A Forrester Total Economic Impact™ Study

Commissioned By

Red Hat

Project Director:
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June 2016

The Total Economic Impact™ Of Red Hat CloudForms

Service Management And Delivery Efficiencies Enabled By Red Hat CloudForms

FORRESTER®

Table Of Contents

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Executive Summary

In June 2016, Red Hat commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Red Hat CloudForms. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of CloudForms on their organizations.

CloudForms is a cloud management platform that can simplify complex hypervisor and hybrid cloud environments across multiple providers, management tools, and overlapping policy implementations.

To better understand the benefits, costs, risks, and long-term flexibility associated with CloudForms, Forrester interviewed an existing customer with at least six months of experience using the solution. Prior to adopting CloudForms, the interviewed customer, a large US software company, developed a homegrown solution with internal resources. The internal system became too challenging to maintain and update based on the growing complexity and velocity of demands from business units. When the organization could no longer answer certain requests with full, timely updates but only workarounds, it decided to look at external solutions and compare vendor costs with the time and effort involved in adjusting code and deploying new features. Red Hat CloudForms was chosen out of a pool of 10 vendors due to its ability to not only satisfactorily complete the customer's 140 use-case proof-of-concept (POC) test, but also complete more than 140 use cases in one and a half weeks when given a two-week allowance.

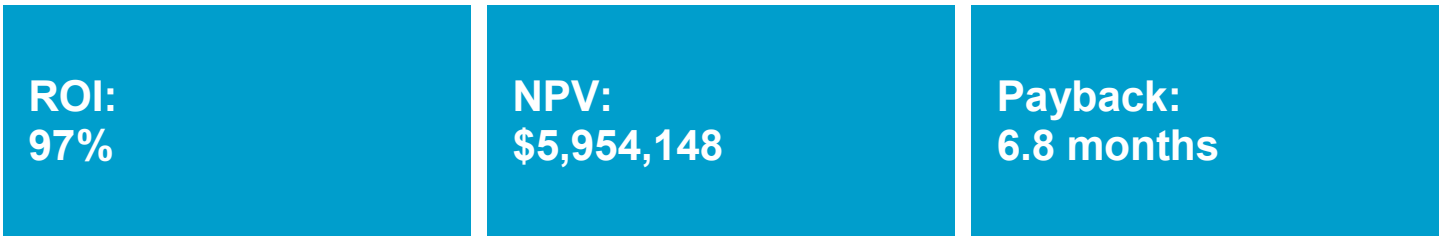
> *"We wanted to focus on integrations and business logic, not the actual provisioning mechanism and worrying about the technical complexities of provisioning a three-tier 15-instance application in two different data centers and the tasks involved."*
>
> ~ Infrastructure engineering group manager, large US software company

RED HAT CLOUDFORMS UNIFIES AND IMPROVES THE EFFICIENCY OF SERVICE MANAGEMENT AND SERVICE DELIVERY

Our interview with an existing customer and subsequent financial analysis found that the interviewed organization experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1.[1] See Appendix A for a description of the interviewed organization.

The interviewed customer experienced three-year risk-adjusted benefits of $12,065,906 versus costs of $6,111,759, resulting in a net present value (NPV) of $5,954,148.

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



Source: Forrester Research, Inc.

› **Benefits.** The interviewed organization experienced the following risk-adjusted benefits:

- **Unified service management efficiency ($8,590,662).** This benefit focuses on the reduction in labor and effort to develop, maintain, and upgrade the internally built solution. The interviewed customer was able to reduce 45 allocated resources to continually update and provision to 10 resources in the first year of deploying Red Hat CloudForms. This 10-person team would be reduced to eight in Year 2 and seven by Year 3. This allowed the customer to reallocate resources to other business enabling and future-thinking custom projects. This can be interpreted as either an approximately 80% efficiency improvement or that the previous state was 4.5x less efficient.
- **Unified service delivery efficiency ($3,475,244).** This benefit centers on the reduction in labor and effort to provision and answer business user requests during the organization's three-month peak season. In past peak seasons, a group of 100 internal resources from different departments and 30 contractors would be collocated for three months to answer all business unit requests. After the first year of deploying Red Hat CloudForms, the customer was able to provision 50% quicker with the same volume of staff. By the second year, the customer was able to provision 91.7% quicker and did not need any of the 30 contractors anymore.

› **Costs.** The interviewed organization experienced the following risk-adjusted costs:

- **Red Hat CloudForms software and services solution cost ($3,703,598).** This cost focuses on the annual subscription fees for Red Hat CloudForms software and services over three years.
- **Internal labor and implementation ($2,408,160).** This cost centers on the upfront deployment and ongoing maintenance time and effort.

Disclosures

The reader should be aware of the following:

- The study is commissioned by Red Hat 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 Red Hat CloudForms.
- Red Hat 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.
- Red Hat provided the customer name for the customer interview but did not participate in the interview.

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 deploying CloudForms. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

APPROACH AND METHODOLOGY

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

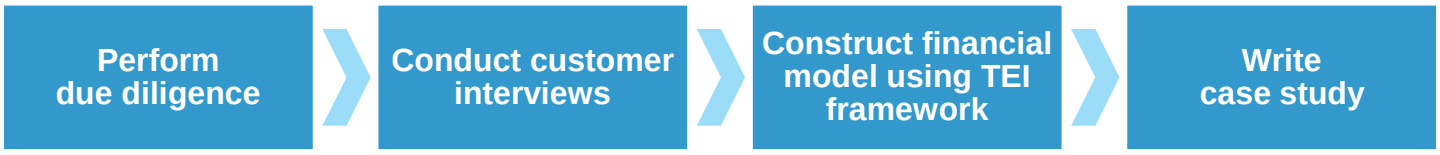
- Interviewed Red Hat CloudForms marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to Red Hat CloudForms' marketplace.
- Interviewed one organization currently using Red Hat CloudForms to obtain data with respect to costs, benefits, risks, and long-term flexibility.
- 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.
- Risk-adjusted the financial model based on issues and concerns the interviewed organization highlighted in the interview. Risk adjustment is a key part of the TEI methodology. While the interviewed organization 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 CloudForms' value: 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

INTERVIEWED CUSTOMER DESCRIPTION

For this study, Forrester interviewed a large, US-based software company with the following characteristics:

- Over $4 billion in annual revenue selling software to businesses and consumers.
- More than 7,500 staff, with 45 on the infrastructure engineering team and 10 specifically allocated to Red Hat CloudForms.
- Twenty-five thousand virtual machines and 4,000 hosts by Year 2 of its Red Hat CloudForms deployment.
- Use of Red Hat CloudForms by the product infrastructure group, which is responsible for business unit requests and applications.

INTERVIEW HIGHLIGHTS

The interviewed customer highlighted the following pre-Red Hat CloudForms issues and gaps, technology selection criteria and goals, and post-Red Hat CloudForms deployment results.

Situation

Prior to engaging Red Hat CloudForms, the interviewed customer developed, maintained, and updated an internally built solution. The maintenance and upgrading became a challenge when business unit demands became more complex and frequent. The solution was also maintained by resources from different teams, thus amplifying the negative impacts of staff turnover and resulting effort for knowledge transfer and potential knowledge gaps.

Solution

The interviewed customer took a three-step approach to select a suitable solution. In the first step, the customer researched 10 external solutions through publicly available content. The customer narrowed them down to six external vendors that participated in a 4-hour technical assessment to conceptually discuss how each vendor would handle the customer's environment as compared with the homegrown tool. The customer finally narrowed them down to two vendors for a two-week POC.

The POC consisted of evaluating how each solution performed against the customer's 140 use cases. While the alternative solution experienced several different issues related to infrastructure and lab environments during an extended POC of six weeks, Red Hat CloudForms was able to successfully complete more than the 140 prescribed use cases in only one and a half weeks.

> *"During our peak season, we have 100 people from different teams plus 30 contractors in one room to ensure all infrastructure is rendered, working, tested, and apps loaded. We were 50% faster in Year 1; reliability [went] from 65% to 90%. By Year 2, reliability [went] to 99.9%, no contractors, and we only needed one week to do three months of work."*
>
> ~ Infrastructure engineering group manager, large US software company

> *"We saw a 40-point increase in our NPS. . . . And instead of a 16-month payoff, we deployed four months quicker, got better-than-expected results, and broke even around eight months."*
>
> ~ Infrastructure engineering group manager, large US software company

Each organization should have its own criteria and technology selection process — the following is a sample of example use cases that the interviewed customer mentioned:

- Due to the company's heavy security constraints, apply different provisioning restrictions to different groups and adjust them uniquely and under a single tenant.
- Integrate with Active Directory (AD) to have the same message groups.
- Apply SSO.

After selecting Red Hat CloudForms, the interviewed customer deployed with the following goals:

- Deploy without disruption to the company's peak season.
- Replace the internally developed solution, and reduce time and effort for service management.
- Reduce time, effort, and complexity for service delivery, and allow for a shorter time-to-market for business users.
- Build a foundation to incorporate a hybrid cloud environment and potential chargeback systems in the future.

Results

The interview revealed the following themes:

- **The benefit of simplifying complexity is amplified by the level of complexity in the prior state.** Red Hat CloudForms is a cloud management platform that allows users to manage multiple virtual, private cloud, and public cloud environments, tools, and sets of policies with one consolidated platform. The value of simplifying and consolidating is greater when the prior state is more complex. Complexity could relate to multiple data centers, public cloud deployments, or internally developed solutions that have become difficult to maintain. The higher the cost of time and effort required to operate a complex environment, the higher the value of simplifying that environment.
- **Technology teams shift focus, talent, and budget to develop new business capabilities and either outsource or automate operational processes and services.** The customer wanted to focus on its coding instead of worrying about which part of the infrastructure does not work or whether an environment will be provisioned on time. The organization wanted to allocate its best resources to its most important business capabilities and future-looking, custom projects because talent resources are trained, have context, and understand the company's mission and objectives. Conversely, nontalent resources like cash do not have functional expertise or context; thus, process-driven activities that can be standardized and automated by software can be resourced with funding instead of talent, as long as the software solution costs less than applying trained and context-rich talent to develop internally.

BENEFITS

The interviewed organization experienced two benefits in this case study:

- Unified service management efficiency.
- Unified service delivery efficiency.

Unified Service Management Efficiency

The interviewed customer needed 45 internal resources to maintain and update the internally developed solution. After deploying Red Hat CloudForms with 12 resources, the customer only needed 10 for ongoing operations in Year 1. In Year 2, the customer was able to offload two more resources, and it expects to stabilize with seven resources by Year 3. This frees up 35 to 38 resources that can be reallocated for other activities and projects with more value-add.

The total three-year risk-adjusted benefit value of unified service management efficiency is $10,386,702, as shown in Table 1.

TABLE 1
Unified Service Management Efficiency

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	Pre-CloudForms development and maintenance resources	Customer provided	45	-	-	-
A2	CloudForms efficiency	$1-(A3/A1_{initial})$	-	77.8%	82.2%	84.4%
A3	Post-CloudForms development and maintenance resources	D1	-	10	8	7
A4	Annual salary	D3	$100,000	$100,000	$103,000	$106,090
At	Unified service management efficiency	$(A1*A4)_{initial}-(A3*A4)$	-	$3,500,000	$3,676,000	$3,757,370
	Risk adjustment	↓5%				
Atr	**Unified service management efficiency (risk-adjusted)**		**$0**	**$3,325,000**	**$3,492,200**	**$3,569,502**

Source: Forrester Research, Inc.

Unified Service Delivery Efficiency

In addition to the offloading time and effort it required to maintain an internal solution, the customer experienced material efficiencies in service delivery and provisioning environments. Prior to deploying Red Hat CloudForms and during its peak season each year, the customer brought together 100 internal resources from different teams and 30 contractors for three months to answer all business unit requests and ensure minimal failure rates during peak season.

In the first year of deployment, provisioning time improved by 50% and reliability improved from 65% to 90%. In the second year, the customer was able to provision 1,500 virtual machines in 24 hours, complete the environment in one week, and attain 99.9% reliability, and it did so without contractor support. Furthermore, the organization's Net Promoter Score (NPS) improved by 40 points.[2]

The total three-year risk-adjusted benefit value of unified service delivery efficiency is $4,275,000, as shown in Table 2.

TABLE 2
Unified Service Delivery Efficiency

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
B1	Pre-CloudForms contractor resources	Customer provided	30	30	30	30
B2	Hourly wage	Customer provided	$125	$125	$125	$125
B3	Peak season days	Customer provided	60	60	60	60
B4	Pre-CloudForms peak season contractor cost	B1*B2*B3*8	$1,800,000	-	-	-
B5	CloudForms time efficiency	Customer provided	-	50.0%	91.7%	91.7%
B6	CloudForms labor efficiency	Customer provided	-	0%	100%	100%
B7	Post-CloudForms peak season contractors needed	B1*(1-B6)	-	30	0	0
B8	Post-CloudForms peak season time-to-market	B3*(1-B5)	-	30	5	5
B9	Post-CloudForms peak season contractor cost	B2*B7*B8*8	-	$900,000	$0	$0
Bt	Unified service delivery efficiency	$B4_{initial}$-B9	-	$900,000	$1,800,000	$1,800,000
	Risk adjustment	↓5%				
Btr	**Unified service delivery efficiency (risk-adjusted)**		**$0**	**$855,000**	**$1,710,000**	**$1,710,000**

Source: Forrester Research, Inc.

Total Benefits

Table 3 shows the total of all benefits across the two quantified areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the interviewed customer expects risk-adjusted total benefits to be a PV of $12,065,906.

TABLE 3
Total Benefits (Risk-Adjusted)

Ref.	Benefit Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Unified service management efficiency	$0	$3,325,000	$3,492,200	$3,569,502	$10,386,702	$8,590,662
Btr	Unified service delivery efficiency	$0	$855,000	$1,710,000	$1,710,000	$4,275,000	$3,475,244
	Total benefits (risk-adjusted)	**$0**	**$4,180,000**	**$5,202,200**	**$5,279,502**	**$14,661,702**	**$12,065,906**

Source: Forrester Research, Inc.

COSTS

The interviewed organization experienced two costs associated with the solution:

- Red Hat CloudForms software and services solution cost.
- Internal labor and implementation.

Red Hat CloudForms Software And Services Solution Cost

The customer highlighted that it had approximately 25,000 virtual machines and 4,000 hosts by Year 2. The customer also provided an estimated investment in licensing that included standard and premium offerings. The summarized cost for software and services is shown in Table 4 for reference and to provide context for this case study's financial summary metrics. As pricing could vary, readers are encouraged to directly reach out to Red Hat for a quote and to determine which offerings are most suitable for their environment.

The total three-year risk-adjusted solution cost is $4,310,250, as shown in Table 4.

TABLE 4
Red Hat CloudForms Software And Services Solution Cost

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Software and services	Red Hat and customer provided	$1,368,333	-	$1,368,333	$1,368,333
Ct	Red Hat CloudForms solution cost	C1	$1,368,333	-	$1,368,333	$1,368,333
	Risk adjustment	↑5%				
Ctr	**Red Hat CloudForms solution cost (risk-adjusted)**		**$1,436,750**	**$0**	**$1,436,750**	**$1,436,750**

Source: Forrester Research, Inc.

Internal Labor And Implementation

The customer highlighted that deployment took five to six months with 12 resources. The team was then reduced to 10 resources for ongoing operations in Year 1, reduced again to eight in Year 2, and finally reduced to seven in Year 3.

The total three-year risk-adjusted cost of labor is $2,799,962, as shown in Table 5.

TABLE 5
Internal Labor And implementation

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	IT resources	Customer provided	12	10	8	7
D2	Months	Customer provided	6	6	12	12
D3	Annual salary	Initial and Year 1: assumption Years 2 and 3: $D3_{py}$*103%	$100,000	$100,000	$103,000	$106,090
D4	Dedicated portion	D2/12	50%	50%	100%	100%
Dt	Internal labor and implementation	D1*D3*D4	$600,000	$500,000	$824,000	$742,630
	Risk adjustment	↑5%				
Dtr	**Internal labor and implementation (risk-adjusted)**		**$630,000**	**$525,000**	**$865,200**	**$779,762**

Source: Forrester Research, Inc.

Total Costs

Table 6 shows the total of all costs as well as associated PVs, discounted at 10%. Over three years, the interviewed organization expects total costs to be a PV of $6,846,797.

TABLE 6
Total Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Ctr	Red Hat CloudForms solution cost	$1,436,750	$0	$1,436,750	$1,436,750	$4,310,250	$3,703,598
Dtr	Internal labor and implementation	$630,000	$525,000	$865,200	$779,762	$2,799,962	$2,408,160
	Total costs (risk-adjusted)	**$2,205,000**	**$525,000**	**$2,597,700**	**$2,685,512**	**$8,013,212**	**$6,846,797**

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 and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix B).

The interviewed customer has engaged with Amazon Web Services (AWS) and plans to expand its public cloud footprint. As it determines its public cloud strategy, addresses security concerns, and identifies the best way to leverage public cloud, the customer will fold the public cloud component into CloudForms management.

The customer's product infrastructure group also recognizes that it is not categorized as a profit center or revenue-generating group in the accounting system. This designation or nondesignation has made it technically difficult to create a chargeback; thus, the company has operated with cost allocation by business unit instead. With that context, an internal chargeback model may still be possible in the future as CloudForms sets the foundation for it.

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 CloudForms 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 CloudForms, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

TABLE 7
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Unified service management efficiency	↓ 5%
Unified service delivery efficiency	↓ 5%
Costs	**Adjustment**
Red Hat CloudForms software and services solution cost	↑ 5%
Internal labor and implementation	↑ 5%

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:

- Continuing to operate and maintain the legacy, internally developed solution.
- Overstaffing and overbudgeting resource needs in the context of more efficient operations and provisioning.

The following implementation risks that affect costs are identified as part of this analysis:

- Scaled-up infrastructure and virtualization demands.
- Deployment delays and peak season infrastructure lockdowns.

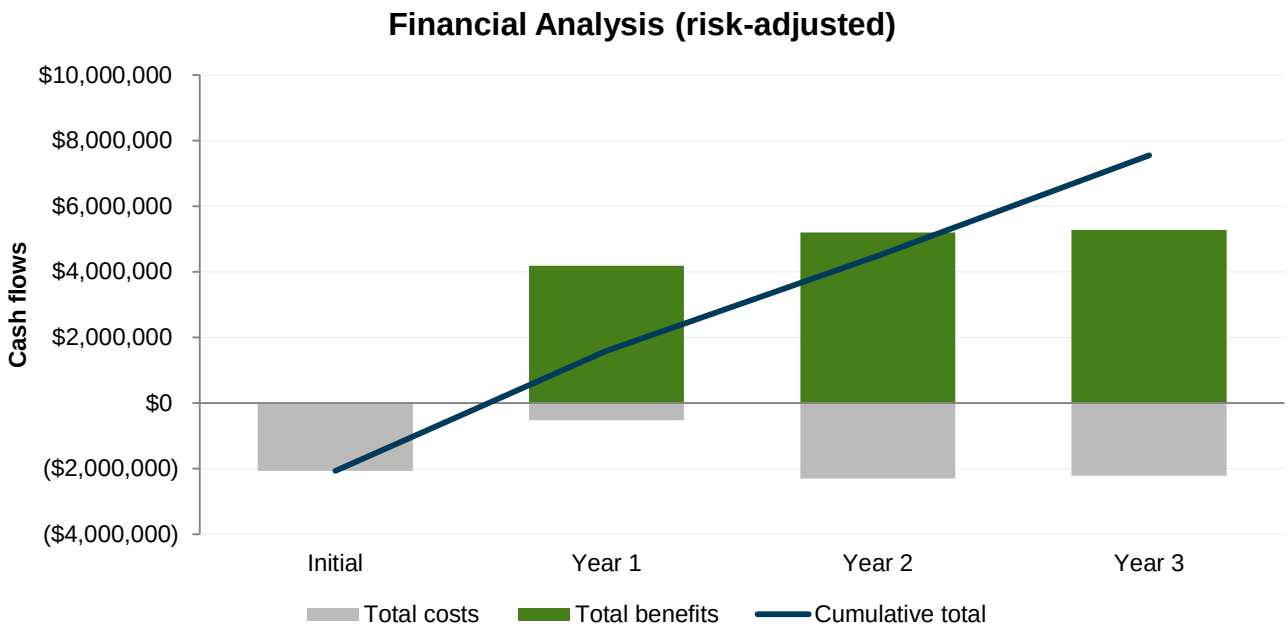
Table 7 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the interviewed organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

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 interviewed organization's investment in CloudForms.

Table 8 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 7 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 8
Cash Flow (Risk-Adjusted)

Summary	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($2,066,750)	($525,000)	($2,301,950)	($2,216,512)	($7,110,212)	($6,111,759)
Total benefits	$0	$4,180,000	$5,202,200	$5,279,502	$14,661,702	$12,065,906
Total	**($2,066,750)**	**$3,655,000**	**$2,900,250**	**$3,062,990**	**$7,551,490**	**$5,954,148**
ROI			**97%**			
Payback period (months)			**6.8 months**			

Source: Forrester Research, Inc.

CloudForms: Overview

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

Managing a complex, hybrid IT environment can require multiple management tools, redundant policy implementations, and extra staff to handle the operations. Red Hat CloudForms simplifies IT, providing unified management and operations in a hybrid environment.

As IT infrastructure progresses from traditional virtualization toward an infrastructure-as-a-service (IaaS) model, CloudForms evolves, protecting investments and providing consistent user experience and functionality. Highlighted capabilities include:

› **Accelerate service delivery and reduce operational costs.**

- Self-service portal and catalog with automatic provisioning.
- Workload life-cycle management, including reconfiguration and retirement.
- Resource quota enforcement, cost allocation, and chargeback.

› **Improve operational visibility and control.**

- Continuous discovery, monitoring, and tracking.
- Resource usage, optimization, and capacity planning.
- Entity relationship planning with timelines and events.

› **Ensure compliance and governance.**

- Automated policy enforcement and remediation.
- Segmented user access with approval workflows.
- Configuration auditing, change tracking, and drift analysis.

Appendix A: Interviewed Customer Description

For this study, Forrester interviewed a large, US-based software company with the following characteristics:

- Over $4 billion in annual revenue selling software to businesses and consumers.
- More than 7,500 staff, with 45 on the infrastructure engineering team and 10 specifically allocated to CloudForms.
- Twenty-five thousand virtual machines and 4,000 hosts by Year 2 of its CloudForms deployment.
- Use of CloudForms by the product infrastructure group, which is responsible for business unit requests and applications.

INTERVIEW HIGHLIGHTS

The interviewed customer highlighted the following pre-CloudForms issues and gaps, technology selection criteria and goals, and post-CloudForms deployment results.

Situation

Prior to engaging CloudForms, the interviewed customer developed, maintained, and updated an internally built solution. The maintenance and upgrading became a challenge when business unit demands became more complex and frequent. The solution was also maintained by resources from different teams, thus amplifying the negative impacts of staff turnover and resulting effort for knowledge transfer and potential knowledge gaps.

Solution

The interviewed customer took a three-step approach to select a suitable solution. In the first step, the customer researched 10 external solutions through publicly available content. It narrowed them down to six external vendors that participated in a 4-hour technical assessment to conceptually discuss how each vendor would handle the customer's environment as compared with the homegrown tool. The customer finally narrowed them down to two vendors for a two-week POC.

The POC consisted of evaluating how each solution performed against the customer's 140 use cases. While the alternative solution experienced several different issues related to infrastructure and lab environments during an extended POC of six weeks, Red Hat CloudForms was able to successfully complete more than the 140 prescribed use cases in only one and a half weeks.

Each organization should have its own criteria and technology selection process — the following is a sample of example use cases that the interviewed customer mentioned:

- Due to the company's heavy security constraints, apply different provisioning restrictions to different groups and adjust them uniquely and under a single tenant.
- Integrate with AD to have the same message groups.
- Apply SSO.

After selecting CloudForms, the interviewed customer deployed with the following goals:

- Deploy without disruption to the company's peak season.
- Replace the internally developed solution, and reduce time and effort for service management.
- Reduce time, effort, and complexity for service delivery, and allow for a shorter time-to-market for business users.
- Build a foundation to incorporate a hybrid cloud environment and potential chargeback systems in the future.

FRAMEWORK ASSUMPTIONS

Table 9 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 9
Model Assumptions

Ref.	Metric	Value
X1	Hours per week	40
X2	Weeks per year	52
X3	Hours per year (M-F, 9-5)	2,080
X4	Hours per year (24x7)	8,760
X5	Annual salary (IT FTE)	$100,000
X6	Contractor hourly wage	$65
X7	Salary growth	3%
X8	Company/infrastructure growth	10%
PY	Previous year	

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.

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: 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 D: 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.

[2] Net Promoter and NPS are registered service marks, and Net Promoter Score is a service mark, of Bain & Company, Inc., Satmetrix Systems, Inc., and Fred Reichheld.