FORRESTER®

The Total Economic Impact™ Of VMware Cloud Foundation Automation

Business Benefits Enabled By VMware Cloud Foundation Automation (Formerly VMware Aria Automation)

A FORRESTER TOTAL ECONOMIC IMPACT STUDY
COMMISSIONED BY BROADCOM, AUGUST 2024

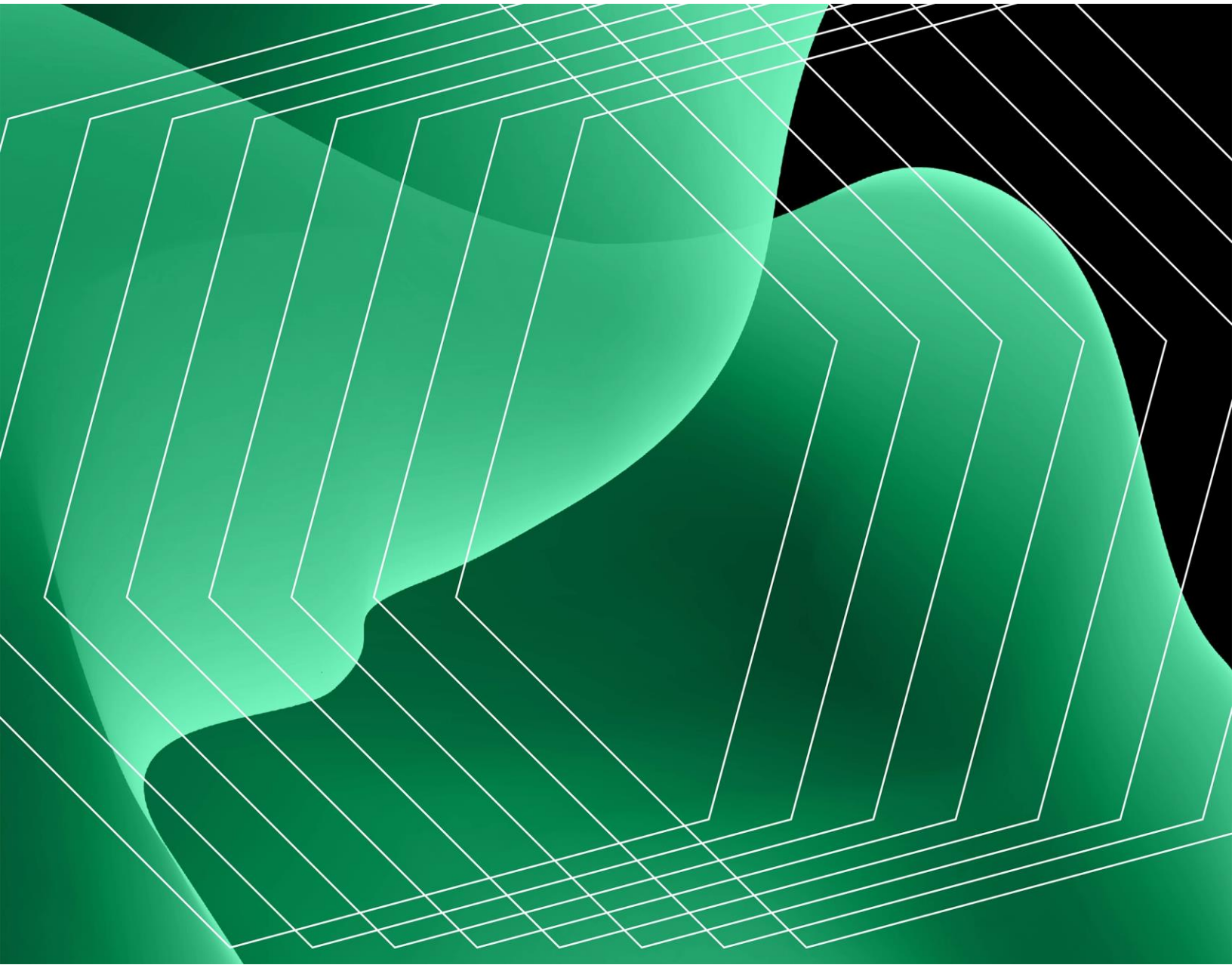

Table Of Contents

Consulting Team:

Courtenay O'Connor

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

Infrastructure automation is crucial to a firm's success, and yet it can be complex and continually evolving. Since IT resources, budgets, and time are limited, effective infrastructure automation hinges on having tools that are flexible, integrated, and intelligent. Organizations that leverage automation to support their digital initiatives and modern applications, such as generative AI can go to market faster, improve productivity, and ensure large-scale compliance.[1]

As a component of VMware Cloud Foundation, VMware Cloud Foundation Automation (formerly called VMware Aria Automation) is a cloud infrastructure automation solution that delivers a self-service private cloud. The solution empowers users with self-service consumption of Kubernetes and modernized cloud infrastructure-as-a-service (IaaS) capabilities, allowing organizations to harness the power of a private cloud-native ecosystem. VMware Cloud Foundation Automation supports organizations that are looking to new technologies such as Kubernetes, open-source software, multiple clouds, and different operating models and practices like DevOps and platform engineering.

Broadcom, which acquired VMware in November 2023, commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential benefits and financial impacts enterprises may realize by deploying VMware Cloud Foundation Automation.[2] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of VMware Cloud Foundation Automation on their organizations.

Benefits Present Value

$2.4M

Reduced time to deploy new virtual machines

50%

To better understand the benefits and risks associated with this investment, Forrester interviewed four customers with experience using VMware Cloud Foundation Automation.

Prior to using VMware Cloud Foundation Automation, interviewees said that their organizations had sprawling prior technology environments prone to frequent outages due to noncompliant and unenforceable systems and technologies. Manual processes — both proactive and reactive — were prone to error and led to high volumes of infrastructure support tickets. As a result, interviewees' organizations suffered from bloated IT management costs and were limited in their abilities to scale to meet business needs.

After the investment in VMware Cloud Foundation Automation, the interviewees' organizations digitally centralized and transformed their infrastructure and services in support of business growth. This mitigated the burden of technology management through a single, streamlined, and unified ecosystem. In addition to avoiding capital outlays for hardware investments, interviewees pointed out significant internal labor cost savings related to legacy technology management. System administrators accelerated and amplified their provisioning capacity as VMware Cloud Foundation Automation helped stabilize system availability, further contributing productivity improvements across technical and nontechnical teams.

For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization that is a global enterprise based in the United States with revenue of $10 billion per year.

KEY FINDINGS

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

- **Reduced one-off technology hardware and software savings in technology management costs post-cloud adoption by 5%.** As the composite organization implements a self-service private cloud with VMware Cloud Foundation Automation in combination with other VMware Cloud Foundation components, it experiences one-off technology hardware and software savings attributed to the transition process. When virtualized infrastructure is then automated with end-to-end, bidirectional integrations, the composite organization further reduces friction previously created by manual processes and optimizes the vendor solutions and workflows used to connect them across the stack. The

value of this additional, post-transition optimization of technology management costs come to nearly $774,000.

- **Reduced unplanned downtime by 73% due to VMware Cloud Foundation Automation.** With VMware Cloud Foundation Automation, the composite organization improves uptime and availability, reducing the number of hours that critical systems were left offline. This prevented costly revenue leakage, thereby improving profitability. The value of improved uptime to the composite organization totals more than $676,000.
- **Reduced time to deploy new virtual machines (VMs) by 50% and increased annual deployment capacity by 60%.** The VMware Cloud Foundation Automation solution allows the composite organization to decrease the time required for infrastructure resources to manage the entire VM lifecycle. These automations also increase the number of deployments that the composite organization can handle, allowing teams to better serve their internal customers, including developers. Combined, this optimized deployment agility is worth more than $436,000.
- **Recaptured 7,900 hours of end-user productivity from improved availability and developer time to value.** By reducing outages, the composite organization has a direct impact on the number of hours in which employees can work productively. In addition, efficiencies gained in the provisioning process help to effectively democratize infrastructure as code (IaC), empowering more developers to deliver and consume infrastructure in a private cloud with existing skill sets. By leveraging IaC, the composite's developers reduce the amount of time spent waiting for services to be provisioned, while also eliminating several configuration steps that were needed in the prior environment. This further lends developers valuable efficiency and flexibility, helping speed their time to value. For the composite organization, these end-user and developer productivity improvements are worth more than $500,000.
- **Avoided 60% of infrastructure-related IT tickets with automated, self-service provisioning.** Although a small portion of the IT budget, an organization's help desk operations can have an outsized impact on organizational productivity and agility. The VMware Cloud Foundation Automation self-service private cloud environment transforms the composite's formerly

manual processes to request and provision new instances. As a result, thousands of provisioning requests are completed without the assistance of a live agent. In total, the infrastructure support optimization benefit is worth over $52,000.

Unquantified benefits. Qualitative benefits that provide value for the composite include time savings that are attributed to higher-value activities, improved compliance and governance, and additional VMware ecosystem benefits.

Cost considerations. VMware Cloud Foundation Automation is a component included in VMware Cloud Foundation, so no product costs are quantified for this study. Interviewees discussed several cost considerations that contributed to their value assessment. These included internal and external costs related to deployment and administration activities and timelines for achieving a mature automation environment.

The representative interviews and financial analysis found that a composite organization experiences benefits of $2.44 million over three years (see Supplemental Material for further information).

> "We used to take up to three or four days to [deliver] services, but now customers can provision them directly from the VMware Cloud Foundation Automation catalog in about a half hour. That's it. We have gone from days to minutes."
>
> CLOUD AND SYSTEM ADMINISTRATOR, OIL AND GAS

BENEFITS PRESENT VALUE

$2.4M

NETWORK AVAILABILITY IMPROVEMENT

73%

INCREASE IN DEPLOYMENT CAPACITY

60%

REDUCTION IN TIME TO DEPLOY NEW VIRTUAL MACHINES

50%

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 VMware Cloud Foundation Automation.

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 VMware Cloud Foundation Automation can have on an organization.

DISCLOSURES

Readers should be aware of the following:
This study is commissioned by Broadcom 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 VMware Cloud Foundation Automation. For the interactive functionality using Configure Data/Custom Data, the intent is for the questions to solicit inputs specific to a prospect's business. Forrester believes that this analysis is representative of what companies may achieve with VMware Cloud Foundation Automation based on the inputs provided and any assumptions made. Forrester does not endorse Broadcom or its offerings. Although great care has been taken to ensure the accuracy and completeness of this model, Broadcom and Forrester Research are unable to accept any legal responsibility for any actions taken on the basis of the information contained herein. The interactive tool is provided 'AS IS,' and Forrester and Broadcom make no warranties of any kind.
Broadcom 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.
Broadcom provided the customer names for the interviews but did not participate in the interviews.

1. **Due Diligence**
   Interviewed four Broadcom stakeholders and Forrester analysts to gather data relative to VMware Cloud Foundation Automation.
2. **Interviews**
   Interviewed four representatives at organizations using Cloud Foundation Automation to obtain data about costs, benefits, and risks.
3. **Composite Organization**
   Designed a composite organization based on characteristics of the interviewees' organizations.
4. **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.
5. **Case Study**
   Employed fundamental elements of TEI in modeling the investment impact: benefits, 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 Automation Customer Journey

Drivers leading to the Cloud Foundation Automation investment

Interviews			
Role	**Industry**	**Region**	**Legacy Infrastructure**
Cloud and system administrator	Oil and gas	Africa	Multiple legacy data centers
IT architect	Government	Europe	Multiple legacy data centers
IT executive director	Education	North America	Software-defined data center in the public cloud
Principal engineer	Media	North America	85% of workloads in public cloud; multiple legacy data centers

KEY CHALLENGES

Prior to the investment in VMware Cloud Foundation Automation, interviewees shared how their organizations dealt with complex, widely distributed, poorly managed, and often hardware-based environments. These environments had costly, cascading impacts to business operations and internal and external users, which overly complicated networking and infrastructure teams' remit. Interviewees further noted how their organizations struggled with common challenges, including:

- **Sprawling legacy infrastructure and excess associated labor.** Several interviewees described large, physical technology footprints prior to their investment in VMware Cloud Foundation Automation. They described excessive processes needed to maintain and connect private data centers to multiple sites and hubs, even while acknowledging that the legacy systems were not equipped to meet future business needs.

  The cloud and system administrator in the oil and gas industry described how their organization's physical footprint required staff to maintain and extend it nationwide: "We have a lot of data centers and branches in [our country]. Every data center had its [own] platform, servers, and applications."

- **Frequent network outages and unplanned downtime.** Interviewees lamented how unplanned system downtime resulting from the poorly configured prior environment regularly disrupted important business operations.

  The cloud and system administrator in the oil and gas industry shared how unplanned downtime plagued their organization's prior environment. This downtime was prolonged due to poor support from other vendors when in need. This interviewee stated: "We worked with other vendors' platforms, and we had many instances of downtime. Even when we worked with the [vendor's] support, they didn't find the solution very quickly."

- **Manual systems and onerous provisioning processes that limited organizational agility.** Prior to their investments in the VMware Cloud Foundation Automation solution, interviewees described the burdensome technology management processes, including for the provisioning lifecycle, which led to excess labor costs. The IT architect in the government industry noted a lack of scalability in their prior environments' VM provisioning process, stating, "[We had] to create the VM, connect to VM to the internet, [and then] connect this internet to the private network — and everything had to be done manually."

  The principal engineer in the media industry told Forrester: "[If] we have all the information … it would usually take us between 24 and 48 hours to turn a deployment around. If we didn't have the information, it took us however long it took to get the information from the customer [on the] app team."

- **Time-consuming, ticket-driven, and manual provisioning processes that were subject to error and rework.** Interviewees described high staffing requirements for rote, manual work that was often connected to triage. This often resulted in a lack of qualified technical talent just to maintain inferior systems, let alone to meet business needs looking ahead.

  The cloud and system administrator in the oil and gas industry indicated that the provisioning process in their organization's prior environment was highly manual for both the end-user customer requesting the services and the networking staff fulfilling the request: "If [the customer] wants to create a virtual machine, they needed to send an email and wait [until one] of us was available to do that for

them and find a free IP address, [with more] work to do from the network and the system teams."

- **Limits to scaling.** Interviewees described how their organizations' prior environments placed unwanted constraints on their ability to scale to meet respective business objectives.

  The IT executive director in the education industry noted how their prior, physical computing environments faced a large amount of overhead as they required highly manual management processes, explaining, "The fixed number of machines was one thing, but if we [were to] grow the footprint, our management was going to increase by [two headcounts for every 30 machines]."

- **Unplanned end-user downtime and cascading business disruption from poor system availability.** Sprawling infrastructure and high downtime meant more issues to troubleshoot on top of supporting and maintaining everyday business operations. While IT staff were preoccupied with the latter, internal customers, such as engineers and developers, were subject to lengthy disruption and long wait times for critical services. They also pointed to their organizations' difficulties in securing and retaining IT experts with specialized skills in cloud-native technologies, infrastructure automation, DevOps, and knowledge of specialized coding and scripting languages.

  Retaining qualified staff was a central issue for the IT architect's government organization. This interviewee discussed how each agency was required to maintain a separate technology environment but lacked the staff to do so properly. They said: "Before, every public body, every agency [each] had their own data center and nothing else. They did everything inside their own [environments but] they didn't have enough qualified engineers to run their systems properly. … Public sector salaries for IT staff are not very good and [our organization] lost their people during the time. Now, we have ministries without any IT person … they lost almost all IT staff there."

- **Noncompliant, unenforceable systems opening organizations to vulnerabilities.** With limited governance over data center and networking hardware, interviewees described several situations in which networking teams

faced noncompliant systems that rendered their organizations susceptible to outages and unwanted downtime and vulnerable to severe data breaches.

The cloud and system administrator in the oil and gas industry and the IT architect in the government industry both shared how some branches would not respect the norms of the data center and server equipment. They shared that server rooms and systems were not standardized, leading to many technical issues and availability problems

INVESTMENT OBJECTIVES FOR VMWARE CLOUD FOUNDATION AUTOMATION

The interviewees' organizations selected VMware Cloud Foundation Automation because it could:

- **Optimize technology management and associated costs.** Interviewees shared that their organizations sought to consolidate and then automate their technology infrastructure with a centralized cloud platform. Their organizations selected the VMware ecosystem to streamline technology management in part by leveraging the VMware Cloud Foundation Automation solution.

  The cloud and system administrator in the oil and gas industry shared how their organization intended to optimize costs while at the same time improve performance by centralizing service with VMware Cloud Foundation Automation. They shared: "We wanted something that managed everything from one central platform. That was the main goal, so that's the reason why we wanted a private cloud for the whole company."

- **Further stabilize and improve system availability.** Given the high likelihood of outages in the prior environment, interviewees shared how their organizations sought to further reduce unplanned system downtime as part of their VMware Cloud Foundation investment. Prior to the transition to VMware Cloud Foundation Automation, interviewees described how they used manual processes to provision and deploy and networks, which exacerbated poor availability issues stemming from their legacy environment. These customers' organizations further extended the improved availability afforded by the transition to VMware Cloud Foundation by leveraging VMware Cloud Foundation Automation in combination with the VMware Cloud Foundation network automation solution. Several interviewees indicated that they had worked with

multiple vendors and found that, in their organizations' experience, VMware's availability and stability metrics outperformed those of its competitors.

The cloud and system administrator in the oil and gas industry indicated that VMware's product capabilities and platform stability outperformed that of other vendors with which their organization contracted: "We have worked with the competitors of VMware [and used] their products, and we think that VMware products are the best. It's by experience. With VMware, I think that the solution is very stable, and we don't face as many problems. We started virtualizing our services back in 2010, so I think that 14 years is enough for us to know which platform is the best."

- **Improve ability to scale while eliminating manual processes.** Interviewees reported that their organizations aimed to eliminate labor-intensive, manual processes. They discussed how their organizations leveraged VMware Cloud Foundation Automation as part of transforming their technology delivery processes.

  The principal engineer in the media industry said VMware Cloud Foundation Automation exceeded their organization's expectations regarding the extent to which they could fully automate their workflows: "All of the integrations allowed us to pull all the automation into the one workflow. … That was the biggest surprise. We never thought we were going to be able to get everything into the process."

- **Streamline and accelerate operational support.** Interviewees shared that their organizations found value in VMware Cloud Foundation Automation's ease of integration with a wide range of critical apps and tools, such as SAP, IPAM, Ansible, and Infoblox, for end-to-end automations. The organizations used these automated workflows to displace manually driven ticketing processes for reactive troubleshooting and proactive deployments.

  The cloud and system administrator in the oil and gas industry described their organization's objective for the VMware Cloud Foundation Automation investment, "It [allows] us to respond to the requests faster and more efficiently with better communication between the teams because when we are all using the same platform, our communication is better."

- **Enhance organizational agility.** Interviewees described how the various infrastructure and process improvements afforded by the VMware Cloud Foundation Automation investment served their organizations' business objectives. They told Forrester about how the VMware Cloud Foundation Automation investment better positioned their organizations to meet internal and external customer needs.

  The IT executive director in the education industry shared why their organization sought to leverage the Automation solution within the Broadcom ecosystem: "[We selected the VMware Cloud Foundation Automation solution] because it is baked in. It's integrated so well with our VMware products so [it was] just a really natural fit."

- **Serve as a trusted partner in governing technology systems.** Interviewees mentioned that their organizations sought to improve technology governance and reduce the amount of vulnerability introduced by a poorly configured environment. Their organizations considered Broadcom to be a trusted partner with high-quality products, services, and support.

  The IT executive director in the education industry similarly shared: "VMware Cloud Foundation Automation complements our suite of Broadcom products [as part of our] cloud implementation strategy. We … use a software defined data center on a public cloud, and that software defined data center is powered by VMware Cloud Foundation Automation. VMware Cloud Foundation Automation is a high-quality product in the sense that it can deliver what it promises."

> "We chose a solution that would allow us to consolidate technology, storage and automations into the platform. [That] allows us to accelerate everything we do in the platform."
>
> PRINCIPAL ENGINEER, MEDIA

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 interviewees, 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 enterprise based in the United States. In its prior environment, it dedicated 0.2% of its $10 billion in annual revenue to IT management. It had a siloed, distributed, complex infrastructure with a number of loosely governed, heterogenous hubs resulting in 99.6% system availability.

The composite deploys 3,000 virtual machines annually with business needs requiring it to scale its provisioning capacity. In the prior environment, half of all VMs deployed were for developer use. The composite organization promised a three-day SLA for VM deployment, with the developer wasting 10% of that time waiting for services.

Deployment characteristics. The composite organization deploys VMware Cloud Foundation Automation as part of a broader transition from a sprawling physical footprint to a virtualized VMware Cloud Foundation private cloud. With the investment, it seeks to digitally centralize technology and transform network services while optimizing for availability and cost savings.

KEY ASSUMPTIONS

$10 billion in annual revenue

20,000 employees

99.6% prior availability

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	Optimized technology management	$160,650	$321,300	$481,950	$963,900	$773,679
Btr	Improved availability	$138,755	$282,847	$421,602	$843,203	$676,654
Ctr	Optimized deployment agility	$90,585	$181,170	$271,755	$543,510	$436,251
Dtr	Improved organizationwide productivity	$154,700	$205,190	$253,810	$613,700	$500,906
Etr	Optimized infrastructure support	$10,988	$21,975	$32,963	$65,927	$52,916
	Total benefits (risk-adjusted)	$555,678	$1,012,482	$1,462,080	$3,030,240	$2,440,406

OPTIMIZED TECHNOLOGY MANAGEMENT

Evidence and data. As the interviewees' organizations adopted a cloud platform, they expected to experience one-off technology hardware and software savings throughout the cloud adoption process. This often came in the form of hard costs, such as licenses, equipment, and software-as-a-service (SaaS) subscription fees. For every technology solution in their prior environment, however, interviewees' organizations also required resources to manage them.

This benefit primarily centers on the decrease in the interviewees' organizations IT management costs associated with integration, administration, and maintenance of a proliferation of legacy tools, which further prompts additional hard cost savings and capacity optimization in a virtuous cycle (see Supplemental Material for information on additional technology hardware and management cost savings with the VMware Cloud Foundation products).

This optimization of technology management manifested in several ways for interviewees' organizations, including:

- **More efficient use of hardware compared to the prior environment.** When leveraged in combination with VMware Cloud Foundation Operations and other VMware products, VMware Cloud Foundation Automation provided the interviewees' organizations with governance controls, providing visibility into cost and consumption, lease policies, and automated reclamation. This meant that previous activities and challenges related to data center equipment and maintenance were now automated and enhanced as part of their organizations' VMware software-defined data center ecosystem and streamlined operations involving remaining the remaining hardware footprint.
    - The cloud and system administrator in the oil and gas industry shared that VMware Cloud Foundation Automation helped their organization optimize and centralize hardware purchasing costs and streamline the operational cost of technology resources.
- **Capacity optimization.** VMware Cloud Foundation Automation amplified capacity optimizations when leveraged in combination with VMware Cloud Foundation Operations and other VMware products by automating technology management across the full lifecycle of a machine. Interviewees described how their organizations improved capacity consumption from deployment to retirement, including the reclamation of unused, allocated resources.
    - The IT architect in the government industry indicated that VMware Cloud Foundation Automation made it easier to optimize resource capacity by fully automating the management of a machine across its entire lifecycle, stating, "We were able to do full decommission, full zero-touch provisioning, and zero-touch decommissioning, beginning to end."
- **Additional efficiencies from scaling and adoption of automations for additional workflows and operations.** As stated above, interviewees experienced direct technology consolidation costs as part of the cloud adoption process and in combination with other solutions in their VMware Cloud Foundation configuration. On top of these initial, one-time savings, interviewees described how their teams were able to accrete further optimizations as automations were scaled and adopted organizationwide.

- The cloud and system administrator in the oil and gas industry shared how their organization modernized its services with VMware in replacing competitor solutions. They described how their organization optimized IT management costs for its disparate environment by deploying VMware Cloud Foundation Automation-driven workflows to displace hardware-driven services. Their organization discontinued many sites across its widely distributed footprint and avoided extending the platform, preventing further sprawl with centralized hosting and integrations in the VMware environment. When compared to workflows that previously managed the legacy environment, the interviewee indicated that their organization saved significant labor effort across networking, system infrastructure, security, and data center operations teams. This was due in part to the VMware ecosystem with added optimization through VMware Cloud Foundation Automation workflows that previously were handled through physical hardware. They said: “From the licensing perspective, paying for one platform is better than paying for many vendors. And when you virtualize [and automate] the network, you need less network equipment.”

- **Error reduction.** The interviewees’ organizations’ complex prior technology infrastructure was often managed with error-prone manual processes. This added drag across the interviewees’ organizations by disrupting end users while adding costly rework for IT resources. With VMware Cloud Foundation Automation, the interviewees discussed how their organizations reduced the prevalence of failed or incorrect deployments through automation, establishing builds and configurations that were consistent from the start, removing human error from the process.
    - The IT architect in the government industry shared how VMware Cloud Foundation Automation allowed their organization to avoid excess costs to build out and maintain a virtualized, automated environment. The interviewee indicated that their organization enabled a high-quality delivery process with fewer errors as more manual operations were automated on the VMware Cloud Foundation Automation solution over the investment period.

- **More mature, fit-for-purpose, and best-of-breed stack.** Interviewees reported how the time savings captured by automations allowed their teams to refocus attention on leveraging open-source technologies. VMware Cloud Foundation Automation allowed their organizations to take advantage of a best-of-breed approach that enabled the use of more sophisticated, cost-effective tools and languages that would have been too difficult to operate in their prior environments — and without VMware Cloud Foundation Automation.
    - The principal engineer in the media industry shared: “By going to VMware Cloud Foundation Automation, we are going to be able to handle more versions of operating systems. … At the end of the day, being able to onboard and maintain more versions is going to help us between application teams and vendor support on more specialized systems or more systems [in general, along with] simplifying and maintaining additional titles. … We have one standardized system with our VMware Cloud Foundation Automation orchestration behind it that we put all of our scripts into.”

Evidence and data. Based on the interviews, Forrester assumes the following about the composite organization:

- In the prior environment, the composite organization dedicates 2.1% of annual revenue to IT. Technology management costs total 9% of all IT spend.
- Following the initial adoption of a private cloud with a VMware Cloud Foundation environment, the composite increases the number of workloads supported by VMware Cloud Foundation Automation by 20% each year.
- Within this VMware Cloud Foundation Automation environment, the composite streamlines and optimizes technology management, resulting in an additional 5% of savings beyond those incurred in the initial transition to the cloud.

Risks. Organizations may experience results that differ from those presented in the financial model due to:

- Total revenue and the amount dedicated to IT and technology management.
- Size, makeup, and complexity of IT environment.
- Industry, geography, and related enterprise demands for IT spend.

- Prevailing wages.
- An organization's organic growth.

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 $774,000.

Additional 5%

Reduction in technology management labor costs

"[Networking resources] are saving a lot of time because before they needed much more time to configure the physical equipment. [It was] maybe a three-person job."

CLOUD AND SYSTEM ADMINISTRATOR, OIL AND GAS

Optimized Technology Management					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	Annual infrastructure costs in prior environment	Composite	$18,900,000	$18,900,000	$18,900,000
A2	Percentage of workloads automated with VMware Cloud Foundation Automation	Composite	20%	40%	60%
A3	Reduction in infrastructure and management costs attributable to VMware Cloud Foundation Automation	Interviews	5%	5%	5%

At	Optimized technology management	A1*A2*A3	$189,000	$378,000	$567,000
	Risk adjustment	↓15%			
Atr	Optimized technology management (risk-adjusted)		$160,650	$321,300	$481,950
	Three-year total: $963,900			**Three-year present value: $773,679**	

IMPROVED AVAILABILITY

Evidence and data. Prior to the VMware Cloud Foundation Automation investment, interviewees described how their organizations' core network services were often plagued with outages despite 24/7 availability requirements for revenue operations (see Benefit C for more on how VMware Cloud Foundation Automation mitigated internal user impacts of downtime when used in combination with other VMware Cloud Foundation solutions). Within the VMware environment — and more so when VMware Cloud Foundation Automation was deployed — interviewees pointed out the following ways in which their organizations softened these impacts, including:

- **Reduced frequency of outages leading to unplanned downtime incidents.** Frequent downtime incidents in the prior environment posed a significant organizational pain point for several interviewees' organizations. They described how VMware Cloud Foundation Automation flows replaced error-prone manual processes and better integrated with enterprise apps, which added further stability to their network services.
    - The IT architect in the government industry shared how transitioning to the VMware Cloud Foundation Automation environment vastly improved the stability of their organization's services. They shared: "For the past five years, we have not experienced any major system outages. Now, we are serving more than 700 customers, which could mean an agency, hospital, etc., and we haven't experienced any major system outages."
    - The cloud and system administrator in the oil and gas industry shared how outages impacted access to their organization's critical services: "We had a major problem with our [critical services] every two to three months. … Now, for all the solutions that we migrated to VMware Cloud Foundation

Automation, we are not facing as many issues [with] no big production issues up to now."

- **Improved time to resolve issues.** Interviewees pointed to many reasons why the VMware Cloud Foundation Automation environment allowed their organizations to reduce the mean time to resolve downtime incidents. Interviewees also noted the VMware support was more responsive and helpful than vendors in their prior environments.
    - The cloud and system administrator in the oil and gas industry discussed how their organization's prior environment lacked a unified cloud, leaving its network, security, and infrastructure teams to each work in their own siloed environment. This meant that when problems frequently occurred, they would need to engage many internal and external resources to coordinate an effective response. They described how this was centralized on the VMware Cloud Foundation solution, then streamlined with VMware Cloud Foundation Automation: "When you have the same platform from the same vendor with everything virtualized, you have the compute virtualized, the network, the security [all] on the same platform. We all see the changes … and you know all the new configurations that are made in the platform. So it makes it easier to troubleshoot any issue."

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

- In the prior environment, the composite organization: Experienced annual unplanned downtime of 0.2% in which critical, revenue-generating apps went offline.
    - Due to redundancies, there was a 50% likelihood that unplanned downtime resulted in lost profit.
    - Averaged $10 billion in annual revenue (held constant for analysis purposes).
    - Had an 11% profit margin.
    - Experienced an average cost per hour of downtime of $62,785 in lost revenue.

- Following the initial transition to the VMware Cloud Foundation environment, the composite increases the number of workloads supported by VMware Cloud Foundation Automation by 20% each year.
- The composite organization experiences a 73% reduction in unplanned downtime attributable to VMware Cloud Foundation Automation, avoiding 15.8 hours of unplanned downtime with VMware Cloud Foundation Automation.

Risks. Organizations may experience results that differ from those presented in the financial model due to:

- Size, makeup, and complexity of IT environment.
- Level of unplanned downtime in legacy state.
- The impact of size, industry, and region on the cost of unplanned downtime.

Results. To account for these variables, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $677,000.

73%

Reduction in unplanned downtime attributable to VMware Cloud Foundation Automation

> "Over the past five years, I would like to say our system has had less than 2 hours of outages. … And when we migrated VMware Cloud Foundation Automation onto our system, we experienced much better performance. There are no outages, and everything is planned and structured."
>
> **IT ARCHITECT, GOVERNMENT**

Improved Availability					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
B1	Average annual unplanned downtime prior to using VMware Cloud Foundation Automation	Composite	0.2%	0.2%	0.2%
B2	Reduction in unplanned downtime attributable to VMware Cloud Foundation Automation	Interviews	73%	73%	73%
B3	Percentage of workloads automated with VMware Cloud Foundation Automation	A2	20%	40%	60%
B4	Annual unplanned downtime with VMware Cloud Foundation Automation	B1*B3*(1-B2)+B1 *(1-B3)	0.17%	0.14%	0.11%
B5	Avoided hours of unplanned downtime with VMware Cloud Foundation Automation	8,760*(B1-B4)	2.6	5.3	7.9
B6	Annual revenue	Composite	$10,000,000,000	$10,000,000,000	$10,000,000,000
B7	Likelihood that unplanned downtime resulted in lost profit in the prior environment	Composite	50%	50%	50%
B8	Operating profit margin	Composite	11%	11%	11%
B9	Average cost per hour of unplanned downtime	B6*B7*B8/8760	$62,785	$62,785	$62,785
Bt	Improved availability	B5*B9	$163,241	$332,761	$496,002
	Risk adjustment	↓15%			
Btr	Improved availability (risk-adjusted)		$138,755	$282,847	$421,602
	Three-year total: $843,203			**Three-year present value: $676,654**	

OPTIMIZED DEPLOYMENT AGILITY

Evidence and data. Interviewees discussed how the automation solution helped their organizations reimagine how they deploy environments on a virtualized IaaS platform. Although the nature of deployments varied as widely as the organizations themselves, interviewees pointed to wide-ranging efficiencies that conferred a multitude of benefits on their respective organizations, including:

- **Broad-based deployment efficiencies accelerating time to value.** Interviewees described how the VMware Cloud Foundation Automation solution allowed their organizations to deploy the self-service catalog to better and more quickly serve their customers. Interviewees described how their organizations were able to reduce a significant volume of deployments that needed to be directly managed by IT resources.
    - The IT architect in the government industry indicated that their organization would need up to eight additional full-time employees to complete all the manual operations and provisioning processes involved in deploying VMs. They shared: “When we automate them now, we have two resources fully running this automation, doing the scripting, and so on. [So,] we reduced [the number of resources required for deployments] from 10 to two.”
    - The principal engineer in the media industry calculated that, by shrinking the delivery timeline for services from up to 48 hours down to just minutes, their organization saved approximately 2,500 days’ worth of delay. The interviewee further shared how VMware Cloud Foundation Automation helped automate key processes without any external assistance: “When we started this, our estimation was that we were only going to bring a portion of our workflows in, and we were still going to have to do a lot of it manually or semiannually after the fact. We were able to pull an entire postdeployment workflow into vRA [VMware Cloud Foundation Automation] without any need for external involvement and without us having to go back after the fact.”
- **Reduced volume of managed deployments with VMware Cloud Foundation Automation self-service catalog.** Interviewees described how the VMware

Cloud Foundation Automation solution reduced a significant volume of IT-managed deployments with its self-service catalog. This enabled their organizations to reduce a significant volume of IT-managed deployments as follows:

- The principal engineer in the media industry described the benefits of the VMware Cloud Foundation Automation IaaS, which was fully automated within their platform: “The great thing is that it doesn’t involve me. It doesn’t involve my team. It doesn’t involve anybody. Now, almost everything is automated. After we defined how the final landscape looks like for our customers, we have almost everything automated because we are offering them standardized services.”
- The IT architect in the government industry discussed how their organization’s prior process for provisioning new deployments was handled by one of 200 individual sites, i.e., an agency or public body rather than centralized across the organization. In the VMware Cloud Foundation Automation private cloud environment, however, the interviewee reported that their organization was able to consolidate and scale its provisioning capacity: “We can provision 50 systems today. Three years ago, it was one or two systems per day. It’s a huge difference when you put automation in place because everything is standardized. That means [our customers] can choose things from the service catalog and they are automatically provisioned in our system.”

- **Faster VM lifecycle management.** Interviewees further pointed to efficiencies gained in shortening the length of time it took to deploy and manage the entire lifecycle of their new environments. This was both in terms of the overall SLA and the actual effort expended during the deployment. In some cases, interviewees reported decreasing both the overall length of their SLAs for deploying new environments — as well as the effort required to deploy them — from days to hours.
    - The principal engineer in the media industry recounted how VMware Cloud Foundation Automation helped their organization significantly compress the time to provision a new environment while also reducing effort across the entire VM lifecycle. They shared how their team was

particularly surprised by the VMware Cloud Foundation Automation solution's ability to fully manage the VM lifecycle: "Now, we have taken that entire deployment process that — interrupted — would usually take us a day. Uninterrupted, you could do it in 2 or 3 hours and VMware Cloud Foundation Automation has turned that into a plus or minus 15 minutes. [And] we can do full decommissioning."

- The IT architect in the government industry shared how the prior environment had an inefficient process to deploy virtual machines with an SLA of up to three days to permit time for manual configuration of services. With VMware Cloud Foundation Automation, their organization was able to leverage the infrastructure-as a-service catalog in which users could deploy VMs themselves directly in an average of 30 minutes. They said: "Now, with VMware Cloud Foundation Automation, it's fully automated. We have automation behind the service portal, which means that we will give you infrastructure to install your application and you can run your service in our infrastructure in 30 minutes more or less."
- The IT executive director in the education industry shared how the IaaS platform was removing the constraints that its organization previously experienced regarding the number of deployments it could manage. They shared: "In a typical situation, you may have to proportionately add headcount on the number of machines you support. Now that's not the case. That number has been disrupted."

- **More scalable deployments.** Multiple interviewees cited specific and significant deployment capacity improvements. The IT executive director in the education industry described how their organization's prior, physically defined computing environment was directly constrained by the amount of classroom space, equipment, and FTEs available. In order to scale to meet business needs in the prior environment, the interviewee indicated that there was a linear increase in the level of resources, with little room for efficiencies. With the VMware Cloud Foundation Automation solution, however, their organization significantly scaled their deployment capacity.
  - The IT executive director said: "From 30 deployments to 80 is a big jump quickly and without a whole lot of overhead for us to scale that. With a

physical machine, you had to prepare those individually and set up the environment. In a virtual environment, it's a template. It's quickly created. Templates can do some of this work, automating that process. So it is a game changer in the sense that now we are moving away from having to be rigid [and] we become nimble, [which] is a very positive value proposition for us. We can expand easily. … We could add anywhere, anytime access for students."

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

- In the prior environment, the composite organization deployed 3,000 virtual machines annually, spending an average of 2.5 hours per deployment across a three-day SLA period.
- Following the initial transition to the VMware Cloud Foundation environment, the composite increases the number of workloads supported by VMware Cloud Foundation Automation by 20% each year.
- With the VMware Cloud Foundation Automation solution, the composite both:
    - Reduces the time required to deploy new virtual machines by 50%, recapturing 4,500 labor hours.
    - Amplifies its capacity to deploy additional machines by 60%, avoiding more than 2,000 hours of additional labor needed to scale to meet business objectives.
    - The fully burdened hourly rate for a systems administrator is $61.

Risks. Organizations may experience results that differ from those presented in the financial model due to:

- Size, makeup, and complexity of IT environment.
- Prior state of deployment process and volume of requests.
- Prevailing wages.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $436,000.

50%

Reduction in time to deploy new virtual machines

"That [full VM decommissioning] was surprising because we … thought there was going to be some type of manual intervention, like run an IP creation script for [another app] or run decommissioning manually. So, when all that worked, we were pretty flabbergasted."

PRINCIPAL ENGINEER, MEDIA

Optimized Deployment Agility					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
C1	Total number of new virtual machines deployments in the prior environment	Composite	3,000	3,000	3,000
C2	Average hours to deploy new virtual machines in the prior environment	Interviews	2.5	2.5	2.5
C3	Reduction in time to deploy new virtual machines to VMware Cloud Foundation Automation	Interviews	50%	50%	50%
C4	Percentage of workloads automated with VMware Cloud Foundation Automation	B3	20%	40%	60%
C5	Total recaptured labor hours	C1*C2*C3*C4	750	1,500	2,250
C6	Fully burdened hourly salary for systems admin	Composite	$61	$61	$61

C7	**Subtotal: deployment efficiencies**	**C5*C6**	**$45,750**	**$91,500**	**$137,250**
C8	Amplified deployment capacity with VMware Cloud Foundation Automation	Interviews	60%	60%	60%
C9	Total additional VMs deployed via amplified deployment capacity with VMware Cloud Foundation Automation	C2*C6*C9	360	720	1,080
C10	**Subtotal: deployment optimizations**	**C2*C6*C9**	**$54,900**	**$109,800**	**$164,700**
Ct	Optimized deployment agility	C7+C10	$100,650	$201,300	$301,950
	Risk adjustment	↓10%			
Ctr	Optimized deployment agility (risk-adjusted)		$90,585	$181,170	$271,755
	Three-year total: $543,510			**Three-year present value: $436,251**	

IMPROVED ORGANIZATIONWIDE PRODUCTIVITY

Evidence and data. Interviewees pointed out how VMware Cloud Foundation Automation's preceding benefits further cascaded throughout their organizations by both avoiding downtime for end users in general, as well as improving productivity and time to value for costly developer resources. In particular, interviewees shared how VMware Cloud Foundation Automation:

- **Reduced end-user downtime from improved availability with VMware Cloud Foundation Automation.** In Benefit B, interviewees described the striking impact of VMware Cloud Foundation Automation on availability and uptime for their core network services and critical apps. In addition to avoiding the external impacts of downtime described in that section, interviewees also pointed to the impact that improved availability had internally on their services that required 40-hour-work-week availability.
    - The IT architect in the government industry shared how VMware Cloud Foundation Automation infrastructure as a service offered developers standardized services across their full lifecycle depending on customer needs. In the prior environment, these processes were manually conducted by engineers and often led to errors and rework, with a potential impact on availability. The GitOps repositories in VMware Cloud Foundation Automation, however, allowed the interviewee's fledgling shared services organization to standardize product offerings and thereby

improve availability. The interviewer noted that the added deployment speed agilities their organization experienced due to VMware Cloud Foundation Automation lent developers valuable efficiency and flexibility: "Because we are very fast in provisioning our services, the developers have more flexibility to run their service on the infrastructure. … That means that the deployment of applications is faster and more flexible in combination with VMware Cloud Foundation Automation."

- **Reduced developer downtime with a self-service, infrastructure-as-code catalog.** With VMware Cloud Foundation Automation, interviewees discussed how their engineering resources enhanced application delivery while improving satisfaction from faster provisioning and easier access to desired developer tools.
    - The cloud and system administrator in the oil and gas industry told Forrester about the impact that VMware Cloud Foundation Automation had on the internal customers that requested infrastructure: "They have a catalog, they choose what they want, they fill [out] the form, and they have their service up and running. The final end users just need to fill out a form and the service is provisioned. They can start using it [then]."
    - The cloud and system administrator in the oil and gas industry further discussed how the automated provisioning process eliminated several steps for which the end user was responsible. This lessened their configuration workload and eliminated the potential for errors and rework that manual processes prompted in the prior environment: "[We use it to] configure IT services. Authentication naming is done through the portal. We enforce a naming policy, so you cannot name your services as you like. ... The DNS [domain name system] is preconfigured in the images, and it's configured with the main active directory of the company, so you cannot create a VM and leave it out of domain. … There is [also] a monitoring integration [where] the final users who provision the services are able to monitor their own services."
    - The IT architect in the government industry described how the self-service, infrastructure as code (IaC) catalog discussed in Benefit D streamlined the customer experience by removing customizations and offering a fully

standardized set of products, explaining: “[The catalog] is fully standardized. [Developers] can choose the service from the service catalog and there is no customization for them. That means that we reduce the operations, we can optimize everything. And in the end, this is beneficial for both sides.”

- **Improved internal customer experience and added innovations from optimized self-service infrastructure with VMware Cloud Foundation Automation.** Interviewees pointed out how an optimized self-service catalog improved their internal customers’ overall experiences. The simplified and efficient use of IaC via a low-code approach allowed users to easily create and replicate cloud templates, permitting more time to focus on features and innovation rather than core provisioning tasks and draining rework.
    - The principal engineer in the media industry pointed out how their organization’s internal customer experience improved when their infrastructure teams were able to focus on delivering the tools that developers preferred, rather than what legacy infrastructure could support. In Benefit A, this interviewee noted that consolidating on VMware Cloud Foundation gave their teams a single infrastructure upon which they could build a number of different language environments according to a developer’s preference.

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

- The composite organization’s 20,000 FTEs had a 5% chance of downtime during an outage.
- Following the initial transition to the VMware Cloud Foundation environment, the composite increases the number of workloads supported by VMware Cloud Foundation Automation by 20% each year.
- With the improved availability noted in Benefit B, the composite organization avoids nearly 8,000 hours of employee downtime.
- The fully burdened hourly rate for an end user is $44.

- The composite reduces developer downtime by offering self-service infrastructure deployments as follows:
    - In the prior environment, half of all VMs deployed were for developer use in product development and innovation. The composite organization promised a three-day SLA for VM deployment with the developer wasting 10% of that time waiting for services.
    - In the VMware Cloud Foundation Automation environment, the composite organization deploys more than 1,680 virtual machines and reduces the length of its SLA from three days down to one.
    - The fully burdened hourly rate for a developer is $65

Risks. Organizations may experience results that differ from those presented in the financial model due to:

- Size, makeup, and complexity of IT environment.
- Volume and nature of deployments and their ensuing SLAs.
- Prevailing wages.

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 $501,000.

7,900

Avoided hours of unplanned FTE downtime

> "[Our internal customers] are much happier with this automation because we [free up] time for much 'smarter' things. They develop new features and offerings [instead of] the basic provisioning of services."
>
> **IT ARCHITECT, GOVERNMENT**

Improved Organizationwide Productivity					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
D1	Total FTEs	Composite	20,000	20,000	20,000
D2	Avoided hours of unplanned downtime with VMware Cloud Foundation Automation	B5	2.6	5.3	7.9
D3	Percentage of FTEs impacted during unplanned downtime	Composite	5%	5%	5%
D4	Productivity recapture	TEI standard	50%	50%	50%
D5	Total avoided hours of unplanned downtime with VMware Cloud Foundation Automation	D1*D2*D3*D4	1,300	2,650	3,950
D6	Fully burdened hourly salary for an end user	Bureau of Labor Statistics	$44	$44	$44
D7	**Subtotal: reduced end user downtime from improved availability with VMware Cloud Foundation Automation**	**D5*D6**	**$57,200**	**$116,600**	**$173,800**
D8	Total VMs deployed in the VMware Cloud Foundation Automation environment for developer use	(C1*(1+C8))/2	2,400	2,400	2,400
D9	Reduced hours to fulfill provisioning request with VMware Cloud Foundation Automation	Interviews	16.0	16	16
D10	Percentage of time wasted while waiting	Composite	10%	10%	10%
D11	Productivity recapture rate	Composite	50%	50%	50%
D12	Fully burdened hourly salary for a developer	Composite	$65	$65	$65
D13	**Subtotal: reduced developer downtime from self- service**	**D8*D9*D10*D11* D12**	**$124,800**	**$124,800**	**$124,800**

	infrastructure with VMware Cloud Foundation Automation				
Dt	Improved organizationwide productivity	D7+D13	$182,000	$241,400	$298,600
	Risk adjustment	↓15%			
Dtr	Improved organizationwide productivity (risk-adjusted)		$154,700	$205,190	$253,810
	Three-year total: $613,700		**Three-year present value: $500,906**		

OPTIMIZED INFRASTRUCTURE SUPPORT

Evidence and data. Compared to their prior environments and to their VMware Cloud Foundation environments without VMware Cloud Foundation Automation, interviewees noted that the preceding benefits eased pressure on the IT support function. Optimizing technology management, improving availability, and optimizing for deployment agility led to numerous downstream improvements and allowed their organizations to streamline their IT support function in terms of infrastructure, networking, and end-user experience.

- The cloud and system administrator in the oil and gas industry pointed to the large number of resources required to troubleshoot their prior environment compared to the instant visibility conferred by the VMware Cloud Foundation Automation solution: “When you had a problem you needed to engage many people, you had different vendors, and so on. But when you have the same platform from the same vendor with everything virtualized, you have the compute virtualized, the network, the security, we all work on the same platform. We all see the changes [if] somebody changed something [without telling you].”
- The principal engineer in the media industry shared how the VMware Cloud Foundation Automation solution eliminated a significant amount of their own labor as well as end-user rework on a day-to-day basis (see Benefit C). In the prior environment, which lacked an automated ticketing and self-service system, deployment requests and troubleshooting tickets required manual oversight to assure quality and accuracy. They shared: “Before, anytime you wanted a new VM, you had to fill out a ticket … and then it would come to my

team, and I would vet it. So, a lot of that delay came in me just vetting tickets for wrong information. Now, it's all built-in automation."

- The IT architect in the government industry noted that the establishment of a shared service center, supported by VMware Cloud Foundation Automation workflows, reduced their organization's monthly ticket volume of up to 500 tickets by 25%. They further noted how automation eliminated the workload related to correcting manual errors in the prior environment. They said: "With automation, we don't have human mistakes. That's the major difference. … When you have automation, you don't have human mistakes and you don't have to troubleshoot what is wrong afterwards."

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

- The composite organization fielded 400 infrastructure-related tickets per month in the prior environment with a $15 average cost per help desk ticket.
- Following the initial transition to the VMware Cloud Foundation environment, the composite increases the number of workloads supported by VMware Cloud Foundation Automation by 20% each year.
- With the VMware Cloud Foundation Automation self-service solution, the composite avoids 60% of infrastructure-related tickets, totaling more than 3,000 tickets. It also avoids 75% of the effort required to vetting deployment requests, or more than 800 hours of supervision, vetting, and prioritization effort.
- The fully burdened hourly rate for a systems administrator is $61.
- Forrester's productivity recapture rate is 50% acknowledging that not all efficiencies are attributed to useful work.

Risks. Organizations may experience results that differ from those presented in the financial model due to:

- Size, makeup, and complexity of IT environment.
- Average cost per help desk ticket and relevant ticket volumes.
- Prevailing wages.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $53,000.

60%

Reduction in infrastructure-related help desk tickets

"VMware Cloud Foundation Automation is saving me personally because I vetted all the tickets. It saves me about 4 hours a day, which I am spending on everything else..."

PRINCIPAL ENGINEER, MEDIA

Optimized Infrastructure Support					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
E1	Total annual infrastructure-related help desk tickets in the prior environment	Composite	4,800	4,800	4,800
E2	Percentage of workloads automated with VMware Cloud Foundation Automation	B3	20%	40%	60%
E3	Percentage of tickets avoided through self-service infrastructure with VMware Cloud Foundation Automation	Interviews	60%	60%	60%
E4	Annual tickets deflected by VMware Cloud Foundation Automation	E1*E2*E3	576	1,152	1,728
E5	Average help desk cost per ticket	Composite	$15	$15	$15
E6	**Subtotal: reduced help desk ticket volumes from VMware Cloud Foundation Automation self service**	**E4*E5**	**$8,640**	**$17,280**	**$25,920**
E7	Annual system admin hours for vetting deployment request tickets in prior environment	Interviews	780	780	780

E8	Time savings for vetting deployment requests with VMware Cloud Foundation Automation	Interviews	75.0%	75.0%	75.0%
E9	Fully burdened hourly salary for systems admin	C6	$61	$61	$61
E10	Productivity recapture rate	TEI standard	50%	50%	50%
E11	**Subtotal: reduced time to vet deployment request tickets with VMware Cloud Foundation Automation self service**	**E2*E7*E8*E9*E10**	**$3,569**	**$7,137**	**$10,706**
Et	Optimized infrastructure support	E6+E11	$12,209	$24,417	$36,626
	Risk adjustment	↓10%			
Etr	Optimized infrastructure support (risk-adjusted)		$10,988	$21,975	$32,963
	Three-year total: $65,927			**Three-year present value: $52,916**	

UNQUANTIFIED BENEFITS

- **Increased time savings attributed to higher-value activities.** Interviewees described how the optimized VMware Cloud Foundation Automation environment permitted their organizations to reallocate the time previously spent on time-consuming, low-value, and repetitive activities and quality assurance.
    - In Benefit C, the principal engineer in the media industry described how their organization was able to accelerate the deployment of VM pods. Beyond those immediate time savings, the interviewee discussed the higher-value activities that they could now take on, further adding value to their organization. They expanded: “Deployments are going faster. My two contractors have gone from doing deployments … all day, every day to now contributing more. [For example], our higher-end work contractor is now working on vROps [VMware Cloud Foundation Operations] dashboards, including the chargeback dashboard. So, by now taking them off doing menial tasks, I’m able to have them do things that are more productive.”
    - The principal engineer in the media also industry shared how the VMware Cloud Foundation Automation solution saved time on day-to-day tasks and error reduction. With that time, they noted that they were able to spend more time analyzing the value and efficacy of tools within and outside of

the VMware Cloud Foundation environment, further driving optimizations. They said: “By me having that time back, I spend it on doing things like learning more about vRNI [VMware Cloud Foundation Network Operations and] learning more about the other VMware apps because everything I get to save, I get to spend on something else that’s going to drive value.”

- **Improved compliance and governance.** Interviewees described how the VMware Cloud Foundation Automation environment conferred a more secure and compliant environment that provided better tools for infrastructure governance compared to previous environments. Interviewees discussed how automating deployment, day-two operations, and system retirement enabled a significantly higher degree of compliance with strong preestablished governance procedures and reduced human error. By providing better visibility and data tracking, as well as helping to detect and act on out-of-compliance environments quickly with minimal to no human intervention, resources reduced the labor needed to conduct audits and resolve compliance issues.
    - The IT executive director in the education industry told Forrester that the VMware Cloud Foundation Automation solution allowed for better role-based access controls (RBAC) privileges, stating, “It would be a lot harder to manually configure and prepare that integration with group policy authentications and interfacing with the firewall.”
    - The principal engineer in the media industry shared that the efficiencies gained (mentioned above) freed up resources to drive better compliance. They also pointed to the security benefit of automating RBAC with VM deployment, saying: “It’s allowed us to enforce standards. Every group has access to their VMs based off of their RBAC group policy. ... They can set [everything according to] their group policy roles. With that, we have complete security compliance when it’s done deploying. It’s joined to the domain. It’s joined to patching. It’s patched. It’s joined to our management structure … and it’s on the right subnet in the right IP space in each one of those data centers.”
    - The IT executive director in the education industry shared that the VMware Cloud Foundation Automation solution enabled their organization to build out and test new threat-hunting capabilities. They said: “We [can set up] a

purple team environment where VMware Cloud Foundation Automation ties in all of the networking IP address assignments, range allocations, and distributed firewall rules."

- The cloud and system administrator in the oil and gas industry indicated that VMware Cloud Foundation Automation improved their organization's security compliance and license entitlement enforcement: "Every image or service published in the catalog must be scanned and approved by the security team. … Only the licensed software is published in the catalog, so we don't use systems that are not licensed."

FLEXIBILITY

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

- **VMware ecosystem benefits.** Interviewees note that the value of their VMware Cloud Foundation Automation solution was augmented by the larger ecosystem of VMware capabilities and services.
  - The IT architect in the government industry shared how their organization found value in streamlining its entire technology environment with VMware products: "We use VMware for everything possible. … If you're building a very serious system, then [this platform engineering approach] is the best. Almost everything inside [the platform] is integrated. That means that we reduce operations, we reduce the complexity, and we have one point of support." It's much easier than if you are using third-party tools because it's a fully integrated environment out of the box."
  - The principal engineer in the media industry shared how integrating VMware Cloud Foundation Automation with other aspects of the VMware product configuration with other aspects of the VMware product configuration, including VMware vSAN and VMware Cloud Foundation Operations, assisted in lowering storage costs. They said: "By switching to VMware, we eliminated seven SANs [storage area networks] [and with the VMware Cloud Foundation Automation solution, we also] eliminated a ton of overhead. … Two storage

team members were freed up to go do other things. It's the VMware Cloud Foundation Automation solution that lowers the storage [but] the automation enables that by speeding up the deployment process."

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

Discussion Of Costs

Customer cost considerations

VMware Cloud Foundation Automation is an integrated component of VMware Cloud Foundation, VMware's private cloud solution. Interviewees cited the following cost considerations relative to a value assessment of their VMware Cloud Foundation Automation environments:

- **Internal deployment and administration activities.** Beyond the initial deployment of the VMware Cloud Foundation environment, interviewees discussed phased deployments of automation workflows around the organization at various times during the investment period.
    - The IT executive director in the education industry pointed out that initial efforts to map out end-user processes and optimize workflows accordingly was an iterative exercise. While it required half an FTE to develop and deploy automations with subsequent deployments of automated workflows, their organization gained efficiencies and built a robust environment. The interviewee stated, “It takes effort to understand what [automations are] needed and then prepare them, but it’s very repeatable, so that means it’s very sustainable for us to do that.”
    - The IT architect in the government industry shared that their organization dedicated two resources to running and optimizing their VMware Cloud Foundation Automation solution, saying: “When you are running the system live, you are always upgrading something, adding new features, etc. And [these two resources] in place are ready to align new [automations] with the whole landscape.”
- **Adoption ramp.** Interviewees indicated that their organizations’ adoption ramp for VMware Cloud Foundation Automation was highly fluid and iterative, particularly within the first two years of automation efforts. The IT architect in the government industry indicated that their organization took approximately two years to reach automation maturity.

- **Third-party costs**. Not all interviewees' organizations deployed internal resources for the development, testing, and integration of VMware Cloud Foundation Automation flows. Some engaged outside firms that specialize in such activities to ensure optimal deployment and adoption of automations for their specific environment.

Risks. Organizations may experience results that differ from those presented in the financial model due to:

- Size and scope of implementation.
- Level of customization required and state of legacy environment.
- Number of VMware Cloud Foundation components deployed.

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, allowing for a full examination of the effect of the technology on the entire organization.

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 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

"The Total Economic Impact of VMware Cloud Foundation," a commissioned study conducted by Forrester Consulting on behalf of Broadcom, publication forthcoming.

"The Total Economic Impact of VMware ANS," a commissioned study conducted by Forrester Consulting on behalf of Broadcom, publication forthcoming .

APPENDIX C: ENDNOTES

[1] Source: The State Of Infrastructure Automation, 2023, Forrester Research, Inc., July 31, 2023.

[2] 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.

FORRESTER®