	Three-year total: $1,344,000			**Three-year present value: $1,194,050**	

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Headcount avoided to convert legacy workloads for Azure

"The administration is easier with Azure VMware Solution; you don't need as many people when you are on the cloud. Of course, the fluctuation of IT staff remains high. … It's not easy to hire and retain IT people in a government institution."

ASSISTANT DIRECTOR, DEVELOPMENT DEPARTMENT, GOVERNMENT

REDUCED INFRASTRUCTURE MAINTENANCE EFFORT

Evidence and data. By moving workloads to Microsoft Azure VMware Solution, interviewees reported that fewer IT workers were required to maintain these workloads on-premises and could be reallocated to other tasks.

The executive director, technology delivery for the healthcare organization said: "[Before adopting Microsoft Azure VMware Solution,] we had a team of 12 to 13 people. They had to do a lot of data replication work, manual stuff, and stay really late. Once we moved to Azure, that team is now five people, and we're using the other people on development and analysis."

> "We wanted to free up some of the people who were constantly devoting significant time to babysitting the hardware and the data center — even in our busiest time of year for open enrollment. Migrating our VMware workloads to the cloud with AVS accomplished that."
>
> EXECUTIVE DIRECTOR, TECHNOLOGY DELIVERY, HEALTHCARE

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- The composite organization had 15 FTEs providing IT labor managing VMware workloads as systems administrators before Microsoft Azure VMware Solution.
- Previously, each administrator spent 5 hours per month on-premises updates, 20 hours per month on workload provisioning, and 4 hours per month on infrastructure maintenance.

- After deploying Microsoft Azure VMware Solution, the organization reduces this time by 35%, 60%, and 80% in Year 1, Year 2, and Year 3, respectively.
- The organization recaptures 80% of the time saved through the reduced infrastructure maintenance effort.

Risks. Factors that could impact the size of this benefit for organizations include the following:

- Size of the IT team working on VMware workloads before Microsoft AVS.
- Degree to which IT team members can be redeployed due to increased productivity.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $317,000.

Reduced Infrastructure Maintenance Effort					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
D1	System administrators	Composite	15	15	15
D2	Hours/month per administrator spent on on-premises updates	Interviews	5	5	5
D3	Hours/month per administrator spent on workload provisioning	Interviews	20	20	20
D4	Hours/month per administrator spent on infrastructure maintenance	Interviews	4	4	4
D5	Reduction in time spent after deploying Azure VMware Solution	Interviews	35%	60%	80%
D6	Average fully burdened wage	TEI standard	$67	$67	$67
D7	Productivity recapture	TEI standard	80%	80%	80%
Dt	Reduced infrastructure maintenance effort	D2*D6	$97,927	$167,875	$223,834
	Risk adjustment	↓20%			
Dtr	Reduced infrastructure maintenance effort (risk-adjusted)		$78,342	$134,300	$179,067
	Three-year total: $391,709			**Three-year present value: $316,747**	

UNQUANTIFIED BENEFITS

Interviewees mentioned the following additional benefits that their organizations experienced but were not able to quantify:

- **Broader access to the Microsoft Azure ecosystem.** Interviewees expressed interest in Microsoft's AVS as a way to access more features of the broader Azure ecosystem. This was particularly useful for those organizations planning to continue modernizing their applications after their cloud migration. For instance, the director of global IT services at a manufacturing company related that, while they migrated their data warehousing environment on AVS, "we are moving this more towards a data mesh solution from Microsoft that better handles and deals with these kind of data warehouse elements and when that's in place we will decommission the data warehouse server in the AVS data center and we can return a couple of nodes again." Similarly, they will be moving their integration platform from the one they migrated using AVS to Azure integration services. Both of these projects were enabled by the ease of continuing to run the same platform on AVS while evaluating and preparing to transition to another, more modern, Azure solution.

> "The ecosystem that Microsoft Azure brings to the table in terms of the cloud, its monitoring services, the interconnectivity with other Microsoft technologies — and even non-Microsoft technology — that has been fantastic."
>
> EXECUTIVE DIRECTOR, TECHNOLOGY DELIVERY, HEALTHCARE

- **Improved disaster recovery and business resiliency.** The flexibility and distributed nature of the cloud enabled organizations to avoid catastrophic incidents and achieve faster recovery rates in cases of downtime or other disasters. The assistant director, development department, for the government organization told Forrester: “We’re reducing risk. When I have my physical data center, I have a risk associated with managing the environment and the hardware. When I migrate to AVS, I’ve transferred that risk to Microsoft.”

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement Azure VMware Solution and later realize additional uses and business opportunities, including:

- **Organizational flexibility enabled by the cloud.** Interviewees told Forrester that the scalability provided by on-demand capacity would help make their organizations more flexible. They could scale back on AVS nodes during slower periods or scale up to take advantage of new opportunities.
- **Enabling the big step into the future.** Interviewees agreed that Azure VMware Solution allowed their organizations to jump-start their modernization journey with relatively little effort and expense. They felt much more prepared to take advantage of future opportunities with this work well underway.

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

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	Microsoft Fees	$0	$352,800	$441,000	$529,200	$1,323,000	$1,082,786
Ftr	Implementation	$1,581,347	$0	$0	$0	$1,581,347	$1,581,347
	Total costs (risk-adjusted)	$1,581,347	$352,800	$441,000	$529,200	$2,904,347	$2,664,133

MICROSOFT FEES

Evidence and data. Interviewees told Forrester that their organizations paid a monthly fee for each Microsoft Azure node they had in place. The number of nodes could vary from year to year depending on capacity.

Modeling and assumptions. For the composite organization, Forrester assumes the following:

- The composite organization has eight nodes in Year 1, 10 nodes in Year 2, and 12 nodes in Year 3.
- Each node has a fee of $3,500 per month.
- The organization locks in its pricing for most of its workloads with relatively stable capacity requirements using Microsoft's Reserved Capacity pricing.
- NB: Pricing may vary depending on a number of factors. Contact your Microsoft sales representative for information specific to your organization.

Risks. Factors that could impact the size of this cost for organizations include:

- Number of nodes in place.
- Fee per node.

- The potential for price increases on the “pay-as-you-go” portion of the organization’s capacity, which tends to vary significantly.

Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $1.08 million.

Microsoft Fees						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
E1	Azure nodes in place	Assumption		8	10	12
E2	Price per node per month	Microsoft list		$3,500	$3,500	$3,500
Et	Microsoft Fees	E1*E2*12	$0	$336,000	$420,000	$504,000
	Risk adjustment	↑5%				
Etr	Microsoft Fees (risk-adjusted)		$0	$352,800	$441,000	$529,200
	Three-year total: $1,323,000			**Three-year present value: $1,082,786**		

IMPLEMENTATION

Evidence and data. Interviewees described an implementation process to Forrester consisting of working with third-party partners and a dedicated team of internal IT personnel. According to the senior director of IT operations at a technology company: “we used a Microsoft partner to help stand it up in Azure, but we did the rest ourselves because everyone was already familiar with VMware. It took less than six months including the initial standup, and there was never more than five people on the project.”

> “We wanted to do the migration during business hours so the team wouldn’t have to work nights and weekends; with Azure VMware Solution, the process was so seamless we migrated servers with only a 5 second disruption that was not noticeable to the application users.”
>
> DIRECTOR OF GLOBAL IT SERVICES, MANUFACTURING

Modeling and assumptions. For the composite organization, Forrester assumes the following:

- The composite organization pays $1,340,000 in third-party partner fees.
- The composite organization has an internal IT team of five FTEs working at 50% time for six months on implementation tasks.

Risks. Factors that could impact the size of this cost for organizations include the following:

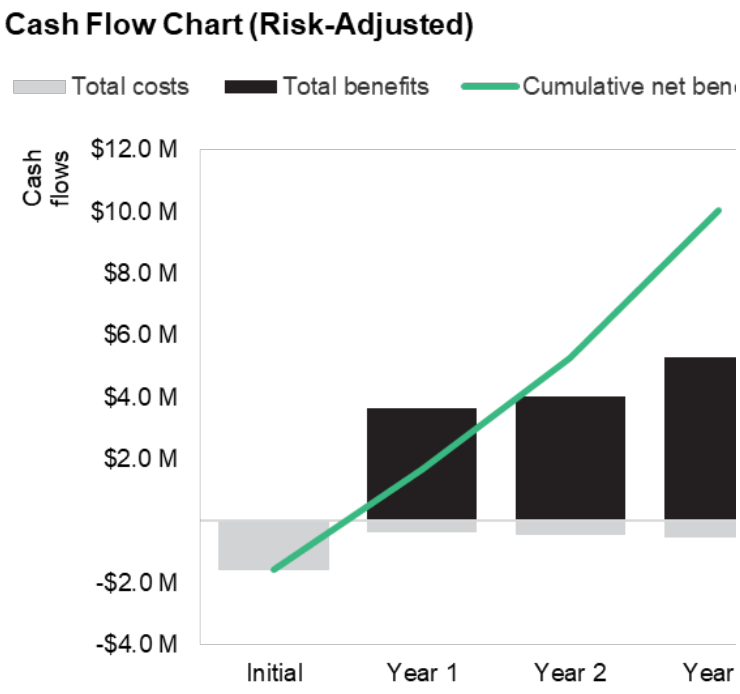
- Size of third-party fees.
- Size of internal team required.
- Length of implementation.

Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $1.58 million.

Implementation						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
F1	Third party partner fees	Interviews	$1,340,000	$0	$0	$0
F2	Internal IT personnel	Interviews	5	0	0	0
F3	Project duration (months)	Interviews	6	0	0	0
F4	Time commitment for internal IT	Interviews	50%	0	0	0
F5	Average fully burdened monthly wage	D6/12	$11,000	$0	$0	$0
Ft	Implementation	F1+ (F2*F3*F4*F5)	$1,505,000	$0	$0	$0
	Risk adjustment	↑5%				
Ftr	Implementation (risk-adjusted)		$1,581,347	$0	$0	$0
	Three-year total: $1,581,347			**Three-year present value: $1,581,347**		

Financial Summary

Consolidated Three-Year Risk-Adjusted Metrics



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	($1,581,347)	($352,800)	($441,000)	($529,200)	($2,904,347)	($2,664,133)
Total benefits	$0	$3,631,917	$4,007,750	$5,293,861	$12,933,528	$10,591,288
Net benefits	($1,581,347)	$3,279,117	$3,566,750	$4,764,661	$10,029,181	$7,927,155
ROI						298%
Payback period (months)						<6

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."

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.

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.

APPENDIX B: SUPPLEMENTAL MATERIAL

Related Forrester Research

"Forrester's Guide to VMware Services In The Cloud," Forrester Research, Inc., November 1, 2022.

APPENDIX C: 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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