FORRESTER®

The Total Economic Impact™ Of Migrating Expensive Operating Systems and Traditional Software to Google Cloud

Cost Savings and Business Benefits Enabled by Modernizing with Open Platforms and Managed Services in Google Cloud

JUNE 2021

A FORRESTER TOTAL ECONOMIC IMPACT™ STUDY COMMISSIONED BY GOOGLE

Table Of Contents

Executive Summary 1

The Google Cloud Platform Customer Journey ... 6

Key Challenges 6

Composite Organization 7

Analysis Of Benefits 8

IT Administrative Time Savings 8

On-Premises Data Center And Legacy Cloud Solution Cost Savings 10

Avoided Cost Of Downtime 11

Cloud Infrastructure Optimization Cost Savings 12

Savings From Accelerated Cloud Migration 14

Unquantified Benefits 15

Flexibility 16

Analysis Of Costs 17

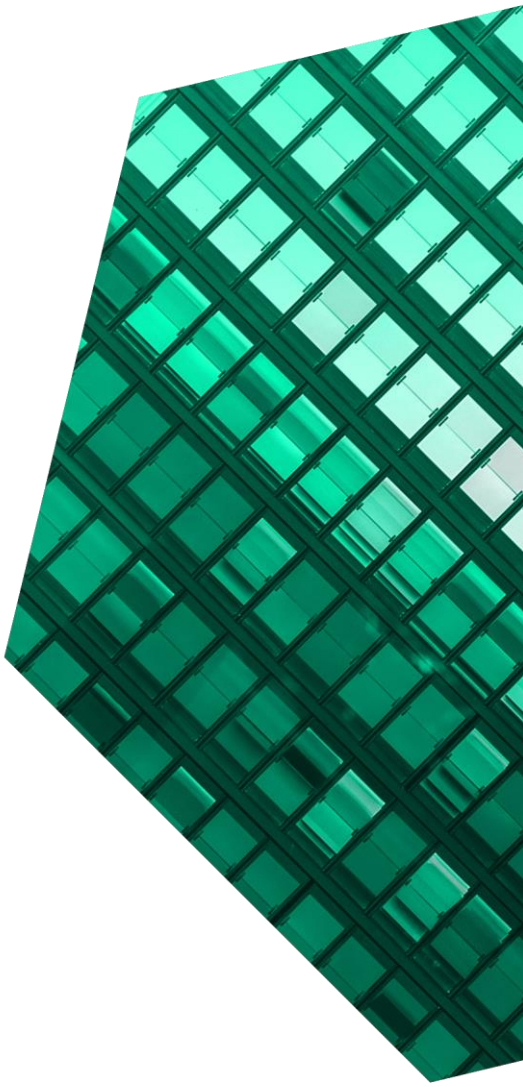
Initial Implementation And Ongoing Management Costs 17

Google Cloud Consumption Costs 18

Financial Summary 19

Appendix A: Total Economic Impact 20

Appendix B: Endnotes 21



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.

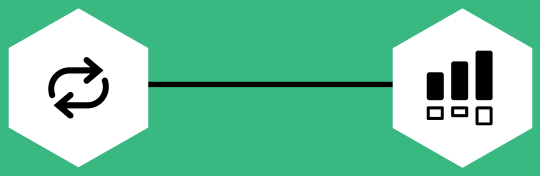
Executive Summary

Cloud computing is no longer just a tactical but a strategic enabler.[1] Migrating on-premises workloads to Google Cloud increases business velocity, enabling organizations to adapt to changing business demands, innovate, and quickly improve customer experiences.

Forrester argues that cloud computing accelerates business velocity by providing organizations with the tools, services, patterns, and practices they need to drive engagement with employees, partners, and customers.[2] To get the most out of their cloud investment, organizations need to migrate — and modernize — their core systems to the cloud. This is especially true for traditional on-premises software and expensive operating systems, usually from legacy enterprise vendors, with high licensing and management costs. Otherwise, the limitations of their on-premises environment will hinder an organization's ability to innovate.

Google provides an enterprise-class environment for running business-critical workloads in the cloud through Google Cloud.[3] Using Google Cloud and Google partners, organizations can quickly and easily migrate their expensive operating systems and traditional workloads and data to Google Cloud with minimal disruption to the business. Migrating expensive operating systems and traditional workloads to Google Cloud can help organizations reduce expensive data center costs while improving performance and uptime. In addition, organizations can work with Google Cloud and Google Cloud partners to further modernize those workloads, resulting in additional licensing savings, and avoiding cumbersome licensing audits by legacy enterprise software vendors

KEY STATISTICS



Return on investment (ROI)
72%

Net present value (NPV)
$13.1M

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

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed five customers with experience using Google Cloud. For this study, Forrester aggregated the experiences of the interviewed customers and combined the results into a single composite organization.

Prior to migrating to Google Cloud, customers managed large, costly on-premises environments, most including workloads running on expensive operating systems. These on-premises environments were costly to maintain, requiring significant hardware and software investments and FTEs to manage. These organizations paid high recurring

licensing fees and frequent threats of license audits by the legacy vendor. These environments were also slow, leading to poor user and customer experiences, and prone to failure.

After migrating to Google Cloud, organizations were able to decommission their data centers. In addition, the interviewees experienced significant improvements in performance and uptime, reduced management costs, and recognized significant cost savings, especially around licensing costs. The interviewees were able to vastly reduce licensing costs and the pressure of time-consuming licensing audits. The interviewees worked with Google to optimize and modernize their environment, allowing them to reduce their compute, management, and overpriced licensing costs further.

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits include:

- **Avoided on-premises hardware, software, and licensing costs, saving more than $7 million annually.** By migrating their core systems to Google Cloud, the interviewees could reduce and ultimately eliminate their on-premises environments. The organizations were able to avoid buying new hardware and cancel software licenses associated with managing their on-premises environment, resulting in significant cost savings.
- **Optimized cloud infrastructure, reducing cloud spending by 45%.** By right-sizing their environments, refactoring applications to run more efficiently, taking advantage of bring-your-own-license (BYOL) programs, and migrating expensive licensed workloads to open source alternatives, the interviewees reduced their licensing and Google Cloud consumption costs over time.
- **Reduced application downtime by 90%.** The interviewees reported experiencing substantial amounts of unplanned downtime on their previous on-premises and non-Google Cloud environments. These outages were costly to resolve and could result in lost business and strained customer relationships. Organizations eliminated these downtime events altogether after moving to Google Cloud with a ≥ 99.9% uptime service-level agreement (SLA).
- **Improved infrastructure management efficiency by 50%.** The interviewees worked on refactoring their workloads and modernized their operations through the use of cloud-native technologies. By using containers through Google Kubernetes Engine (GKE) and other cloud-native management solutions, the interviewees were able to streamline the management of their cloud environment, enabling them to redirect FTEs to other value-adding tasks.
- **Completed their cloud migration in half the time they projected.** Several of the interviewees had attempted to migrate to the cloud in the past; unfortunately, long project timelines and a perceived lack of expertise with other cloud providers halted these attempts. In contrast, the interviewees reported that they were able to migrate to Google Cloud ahead of schedule.

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

- **Improved performance.** The interviewees reported systems running significantly faster on Google Cloud compared to their legacy environments. These performance improvements enabled the interviewees to simplify their environments, improving CX and reducing management and operations costs.
- **Accelerated software release cycles.** By taking advantage of the cloud-native solutions on Google Cloud, the development teams were able to automate parts of the software development cycle, allowing them to release updates far more quickly than they could before.

Costs. Risk-adjusted PV costs include:

- **Initial implementation and ongoing management costs of $5.3 million.** The composite organization migrates its on-premises workloads to Google Cloud in 18 months, with the assistance of a Google partner.
- **Google Cloud licensing costs of $12.9 million.** Organizations shifted costs from a capex to an opex model, paying Google Cloud for usage on a monthly basis.

The customer interviews and financial analysis found that a composite organization experiences benefits of $31.3 million over three years versus costs of $18.2 million, adding up to a net present value (NPV) of $13.1 million and an ROI of 72%.

ROI
72%

BENEFITS PV
$31.3M

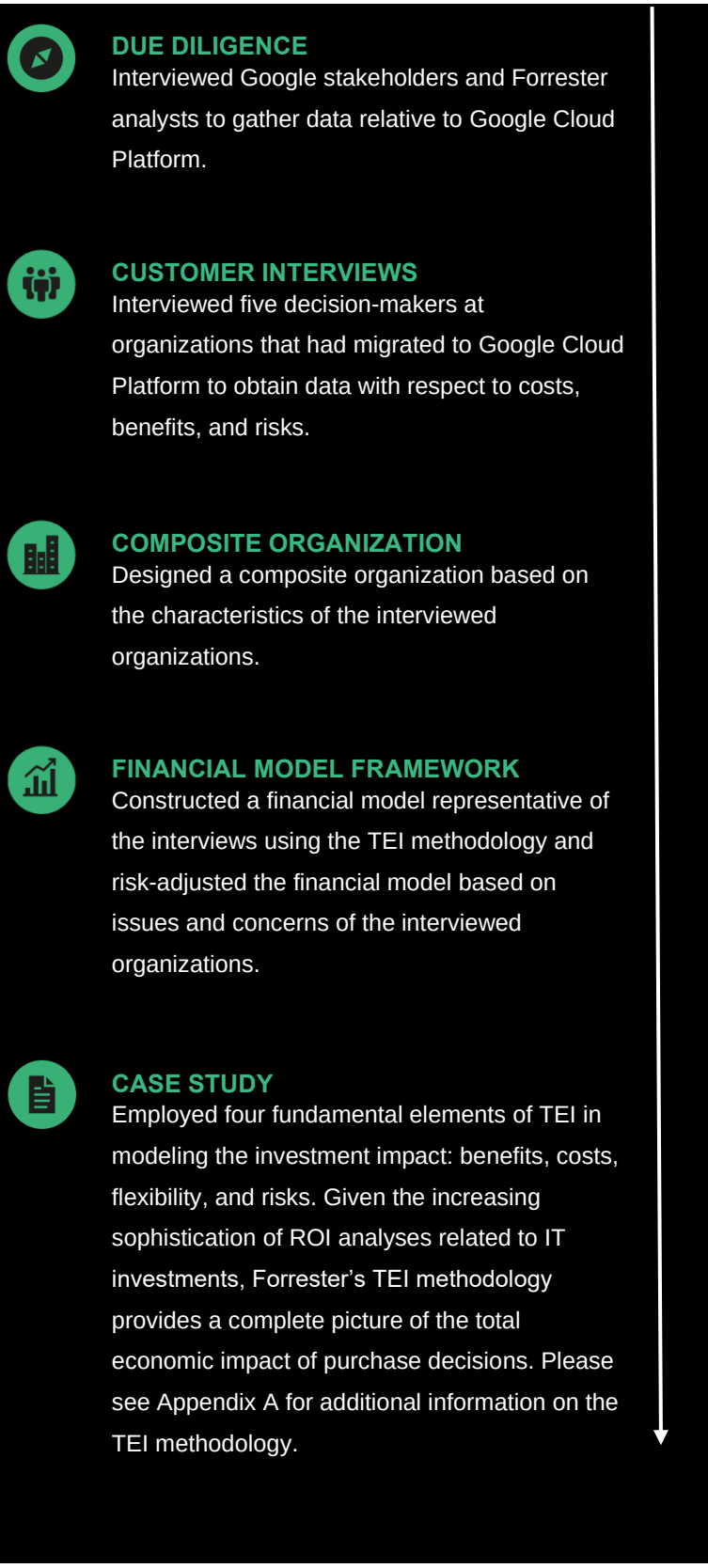
NPV
$13.1M

Annual Software Savings
$2.2 million By Year 3

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering migrating their on-premises workloads to Google Cloud Platform.

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 Google Cloud Platform can have on an organization.



The Google Cloud Platform Customer Journey

Drivers leading to the Cloud Platform investment

Interviewed Organizations

Industry	Headquarters	Interviewee	Revenue
SaaS provider	North America	Director of systems engineering	$100 million to $500 million
SaaS provider	North America	VP of DevOps	$100 million to $500 million
Financial services	EMEA	IT director	$25 billion to $100 billion
Security services	EMEA	CTO	$1 billion to $10 billion
Financial services	North America	Data and cloud architect	$1 billion to $10 billion

KEY CHALLENGES

Before migrating to Google Cloud, the interviewees described the following challenges with their previous solutions:

- **Existing infrastructure lacked the flexibility growing companies needed.** On-premises infrastructure required substantial capital investment that was difficult to adjust when needs varied. The interviewees explained that growing their legacy infrastructure to meet growing business needs was difficult since expanding their environment would take months. This made it difficult for rapidly growing companies to grow at the pace of business.

  The interviewees wanted to be able to scale capacity quickly and easily based on their needs.

- **Managing their infrastructure was time-consuming.** The interviewees wanted to reduce the effort required to provision, deploy, and manage their SQL servers, premium operating systems, and other business-critical workloads. The interviewees believed that migrating to the cloud and leveraging cloud-native management could automate and simplify key workflows. The interviewees hoped that this would enable IT administrators to focus on other value-added tasks, such as optimizing their infrastructure, building new applications, or assisting in other parts of their organizations' digital transformation.

- **Experienced high amounts of planned and unplanned downtime.** Ensuring availability was difficult given the age and specifications of some of the interviewees' on-premises infrastructure. Meanwhile, IT teams lacked efficient ways to manage their infrastructure: Performing even regular system updates could often result in hours of downtime for customers, while unplanned outages could take days to remediate. The interviewees sought to reduce downtime and improve availability, particularly for customer-facing applications.

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 five companies 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 multibillion-dollar global company with 12,000 employees spread across the world. The company is currently expanding and is launching operations into emerging markets.

Deployment characteristics. After an extensive selection process and business-case analysis, the organization decides to migrate to Google Cloud. The organization starts with a lift-and-shift migration before working with Google partners to modernize its infrastructure by rearchitecting core systems and leveraging cloud-native technology.

The organization leverages a sole-tenant environment, BYOL programs, and CPU overcommit capabilities to reduce its expensive operating system and SQL licensing costs. By Years 2 and 3, the composite organization also begins to migrate workloads to open source alternatives to recognize further cost savings.

Key assumptions

- **$5 billion annual revenue**
- **12,000 total FTEs**
- **100% of migration completed at 18 months**
- **2,000 virtual machines running on Google Cloud by Year 1**

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	IT administrative time savings	$1,080,000	$1,080,000	$1,080,000	$3,240,000	$2,685,800
Btr	On-premises data center and legacy cloud solution cost savings	$5,418,000	$7,740,000	$7,740,000	$20,898,000	$17,137,325
Ctr	Avoided cost of downtime	$2,295,000	$2,295,000	$2,295,000	$6,885,000	$5,707,325
Dtr	Cloud infrastructure optimization cost savings	$1,800,000	$2,400,000	$2,550,000	$6,750,000	$5,535,687
Etr	Savings from accelerated cloud migration	$0	$118,800	$237,600	$356,400	$276,694
	Total benefits (risk-adjusted)	$10,593,000	$13,633,800	$13,902,600	$38,129,400	$31,342,831

IT ADMINISTRATIVE TIME SAVINGS

Evidence and data. The interviewees were able to refactor and rearchitect their workloads, improving performance and stability and reducing management costs. The interviewees also leveraged cloud-native solutions such as containers and GKE to automate the management of their systems.

- The VP of DevOps at a SaaS provider explained that their organization was able to automate numerous provisioning and maintenance tasks, freeing up valuable FTE resources. The VP explained: “When we moved to Google Cloud, we wanted to leverage cloud-native solutions to avoid vendor lock-in and streamline our operations. We wanted to be able to spin up new resources and manage them through API calls, scripts, and open-source software. We’ve built tools to predict our customers’ needs and resize their environment based on those needs.”
- The same interviewee noted: “Building a VM [virtual machine] on our on-premises environment took us 4 to 8 hours. Since moving to Google Cloud, we’ve automated the process to the point where we don’t have a human involved — everything is automated.”
- The IT director at a financial services firm stated, “Our DevOps team has created a pipeline to automate the management of our images. Every 21 days, we update our images with the latest updates, automatically test and scan the new images, and push them out to all VMs.”
- The director of systems engineering at a SaaS provider explained that “Google has a truly global network. We don’t need to replicate our shared services and infrastructure from one region to another as we did in our previous cloud environment. On Google Cloud, we have one worldwide virtualizer, whereas we had five with our previous cloud provider. This lowers our operating costs and simplifies our infrastructure.”
- The director of systems engineering stated, “There’s no comparison between how much time we spend maintaining our Google Cloud environment versus our on-premises environment. Our Google Cloud environment is much more reliable — we have almost no

incidents — whereas we always had incidents in our on-premises environment."

- Because of these efficiency gains, the interviewees could slow — or avoid — hiring additional FTEs to support their environment.
- The director of systems engineering explained: "Prior to migrating to Google Cloud, we had 50% of systems administrators we needed. If we [had] stayed on-premises, we would have had to double our staffing levels, which was a costly proposition. But on Google Cloud, we've been able to grow our business and reduce the workload on our team without having to add any significant headcount."
- These efficiency gains allow the organizations to redirect resources to other parts of the business. The CTO at the security services company stated: "Our IT administrators are driving innovation and improving processes rather than just focusing on keeping the lights on. For example, we are migrating to Chromebooks. We're rolling out tens of thousands of Chrome devices to our staff, which is a big change. Many of the staff who were focused on managing our legacy environment are now involved in this rollout."

Modeling and assumptions. Forrester modeled the financial impact for the composite organization based on the following assumptions:

- Twenty IT administrators focus on managing the organization's on-premises workloads.
- The composite organization leverages GKE to automate and streamline the provisioning and management of on-premises instances, reducing the manual effort needed to allocate compute, networking, and storage resources.
- The composite organization reduces unplanned downtime by 90% (quantified in the Avoided Cost Of Downtime section below), freeing up additional time previously spent remediating system outages.
- These efficiency gains reduce the time IT administrator teams spend maintaining their environment by 50%.

Risks. Forrester recognizes that IT productivity improvements may vary from organization to organization. Specific considerations include:

- Existing efficiency gains due to automation and other process improvements.
- The size and complexity of an organization's environment.
- Location and prevailing labor rates.

Results. Forrester adjusted this benefit downward by 10% to account for these risks, yielding a three-year, risk-adjusted total PV (discounted at 10%) of just under $2.7 million.

IT Administrative Time Savings					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	IT administrators dedicated to managing on-premises infrastructure	Composite	20	20	20
A2	Improved productivity with Google Cloud	Interviews	50%	50%	50%
A3	Reduction in IT administrators needed to manage on-premises infrastructure	A1*A2	10	10	10
A4	IT administrator fully burdened annual salary	Composite	$120,000	$120,000	$120,000
At	IT administrative time savings	A3*A4	$1,200,000	$1,200,000	$1,200,000
	Risk adjustment	↓10%			
Atr	IT administrative time savings (risk-adjusted)		$1,080,000	$1,080,000	$1,080,000
	Three-year total: $3,240,000			**Three-year present value: $2,685,800**	

ON-PREMISES DATA CENTER AND LEGACY CLOUD SOLUTION COST SAVINGS

Evidence and data. Many of the interviewees expressed a strong desire to eliminate their on-premises environments. They wanted to direct resources away from maintaining an expansive on-premises environment and toward their core competencies. The data and cloud architect at a financial services firm explained: “We’re a bank. We don’t want to be in the business of purchasing and replacing hardware and maintaining several data centers.”

Maintaining their on-premises environments required significant capex expenditures on annual hardware upgrades, third-party support and software services, premium operating system licenses, cooling, electricity, and other data center costs.

By migrating to Google Cloud, the interviewees were able to eliminate their on-premises infrastructure, realizing significant savings and shifting from a capex to an opex model.

- Moving to Google Cloud also helped the interviewees simplify their environments. The CTO at a security services firm noted: “When I first started, we had 90 countries that ran their local infrastructure entirely separately from one another: different tools, different software, different versions — different everything. Moving to Google Cloud was a way for us to standardize our environment and improve collaboration.”
- The IT director at a financial services firm explained that their organization would have spent $20 million in 2020 on their data centers if they hadn’t migrated to Google Cloud. By migrating to Google Cloud, the interviewee explained that their organization was able to avoid this capex expense; instead, they moved to an opex model on Google Cloud, which was also less expensive from a software-licensing perspective than remaining on-premises.
- The VP of DevOps for a SaaS provider explained that they were slated to spend $4 million just to upgrade their on-premises data analytics servers.

Modeling and assumptions. Based on the customer interviews, Forrester assumes that:

- Annualized expenditure for on-premises workloads total $8.6 million per year.

- The composite organization is able to fully migrate to Google Cloud by the end of Year 2. This figure includes hardware and infrastructure costs, along with third-party support and licensing costs.

Risks. The following factors may affect the magnitude of this benefit and are reflected in the risk-adjustment percentage:

- The total cost for on-premises infrastructure.
- Spending on third-party support and software.
- The speed at which an organization can migrate to Google Cloud.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of more than $17.1 million.

On-Premises Data Center And Legacy Cloud Solution Cost Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Annual on-premises infrastructure costs	Composite	$8,600,000	$8,600,000	$8,600,000
B2	Legacy on-premises infrastructure cost reduction	Interviews	70%	100%	100%
Bt	On-premises data center and legacy cloud solution cost savings	B1*B2	$6,020,000	$8,600,000	$8,600,000
	Risk adjustment	↓10%			
Btr	On-premises data center and legacy cloud solution cost savings (risk-adjusted)		$5,418,000	$7,740,000	$7,740,000
	Three-year total: $20,898,000		**Three-year present value: $17,137,325**		

AVOIDED COST OF DOWNTIME

Evidence and data. The interviewees noted an increase in uptime on Google Cloud compared to their on-premises environment as a key benefit of their investment.

- Prior to Google Cloud, interviewees said their organizations experienced frequent amounts of planned downtime to complete updates and patches, often for several hours per month.
- The VP of DevOps at a SaaS provider explained that they were able to streamline OS patches, updates, and migrations, reducing the number of unplanned downtime customers experienced: “Previously, applying an operating system patch could require 15 to 20 minutes of downtime, and an operating system migration could take an hour. Now we can roll out patches or perform major version upgrades in 5 minutes. We’ve been able to remove a lot of the manual processes and can now do this at scale across hundreds or even thousands of instances.”

The interviewees also reported frequently experiencing unplanned downtime or outages that required immediate remediation. These could result in significant fines or financial losses.

- The director of systems engineering at a SaaS provider explained that moving to Google Cloud allowed their organization to reduce the complexity and fragility of their infrastructure, “Which means that we no longer have as many outages.” The director explained that in their previous environment, they experienced six network outages in the last year with their

previous cloud provider and zero since moving to Google Cloud.

- The data and cloud architect explained that their financial services organization experienced more than 40 hours of downtime per month with their on-premises environment. "[Resolving] these incidents could take anywhere from a few hours to a few days and required us to dedicate 10 to 15 people to remediate. [In contrast], our Google Cloud environment is much more reliable."

Modeling and assumptions. For this analysis, Forrester only quantified the cost of unplanned downtime. Forrester assumes that:

- The average cost of downtime for the composite organization is $75,000 per hour.
- The composite organization goes from having 99.5% uptime on their on-premises environment to 99.95% uptime on Google Cloud

Risks. The following factors may affect the savings organizations recognize:

- The amount of unplanned downtime experienced before migrating to Google Cloud.
- The cost of an hour of downtime.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of more than $5.7 million.

Avoided Cost Of Downtime

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Number of hours of downtime per year	Composite	40	40	40
C2	Cost of an hour of downtime	Composite	75,000	75,000	75,000
C3	Reduction in downtime	Interviews	90%	90%	90%
Ct	Avoided cost of downtime	C1*C2*C3	$2,700,000	$2,700,000	$2,700,000
	Risk adjustment	↓15%			
Ctr	Avoided cost of downtime (risk-adjusted)		$2,295,000	$2,295,000	$2,295,000
	Three-year total: $6,885,000			**Three-year present value: $5,707,325**	

CLOUD INFRASTRUCTURE OPTIMIZATION COST SAVINGS

Evidence and data. Though initial engagements were generally lift-and-shift migrations, all of the interviewees worked to optimize their cloud environment to improve performance and decrease costs. These optimizations resulted in significant cost savings, especially around reducing or eliminating expensive and overpriced licensing costs, and they improved outcomes for both end users and customers.

- The VP of DevOps at a SaaS provider explained that their organization was able to reduce the number of VMs running by two-thirds.
- The data and cloud architect at a financial services firm estimated that they reduced their SQL-related costs by 50% through a combination of using BYOL and migrating some of their SQL

servers to open source. Other partners also leveraged solutions like Google BigQuery.

- Most of the interviewees migrated some workloads, such as premium operating systems, SQL, and software frameworks, to open source alternatives in an effort to reduce their licensing costs.
- In addition, many of the interviewees reported that their organizations focused on rearchitecting their applications to improve performance and stability.
- The interviewees also explained that they leveraged tools such as GKE to right-size their environment, further decreasing costs.
- Lastly, the interviewees explained that they would scale their environments up and down based on their needs. This not only improved CX during high-traffic times but also meant that the interviewees were only paying for what they needed.

Modeling and assumptions. Forrester assumes that:

- The composite organization moves half of its environment to sole-tenant nodes on Google Cloud. The organization takes advantage of the BYOL and committed usage discounts.
- After completing its migration in Year 2, the organization begins migrating its workloads to open source alternatives. By Year 3, it has moved 10% of its environment to open source alternatives, decreasing its licensing spend by a similar amount.
- The organization actively right-sizes its VMs and shuts down VMs that aren't needed. This, coupled with performance increases due to rearchitecting applications, allows the organization to reduce its total number of VMs running by more than 20% by Year 3.

Risks. Infrastructure optimization savings will vary based on:

- Utilization of Google Cloud discounts.
- How aggressively organizations right-size their environments.
- The number of workloads migrated to open source alternatives.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV of $5.5 million.

Cloud Infrastructure Optimization Cost Savings					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
D1	Annual Google Cloud spending without optimizations	Composite	$7,500,000	$7,500,000	$7,500,000
D2	Reduction in Google Cloud spending due to BYOL licensing benefits	Interviews	15%	15%	15%
D3	Reduction in Google Cloud spending due to instance runtime optimization	Interviews	5%	5%	5%
D4	Reduction in Google Cloud spending due to right-sizing instances	Interviews	10%	15%	15%
D5	Reduction in Google Cloud spending due to modernization efforts	Interviews	0%	5%	7.5%
D6	Total reduction in Google Cloud spending due to BYOL licensing benefits, right-sizing resources, and modernization	D2+D3+D4+D5	30.0%	40.0%	42.5%
Dt	Cloud infrastructure optimization cost savings	D1*D6	$2,250,000	$3,000,000	$3,187,500
	Risk adjustment	↓20%			
Dtr	Cloud infrastructure optimization cost savings (risk-adjusted)		$1,800,000	$2,400,000	$2,550,000
	Three-year total: $6,750,000		**Three-year present value: $5,535,687**		

SAVINGS FROM ACCELERATED CLOUD MIGRATION

Evidence and data. Most migrations were completed in less than a year, with some workloads being completely migrated in less than a month. Several interviewees raved about the support Google provided and the speed of their migrations.

- The IT director for a financial services firm explained: “Google is a very good partner for both the IT and business teams. They were a very great resource to leverage during our migration and modernization projects. Google was very involved during our migration; they had financial industry experts attend our team meetings to provide us with their insights on what other financial services firms are doing and how to improve performance.”
- The VP of DevOps for a SaaS provider noted: “Working with Google is excellent. They’ve been so responsive and helpful throughout the migration. And our migration has gone very smoothly. We’ll be done with our migration to Google Cloud after a year of work. In comparison, it took us a year just to move 10% to 15% of our environment to a different cloud provider. It would have taken us three years to complete our migration with that provider.”

By accelerating their cloud migration, the interviewees were able to reallocate resources and begin additional modernization projects sooner than projected.

Modeling and assumptions. Forrester assumes that the resources and expertise provided by Google reduces the time required to complete a cloud migration by 50%.

Risks. An organization’s ability to achieve these outcomes will vary based on several factors:

- Existing resource knowledge and experience.
- The size and complexity of an organization’s infrastructure.
- Local professional services and labor costs.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $276,694.

Savings From Accelerated Cloud Migration					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
E1	Months expected to complete migration without Google Cloud	Interviews	12	12	12
E2	Reduction in time due to Google Cloud	Interviews	0%	50%	100%
E3	Months saved due to Google Cloud	E1*E2	0	6	12
E4	FTEs dedicated to migration	Composite	2	2	2
E5	Monthly FTE salary	$120,000/12 months	$10,000	$10,000	$10,000
E6	Internal FTE labor savings	E3*E4*E5	$0	$120,000	$240,000
E7	Monthly professional services fees	Assumption	$2,000	$2,000	$2,000
E8	Avoided professional services expenditures	E3*E7	$0	$12,000	$24,000
Et	Savings from accelerated cloud migration	E6+E8	$0	$132,000	$264,000
	Faster data center migration	↓10%			
Etr	Savings from accelerated cloud migration (risk-adjusted)		$0	$118,800	$237,600
	Three-year total: $356,400			**Three-year present value: $276,694**	

UNQUANTIFIED BENEFITS

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

Improved application performance. The interviewees reported systems running significantly faster on Google Cloud compared to their legacy environments. These performance improvements resulted in a range of benefits: They enabled the interviewees to simplify their environment, reduce their cloud footprint, and improve customer outcomes.

- The VP of DevOps for a SaaS provider explained that they saw SQL operations run much more quickly on Google Cloud compared to their previous infrastructure. The VP explained: “If you’re a company that’s very SQL-dependent like we are, is a measure of success. The faster we can write data to the disk and read it back off the disc, the faster our application is going to work for our customers. We’ve been able to reduce the amount of time it takes an operation to run by a third. This is a very tangible, very real operating cost for the customers and for us.”
- The same interviewee explained that they were able to reduce their cloud footprint by 66%, even as they grew in size. This was possible in large part because the performance of applications running Google Cloud eliminated the need to replicate shared services across different geographies.
- The IT director at a financial services firm explained that the ability to scale their environment up and down as needed, coupled with the improved performance on Google Cloud, had a significant impact on their organization: “When the economy was at its worst during the COVID-19 pandemic, the business asked us to run our risk calculations hourly instead of daily. We wouldn’t have been able to meet this request in our on-premises environment since it took 8

hours to complete these analyses. But we could scale our environment up on Google Cloud to meet these needs. This meant that our traders had a much better view of the market, instead of having to rely on approximations."

- **Increased developer productivity.** Development teams are able to work much more quickly since migrating their workloads to the cloud. Previously, development cycles were slow due to long procurement cycles and infrastructure issues. On Google Cloud, development teams are able to spend less time troubleshooting infrastructure issues or waiting for computing resources and spend more time building applications.

  The data and cloud architect for a financial services firm explained that, by using GKE and App Engine: "We can focus more on what the customer needs instead of infrastructure considerations. We've been able to deliver features much faster than before. For example, we were able to deliver a new feature to our customers centered around the COVID-19 relief program in less than two days."

FLEXIBILITY

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

- **Deploying additional Google Cloud or open source technologies.** Once on Google Cloud, organizations can more easily adopt additional Google offerings. Organizations also have the option to adopt more open source solutions.
- **Adapt more quickly to changing market forces.** The flexibility offered by Google Cloud allows organizations to adapt more quickly to changing conditions. Organizations can develop new applications or change their compute needs as needed, enabling them to stay competitive in uncertain times.

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**
Ftr	Initial implementation and ongoing management costs	$220,000	$2,530,000	$1,925,000	$1,595,000	$6,270,000	$5,309,256
Gtr	Google Cloud consumption costs	$0	$5,775,000	$4,950,000	$4,743,750	$15,468,750	$12,904,959
	Total costs (risk-adjusted)	$220,000	$8,305,000	$6,875,000	$6,338,750	$21,738,750	$18,214,215

INITIAL IMPLEMENTATION AND ONGOING MANAGEMENT COSTS

Evidence and data. Organizations usually conducted a proof of concept before moving forward with their migration. Most customers were done with their migrations in less than two years, with many finishing in less than a year. Customers explained that Google provided them with both technical and industry experts to assist in their migration efforts.

Infrastructure teams received training related to migrating and running their workloads on Google Cloud.

Modeling and assumptions. Based on customer interviews, Forrester estimates the following for the composite organization:

- Five FTEs are dedicated to initial implementation.
- Beginning in Year 1, 10 FTEs are dedicated to ongoing management.
- The average annual salary for an IT professional performing implementation and maintenance of Google Cloud Platform is $120,000.
- The composite organization spends an average of $350,000 per year on professional services.

Risks. Migration and management costs will vary based on:

- The size and complexity of an organization's environment.
- The in-house resources and expertise that the organization can dedicate to the project.

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 $5.3 million.

Initial Implementation And Ongoing Management Costs						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
F1	FTEs dedicated to initial implementation		5	5	5	0
F2	FTEs dedicated to initial implementation and ongoing management		0	10	10	10
F3	Months spent on initial implementation		3	12	6	0
F4	Annual IT FTE salary		$120,000	$120,000	$120,000	$120,000
F5	Professional services		$50,000	$500,000	$250,000	250,000
Ft	Initial implementation and ongoing management costs	(F1*F4/12*F3) +F5+(F2*F4)	$200,000	$2,300,000	$1,750,000	$1,450,000
	Risk adjustment	↑10%				
Ftr	Initial implementation and ongoing management costs (risk-adjusted)		$220,000	$2,530,000	$1,925,000	$1,595,000
	Three-year total: $6,270,000			**Three-year present value: $5,309,256**		

GOOGLE CLOUD CONSUMPTION COSTS

Evidence and data. Pricing for Google Cloud is flexible and can be finely tuned to accommodate specific requirements around compute, storage, and related services. Google Cloud also allows organizations to reduce or eliminate reliance on expensive, overpriced licenses; they also avoid cumbersome licensing audits by vendors. Interviewees highlighted contract terms and optimizations such as committed use discounts, sustained use discounts, CPU overcommits, and BYOL programs to help reduce licensing costs.

Modeling and assumptions. Google Cloud consumption costs include compute, storage, and licensing fees. The composite organization reduces its year-over-year consumption costs over time as it optimizes its cloud infrastructure.

Risks. Consumption costs will vary based on:

- The size and complexity of an environment.
- To what extend customers take advantage of discounts.
- The degree to which customers optimize their environments.

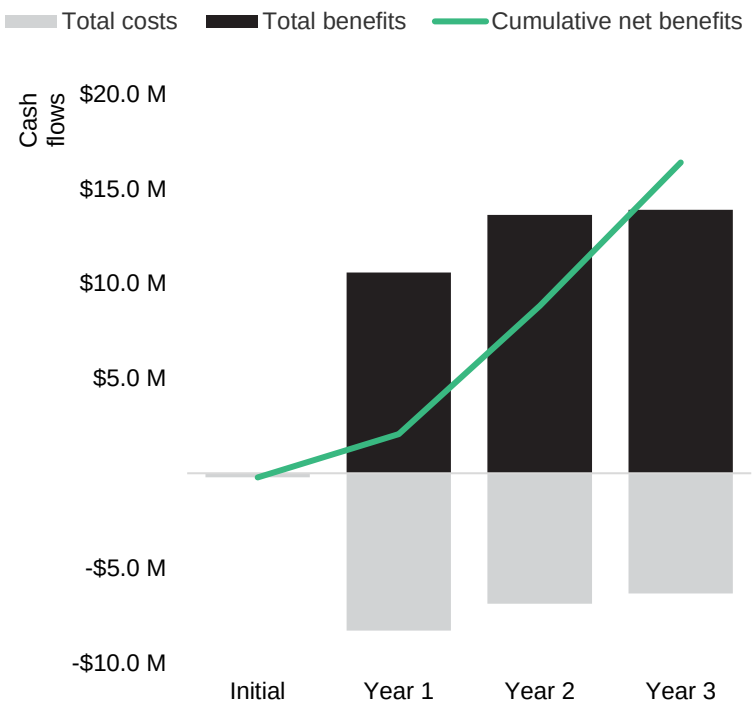
Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $12.9 million.

Google Cloud Consumption Costs						
Ref.	**Metric**	**Calculation**	**Initial**	**Year 1**	**Year 2**	**Year 3**
G1	Google Cloud consumption costs	Interviews		5,625,000	4,500,000	4,125,000
Gt	Google Cloud consumption costs	G1		$5,625,000	$4,500,000	$4,125,000
	Risk adjustment	↑10%				
Gtr	Google Cloud consumption costs (risk-adjusted)		$0	$6,187,500	$4,950,000	$4,537,500
	Three-year total: $15,675,000			**Three-year present value: $12,904,959**		

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	($220,000)	($8,305,000)	($6,875,000)	($6,338,750)	($21,738,750)	($18,214,215)
Total benefits	$0	$10,593,000	$13,633,800	$13,902,600	$38,129,400	$31,342,831
Net benefits	($220,000)	$2,288,000	$6,758,800	$7,563,850	$16,390,650	$13,128,616
ROI						72%
Payback (months)						<6

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: “Cloud Powers The Adaptive Enterprise,” Forrester Research, Inc., November 30, 2020.

[2] Ibid.

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


FORRESTER®