

A Forrester Total Economic Impact™
Study Commissioned By Dell Technologies, VMware,
And Intel Corporation
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The Total Economic Impact™ Of APEX Cloud Services

Cost Savings And Business Benefits
Enabled By APEX Hybrid Cloud

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Executive Summary

Key Benefits



Avoided rearchitected and migration costs:
90% per VM, equaling \$326,455



Reduced and avoided infrastructure management effort:
19%, equaling \$230,345

Dell Technologies commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying APEX Hybrid Cloud. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of APEX Hybrid Cloud on their organizations.

APEX Hybrid Cloud provides a hybrid cloud platform that helps its customers unify management and migrate workloads between their private and public clouds. To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed eight customers with experience using APEX Hybrid Cloud.

Prior to using APEX Hybrid Cloud, the interviewed organizations were managing an on-premises private cloud and made a strategic decision to migrate a portion of their workloads to public cloud (while keeping the remainder on-premises). However, after evaluating their choices (one of which being to migrate their workloads to a public cloud environment), organizations were concerned about: a potential loss of control over their environment; a significant effort to rearchitect applications and workloads to run in a public cloud; and additional management overhead and silos that would be required in managing multiple and separate environments.

The interviewed organizations decided to deploy APEX Hybrid Cloud. This resulted in significant incremental benefits over the alternative of spinning up a separately managed native public cloud environment, as detailed in this case study. With APEX Hybrid Cloud, organizations reduced and avoided: migration and rearchitecting costs, and infrastructure management effort.

Forrester developed a composite organization based on data gathered from the customer interviews to reflect the total economic impact that APEX Hybrid Cloud could have for an organization. The composite organization is representative of the organizations that Forrester interviewed and is used to present the aggregate financial analysis in this study; for this analysis, the composite is modeled as a global organization with \$200 million in annual revenue.

All values are reported in risk-adjusted, three-year present value (PV) unless otherwise indicated.

Key Financial Findings

Quantified benefits. The following benefits reflect the financial analysis associated with the composite organization.

- › **Reduced and avoided migration and rearchitecting costs by 90% per VM, totaling \$326,455.** Interviewed organizations noted that with APEX Hybrid Cloud there is a consistent infrastructure abstraction of the VMware software-defined data center (SDDC) available across both private and public cloud infrastructure. This means that they can easily move VMs from private to public cloud environment without making any changes to their existing workloads. This results in a significant reduction in potential migration and rearchitecting effort that would otherwise be needed in order to move workloads off their private cloud and onto a native public cloud environment.



Incremental ROI
171%



Benefits PV
\$556,800



NPV
\$351,626



Payback
< 6 months

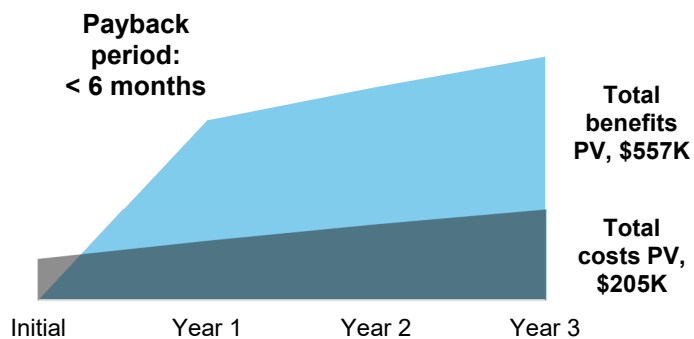
- › **Reduced and avoided infrastructure management effort by 19%, totaling \$230,345.** The consistent management layer provided by APEX Hybrid Cloud allowed them to reduce management effort in moving to the public cloud. It is possible because the IT administrators are using the already familiar VMware tools. Interviewed organizations were also able to avoid spinning up or implementing a separate public cloud management effort and processes that would have been required if they were to migrate their workloads to a native public cloud infrastructure. In addition, it avoided any management efforts of maintaining consistent policies and security between the multiple environments, which averted any issues from potentially falling through the cracks.

Costs. The following costs reflect the financial analysis associated with the composite organization.

- › **Incremental subscription costs of \$100,501.** While there are subscription costs associated with APEX Hybrid Cloud, these are partially offset by costs associated with public cloud that would have otherwise been paid, regardless of the approach taken.
- › **Implementation and training costs of \$104,673.** Customers noted both implementation and training costs associated with migrating to a hybrid cloud environment with APEX Hybrid Cloud.

Forrester's interviews with eight existing customers and subsequent financial analysis found that a composite organization experienced incremental benefits of \$556,800 over three years versus incremental costs of \$205,174, adding up to an incremental net present value (NPV) of \$351,626 and an incremental ROI of 171%.

Financial Summary



The TEI methodology helps companies demonstrate, justify, and realize the tangible value of technology initiatives to both senior management and other key business stakeholders.

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing APEX Hybrid Cloud.

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 APEX Hybrid Cloud can have on an organization:



DUE DILIGENCE

Interviewed Dell stakeholders and Forrester analysts to gather data relative to APEX Hybrid Cloud.



CUSTOMER INTERVIEWS

Interviewed eight organizations using APEX Hybrid Cloud to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewed organizations.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.



CASE STUDY

Employed eight fundamental elements of TEI in modeling APEX Hybrid Cloud's impact: 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 A for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Dell, VMware, & Intel Corporation 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 APEX Cloud Services.

The sponsoring companies 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.

The sponsoring companies provided the customer names for the interviews but did not participate in the interviews.

The APEX Hybrid Cloud Customer Journey

BEFORE AND AFTER THE APEX HYBRID CLOUD INVESTMENT

Interviewed Organizations

For this study, Forrester conducted eight interviews with APEX Hybrid Cloud customers. Interviewed customers include the following:

INDUSTRY	REGION	INTERVIEWEE	REVENUE
Engineering services	Global	IT manager	\$40 million
Financial services	North America	Manager, system engineering	\$300 million
Higher education	North America	Director of cloud platforms	N/A
IT services	Global	Director	\$10 million
Media	North America	Cloud and infrastructure architect	\$1 billion
Security	North America	Senior director, cloud and data center engineering	\$4 billion
Technology	North America	IT director	\$250 million
Technology	Global	VP, strategy and products	\$10+ billion

Key Challenges Before APEX Hybrid Cloud

Before the investment in APEX Hybrid Cloud, interviewees described the following potential challenges they wanted to solve for before moving to a public cloud environment:

- › **Potential loss of control over their environment with a move to public cloud.** Companies voiced concern over a potential loss of control over their environment with a move to public cloud, stating that much of the tuning and security of their environment would be essentially outsourced to a third party.
- › **Significant effort to rearchitect applications and workloads to run in a specific public cloud.** Without APEX Hybrid Cloud, moving workloads over to a cloud-native environment would take significant rearchitecting effort to ensure the applications would still work appropriately.
- › **Additional management overhead and silos in managing multiple and separate environments.** APEX Hybrid Cloud allows companies to move workloads easily into a public cloud environment and manage those workloads with a single set of tools.

A senior director told Forrester: “We run a very small staff, and so, being able to use the same people for managing workloads both on-premises and in the cloud through the VMware tools that we were already familiar with was one of the biggest driving factors.”

Key Results With APEX Hybrid Cloud

The interviews revealed that, compared to pursuing a native public cloud environment, the investment in APEX Hybrid Cloud addressed the

challenges interviewees are trying to solve for:

- › **Avoided migration and rearchitecting costs.** Organizations avoided the need to rearchitect their applications for the cloud by expanding their capacity via VMware with VMC on AWS public cloud resources. This results in a significant reduction in migration effort and the elimination of rearchitecting effort that would otherwise be needed in order to move workloads off their private cloud and onto a native public cloud environment.
- › **Reduced and avoided infrastructure management effort.** In addition to avoiding spinning up a separate public cloud management effort, companies were able to avoid any efforts associated with maintaining consistent policies and security between the multiple environments and any issues from potentially falling through the cracks.

Composite Organization

Forrester constructed a TEI framework, a composite company, and an associated ROI analysis to evaluate the Total Economic Impact of APEX Cloud Services. The composite organization is representative of the eight interviewed APEX Hybrid Cloud customer companies and is used to present the aggregate financial analysis. The composite organization:

- › Is a global organization with \$200 million in annual revenue.
- › Has four infrastructure IT FTEs managing its private cloud, from which a portion of workloads will be migrated to the public cloud.
- › Has decided to deploy Dell Technology Cloud for its cloud environment, instead of creating a separate native public cloud environment.

Incremental ROI Analysis

In this case study, Forrester is evaluating an incremental ROI. Forrester is making an assumption that the composite organization has already decided to expand its private cloud capacity by adding public cloud resources, and now they have to make the choice between APEX Hybrid Cloud or pursuing a native public cloud environment. This case study both evaluates the incremental benefits of APEX Hybrid Cloud above and beyond that of a native public cloud environment and compares it against the incremental costs in order to determine the incremental return on that incremental investment.

Key assumptions:

- Global organization
- \$200M annual revenue
- Using APEX Hybrid Cloud to manage its hybrid cloud environment

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	Avoided migration and rearchitecting costs	\$359,100	\$0	\$0	\$359,100	\$326,455
Btr	Reduced and avoided infrastructure management effort	\$92,625	\$92,625	\$92,625	\$277,875	\$230,345
Total benefits (risk-adjusted)		\$451,725	\$92,625	\$92,625	\$636,975	\$556,800

Benefit 1: Avoided Migration And Rearchitecting Costs

The APEX Hybrid Cloud solution features consistent infrastructure, meaning it leverages the same SDDC abstraction (based on VMware Cloud Foundation) in both private and public cloud data centers. Due to a consistent management platform, i.e., the ability to control on-premises and public cloud-based infrastructure using one tool, interviewed organizations noted that with APEX Hybrid Cloud the same virtual machine (VM) will be able to run unchanged in a public cloud data center. Because there is no need to modify the application, they can easily move VMs from private to public cloud environments. This results in a significant reduction in migration effort and an elimination of rearchitecting effort that would otherwise be needed in order to move workloads off their private cloud and onto a native public cloud environment.

Based on the customer interviews, Forrester modeled the financial impact for the composite organization with the following estimates:

- › Three hundred (300) VMs are migrated from the on-premises private cloud to VMC on AWS.
- › Avoided 20 hours of effort to migrate each VM with APEX Hybrid Cloud (note that an application could be split-hosted on multiple VMs).
- › Average fully burdened annual salary of \$130,000 for IT FTEs.

This benefit can vary due to uncertainty related to:

- › Number of VMs migrated.
- › Avoided effort to migrate each VM.
- › Average fully burdened salary.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a risk-adjusted benefit of \$359,100, which has a PV of \$326,455.

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to have a PV of \$556,800.

Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

Benefit 1: Avoided Migration And Rearchitecting Costs Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Number of VMs migrated	Composite organization	300		
A2	Avoided migration hours per VM	Composite organization	20		
A3	Subtotal: Avoided labor hours	A1*A2	6,000		
A4	Fully burdened annual salary	Composite organization	\$130,000		
A5	Fully burdened hourly salary	A4/2,080 (rounded)	\$63		
At	Avoided migration and rearchitecting costs	A3*A5	\$378,000	\$0	\$0
	Risk adjustment	↓5%			
Atr	Avoided migration and rearchitecting costs (risk-adjusted)		\$359,100	\$0	\$0

Benefit 2: Reduced And Avoided Infrastructure Management Effort

Interviewed organizations described the following benefits related to the reduced and avoided infrastructure management effort:

- › The APEX Hybrid Cloud approach provides a consistent management approach by using a common set of tools (based on VMware Cloud Foundation) to manage both private cloud and VMC on AWS public cloud deployment options. This means that organizations can avoid having to learn a set of new tools and manage workloads deployed in a public cloud data center. That consistent management approach allowed organizations to realize a reduction in management effort for the resulting combination of private and public cloud resources. Since one set of tools is used, there is no need to maintain knowledge of how to perform management tasks in multiple tools. Companies noted that the same operations personnel can be used to manage both private and VMC on AWS public cloud capacity with APEX Hybrid Cloud.
- › Because of this, they were also able to avoid spinning up a separately managed public cloud environment that would have been otherwise required in order to migrate workloads to a public cloud. This additionally avoids any effort associated with maintaining consistent policies, security, compliance, reliability, support, and servicing across the multiple environments. It also further avoids any issues from potentially falling through the cracks.

While these are two distinct benefits, for the purpose of this analysis they are aggregated into an avoided FTE hire that was originally meant to manage a separate public cloud environment. Based on the customer interviews, Forrester modeled the financial impact for the composite organization with the following estimates:

- › Avoided hiring one FTE with 75% of its time managing a separate native public cloud environment and ensuring consistent policies between environments.

- › Average fully burdened annual salary of \$130,000 for IT FTEs.

This benefit can vary due to uncertainty related to:

- › Avoided native public cloud management effort.
- › Average fully burdened salary.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding an annual benefit of \$92,625, with a three-year, risk-adjusted total PV of \$230,345.

Benefit 2: Reduced And Avoided Infrastructure Management Effort Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Avoided FTE hires	Composite organization	1.0	1.0	1.0
B2	Time spent managing public cloud environment	Composite organization	75%	75%	75%
B3	Fully burdened annual salary	A4	\$130,000	\$130,000	\$130,000
Bt	Reduced and avoided infrastructure management effort	$B1*B2*B3$	\$97,500	\$97,500	\$97,500
	Risk adjustment	↓5%			
Btr	Reduced and avoided infrastructure management effort (risk-adjusted)		\$92,625	\$92,625	\$92,625

Unquantified Benefits Including Security And Operational Efficiency

While there were strong and quantifiable incremental benefits that the interviewed organizations observed by deploying APEX Hybrid Cloud, there are significant qualitative benefits as well. These could potentially be quantified in a financial analysis if given the appropriate data and metrics.

- › **Avoided costs due to disruption and security breaches.** Since APEX Hybrid Cloud allows for a single set of management tools for your hybrid private and public cloud environment, the likelihood of mismatching policies leading to a disruption of service or security breach is significantly reduced, compared to the effort associated with attempting to align policies across separate environments.
- › **Increased revenue opportunities and operational efficiency.** APEX Hybrid Cloud allows companies to seamlessly move workloads between private and VMC on AWS public cloud environments, which allows for more flexibility and scalability to adjust to increases in demand. This can allow companies to capture more revenue opportunities, compared to a private-cloud-only environment that requires more lead time to increase capacity.



Unquantified benefits:

- Avoided disruptions and breaches
- Increased revenue

Analysis Of Costs

QUANTIFIED COST DATA AS APPLIED TO THE COMPOSITE

Total Costs							
REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Ctr	Incremental subscription costs	\$0	\$40,413	\$40,413	\$40,413	\$121,239	\$100,501
Dtr	Implementation and training costs	\$93,142	\$4,637	\$4,637	\$4,637	\$107,053	\$104,673
	Total costs (risk-adjusted)	\$93,142	\$45,050	\$45,050	\$45,050	\$228,291	\$205,174

Cost 1: Incremental Subscription Costs

While there are subscription costs associated with APEX Hybrid Cloud, these are partially offset by costs associated with public cloud that would have otherwise been paid, regardless of the approach taken.

APEX Hybrid Cloud and VMware subscription costs include support and enterprise license costs that are associated with compression and network/security features. In order to evaluate a similar comparison on public cloud, support and enterprise license costs are added to the cost for an equivalent dedicated public cloud host.

Pricing can vary significantly depending on each company's requirements and existing environments; as a reminder, readers are encouraged to evaluate the costs (and benefits) for their own company.

Forrester adjusts this cost upward by 10% to account for risks, yielding an annual incremental subscription cost of \$40,413, with a three-year, risk-adjusted total PV of \$100,501.

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to have a PV of \$205,174.

Cost 1: Incremental Subscription Costs Calculation Table						
REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
C1	VMware subscription costs on AWS	Composite organization		\$328,099	\$328,099	\$328,099
C2	Native public cloud costs	Composite organization		\$291,360	\$291,360	\$291,360
Ct	Incremental subscription costs	C1-C2		\$36,739	\$36,739	\$36,739
	Risk adjustment	↑10%				
Ctr	Incremental subscription costs (risk-adjusted)			\$40,413	\$40,413	\$40,413

Cost 2: Implementation And Training Costs

Customers noted both implementation and training costs that were associated with migrating to a hybrid cloud environment with APEX Hybrid Cloud.

Based on the customer interviews, Forrester modeled the financial impact for the composite organization with the following estimates:

- › Implementation period of one month, requiring one FTE for internal labor and \$50,000 in professional services.
- › Initial 80-hour training for four IT FTEs to manage the hybrid cloud environment, with 16 hours of refresher training each year.
- › Average fully burdened annual salary of \$130,000 for IT FTEs.

This cost can vary due to uncertainty related to:

- › Implementation effort and professional services costs.
- › Required training.

To account for these risks, Forrester adjusted this benefit upward by 15%, yielding an initial cost of \$93,142, an annual cost of \$4,637, and a three-year, risk-adjusted total PV of \$104,673.

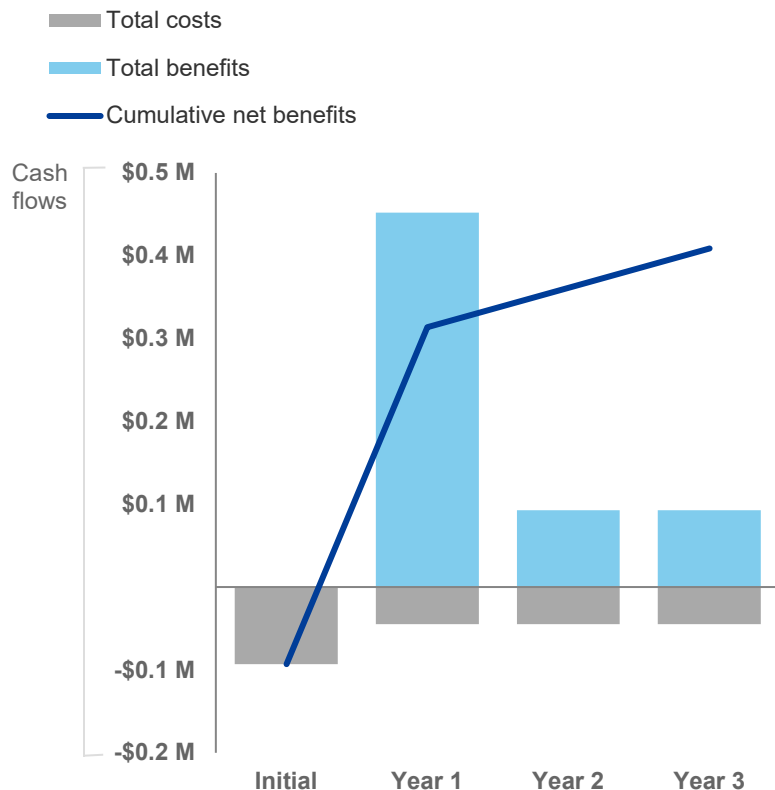
Cost 2: Implementation And Training Costs Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
D1	Implementation professional services	Composite organization	\$50,000	0	0	0
D2	Number of months for implementation	Composite organization	1	0	0	0
D3	Internal FTEs for implementation	Composite organization	1	0	0	0
D4	FTEs requiring training	Composite organization	4	4	4	4
D5	Hours of training per FTE	Composite organization	80	16	16	16
D6	Fully burdened annual salary	A4	\$130,000	\$130,000	\$130,000	\$130,000
D7	Fully burdened hourly salary	A5	\$63	\$63	\$63	\$63
Dt	Implementation and training costs	$D1 + (D2/12)^* (D3*D6) + (D4*D5*D7)$	\$80,993	\$4,032	\$4,032	\$4,032
	Risk adjustment	↑15%				
Dtr	Implementation and training costs (risk-adjusted)		\$93,142	\$4,637	\$4,637	\$4,637

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.



These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$93,142)	(\$45,050)	(\$45,050)	(\$45,050)	(\$228,291)	(\$205,174)
Total benefits	\$0	\$451,725	\$92,625	\$92,625	\$636,975	\$556,800
Net benefits	(\$93,142)	\$406,675	\$47,575	\$47,575	\$408,684	\$351,626
ROI						171%
Payback period						< 6 months

APEX Cloud Services: Overview

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

This research was commissioned by Dell Technologies, VMware, and Intel Corporation, all of which are keenly focused on helping organizations achieve their cloud goals with APEX Cloud Services. Any technology decision must be made with consideration for the people, processes, and current state accounted for. Dell Technologies is focused on meeting organizations where they are and delivering the technology and services solutions necessary to help them architect a winning multicloud IT strategy that builds on existing tools and skillsets to unlock better outcomes.

APEX Cloud Services is a set of cloud infrastructure solutions designed to enable a consistent operating model and simplified management across private clouds, public clouds, and edge locations, which reduces the barriers of cloud adoption and provides the ability to let application and business requirements determine where workloads reside. This vision for APEX Cloud Services is based on an understanding of cloud as an operating model, not a place, and ambition to become the trusted technology partner for organizations that are looking to reduce the complexity of multiple cloud environments with a consistent infrastructure and operations layer.

To learn more about APEX Hybrid Cloud, [start here](#).

Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

Total Economic Impact Approach



Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.



Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.



Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.



Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



Present value (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



Net present value (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.



Return on investment (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



Discount rate

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



Payback period

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.