FORRESTER®

The Total Economic Impact™ Of Cloud And Application Modernization Services From Hitachi Vantara

Cost Savings And Business Benefits Enabled By Cloud And Application Modernization Services

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A FORRESTER TOTAL ECONOMIC IMPACT™ STUDY COMMISSIONED BY HITACHI VANTARA

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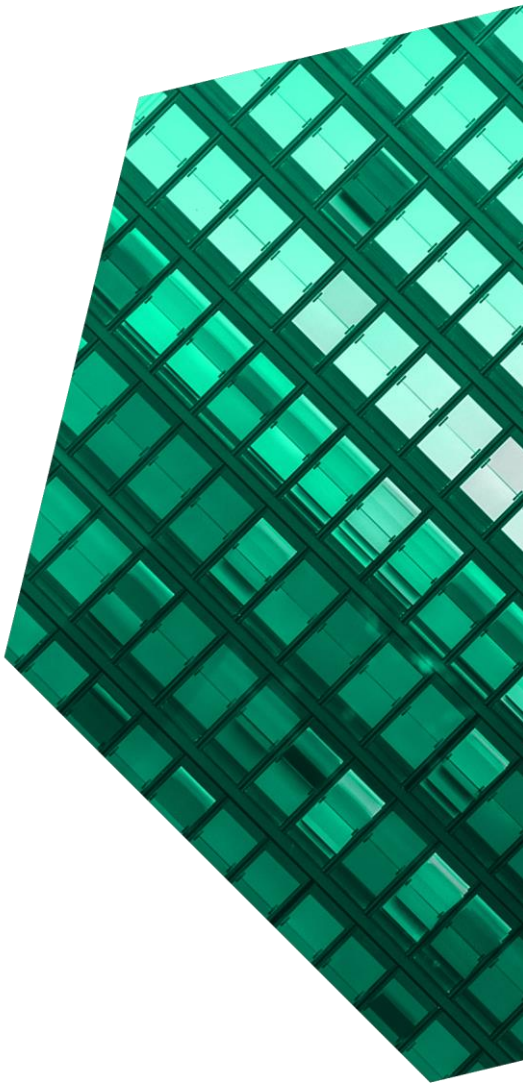
Consulting Team: Rishabh Dua
Kathleen Byrne
Jonathan Lipsitz
Claudia Heaney



ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. For more information, visit forrester.com/consulting.

Executive Summary

Cloud technologies allow organizations to innovate and scale internal processes to meet new business needs. Firms must adapt to the cloud to access cloud-native resources and tools and remain competitive in the marketplace. Cloud and application modernization services from Hitachi Vantara provide the necessary expertise and resources to help organizations migrate infrastructure, modernize applications, and manage the cloud environment to fully utilize the potential of cloud technologies.

Cloud technologies — across cloud infrastructure, cloud database and analytics, cloud development, and cloud applications — have become critical business assets. Without these technologies, organizations lack the speed and tools to innovate, scale processes, or focus on differentiation as opposed to simple maintenance of systems.[1]

Organizations prioritize application modernization in response to trends toward digital-first business models. With the fast pace of change and evolution, there is additional pressure to stay ahead of the curve; 36% of infrastructure decision-makers see increasing cloud-native applications within their organizations as a critical priority.[2] Cloud-native technologies (e.g., containers, serverless, and even cloud platform use overall) add little value without the support of modernized practices and systems.[3]

Furthermore, organizations implementing cloud technologies require employees with the skills to work on these technologies but face a skills gap internally and struggle to hire the right talent.[4] Digital acceleration will push reform, and cloud-native adoption will continue to rise as container adoption hits 50% and organizations pursue cloud efficiencies, scalable solutions, and unique customization.[5] Cloud and application modernization services from Hitachi Vantara help organizations migrate, modernize, and manage applications in the cloud, which in turn enables faster timelines as well as the latest processes and technologies.

KEY STATISTICS

Return on investment (ROI)
114%

Net present value (NPV)
$2.03M

Time saved for cloud migration
7 months

Hitachi Vantara commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study to examine the potential return on investment (ROI) enterprises may realize by deploying cloud and app modernization services from Hitachi Vantara.[6] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of cloud and app modernization services from Hitachi Vantara on their organizations. The analysis describes services including cloud migration and cloud application modernization.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four decision-makers with experience using cloud and app modernization services from Hitachi Vantara. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization.

Prior to using cloud and app modernization services from Hitachi Vantara, customers primarily worked with on-premises solutions and had limited cloud experience. They planned to transform by migrating infrastructure and modernizing applications with in-house resources. However, interviewees' organizations did not have the appropriate in-house expertise to manage the transition to the cloud and larger digital transformation. Moreover, they had insufficient resources to build and manage cloud-native applications despite a market need to adapt to the new cloud-focused environment.

Interviewees stated that using Hitachi Vantara for their cloud infrastructure migration saved them months, compared to how long the migration would have taken had they tried to complete the project themselves. Furthermore, without modernization of applications, processes, and systems, organizations would have been unable to take full advantage of the additional benefits of the cloud, such as new tools and automation capabilities. Additionally, without migration and modernization services from Hitachi Vantara, costs would have been much higher, with additional investments required in hardware and other cloud management services. The services from Hitachi Vantara helped limit resource requirements, decrease spending on cloud-based hardware and software, and support the ongoing management and monitoring of the cloud environment.

Interviewees reported faster cloud implementations with cloud migration services, improved efficiency to rearchitect applications with application modernization tools, and fewer engineering resources required to manage the cloud environment.

Cloud migration completed faster than anticipated

7 months saved

Hitachi Vantara enabled these results through its expertise, cloud best practices, and cloud accelerator platform.

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits for a composite organization based on data collected from four interviews include:

- **Speed to cloud migration, which was 58% faster than planned.** According to interviewees, organizations initially estimated that cloud migration would take a year or more, but cloud migration was completed seven months faster than expected. Moreover, organizations did not need to grow their internal engineering teams as they had originally anticipated for the cloud migration. Improved efficiency of time and resources for cloud migration enabled by Hitachi Vantara totaled more than $300,000.
- **Time savings of 85% for internal engineering teams working on cloud application modernization.** With the Hitachi Vantara tools and resources made available via the updated cloud environment, engineers working on cloud applications were more efficient in refactoring, reengineering, and rearchitecting applications.

> **"We had an idea of how we can get there [for cloud migration], and I'll safely say that we were about 50% wrong. Having a partner in Hitachi Vantara enabled us to pivot, to be able to make those changes, [and] to be able to actually get to a point where we are viable in the cloud."**
>
> *Vice president of R&D, fintech*

Without the tools and resources enabled by Hitachi Vantara, the engineering team would have spent more time trying to modernize applications. This cost avoidance translated to more than $700,000 in total savings over three years.

- **Ongoing support and management services, which saved more than $2.7 million.** Organizations would have continued purchasing and maintaining on-premises hardware; therefore, without Hitachi Vantara's cloud and app modernization services, they would have required additional resources to manage the cloud environment. Given the resources of Hitachi Vantara and its expertise in managing cloud projects, interviewees did not need to hire additional resources and avoided additional spending, which led to a savings of more than $2.7 million over three years.

Unquantified benefits. Benefits that are not quantified for this study include:

- **Improved efficiency for application release management with modernization.** Interviewees noted improved capacity to work on modernized applications with the tools and services available within the cloud environment. Engineering teams were more efficient in building new capabilities and updating applications, with quicker turnaround times for release management.
- **Improved compliance and governance management.** Interviewees realized greater governance and compliance management for regulations using the cloud architecture and Hitachi Vantara's expertise in managing cloud projects.
- **Improved application quality, which led to fewer application failures.** Working with Hitachi Vantara, engineers found greater efficiency with application performance within the cloud environment, resulting in fewer failures.

Costs. Risk-adjusted PV costs include:

- **Implementation and services costs.** Hitachi Vantara services costs include migration, application modernization, and ongoing support. These costs also include the use of automation tools and resources, which allow organizations to leverage Hitachi Vantara's expertise to maximize utilization of the cloud within their organizations.

The decision-maker interviews and financial analysis found that a composite organization experiences benefits of $3.81 million over three years versus costs of $1.78 million, adding up to a net present value (NPV) of $2.03 million and an ROI of 114%.

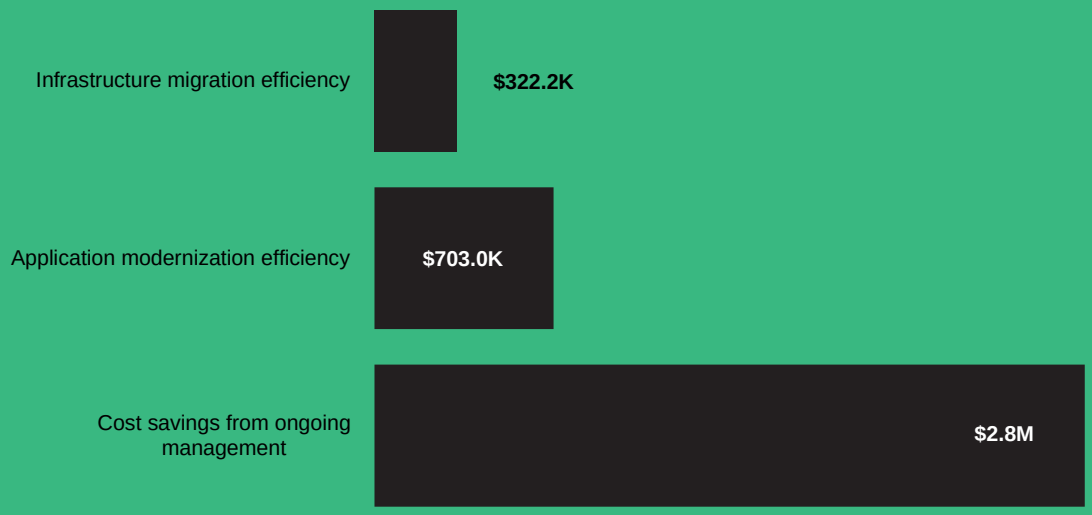
ROI
114%

BENEFITS PV
$3.81M

NPV
$2.03M

PAYBACK
10 months

Benefits (Three-Year)



Being able to bring Hitachi Vantara to the table as a partner — bringing all that provable expertise to the model — gives us that trust and credibility level to move forward.

— Vice president of R&D, fintech

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in cloud and app modernization services from Hitachi Vantara.

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 cloud and app modernization services from Hitachi Vantara can have on an organization.

DUE DILIGENCE

Interviewed Hitachi Vantara stakeholders and Forrester analyst to gather data relative to the cloud and app modernization services.

DECISION-MAKER INTERVIEWS

Interviewed four decision-makers at organizations using cloud and app modernization services from Hitachi Vantara to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' organizations.

FINANCIAL MODEL FRAMEWORK

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

CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The Cloud And App Modernization Services Journey For Hitachi Vantara Customers

Drivers leading to the cloud and app modernization services investment

Interviewed Decision-Makers

Interviewee	Industry	Region	Start Of Cloud Transformation Process	Current Services With Hitachi Vantara
Product owner	Nonprofit	North America	2016	Ongoing management of services
Senior infrastructure and cybersecurity architect	Insurance	North America	2020	Application modernization and ongoing management of services
Vice president of R&D	Fintech	North America	2021	Migration, application modernization, and ongoing management of services
Public cloud delivery manager	Pharmaceuticals	Europe	2019	Application modernization and ongoing management of services

KEY CHALLENGES

The interviewees' organizations originally had on-premises solutions or were trying to build and deploy cloud solutions, either in-house or with third-party cloud providers. They did not feel they had the necessary internal expertise or resources to successfully move to the cloud. Organizations that did have some cloud services in place were struggling to best utilize and maintain those services.

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

- **Lack of internal experience.** Organizations lacked the necessary skills in-house to lead an effective cloud transformation. Leaders were uncertain about how to plan the migration and successfully execute on key outcomes. For example, the senior infrastructure and cybersecurity architect at an insurance firm noted how different teams did not fully grasp how a cloud solution would benefit their organization: "We needed to understand the plan to use the cloud more broadly for the next three to five years." Another necessary element for moving to the cloud is an engineering team whose members have the necessary knowledge and skills to implement a transformation; interviewed

> **"We didn't have the in-house resources, and the main obstacle we faced was understanding how we would get the platform on the appropriate security level."**
>
> *Product owner, nonprofit*

> **"We needed to scale and modernize the environment but lacked the required skill sets."**
>
> *Public cloud delivery manager, pharmaceuticals*

decision-makers were not confident about the relevant capabilities of their internal teams.

Interviewees also recognized the need to develop a strategic timeline for implementing a modern digital cloud transformation, since a project of this magnitude needed to be properly resourced and managed. Overall, organizations' leadership worried that they might fall short if they attempted cloud migration without the required expertise. The product owner at a nonprofit noted the strict security protocols the specific organization required for a cloud environment based on their user profiles and industry.

- **Competitiveness in their markets.** Digital transformation, including the migration from an on-premises environment to the cloud, is an arguably necessary endeavor for any organization aiming for success in an increasingly digital world. The senior infrastructure and cybersecurity architect at an insurance firm noted, "We wanted to be able to offer more cloud solutions as a potential answer to business needs." On-premises solutions lack the accessibility, connectivity, and functionality to work smoothly with cloud tools and environments. Some organizations use a lift-and-shift approach to migration, with the goal of moving applications and associated data to the cloud with minimal changes, but that strategy only provides partial improvements — whereas the accompanying modernization of applications makes the move to the cloud more impactful. Interviewees recognized their need for migration strategies that would position them to take advantage of new, greater capabilities inherent to the cloud or risk being less competitive in the marketplace. The vice president of R&D at a fintech organization noted that company leadership felt they needed to move to the cloud to support market-driven initiatives such as anti-phishing simulations and open banking.

"We needed a partner with experience that could accelerate time-to-market."

Vice president of R&D, fintech

"We needed to pursue a government-related security authorization, which is a fairly complex and arduous process."

Product owner, nonprofit

"We realized if we don't transform, our chances for growth or survival in the long-term future weren't great. The market accelerated, so [moving to the cloud] was necessary."

Vice president of R&D, fintech

COMPOSITE ORGANIZATION

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

Description of composite. The composite organization is a global enterprise with 3,000 employees and annual revenues of $500 million. The organization had been using on-premises business hardware but decided to pursue a digital transformation to improve its operations. The organization planned to increase the size of the engineering team to meet the workload for the transformation project. The initial migration timeline estimated 12 months to completion and planned for 22 applications to be modernized over three years. The composite organization partnered with Hitachi Vantara to support a cloud migration, application modernization, and ongoing maintenance and support for the upgraded environment and applications.

Key assumptions

- **$500 million in revenue**
- **3,000 employees**
- **12-month cloud migration timeline**
- **Plans to modernize 22 applications**

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	Infrastructure migration efficiency	$354,375	$0	$0	$354,375	$322,159
Btr	Application modernization efficiency	$251,556	$280,179	$323,113	$854,849	$703,000
Ctr	Cost savings from ongoing management	$1,120,500	$1,120,500	$1,120,500	$3,361,500	$2,786,518
	Total benefits (risk-adjusted)	$1,726,431	$1,400,679	$1,443,613	$4,570,724	$3,811,677

INFRASTRUCTURE MIGRATION EFFICIENCY

Evidence and data. Typically, organizations view infrastructure migration as a first step within the broader plan for cloud transformation. Interviewees noted that prior to engaging with Hitachi Vantara, they each had simple and preliminary plans for digital transformation, which included moving infrastructure to the cloud. They expected that the migration would take a year or longer to complete. The interviewees' organizations strove to internally compile the necessary resources, required expertise, and focused planning in order to implement a successful cloud migration. The interviewed decision-makers looked to Hitachi Vantara's expertise for cloud migration services to move aging infrastructure to the cloud. Hitachi Vantara accelerated the cloud migration and achieved this efficiency through virtualization and containers. Hitachi Vantara also created a distributed cloud infrastructure to ensure secure, streamlined operations. Hitachi Vantara built a landing zone; created compliance controls; and rehosted, reinstalled, and replatformed to migrate workloads to the cloud. After working with Hitachi Vantara to complete infrastructure migration, interviewees reported that the cloud migration happened much faster and with fewer resources than originally expected.

The senior infrastructure and cybersecurity architect for an insurance firm explained how Hitachi Vantara's expertise in planning and resource allocation saved them not only additional costs but also valuable time, shaving months off a one-year timeline. The same interviewee acknowledged, "We had underestimated the knowledge required to complete the task, and the [Hitachi Vantara team] helped us design a secure cloud architecture from scratch."

"The migration, which could have taken almost a year, was completed in approximately four months. In total [it] could have taken twice the cost, and three to four times longer [without Hitachi Vantara]."

Vice president of R&D, fintech

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

- The anticipated time required to complete an infrastructure migration in-house is 12 months, based on internal expectations.
- The organization completed the cloud migration in five months with Hitachi Vantara.
- Five additional engineers would have been required to work on the cloud migration without the support of Hitachi Vantara.
- An engineer's fully burdened annual salary is $135,000.

Risks. The magnitude of this benefit may vary based on:

- The time and resource requirements for migration, which will vary based on an organization's size and maturity.
- Engineer salaries, which will vary based on industry averages, geography, etc.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of more than $322,000.

Infrastructure Migration Efficiency

Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Expected in-house migration time (months)	Interviews	12		
A2	Actual migration time with Hitachi Vantara Services (months)	Assumption	5		
A3	Reduction in migration time with Hitachi Vantara compared to expectation (months)	A1-A2	7		
A4	Additional engineers that would have been required for migration without Hitachi Vantara	Interviews	5		
A5	Average fully burdened annual engineer salary	TEI standard	$135,000		
A6	Average fully burdened monthly engineer salary	A5/12 months	$11,250		
At	Infrastructure migration efficiency	A3*A4*A6	$393,750	$0	$0
	Risk adjustment	↓10%			
Atr	Infrastructure migration efficiency (risk-adjusted)		$354,375	$0	$0
	Three-year total: $354,375		**Three-year present value: $322,159**		

APPLICATION MODERNIZATION EFFICIENCY

Evidence and data. Following migration to the cloud environment, interviewees said that without the support of Hitachi Vantara in application modernization efforts, it would have taken immense effort from their engineering teams to reengineer and rearchitect every application. Organizations had the option to complete a lift and shift in migrating to the cloud and not modernize most of their applications, but IT teams worried that this would keep the organization from reaping the full benefits of cloud migration. Interviewees noted that Hitachi Vantara helped them conduct a portfolio assessment using its E3 methodology to better understand which applications would be most valuable as cloud-native applications. Engineers were then able to prioritize and efficiently rearchitect cloud-native applications and set up automation using the tools and resources that were available within the updated cloud environment.

- The vice president of R&D at a fintech organization noted that they had 12 different services being modernized and that internal engineering teams were more efficient because of Hitachi Vantara's help: "Engineers require fewer steps, and they can work more efficiently in the cloud with these tools — what would have taken 8 hours previously now takes 6. [Without Hitachi Vantara], we would have needed to staff five or six more employees for 8-hour shifts."
- The public cloud delivery manager for a pharmaceuticals organization noted that after engaging Hitachi Vantara, a major initiative (a solution to automate provisioning that would have cost $200,000) was sunset.
- The senior infrastructure and cybersecurity architect at an insurance firm noted how automation in the cloud environment reduced the resources required for rearchitecting applications: "We would have needed 10 more people without automation, and it has certainly taken less time to rearchitect [with Hitachi Vantara]."

> **"What could have taken two to three weeks now takes 20 minutes to complete."**
>
> *Public cloud delivery manager, pharmaceuticals*

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

- Seven engineers are on the internal engineering team supporting the application modernization efforts.
- An engineer's fully burdened annual salary is $135,000.
- Without Hitachi Vantara, it would have taken 40 hours to reengineer, refactor, and rearchitect an application. With Hitachi Vantara, it takes 5 hours to make the same changes to an application.
- The composite organization plans to modernize 22 applications and/or services over three years. In Year 1, five applications are modernized — this number is lower than in subsequent years because the first six months of the year are spent on the cloud migration. The application modernization process begins upon completion of the migration.
- The cost savings of $200,000 include avoided tooling, services, and provisioning such as data management software and cloud service fees for additional storage and processing that an organization would have needed to work on application modernization. These avoidances were achieved due to access to Hitachi Vantara's resources.

Risks. The magnitude of this benefit may vary based on:

- The number of engineers required for application modernization, which will vary based on organization size.
- The time required to develop and rearchitect applications or services, which will vary based on the type of applications or services.
- The number of applications or services to be modernized, which will vary based on organizational maturity.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $703,000.

Application Modernization Efficiency

Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Engineers required for application modernization	Interviews	7	7	7
B2	Average annual fully burdened engineer salary	TEI standard	$135,000	$135,000	$135,000
B3	Average hourly fully burdened engineer salary	B2/2,080	$65	$65	$65
B4	Time required to develop and rearchitect one application prior to Hitachi Vantara (hours)	Interviews	40	40	40
B5	Time required to develop and rearchitect one application after Hitachi Vantara (hours)	Assumption	5	5	5
B6	Time saved to develop and rearchitect one application with Hitachi Vantara	B4-B5	35	35	35
B7	Number of applications/services	Assumption	5	7	10
B8	Avoided cost savings with Hitachi Vantara	Assumption	$200,000	$200,000	$200,000
Bt	Application modernization efficiency	(B1*B3*B6*B7)+B8	$279,507	$311,310	$359,014
	Risk adjustment	↓10%			
Btr	Application modernization efficiency (risk-adjusted)		$251,556	$280,179	$323,113
	Three-year total: $854,849			**Three-year present value: $703,000**	

COST SAVINGS FROM ONGOING MANAGEMENT

Evidence and data. Without Hitachi Vantara's support for cloud migration and application modernization, organizations would have continued paying for additional on-premises hardware and resources. Hitachi Vantara's cloud and app modernization services include ongoing management support with administration, monitoring, and security. Given the significant resources of Hitachi Vantara and its expertise in managing cloud projects, interviewees did not need to hire additional resources or invest in additional infrastructure, reducing ongoing spending for cloud management.

- The public cloud delivery manager for a pharmaceutical organization stated that their organization would have needed to hire 15 to 20 employees, each working at 50% capacity, to manage the new cloud environment.
- The vice president of R&D at a fintech firm explained how their organization avoided a capital investment for new servers, which would have cost $500,000 total.

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

- The internal engineering team of seven FTEs would have needed to add another seven employees for ongoing cloud management and support.
- The fully burdened annual salary for an engineer is $135,000.
- The composite organization avoids an infrastructure investment of additional servers, which would have cost $300,000 total.

Risks. The magnitude of this benefit may vary based on:

- The number of avoided employee hires, which will vary based on organization size and maturity.
- The number of avoided additional servers and cost per server.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of nearly $2.8 million.

> **"They figure out how to do it and execute it, which takes a lot of effort. I spend 20% of my time working solely on the platform interfacing with Hitachi. If I didn't have them, it would be 100% [of my time instead] — a big time savings. I wouldn't be able to do anything else."**
>
> *Product owner, nonprofit*

Cost Savings From Ongoing Management					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
C1	Avoided engineer requirements (FTEs)	Interviews	7	7	7
C2	Average fully burdened annual engineer salary	TEI standard	$135,000	$135,000	$135,000
C3	Infrastructure cost avoidance	Assumption	$300,000	$300,000	$300,000
Ct	Cost savings from ongoing management	C1*C2+C3	$1,245,000	$1,245,000	$1,245,000
	Risk adjustment	↓10%			
Ctr	Cost savings from ongoing management (risk-adjusted)		$1,120,500	$1,120,500	$1,120,500
	Three-year total: $3,361,500			**Three-year present value: $2,786,518**	

UNQUANTIFIED BENEFITS

Additional benefits that customers observed but were not able to quantify include:

- **Improved efficiency for application management following modernization.** Interviewees noted improved capacity for engineering teams to complete other work on applications, from performing updates to working on new capabilities. The tools and services within the cloud environment allowed engineers to be more efficient with release management.
    - The vice president of R&D at a fintech organization noted, “We are now releasing API sets every month, whereas previously it was ad hoc and would take longer to release.”
    - The public cloud delivery manager for a pharmaceuticals organization noted how release management times shrank after introducing the cloud environment: “Release management used to take six to eight weeks. We can now deliver new capabilities into the cloud within only two weeks given the process improvement linked to automation with testing.” He added that the engineering team saw other benefits as well, such as greater availability and flexibility to respond to spontaneous tasks: “We now keep 30% of our capacity reserved for last-minute and new requests. Velocity is increasing.”
    - The senior infrastructure and cybersecurity architect at an insurance firm noted how the new cloud environment enabled more efficient workflow for the engineering team: “Starting a project is much quicker, which then has the cascading [positive] effect on implementation. Since we have all the information initially, it makes the implementation go that much faster. Turnaround time is definitely a lot shorter since we’ve used Hitachi Vantara.”
- **Improved compliance and governance.** Given the resources and tools provided by Hitachi Vantara, interviewees realized greater governance with the cloud architecture and compliance management for regulations.
    - The senior infrastructure and cybersecurity architect at an insurance firm noted that the organization had a more detailed governance plan and

controls after implementing a cloud environment using Hitachi Vantara: “We were struggling with how we architect something and then get ourselves moving forward with the correct decision. Hitachi Vantara helped us put together a plan that governs how we architect within the cloud. Now that we’ve got good governance in place, we can better manage and do more work with our international division, which is something we weren’t able to [do] in the past.”

- The product owner at a nonprofit explained that the consequences of failing a security audit would include cost implications. The interviewee noted greater security compliance working with Hitachi Vantara, saying, “Hitachi Vantara’s continuous compliance monitoring has been and is still being done successfully. The fact that we have been able to maintain our authorization to operate as a cloud platform is reassuring.”

- **Improved application quality with fewer application failures.** Working with Hitachi Vantara, engineers found that applications performed more effectively in the cloud environment and failed less often. Engineering teams therefore spent less time combating application issues.
  - The vice president of R&D at a fintech organization noted that the engineering team found applications required less rework when the resources in the cloud environment were utilized: “Leveraging the cloud environment, where we have automated our applications and the API work, we’ve seen fewer errors, a lot less rework, and definitely a decrease in defects accumulating in the development methodology.” The vice president also noted that with automation in the cloud, the engineering team was able to eliminate persistent backlogs of rework that would accumulate each month.

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement cloud and app modernization services from Hitachi Vantara and later realize additional uses and business opportunities, including:

Additional automation. After working in the cloud environment and realizing benefits of modernization, interviewees reported plans to modernize more applications, presenting new opportunities for resource cost savings and business initiatives.

- The senior infrastructure and cybersecurity architect at an insurance firm noted, “Because [Hitachi Vantara] has come in and helped us set up that foundation, that allows us to start building more automation over time. Our philosophy is, ‘Why do it manually when you can automate it?’“
- The vice president of R&D at a fintech organization noted how the time saved with cloud capabilities allowed the engineering team to focus on new tasks: “The cloud enables us to have capabilities fully on-demand and available. With less rework, we can move forward with additional features and functionality. We’re definitely getting value out of the cloud.”

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

Analysis Of Costs

Quantified cost data as applied to the composite

Total Costs							
Ref.	**Cost**	**Initial**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Dtr	Hitachi Vantara implementation and services cost	$1,100,000	$275,000	$275,000	$275,000	$1,925,000	$1,783,884
	Total costs (risk-adjusted)	$1,100,000	$275,000	$275,000	$275,000	$1,925,000	$1,783,884

HITACHI VANTARA IMPLEMENTATION AND SERVICES COST

Evidence and data. The investment costs for Hitachi Vantara's cloud and app modernization services include the initial strategic planning and cloud migration, application modernization services, and ongoing support to manage and monitor the cloud platform and applications. Interviewees noted that costs for this long-term project could be broken up into phases or based on achieved milestones.

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

- The initial cost for planning and cloud migration is $1 million.
- The cost for modernization services and ongoing management is $250,000, charged annually.

Risks. The magnitude of this benefit may vary based on the costs for migration, modernization, and ongoing support, which will vary based on services utilized and how costs are charged, either based on yearly fees or achieved milestones.

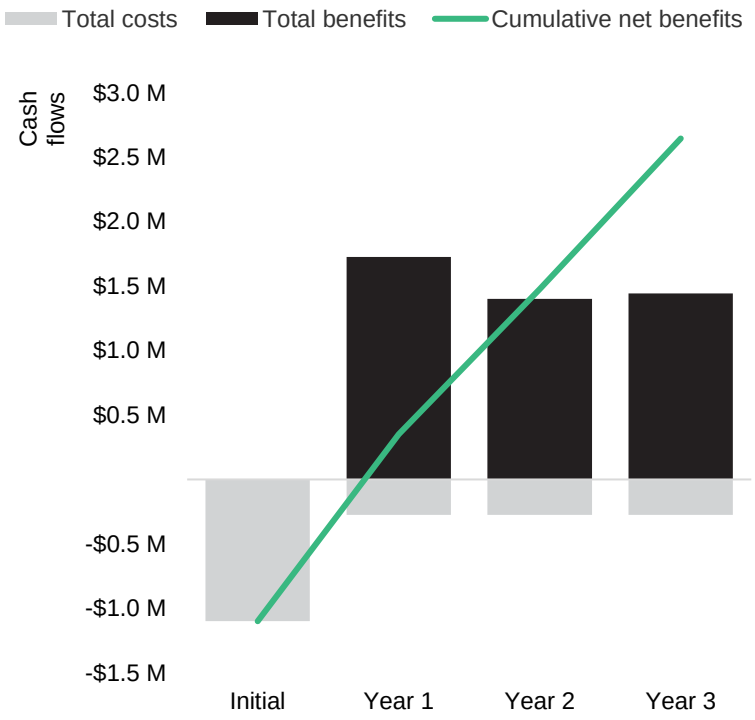
Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of less than $1.8 million.

Hitachi Vantara Implementation And Services Cost						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
D1	Hitachi Vantara services implementation and annual costs		$1,000,000	$250,000	$250,000	$250,000
Dt	Hitachi Vantara implementation and services cost	D1	$1,000,000	$250,000	$250,000	$250,000
	Risk adjustment	↑10%				
Dtr	Hitachi Vantara implementation and services cost (risk-adjusted)		$1,100,000	$275,000	$275,000	$275,000
	Three-year total: $1,925,000			**Three-year present value: $1,783,884**		

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 Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($1,100,000)	($275,000)	($275,000)	($275,000)	($1,925,000)	($1,783,884)
Total benefits	$0	$1,726,431	$1,400,679	$1,443,613	$4,570,724	$3,811,677
Net benefits	($1,100,000)	$1,451,431	$1,125,679	$1,168,613	$2,645,724	$2,027,793
ROI						114%
Payback (months)						10

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.

Appendix B: Endnotes

[1] Source: “Create A Business Case For Your Hybrid Cloud Strategy,” Forrester Research, Inc., August 2, 2021.

[2] Source: “The Forrester Guide To Cloud Modernization,” Forrester Research, Inc., August 2, 2021.

[3] Source: “Modernize With Cloud And New Computing Architectures,” Forrester Research, Inc., August 2, 2021.

[4] Source: “Mind The Cloud Skills Gap,” Forrester Research, Inc., March 11, 2020.

[5] Source: “Predictions 2022: Cloud Computing,” Forrester Research, Inc., October 27, 2021.

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