

A Forrester Total Economic
Impact™ Study
Commissioned By
VMware

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June 2015

The Total Economic Impact™ Of VMware's Automated Application Deployment

Cost Savings And Business Benefits
Enabled By VMware vRealize
Automation Application Services

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Executive Summary

VMware commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying VMware vRealize Automation, with a focus on the Application Services module. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of vRealize Automation, specifically regarding the Application Services module, on their organizations.

Most of the interviewed customers began their automation journey with infrastructure. Prior to the use of vRealize Automation, developers and test engineers in the interviewed organizations often had to wait weeks in order for infrastructure to be provisioned with their specific requirements, leading to long wait times and delays in all subsequent processes.

Addressing this problem with automation reduced these wait times substantially. With this improvement accomplished, companies then turned to the next bottleneck: delays in the application deployment process. With users waiting weeks or even months for application environments, the iterative process to test and deploy would take months. These limitations led to larger-than-necessary capacity requirements, long wait times for developers or test engineers to obtain environments needed, and an inefficient process between testing and development prior to deployment. By using vRealize Automation for application deployment, customers were able to streamline provisioning, testing, and deployment processes in support of key functions and lines of business, enabling them to meet their objectives, increase customer satisfaction, and keep costs in check. As one IT project manager told us, “Today, VMware solutions [including vRealize automation] enable us to deliver new applications and services to market faster, more efficiently, with greater control and greater scalability.” Ultimately, this led to an improvement in IT’s ability to address business needs quickly, increasing users’ confidence and helping to support and grow the business.

To better understand the benefits, costs, and risks associated with vRealize Automation, specifically around application delivery automation, Forrester interviewed several customers with multiple years of experience using vRealize Automation. vRealize Automation Application Services is included in the enterprise edition of both the vCloud and vRealize Suites, which provide customers with a comprehensive cloud management platform. Specifically, the application services features help customers rapidly deploy both infrastructure and application components by assembling multitier application environments from pre-built components and automating their delivery. These application blueprints and automation workflows speed the time from request to deployment for application environments, reduce errors, and simplify the process of standing up multiple testing and development environments.

VMWARE VREALIZE AUTOMATION ACCELERATES NEW BUSINESS OPPORTUNITIES

Our interviews with four existing customers and subsequent financial analysis found that a composite organization based on these interviewed organizations experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1.¹ See Appendix A for a description of the composite organization.

With vRealize Automation, deployment cycle times were improved by three to four weeks per release, and the composite organization experienced additional savings in reclaiming unused server capacity. The composite organization analysis points to benefits of \$2.4 million per year versus license and implementation costs of \$703,000 per year, adding up to a net present value (NPV) of \$5.1 million. This translates to hardware cost avoidance benefits of more than \$4,451 per application environment, license costs of less than \$200 per virtual machine (VM), and an NPV of over \$1,154 per VM. While the quantitative cost savings are compelling, the primary motivation for our composite organization to automate application

vRealize Automation accelerates application deployment, resulting in improved productivity, the ability to deliver new application functionality faster, and a reduction in costs.

Based on customer interviews, the total costs and benefits for a composite organization of 20,000 employees, over a three-year period are:

- **Total cost savings and benefits: \$7,232,822.**
- **License costs: \$1,367,273.**
- **Initial and ongoing costs: \$742,387.**
- **Net benefit: \$5,123,162.**

deployment is reducing service delivery times from weeks to hours, ultimately improving development and test productivity and allowing the business to bring new functionality to its customers faster.

FIGURE 1
Financial Summary Showing Three-Year Risk-Adjusted Results



Source: Forrester Research, Inc.

› **Benefits.** The composite organization experienced the following quantified risk-adjusted benefits, representative of those experienced by the interviewed companies:

- **Improved administration task time by 1,491 hours per year.** vRealize Automation allows administrators to provision and configure servers 9 hours faster initially and reduce ongoing configuration and life-cycle management by 2 hours per week per application. This benefit enables organizations to be more nimble and increases their speed-to-market, creating new business opportunities.
- **Reduced application development time by 144 hours per request.** vRealize Automation significantly reduces the wait time developers and test engineers experience throughout a project, allowing them to focus and be approximately 25% more productive when not waiting. The composite organization's average application wait time went from over three weeks to three days after implementing vRealize Automation. Through the removal of wait time, developers and test engineers can accelerate the delivery of applications, helping to reduce cycle times and improve customer experience (both internal and external) while accelerating business benefits.
- **Made hardware efficiency gains of 25% per year.** Capital avoidance realized from sizing applications properly led to a 15% reduction or avoided purchase of unnecessary server capacity. Repurposing unused server capacity identified by application sizing optimization capabilities included in vRealize Automation drove additional savings of approximately 10% of the total environment per year.
- **Improved delivery of consistent environments.** Due to the use of standardized blueprints to produce application environments, customers saw a reduction in errors, leading to improvements in both administrator and developer productivity. For administrators, fewer errors led to a decrease in rework, while for developers and testers, receiving the correct application environment means they can use it immediately, rather than waiting additional time for any errors to be fixed. Due to the overlap with other productivity benefits, Forrester was not able to isolate the impact of this benefit to quantify it individually, but we highlight it as part of the overall benefit of the solution.

- › **Costs.** The composite organization experienced the following risk-adjusted costs:
- **Software licensing fees of \$1,367,273, or \$200 per virtual machine.** These are perpetual license fees paid to VMware for access to vRealize Automation along with annual maintenance costs of 24% of the license fee.
 - **Implementation fees of \$330,000.** This is an initial cost for 1,650 hours of third-party integration services.
 - **Administrative costs of \$269,712.** These are ongoing costs that decrease over time for VMware on-site resources.
 - **Training costs of \$142,675.** Ongoing training costs were \$90,000 starting in Year 1, ramping down to \$15,000 in Year 3.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by VMware and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.
- › Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in vRealize Automation.
- › VMware reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- › VMware provided the customer names for the interviews but did not participate in the interviews.

TEI Framework And Methodology

INTRODUCTION

From the information provided in the interviews, Forrester has constructed a Total Economic Impact (TEI) framework for those organizations considering implementing vRealize Automation. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision, to help organizations understand how to take advantage of specific benefits, reduce costs, and improve overall business goals.

APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that vRealize Automation can have on an organization (see Figure 2). Specifically, we:

- › Interviewed VMware marketing and sales personnel, along with Forrester analysts, to gather data relative to vRealize Automation and the marketplace for vRealize Automation.
- › Interviewed four organizations currently using VMware vRealize Automation to obtain data with respect to costs, benefits, and risks.
- › Designed a composite organization based on characteristics of the interviewed organizations (see Appendix A).
- › Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the composite organization.
- › Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted in interviews. Risk adjustment is a key part of the TEI methodology. While interviewed organizations provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling VMware vRealize Automation: benefits, costs, flexibility, and risks.

Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

FIGURE 2
TEI Approach



Source: Forrester Research, Inc.

Analysis

COMPOSITE ORGANIZATION

For this study, Forrester conducted a total of four interviews with representatives from the following companies, which are VMware customers based worldwide:

- › Multinational technology company based in the US with over 12,000 virtual machines and 2,300 databases. This company has over 60,000 employees and annual revenues of \$23 billion. It utilizes vRealize Automation to streamline processes in support of personalized analytical applications.
- › Global electronic payment solutions company based in Ireland with 300 virtual machines. It provides electronic payment services in over 100 countries and in 50-plus currencies. vRealize Automation has helped to ensure payment applications maintain the most up-to-date regulations across all operating countries.
- › US-based education organization utilizing 300 virtual machines for its education application. With 44,000 employees and \$2.3 billion of annual revenue, it operates in the UK, Mexico, and Chile. It uses vRealize Automation to enhance student experiences through the use of its learning applications.
- › European telecommunications startup with approximately 200 virtual machines. Founded in June of 2013, its goal is to revolutionize telecommunications in Europe. It adopted VMware from the onset to increase speed-to-market and exceed customers' demands.

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results represents an organization with the following characteristics:

- › US-based technology company.
- › Twenty thousand employees.
- › Four thousand virtual machines.
- › Eight hundred applications.
- › Eight system administrators.

INTERVIEW HIGHLIGHTS

Companies have been operating a traditional delivery model for many years, but their needs are evolving. Lack of timely application delivery has led business teams to pursue public cloud services rather than internal IT or private cloud services, causing increased security risk to organizations. In response, the internal IT organization has been forced to adapt and offer services with similar speed and flexibility. In an effort to speed up the delivery process, save on server costs, reduce risk, and enhance the customer experience, a new application delivery model has evolved, utilizing automation to streamline provisioning processes.

“We can release a lot more often and support a person who wants this platform with some customized functionality. We are much more nimble and have improved customer satisfaction.”

~CTO, international payment services company

All of the interviewed customers began this transformation with infrastructure automation. Interviewees told us that the process to provision servers, formerly multiweek or even multimonth, has now been automated and sped up to less than a day. This infrastructure change has put pressure on the delivery teams to automate their process and speed up the delivery cycles, as they no longer have to wait months for the servers to be ready in order to test and implement their new applications and enhancements. Interviewees then turned to vRealize automation to assist in addressing automation with respect to applications.

For our analysis, the composite organization is searching for a solution that will help it accomplish this goal, with the following specific objectives:

- › Modernize its delivery model.
- › Speed up the delivery process in support of business demands.
- › Reduce server costs while improving resource consumer productivity.
- › Ensure quality and reliability in applications.

Solution

The composite organization selected vRealize Automation for its ability to provide a configurable out-of-the-box solution that works in conjunction with an already implemented virtualized server environment. vRealize Automation allows administrators to model complex multitier applications that can reside on any combination of multivendor virtual, physical, or public cloud infrastructures. The solution also helps organizations to better mimic the behavior of and potentially compete with public clouds in the areas of improved speed, fewer errors, and flexibility. These capabilities allow IT to better manage business environments and ensure proper compliance and security protocols are followed. The increased speed in which these environments can be provisioned for developers and test engineers considerably reduces the amount of after-hours work and rework required. This, among many other benefits listed in the following section, led to increased morale and talent retention within these organizations.

Results

The interviews revealed that by deploying vRealize Automation, companies were able to:

- › **Reduce development cycle time through increased administration, development, and testing efficiencies.** The most significant benefits were the reduced wait times experienced by developers and test engineers to gain access to new environments. Previously, developers and testers could wait up to three weeks for new environments; with vRealize Automation, this time has been decreased to under three days, facilitating the following benefit.
- › **Increase speed-to-market and improve end user experience.** The composite organization considers VMware an important component of its customer experience strategy, focused on improving customer satisfaction. Through automated application delivery, business teams were able to introduce new functionality at a much faster rate, allowing them to be more responsive to customer needs while identifying new business opportunities. In addition, business affiliates (e.g., producers and external adjusters) were able to get their customers' needs satisfied much faster and more effectively.
- › **Increase hardware capacity.** Based on the interviewees' experiences, the composite organization was able to free up nearly 15% of server capacity through optimization of application sizing. An additional 10% improvement of server capacity was recaptured through VMware Automation capacity alerts. The ability to realize these benefits was attributed to the receptivity of developers and testers in allowing inactive resources to be decommissioned. Specifically, these developers were more confident in the organizations' ability to quickly provision new environments when needed with vRealize Automation.

BENEFITS

The composite organization experienced a number of quantified benefits in this case study:

- › Administrative productivity (improved task time).
- › Developer efficiencies (reduced wait time).
- › Hardware capital avoidance.

As a result of the reduced task and wait times, the composite organization was able to increase customer satisfaction. While customer satisfaction depends on a number of factors, the enhanced ability to deliver application updates, reduce application issues, and move to market faster were key contributors to overall improved satisfaction.



Administrative Productivity (Improved Task Time)

The first quantified benefit included in the analysis is a reduction in task time — the work time spent by administrators during initial provisioning and configuration as well as ongoing configuration and life-cycle management. Prior to vRealize, the composite organization had required, on average, 9 hours of additional administration (hands-on) time for initial provisioning as well as 2 additional hours for ongoing configuration. These hours were spent in manual processes, which, in addition to wait time, introduced the potential for significant opportunities for error, requiring rework.

Following the vRealize Automation implementation, the composite organization reduced average administrative work in provisioning and configuration processes (Day 1) by 608 hours per year, as illustrated in Table 1. Before vRealize Automation, resource consumers would be required to perform many manual processes as well as a large amount of paperwork to provision and configure the new environment for development. vRealize Automation essentially automates these processes and removes hours of manual work, freeing up administrator time and capacity. Additionally, time is saved in ongoing configuration and life-cycle management tasks (Day 2); based on interview data, we have assumed that half of the existing applications would need approximately 2 additional hours of effort prior to vRealize, and these hours can be avoided. With 1.3 environments on average being requested for setup each week (approximately five per month), this equates to 1,408 hours in the first year in actual work time savings, growing annually as the total number of applications grows. This time savings, while not only reducing work time, also increases the upon-request capacity to provision new environments. This, in turn, helps lead to shorter cycle times and faster speed-to-market.

TABLE 1
Application Deployment Automation Allows Administrators To Be More Efficient On Tasks

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	Day 1: initial provisioning and configuration hours saved	9 hrs.*1.3x per week*52 weeks		608.4	608.4	608.4
A2	Day 2: ongoing configuration hours saved	800 applications* 50% per year *2 hours growing @ 10% per year		800	880	968
A3	Total hours saved annually			1,408	1,488	1,576
A4	Hourly rate per person			\$75	\$75	\$75
Atr	Administration productivity (task time)	(A1+A2)*A4	\$0	\$105,630	\$111,630	\$118,230

Source: Forrester Research, Inc.



Developer/Test Engineer Efficiencies (Reduced Wait Time)

The next quantified benefit included in this analysis was a reduction in wait time experienced by developers and test engineers throughout the development cycle. Historically, a developer or test engineer could expect to wait three weeks or more for a new environment to be provisioned and for testing to be complete. This “on and off” cadence of work instilled inefficiency in the development cycle and extended the release cycle times by months, ultimately leading to delayed realization of business value from the applications’ delayed release.

The composite organization was able to reduce the development cycle of an application by an average of 18 days after implementing vRealize Automation. This time reduction encompassed savings across various stages of development, testing, and staging. Prior to vRealize Automation, developers and testers were able to multitask and work on other projects approximately 75% of the time while waiting; therefore, we have included the recapture of 25% of the saved time in our composite organization. Additionally, the composite organization has an application demand of 1.3 apps per week, based on the companies interviewed; for some companies, increasing this variable due to higher application development demand could drastically increase the benefits and ROI. In total, this savings translated into an annual reduction of 9,734 hours annually. See Table 2 for the details of the calculation.

Interviewed organizations provided a broad range of developer productivity metrics prior to vRealize Automation, since there are a variety of outside forces that might also affect this. To compensate, this benefit was risk-adjusted by a reduction of 10%. The risk-adjusted total benefit resulting from reduced developer wait times over the three years was \$408,510. See the section on Risks for more detail.

TABLE 2
Improved Developer/Test Engineer Efficiencies (Reduced Wait Time)

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
B1	Hourly rate per person			\$75	\$75	\$75
B2	Number of hours saved per app	18 days*8 hours per day		144	144	144
B3	Applications requested per year	52*1.3 apps per week		67.6	67.6	67.6
B4	Percent captured			25%	25%	25%
Bt	Developer/test engineer efficiencies (wait time)	$B1*B2*B3*B4$	\$0	\$182,520	\$182,520	\$182,520
	Risk adjustment	↓ 10%				
Btr	Developer/test engineer efficiencies (wait time) (risk-adjusted)		\$0	\$164,268	\$164,268	\$164,268

Source: Forrester Research, Inc.



Hardware Capital Avoidance

This benefit is divided into two components: the efficiency gains from rightsizing the application environments and the savings related to reclamation of unused capacity. Both have been highlighted individually below.

The largest benefits realized by the composite organization came from an avoidance of purchasing new infrastructure hardware to support development and testing environments. Prior to vRealize Automation, developers would request application environments an average of 15% larger than necessary. This oversizing was due to the length of time it took to process requests to create additional space in an environment; in order to avoid long wait times, users would request more capacity than required as a buffer for future needs. vRealize Automation, by reducing the time to create new environments, reduces the need to oversize applications — since they can be created quickly, there's less need to overprovision “just in case” a larger environment is needed. This 15% optimization results in approximately \$188 of monthly savings based on the \$1,250 per application environment cost per month (see Table 3: C2).

A broad range of application sizing optimization resulted in differing amounts of savings. To compensate, this benefit was risk-adjusted and reduced by 20%. The risk-adjusted total benefit resulting from application optimization over the three years was \$3,928,320, or about \$4,451 per application environment. See the section on Risks for more detail. (See Table 3 for calculations.)

Another key benefit from vRealize Automation was the ability to reclaim unused capacity. vRealize Automation will send alerts by email to developers and test engineers informing them of idle capacity currently in use by their environments. The developers or testers can then choose to reduce the capacity requirements, allowing the space to be reclaimed and the computing resources to be reduced. As a result, the composite organization realized a 10% reduction in overall capacity used, equating to a present value benefit of \$3,273,600 over three years.

Interviewed organizations provided a varying range for hardware reclamation, since there are a variety of outside forces that might also affect this. To compensate, this benefit was risk-adjusted and reduced by 20%. The risk-adjusted total benefit resulting from hardware reclamation over the three years was \$2,618,880, or about \$2,967 per application. See the section on Risks for more detail. (See Table 3 for calculations.)

TABLE 3
Hardware Capital Avoidance

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Number of assets	Application environments @ 10% annual growth		800	880	968
C2	Cost per asset	\$1,250/month		\$15,000	\$15,000	\$15,000
C3	Rightsizing percent captured			15%	15%	15%
C4	Reclamation percent captured			10%	10%	10%
Ct	Hardware capital avoidance	$C1 \cdot C2 \cdot C3 + C1 \cdot C2 \cdot C4$	\$0	\$3,000,800	\$3,300,880	\$3,630,968
	Risk adjustment	↓ 20%				
Ctr	Hardware capital avoidance (risk-adjusted)		\$0	\$2,400,640	\$2,640,704	\$2,904,774

Source: Forrester Research, Inc.

Total Benefits

Table 4 shows the total of all benefits across the four areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than \$7.2 million, or \$1,629 per VM. We have modeled consistent reductions in wait times, in spite of growing environments, as we assume there is consistency in the amount of productivity each developer is able to reclaim.

TABLE 4
Total Benefits (Risk-Adjusted)

Ref.	Benefit Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Administration productivity (task time)	\$0	\$105,630	\$111,630	\$118,230	\$335,490	\$277,111
Btr	Developer efficiencies (wait time)	\$0	\$164,268	\$164,268	\$164,268	\$492,804	\$408,510
Ctr	Hardware capital avoidance	\$0	\$2,400,640	\$2,640,704	\$2,904,774	\$7,946,118	\$6,547,200
	Total benefits (risk-adjusted)	\$0	\$2,670,538	\$2,916,602	\$3,187,272	\$8,774,412	\$7,232,822

Source: Forrester Research, Inc.

COSTS

The composite organization experienced a number of costs associated with vRealize Automation:

- › Perpetual licensing fees.
- › Annual maintenance costs.
- › Integrator fees.
- › VMware on-site administration costs.
- › Training costs.

These represent the mix of internal and external costs experienced by the composite organization for initial planning, implementation, and ongoing maintenance associated with the solution.



Perpetual Licensing Fees

Perpetual licensing fees for vRealize Automation were incurred during the initial implementation period; in subsequent years, an annual maintenance fee, calculated as a percentage of the initial licensing fee, was applied. During initial implementation, the composite organization incurred software licensing fees for vRealize Automation, estimated at a total of \$800,000, or about \$200 per VM. It's important to note that the pricing was an estimate based on a percentage of the total VMware vCloud Suite cost, as the components are not sold separately. Based on customer input, Forrester has allocated an appropriate portion of the costs of the entire suite for this single component.



Annual Maintenance Cost

Each year, the composite organization incurred a maintenance fee for ongoing access. The maintenance fee included 24x7 support and software upgrades developed by VMware that enhance core functionalities and expand the range of industry-specific features. The composite organization incurred a 24% annual maintenance fee, applied as a percentage of its initial licensing fees (\$800,000), for an annual maintenance cost of \$192,000, growing at 10% annually. Please note that first year of maintenance is included in the upfront licensing fees (please see Table 5 for a detailed calculation).

TABLE 5
Perpetual License Fees And Annual Maintenance Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	License fees	\$200/VM	\$200	\$200	\$200	\$200
D2	Number of virtual machines (incremental new licenses)	10% annual growth	4,000	400	440	484
D3	Initial license cost	D1*D2	\$800,000	\$80,000	\$88,000	\$96,800
D4	Annual maintenance	24% annual fee			\$211,200	\$232,320
Dtr	Software license and maintenance fees	D3+D4	\$800,000	\$80,000	\$299,200	\$329,120

Source: Forrester Research, Inc.



Integrator Fees

The composite organization incurred costs from hiring a third-party integrator to help with the initial integration of vRealize Automation. The integration work required approximately 1,650 man-hours at a cost of \$200 per hour, for an initial cost of \$330,000. For your organization, the rate and hours for a third-party integrator may vary slightly; for the purposes of this analysis, a conservative estimate was used for the composite organization.

TABLE 6
Integrator Fees

Ref.	Metric	Calculation	Initial
F1	Hourly rate		\$200
F2	Hours		1,650
Ftr	Professional fees	F1*F2	\$330,000

Source: Forrester Research, Inc.



Administrative Costs

The composite organization incurred costs from hiring VMware administrative support on-site. Initially, six resources were required to ensure business continuity and help with technical issues and training. The amount of these resources required on-site decreased to two in the second year and one in the third year. These resources were critical early in the deployment, ensuring an optimal environment was set up and the maximum value of VMware was realized. The resource hours required were estimated at 20% of an FTE, adjusting for the support they provided to other vRealize suite products. Assuming a \$75 per hour rate, the annual cost was \$34,320 per resource, or \$308,880 over three years. For an organization, the rate and amount of resources for a third-party integrator may vary slightly; due to this variation, a 10% adjustment was applied for risk to the composite organization.

TABLE 7
Administrative Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
G1	Number of people			6	2	1
G2	Hourly rate per person			\$75	\$75	\$75
G3	Hours	20% FTE for app		416	416	416
Gt	Administrative costs	$G1 \times G2 \times G3$	\$0	\$187,200	\$62,400	\$31,200
	Risk adjustment	↑ 10%				
Gtr	Administrative costs (risk-adjusted)		\$0	\$205,920	\$68,640	\$34,320

Source: Forrester Research, Inc.



Training Fees

The composite organization incurred costs related to formal training fees. Training costs were \$90,000 in Year 1 and decreased to \$60,000 in Year 2 and \$15,000 in Year 3. For your organization, the rate and amount of training resources will vary; we have used a conservative estimate for the composite organization.

TABLE 8
Training Fees

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
H1	Training fixed cost			\$90,000	\$60,000	\$15,000
Htr	Training fees	H1	\$0	\$90,000	\$60,000	\$15,000

Source: Forrester Research, Inc.

Total Costs

Table 9 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the composite organization expects total costs to total a present value of a little more than \$2.1 million, or \$475 per VM.

TABLE 9
Total Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Etr	Software license fees	\$800,000	\$80,000	\$299,200	\$329,120	\$1,508,320	\$1,367,273
Ftr	Professional fees	\$330,000	\$0	\$0	\$0	\$330,000	\$330,000
Gtr	Administrative costs	\$0	\$205,920	\$68,640	\$34,320	\$308,880	\$269,712
Htr	Training fees	\$0	\$90,000	\$60,000	\$15,000	\$165,000	\$142,675
	Total costs (risk-adjusted)	\$1,130,000	\$375,920	\$427,840	\$378,440	\$2,312,200	\$2,109,660

Source: Forrester Research, Inc.

FLEXIBILITY

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some future additional investment. This provides an organization with the “right” or the ability to engage in future initiatives but not the obligation to do so. There are multiple scenarios in which a customer might choose to implement vRealize Automation and later realize additional uses and business opportunities.

For the purposes of this analysis, we have not quantified the future flexibility options gained by the interviewed companies. However, the interviewees were quick to cite the advantages gained in business agility through their use of the solution. All of the interviewed organizations gained the ability to streamline their release process, further increasing the amount of releases and in some cases allowing for a continuous release model to be implemented. One interviewee said that due to the productivity increases (as detailed in the Benefits section), “We are making much better use of the intelligence that we have in-house.” He went on to describe the increase in confidence from the business and that “the company can ramp up in new regions far quicker, and get to market much faster,” facilitating the rapid growth of the company. For the startup using the technology, the interviewee cited automation as key to its business model: “In telco, a lot of things are unpredictable. IT’s kind of a nightmare if you don’t have flexible architecture.”

RISKS

Forrester defines two types of risk associated with this analysis: “implementation risk” and “impact risk.” Implementation risk is the risk that a proposed investment in vRealize Automation may deviate from the original or expected requirements, resulting in higher costs than anticipated. Impact risk refers to the risk that the business or technology needs of the organization may not be met by the investment in vRealize Automation, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

TABLE 10
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Developer efficiencies (wait time)	↓ 10%
Hardware capital avoidance	↓ 20%
Costs	Adjustment
Administrative costs	↑ 10%

Source: Forrester Research, Inc.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as “realistic” expectations since they represent the expected values considering risk.

The following impact risks that affect benefits are identified as part of the analysis:

- › **Developer efficiencies (wait time).** The amount of productivity captured by each organization varied by 10%.
- › **Hardware capital avoidance.** Interviewed organizations saw a range of application optimization and hardware reclamation that varied by 20%.

The following implementation risk that affects costs is identified as part of this analysis:

- › **Administrator costs.** The amount of administrators depend on the demands and complexity of the organization.

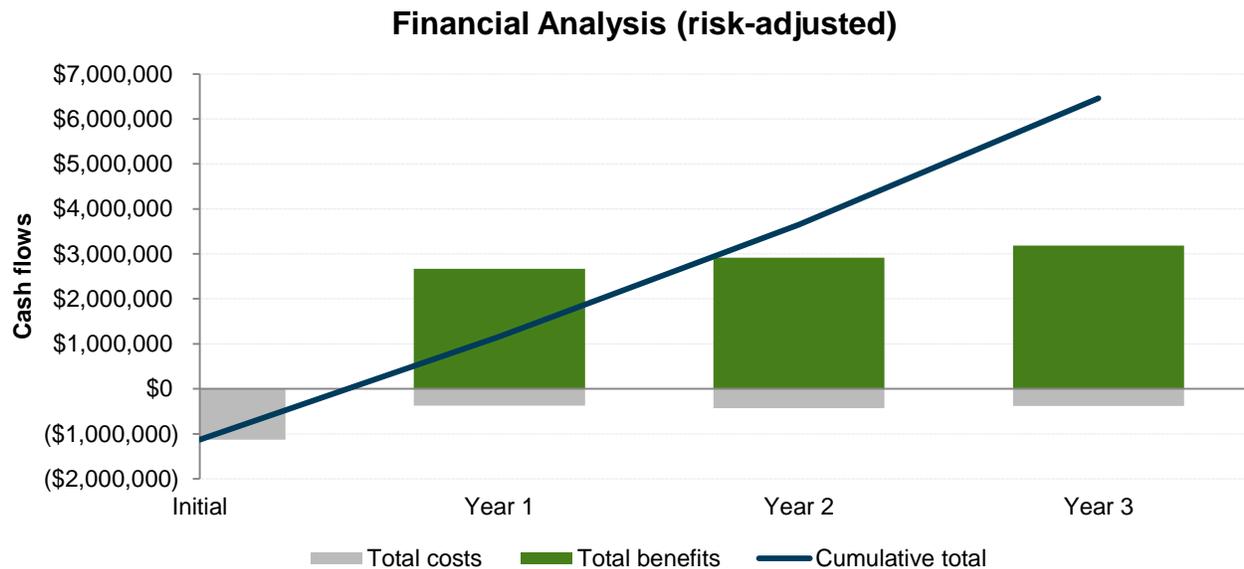
Table 10 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the composite organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Financial Summary

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 in vRealize Automation.

Table 11 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 10 in the Risks section to the unadjusted results in each relevant cost and benefit section.

FIGURE 3
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 11
Cash Flow (Risk-Adjusted)

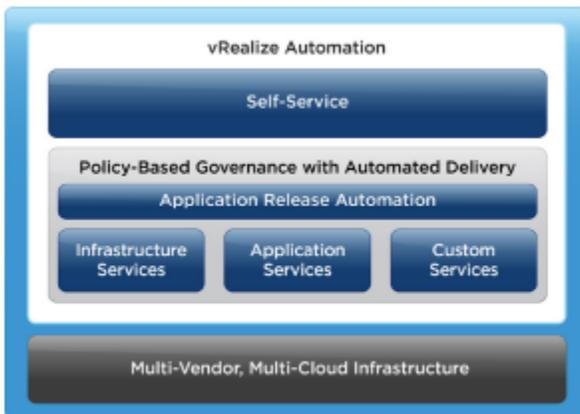
Summary	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$1,130,000)	(\$375,920)	(\$427,840)	(\$378,440)	(\$2,312,200)	(\$2,109,660)
Total benefits	\$0	\$2,670,538	\$2,916,602	\$3,187,272	\$8,774,412	\$7,232,822
Total	(\$1,130,000)	\$2,294,618	\$2,488,762	\$2,808,832	\$6,462,212	\$5,123,162
ROI						243%
Payback period (months)						5.9

Source: Forrester Research, Inc.

VMware vRealize Automation: Overview

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

vRealize Automation empowers IT to accelerate the delivery and ongoing management of personalized, business-relevant infrastructure, applications, and custom services while improving overall IT efficiency. Policy-based governance and logical application modeling assures that multivendor, multicloud services are delivered at the right size and service level for the task that needs to be performed. Full life-cycle management assures resources are maintained at peak operating efficiency and release automation allows multiple application deployments to be kept in-sync through the development and deployment process. vRealize Automation turns IT into business enablers.



Source: VMware

WHAT DOES VREALIZE AUTOMATION DELIVER?

vRealize Automation accelerates the deployment and management of applications and compute services, thereby improving business agility and operational efficiency. The following capabilities empower IT to quickly demonstrate the value of deploying an automated, on-demand cloud infrastructure:

- › Comprehensive purpose-built functionality.
- › Personalized, business-aware governance.
- › Provisioning and management of application services.
- › Infrastructure delivery and life-cycle management.
- › Extensible by design.

Appendix A: Composite Organization Description

For this TEI study, Forrester has created a composite organization to illustrate the quantifiable benefits and costs of implementing VMware vRealize Automation. The composite company is intended to represent a US-based technology company with 20,000 employees and is based on characteristics of the interviewed customers.

The composite company has 4,000 virtual machines and 800 applications.

In purchasing vRealize Automation, the composite company has the following objectives:

- › Speed up the IT delivery process in support of business demands.
- › Ensure quality and reliability in applications.
- › Reduce server costs.
- › Modernize its delivery model.
- › Increase compliance and security within the application development environment.

For the purpose of the analysis, Forrester assumes that there is a 10% annual growth in virtual machines and applications, as well as eight system administrators.

FRAMEWORK ASSUMPTIONS

Table 12 provides the model assumptions that Forrester used in this analysis.

The discount rate used in the PV and NPV calculations is 10%, and the time horizon used for the financial modeling is three years. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

TABLE 12
Model Assumptions

Ref.	Metric	Calculation	Value
I1	Average provisions requested per week		1.3
I2	Average three-year virtual machine count		4,855
I3	Average three-year application count		883
I4	Average monthly application license and support costs		\$1,250
I5	System administrator and developer (annual fully loaded costs)		\$156,000
I6	Hourly	(I5/2,080)	\$75

Source: Forrester Research, Inc.

Appendix B: Total Economic Impact™ Overview

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. TEI assists technology vendors in winning, serving, and retaining customers.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, flexibility, and risks.

BENEFITS

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often, product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place 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. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

COSTS

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

FLEXIBILITY

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprisewide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point. However, having the ability to capture that benefit has a PV that can be estimated. The flexibility component of TEI captures that value.

RISKS

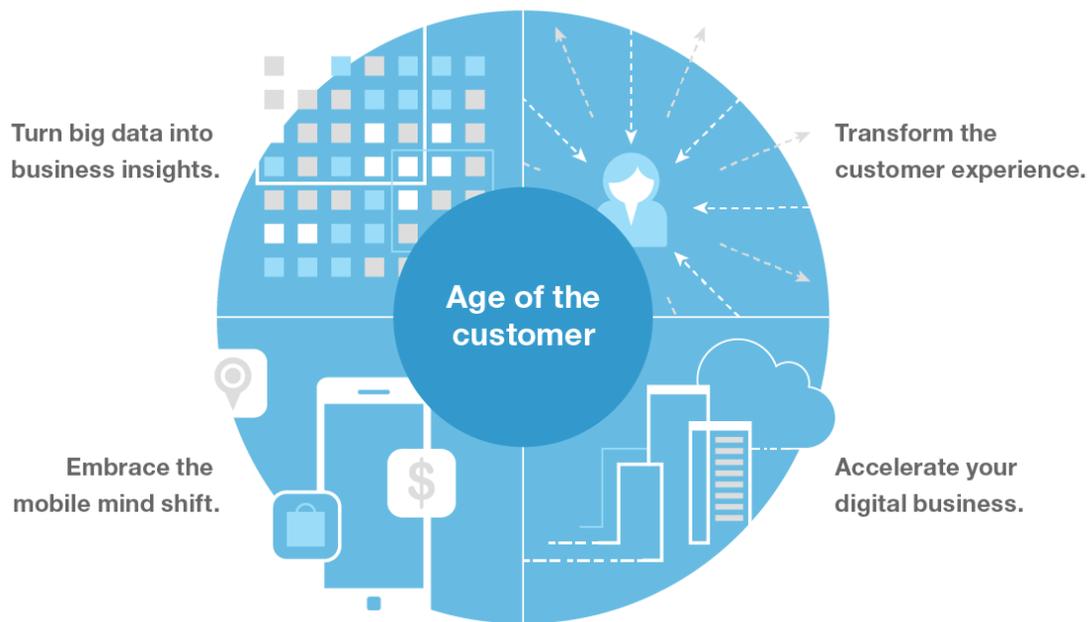
Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections and 2) the likelihood that the estimates will be measured and tracked over time. TEI risk factors are based on a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the risk factor around each cost and benefit.

Appendix C: Forrester And The Age Of The Customer

Your technology-empowered customers now know more than you do about your products and services, pricing, and reputation. Your competitors can copy or undermine the moves you take to compete. The only way to win, serve, and retain customers is to become customer-obsessed.

A customer-obsessed enterprise focuses its strategy, energy, and budget on processes that enhance knowledge of and engagement with customers and prioritizes these over maintaining traditional competitive barriers.

CMOs and CIOs must work together to create this companywide transformation.



Forrester has a four-part blueprint for strategy in the age of the customer, including the following imperatives to help establish new competitive advantages:



Transform the customer experience to gain sustainable competitive advantage.



Accelerate your digital business with new technology strategies that fuel business growth.



Embrace the mobile mind shift by giving customers what they want, when they want it.



Turn (big) data into business insights through innovative analytics.

Appendix D: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organizations to determine the most appropriate discount rate to use in their own environment.

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.

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.

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.

Return on investment (ROI): A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

A NOTE ON CASH FLOW TABLES

The following is a note on the cash flow tables used in this study (see the example table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in years 1 through 3 are discounted using the discount rate (shown in the Framework Assumptions section) at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations are not calculated until 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.

TABLE [EXAMPLE]
Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

Appendix E: Endnotes

¹ Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information, see the section on Risks.