A Forrester Total Economic Impact™
Study Commissioned By Google
July 2020

The Total Economic Impact™ Of SAP On Google Cloud

Cost Savings And Business Benefits Enabled By SAP On Google Cloud

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Top Benefits Of Running SAP On Google Cloud

Legacy infrastructure cost savings:
$7.1 million

Avoided cost of downtime:
$3.8 million

Productivity improvement for business and frontline workers:
$1.3 million

Executive Summary

According to Forrester, cloud is more than just a technology transformation driver — it is a business transformation accelerator. Public cloud services offer organizations an opportunity not only to reduce their on-premises footprint and the associated costs but also to become more agile, connected, and data-driven organizations. The power of a cloud ecosystem is that it can generate analytics of aggregated information and use the network for smarter processes.[1]

Google provides an SAP-certified cloud platform, Google Cloud, that allows organizations to migrate and host their SAP applications in the cloud. Using Google Cloud and Google partners, organizations can quickly and easily migrate their SAP applications and data to Google Cloud with minimal disruption to the business, reduce hardware and maintenance costs, and eliminate the complexities and risks of managing SAP applications on-premises. Because of Google Cloud's pure-cloud infrastructure, organizations can host large instances in a pure-cloud environment, rather than relying on bare-metal servers as part of their public cloud strategies.

Google Cloud commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by migrating and deploying SAP on Google Cloud. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact to their organizations of running SAP on Google Cloud. To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed several customers with years of experience using SAP on Google Cloud and conducted a survey of customers who migrated SAP to Google Cloud, as well as customers who migrated SAP to a different public cloud.

Prior to migrating SAP to Google Cloud, customers were managing large, costly on-premises environments to support their SAP applications. These on-premises environments required a significant amount of maintenance and support to keep running and would still experience frequent downtime and processing issues.

After migrating their SAP infrastructure to Google Cloud, organizations found that they had more flexibility to spin up new SAP instances; reduced cost and effort to maintain SAP systems; and improved reliability, processing speeds, and uptime for SAP applications.

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed:

- **Avoided on-premises hardware, software, and operating costs related to SAP, saving more than $3 million annually.** By migrating SAP infrastructure to Google Cloud, interviewed organizations could reduce the size of their on-premises environments, subsequently reducing the associated operating and maintenance costs. Additionally, organizations could sunset software and security licenses associated with legacy SAP hardware, further reducing the cost and complexity to manage the remaining infrastructure.

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ROI
160%

Benefits PV
$15.4 million

NPV
$9.5 million

Payback
<6 months

- **Eliminated downtime related to SAP systems, saving over $1.5 million annually.** Prior to migrating SAP systems to Google Cloud, interviewed organizations experienced frequent planned downtime, some even monthly, as well as unplanned downtime events a couple times per year. After moving to Google Cloud with a ≥ 99.99% uptime service-level agreement (SLA), organizations eliminated these downtime events altogether.
- **Productivity improvement for business users and frontline workers generating more than $500,000 per year in efficiency gains.** Interviewees noted an improvement to both speed and reliability for daily reporting and queries in SAP. Business users, front line workers, and field sales representatives all benefited from the improved reliability and access to critical data.
- **Efficiency gains for the IT team, resulting in over $500,000 in annual savings.** By migrating SAP to Google Cloud, IT teams could reduce overall management effort associated with SAP, reallocating resources away from management and maintenance toward value-added tasks and teams. Reducing hardware procurement and capacity planning was a major benefit for organizations, along with a reduction in help desk tickets associated with SAP and the reduced maintenance effort associated with the cloud deployment. Additionally, organizations could reduce the security effort by 20% and save time related to financial reporting.
- **Faster and easier-to-implement SAP updates and iterative releases, representing more than $300,000 in annual efficiency gains.** New instances of SAP, including patches and upgrades, are simpler and less error-prone to test and deploy on Google Cloud, reducing the time and effort that developers spend on SAP releases each year. With this time savings, developers can focus on higher-value tasks and projects, delivering greater value to the business.
- **Improve supply chain management efficiency, reducing delays and saving over $420,000 annually.** Prior to migrating to Google Cloud, organizations experienced frequent issues with large batch processing associated with inventory counts and logistics planning. These delays sometimes caused disruptions to the supply chain and prevented goods from being delivered on time. By migrating SAP to Google Cloud, organizations ameliorated these issues.

Unquantified benefits. The interviewed organizations experienced the following benefits, which are not quantified for this study:

- **Improved communication and data quality across the organization.** Interviewed organizations noted a democratization of data as well as a cultural shift toward data accuracy as a result of their SAP migrations. Additionally, frontline workers could more easily communicate with and share data with analysts and office workers, quickly getting data into the hands of those who need it.

"It's so much easier to deploy firewall [and] rules and do network segregation on the cloud than it was here previously on-premises. This conscription and all the standards that come by default. I think 20% time savings would be a fair assessment."

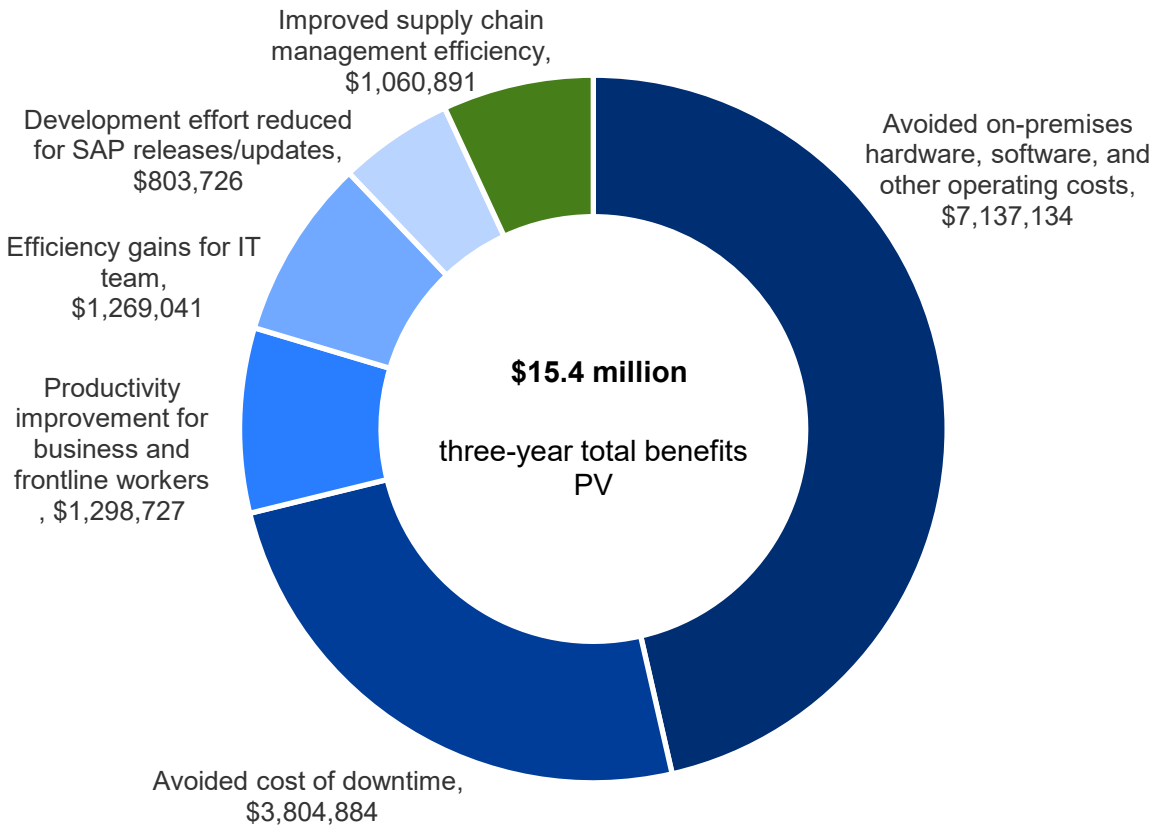
Technical development manager, CPG

- **Flexibility afforded by Google Cloud's pure-cloud environment.** Google Cloud's flexible sizing and the ease with which developers can spin up and down new SAP instances have reduced the development time for SAP applications and made it easier and less costly to plan, develop, and test new applications.

Costs. The interviewed organizations experienced the following risk-adjusted PV costs:

- **Google Cloud licensing fees totaling $1.8 million per year.** Organizations shifted costs from a capex to an opex model, paying Google Cloud for usage on a monthly basis.
- **Implementation and ongoing support costs totaling $1.4 million over three years.** Organizations spent about six months on the initial testing and migration, with subsequent migrations during the following year.

Forrester's interviews with six existing customers, surveys with Google Cloud and non-Google Cloud customers, and subsequent financial analysis found that an organization based on these interviewed organizations experiences **benefits of $15,374,403** over three years versus **costs of $5,907,125**, adding up to a net present value **(NPV) of $9,467,278** and an **ROI of 160%.**



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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 SAP on Google 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 running SAP on Google Cloud can have on an organization:

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

DUE DILIGENCE
Interviewed Google Cloud stakeholders and Forrester analysts to gather data relative to SAP on Google Cloud.

CUSTOMER INTERVIEWS AND SURVEY
Interviewed six organizations and surveyed 20 decision makers across industries using SAP on Google Cloud — and surveyed 75 decision makers across industries using SAP on another 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 four fundamental elements of TEI in modeling SAP on Google 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 Google 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 SAP on Google Cloud.

Google 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.

Google provided the customer names for the interviews but did not participate in the interviews.

The SAP On Google Cloud Customer Journey

BEFORE AND AFTER MIGRATING SAP TO GOOGLE CLOUD

Interviewed Organizations

For this study, Forrester conducted six interviews with SAP on Google Cloud customers. Interviewed customers include the following:

INDUSTRY	REGION	INTERVIEWEE	ANNUAL REVENUE
Food and beverage	MENA	IT director	$350M
Consumer electronics	Europe	Product owner	$22B
Consumer packaged goods (CPG)	Europe	Technical development manager	$1B
Consulting	Global	Managing director of technology	$25B
Industrial manufacturing/sales	Global	Manager of branch operations	$1B
Consumer packaged goods (CPG)	Global	IT manager	$16B

Key Challenges

Before the investment in SAP on Google Cloud, interviewees described the following challenges with their previous solutions:

- **Improving security.** Interviewed organizations were concerned about maintaining their data security both externally and internally. Smaller, in-house teams were spending significant amounts of time maintaining and updating their dynamic environments. Many of their on-premises legacy systems also lacked the enhanced security features these organizations needed to protect sensitive data, including advanced firewalls and network segregation. An IT director in the food and beverage industry said: "With our previous solution, it was very difficult to share information in a secure way even within the company, much less outside the company or with business partners. That is an area we targeted with this investment."
- **Managing growth in a cost-effective way.** As interviewed organizations grew, they struggled to scale their IT infrastructure accordingly. Aging on-premises systems were not providing organizations with the agility they needed to quickly spin up instances or allowing IT teams to easily deploy flexible test environments. Growing organizations wanted a platform that would enable a cost-effective, flexible SAP infrastructure in a way that could adapt to the business's evolving needs.

  A technical development manager in the CPG industry said: "The agility of the cloud, the elasticity, how quickly we can spin up environments, the increased security: Those are the things we were looking for when we invested in Google Cloud."

> "Integrating field and office communication and preparing for a mobile future in all areas from product presentations to quoting was a big reason [we began looking at SAP on Google Cloud]."
>
> *Manager of branch operations, industrial manufacturing/sales*

> "Google Cloud gave us a fresh start to look at everything and apply some of the best security practices from Google Cloud to our SAP environments."
>
> *Technical development manager, CPG*

- **Preparing for a mobile future.** Configuring infrastructure to facilitate more effective mobile access to critical business applications was a top organizational priority for interviewees. Citing recent impacts of COVID-19 and unrealized productivity gains, interviewees expressed their desire for a more mobile IT infrastructure that enables business to happen from anywhere on any device. One manager of branch operations stated: "Integrating field and office communication and preparing for a mobile future in all areas from product presentations to quoting was a big reason [we began looking at SAP on Google Cloud]."

"Hosting SAP on Google Cloud is going to help enable us to be more nimble, consolidate security, and move some of the security responsibility and liability in different places."

Managing director of technology, consulting

Why Migrate And Run SAP On Google Cloud?

Interviewed organizations stated the following reasons for choosing to deploy SAP on Google Cloud to address their challenges:

- **Google Cloud represents a larger organizational shift toward cloud and supporting a modern workforce.** Transitioning SAP infrastructure onto Google Cloud provided interviewed organizations with the opportunity to consolidate their business processes onto the Google Cloud ecosystem while preparing their organizations to support a modern workforce. Google Cloud's product suite offers high-quality services to enterprises that would otherwise require additional allocations from IT budgets.
- **Google Cloud improves security while reducing liability.** Interviewed organizations wanted to minimize the risk of a security breach across their SAP infrastructure and identified Google Cloud to be a leader in data protection. One managing director of technology stated, "The security risk that you mitigate is humungous because a small team has nowhere near the resources that Google Cloud does to support the environment when it comes to infrastructure and the overall support of the network."
- **Google Cloud's support team and roadmap for SAP align to customer expectations and needs.** Interviewed organizations noted that during the proof-of-concept (PoC) process, Google Cloud's support team had a lot of technical expertise and quickly answered any questions, providing a very positive experience. Additionally, Google Cloud could support current size requirements in a pure-cloud environment while sharing its roadmap to ensure that the solution made sense long-term. A technical development manager in the CPG industry said: "One of our priorities was to find a cloud platform that could support SAP on HANA at the sizes we needed. Today, we feel at ease with the support Google Cloud provides for SAP HANA as well as the capacity levels we need today and in the future."

  Interviewees were searching for a platform that would not only host their SAP architecture but also be capable of supporting it in a pure-cloud environment.

"The top benefits for us are flexibility; it's very easy to set up and decommission environments, scalability and for standardization. We're aiming to automate everything."

SAP product owner, consumer electronics (emphasis added)

"[S]ince we switched to Google Cloud a year ago, we haven't experienced any downtime. That has been a very good experience for us. That is where we really tasted the sweetness of cloud."

IT director, food and beverage

Key Results With SAP On Google Cloud

The interviews revealed that key results from migrating SAP to Google Cloud include:

- **Reliable cloud-managed infrastructure that significantly reduced downtime.** Interviewees reported little to no downtime after deploying their SAP architecture on Google Cloud. Less unplanned downtime for critical business functions translated to substantial savings for these organizations, as well as improved employee experience. An IT director stated: “Unplanned downtime could last anywhere from 15 minutes to 1 hour. And it used to cost us a large amount of money.” He added: “During peak hours, an hour of downtime costs around $70K to $75K. It was very expensive for us. But since we switched to Google Cloud a year ago, we haven’t experienced any downtime. That has been a very good experience for us. That is where we really tasted the sweetness of cloud.”
- **An agile cloud platform that enabled flexibility.** Organizations benefited from the flexibility that Google Cloud enabled for their SAP infrastructure. Unlike their legacy infrastructure, Google Cloud empowered IT teams to easily spin up or down SAP instances, which decreased the amount of time, effort, and internal coordination for developers when creating sandbox environments for testing and development. In moving SAP infrastructure expenses from capex to opex, interviewed organizations also experienced more predictable monthly costs to run their environments.

  A product owner in the consumer electronics industry elaborated on the benefits of deploying a less rigid IT infrastructure: “For instance, if you have a sandbox environment, a test environment, and you only need it for two weeks, then you pay for two weeks, and then you can decommission it again. Once you take into account process costs and administrative costs, this is much less than before because before that, we had to have an agreement with our provider, and they had to set up your environment, provide the infrastructure components, and let’s just say it was more complicated and took longer.”
- **Improved security and better backups, reducing effort and liability for IT professionals.** Interviewed organizations realized significant benefits for their IT teams after deploying their SAP architecture on Google Cloud, including improved productivity and mitigated risks.

  A technical development manager in the CPG industry claims: " In general, our organization has a pretty small IT department. We’re quite busy most of the time working on new projects. So, for our internal IT teams, saving time is very important. Saving time means we can get on to the next project. It’s so much easier to deploy new projects, provision new servers, deploy firewall rules, and do network segregation on the cloud than it was here previously on premise. This conscription and all the standards that come by default means we can save up to 75% on like for like tasks on GCP compared to on premise.”

> “The No. 1 thing is, this puts our critical customer data in a secure place, but in a secure place in the hands of the people that can use it to grow our business. And putting this data in the hands of our salespeople and our service people and the people in the field will enable them to make the best decisions — [they] can take the best care of our customers and ultimately take the best care of our future business growth. And all while doing it in a way that enables them to collaborate as a team and deploy and grow globally with much fewer limitations than we currently have.”
>
> *Manager of branch operations, industrial manufacturing/sales*

Composite Organization

Based on the interviews and survey, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the six companies that Forrester interviewed and the responses of the 95 companies that Forrester surveyed; the composite is

used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer interviews has the following characteristics:

The global, publicly traded, $5-billion conglomerate has a centralized headquarters and regional locations around the world. In addition to offices, the organization has warehouse and supply chain considerations that rely on SAP infrastructure for daily logistics reporting and tracking. The organization has completed its migration of SAP instances to Google Cloud, including migrating a HANA environment.

Before investing in Google Cloud for SAP, the organization spent a significant amount of its annual IT budget on on-premises hardware, software, and maintenance and was planning a new data center buildout before deciding to invest in Google Cloud.

The organization has daily reporting requirements that impact its supply chain logistics and frequently experienced downtime or issues related to these reports. Additionally, weekly financial reports were relayed to the global HQ to meet financial reporting requirements, and these reports were frequently delayed or encountered errors in processing.

The organization releases two iterative or new SAP releases each year to deliver new and updated capabilities to the business. Testing and deploying these SAP releases often resulted in unexpected issues, delaying deployment timelines.

After migrating the SAP infrastructure to Google Cloud, the organization continues to run parts of its legacy deployment in parallel before retiring the legacy infrastructure entirely in Year 2.

Key assumptions

- Two SAP releases per year
- $3M per year spent on legacy SAP hardware infrastructure
- Frequent issues related to batch processing and financial reporting

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 on-premises hardware, software, and other operating costs	$2,327,500	$3,182,500	$3,182,500	$8,692,500	$7,137,134
Btr	Avoided cost of downtime	$1,530,000	$1,530,000	$1,530,000	$4,590,000	$3,804,884
Ctr	Productivity improvement for business and frontline workers	$522,237	$522,237	$522,237	$1,566,712	$1,298,727
Dtr	Efficiency gains for IT team	$510,300	$510,300	$510,300	$1,530,900	$1,269,041
Etr	Development effort reduced for SAP releases/updates	$323,190	$323,190	$323,190	$969,570	$803,726
Ftr	Improved supply chain management efficiency	$426,600	$426,600	$426,600	$1,279,800	$1,060,891
	Total benefits (risk-adjusted)	$5,639,827	$6,494,827	$6,494,827	$18,629,482	$15,374,403

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 be a PV of nearly $15.4 million.

Avoided On-Premises Hardware, Software, And Other Operating Costs

Interviewed organizations realized significant cost savings by scaling back their on-premises SAP infrastructure and migrating it to Google Cloud. Challenges associated with previous on-premises SAP deployments included expensive hardware upgrades involving significant capex expenditure, ongoing support and maintenance of aging systems, and poor visibility into monthly operating costs including general maintenance and cooling and electricity costs.

By leveraging Google Cloud to host their SAP infrastructure, interviewed organizations could remove their legacy on-premises SAP infrastructure, realizing significant savings and shifting from a capex to an opex model for SAP. Interviewed organizations estimated a 10% to 20% cost reduction related to hardware when running SAP on Google Cloud versus on-premises.

Organizations avoided large-scale infrastructure upgrades necessary to continue to manage SAP on-premises. A technical development manager in the CPG industry commented on the additional budget that would have been required to upgrade the organization's data center, saying: "We would have had to invest millions into building out a new comms room to accommodate our growth and size requirements. We did actually come to a figure for that buildout but very quickly put that to the side when we saw what Google Cloud could offer."

Organizations wanted to transition to a more flexible opex model. An IT director in the food and beverage industry said: "It was the question of whether you actually invest again, buying completely new hardware with a large capital expenditure, or go for an opex model. We decided to go for the subscription model. And now, if we are not fully leveraging a piece of our infrastructure, we can shut it down and immediately reduce our opex. Those advantages are not there if you are using an on-prem solution."

> "We would have had to invest millions into building out a new comms room to accommodate our growth and size requirements. We did actually come to a figure for that buildout but very quickly put that to the side when we saw what Google Cloud could offer."
>
> *Technical development manager, CPG*

An SAP product owner in the CPG industry echoed this sentiment: “With Google Cloud, it’s only opex. You pay a certain fee per usage, and if you, for instance, have a sandbox environment and you only need it for two weeks, then you pay for two week,s and then you can decommission it again. Once you take process costs and administrative costs into account, running SAP on Google Cloud is cheaper, and the whole process is less complicated and faster than before.”

Based on the customer interviews and survey data, Forrester assumes for the composite analysis:

- Annualized capital expenditure for on-premises legacy infrastructure totaled $20 million per year, with 15% of that infrastructure committed to SAP, prior to migrating SAP to Google Cloud.
- The organization maintains 30% of its on-premises infrastructure associated with SAP in the first year to ensure a smooth transition to the cloud.
- The organization spent over $350,000 a year on general maintenance and ongoing operating costs for on-premises hardware related to SAP, prior to migrating SAP to Google Cloud. Costs included ad hoc hardware purchases, HVAC, and other utility costs.
- After moving SAP to Google Cloud, the composite organization removes the SAP-related infrastructure from its on-premises environment and sunsets all of the associated licenses and other costs.

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

- The total cost for on-prem infrastructure.
- The percentage of that on-premises infrastructure dedicated to SAP.
- The degree to which on-premises, legacy infrastructure is reduced.
- Annual costs related to on-premises hardware maintenance.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of $7,137,134.

Reduce the size and cost of on-premises infrastructure by moving SAP to Google Cloud.

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.

Avoided On-Premises Hardware, Software, And Other Operating Costs: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
A1	Total on-premises infrastructure cost	Composite	$20,000,000	$20,000,000	$20,000,000
A2	Percentage of infrastructure dedicated to SAP	Composite	15%	15%	15%
A3	Total cost of on-premises SAP infrastructure (hardware and software)	A1*A2	$3,000,000	$3,000,000	$3,000,000
A4	Legacy on-prem infrastructure cost reduction	Composite	70%	100%	100%
A5	Annual hardware maintenance and other operating costs (electricity/cooling)		$350,000	$350,000	$350,000
At	Avoided on-premises hardware, software, and other operating costs	(A3*A4) +A5	$2,450,000	$3,350,000	$3,350,000
	Risk adjustment	↓5%			
Atr	Avoided on-premises hardware, software, and other operating costs (risk-adjusted)		$2,327,500	$3,182,500	$3,182,500

Avoided Cost Of Downtime

Interviewees stated that a key benefit of their investment into SAP on Google Cloud was the reduction in both planned and unplanned downtime of their SAP environments. Prior to Google Cloud, interviewees said their organizations frequently planned downtime to complete updates and patches, often for several hours per month. In addition to planned downtime, organizations occasionally experienced unplanned downtime or outages that required immediate remediation from the IT team as well as potential impacts to critical business applications. For these large organizations, unplanned outages are extremely risky and can lead to significant financial losses, so this benefit was a major driver in their decision to invest.

Google Cloud's infrastructure has a ≥99.99% uptime SLA for instances in multiple zones. A technical development manager in the CPG industry said: "One of the main goals that we wanted to achieve by moving SAP to Google Cloud was to take the risk out of running our on-premises infrastructure here at HQ. We were a single point of failure and had experienced some outages before, so we felt good letting Google Cloud handle the infrastructure so we can focus on our core business."

An IT director in the food and beverage industry noted the prior cost of downtime to the organization: "The last nine months, we had no outages or downtime since we moved onto Google Cloud."

Based on the customer interviews and survey data, Forrester assumes for the composite analysis:

- The average cost of downtime for the composite organization is $75,000 per hour.
- Migrating and running SAP on Google Cloud prevents 2 hours of downtime each month, compared with legacy systems.

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

- The frequency of downtime experienced before migrating to Google Cloud.
- The organizational cost of each hour of downtime.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of $3,804,884.

The composite avoids 2 hours of downtime per month by running SAP on Google Cloud.

Google Cloud guarantees 99.99% uptime.

Avoided Cost Of Downtime: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
B1	Reduction in planned and unplanned downtime with legacy solution	2 hr/month	24	24	24
B2	Cost of downtime per hour	Composite	$75,000	$75,000	$75,000
Bt	Avoided cost of downtime	B1*B2	$1,800,000	$1,800,000	$1,800,000
	Risk adjustment	↓15%			
Btr	Avoided cost of downtime (risk-adjusted)		$1,530,000	$1,530,000	$1,530,000

Productivity Improvement For Business And Frontline Workers

Interviewees noted that with previous solutions, access to SAP data was

challenging and that daily reporting was slow and error-prone, causing business users and frontline workers to experience long wait times and delays. Once their SAP systems were migrated to Google Cloud, organizations noted a precipitous increase in both speed and reliability for end users. This benefited a range of employees: business users who leverage SAP reports as part of their day-to-day; frontline workers and field sales representatives who need to communicate with HQ and access crucial data remotely; and manufacturing employees who rely on SAP for inventory and supply chain reporting.

Improved network performance for SAP impacts the entire organization. An IT director in the food and beverage industry said: "The performance improvement is very evident and visible. Things used to slow down and take a long time to run a report. Now, it's very fast; things process in less than a minute. This performance improvement is felt across operations everywhere because every team is interacting with SAP data."

Running SAP in Google Cloud democratizes data and empowers business users. A manager of branch operations in the industrial manufacturing/sales industry said: "The No. 1 thing is, this puts our critical customer data in a secure place, but in a secure place in the hands of the people that can use it to grow our business. And putting this data in the hands of our salespeople and our service people and the people in the field will enable them to make the best decisions — [they] can take the best care of our customers and ultimately take the best care of our future business growth. And all while doing it in a way that enables them to collaborate as a team and deploy and grow globally with much fewer limitations than we currently have."

Based on the customer interviews and survey data, Forrester assumes for the composite analysis:

- Five thousand business users leverage SAP's reporting capabilities during their day-to-day activities.
- Ten percent of those employees are impacted by slow runtimes during daily processes such as running data queries or collecting pricing information.
- The length of cumulative delays totals to 15 minutes of lost time per employee impacted per day.
- The average fully burdened salary of a business user is $74,250. ($55,000 base salary).
- After migrating SAP to Google Cloud, the delays and runtime issues are eliminated.

Interviewees noted that while this benefit was enabled by Google Cloud, fully realizing these results required additional changes and management activities. As such, Forrester attributes 50% of the benefit to Google Cloud.

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

- Number of employees using SAP reporting during day-to-day activities.
- The percentage of employees impacted by slow runtimes.
- The amount of daily delay employees experience with the legacy system.
- The fully burdened salary of business users.

Reduce wait times and improve data access for business and frontline workers.

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To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of $1,298,727.

Productivity Improvement For Business And Frontline Workers: Calculation Table					
REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
C1	Employees who leverage SAP reporting in day-to-day	Composite	5,000	5,000	5,000
C2	Percent impacted by slow runtimes (data queries, price/inventory info, etc.)	Composite	10%	10%	10%
C3	Average delay with legacy system (daily)	15 minutes	15	15	15
C4	Total hours/year saved	(C1*C2*C3)*260/60	32,500	32,500	32,500
C5	Subtotal: Avoided delays with SAP on Google Cloud (FTEs)	C4/2,080	15.63	15.63	15.63
C6	Average fully burdened salary for SAP data end users	$55,000 per year base*1.35 benefits multiplier	$74,250	$74,250	$74,250
C7	Attribution to Google Cloud	Composite	50%	50%	50%
Ct	Productivity improvement for business and frontline workers	C5*C6*C7	$580,264	$580,264	$580,264
	Risk adjustment	↓10%			
Ctr	Productivity improvement for business and frontline workers (risk-adjusted)		$522,237	$522,237	$522,237

Efficiency Gains For IT Team

Migrating SAP architecture to Google Cloud enabled interviewed organizations to reduce the effort required to maintain and secure their infrastructure and prepare for financial audits. These efficiency gains translated into hard benefits for interviewed organizations, which could reallocate employees from working on obsolete tasks to more value-adding initiatives.

The managing director of technology in the consulting industry spoke to the value that time savings enabled by productivity brought to the organization: “We’ve really gained several efficiencies — especially the ability to deploy employees on to other projects. Migrating SAP onto Google Cloud freed up an extra 25% of time off of everyone’s schedules, and we were able to redeploy them onto other projects and engagements.”

3.5 FTE reduction in overall management effort.

A technical development manager in the CPG industry commented on the added security benefits of implementing SAP on Google Cloud and the freedom it has afforded their team to work on other important projects: “For our internal IT teams, it is now so much easier to do like for like tasks on the cloud than it was here previously on-premise. We have a small IT department, so time saved is very important because it means we can start on the next project.”

Interviewed organizations also reported that migrating SAP’s infrastructure from on-premises, legacy solutions to Google Cloud can reduce the amount of time spent tracking bills. The interviewee in the consulting industry added, “We have reduced our effort in billing and tracking effort by around 10%.”

Based on the customer interviews and survey data, Forrester assumes for the composite analysis:

- The IT team reallocates two FTEs to focus on higher-value projects as a result of the efficiency gains enabled by implementing SAP on Google Cloud.
- The IT security team reallocates one FTE to focus on higher-value projects as a result of the security monitoring capabilities provided by Google Cloud architecture.
- The financial reporting and audit preparation team reallocate half an FTE to work on higher-value projects as a result of Google Cloud's ability to enable faster and more reliable reporting than legacy systems could provide.
- The fully burdened annual salary for IT staff is $162,000 ($120,000 base).

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

- Required maintenance effort for the legacy SAP infrastructure.
- Required effort for monitoring and maintaining security of the legacy SAP infrastructure.
- Effort required to support financial reporting and audit needs.
- The average fully burdened salary of SAP specialists.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of $1,269,041.

Efficiency Gains For IT Team: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
D1	Reduced maintenance effort (FTEs)	Composite	2	2	2
D2	Reduced security effort (FTEs)	Composite	1	1	1
D3	Financial reporting and internal audit assist (FTEs)	Composite	0.5	0.5	0.5
D4	Average fully burdened salary for SAP IT staff	E4	$162,000	$162,000	$162,000
Dt	Efficiency gains for IT team	(D1+D2+D3)*D4	$567,000	$567,000	$567,000
	Risk adjustment	↓10%			
Dtr	Efficiency gains for IT team (risk-adjusted)		$510,300	$510,300	$510,300

Development Effort Reduced For SAP Software Releases/Updates

Interviewees described a labor-intensive process with frequent delays and unexpected issues related to keeping their SAP products up to date with the latest releases and patches. Legacy infrastructure could not support a rapid deployment of test environments, and, because SAP applications are business-critical, developers needed to be 100% certain that there would be no issues before launching the updated SAP release.

With SAP environments maintained on Google Cloud, developers have more flexibility and are no longer constrained by the speed and capabilities of their legacy on-premises infrastructure, allowing them to launch new releases faster and more efficiently.

A product owner in the consumer electronic industry stated: "We are at the present stage of a new project to upgrade to a new version of SAP. The migration onto Google Cloud has helped us a lot because before, we would have been completely tied up in the upgrade, so if a vendor

asked us for a test environment, it was almost impossible for us to produce one. But now, we are not even considering that as a major factor in the project plan, and it is very easy to do at any time. We were spending about a third of the total project time — about three months — procuring hardware and getting it set up on-premises."

In addition to reduced time-to-value for SAP releases, Google Cloud's cloud-native SAP infrastructure enables organizations to rely less on specialized knowledge when maintaining their SAP environments. A product owner in the consumer electronics industry stated: "Our required skill set has changed. Before we migrated, we had to rely on a managed service provider and some cloud architects to commission new infrastructure components. It took time and was costly. Now, we can do it all ourselves and at a predictable cost."

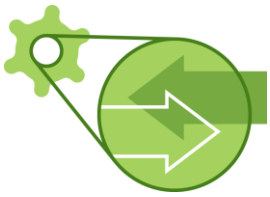
Based on the customer interviews and survey data, Forrester assumes for the composite analysis:

- There are two iterative or new SAP releases annually.
- Three FTEs were required to implement these releases with the legacy on-premises infrastructure.
- Google Cloud's architecture reduces the amount of effort required from developers to implement releases by 35%.

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

- The number of FTEs required to update the on-prem SAP environment with the legacy system.
- The amount of effort required to push out SAP releases with the on-premises, legacy system.
- The annual salary of SAP administrators.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of $803,726.



35% less effort for SAP updates and releases

Development Effort Reduced For SAP Releases/Updates: Calculation Table

REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
E1	Annual SAP releases	Composite	2	2	2
E2	Effort associated with on-prem SAP updates/releases — legacy system	FTE	3	3	3
E3	Reduced effort associated with SAP updates/releases — Google Cloud	Composite	35%	35%	35%
E4	Annual Salary — SAP architect	$120,000 base*1.35 benefits multiplier	$162,000	$162,000	$162,000
Et	Development effort reduced for SAP releases/updates	E1*E2*E3*E4	$340,200	$340,200	$340,200
	Risk adjustment	↓5%			
Etr	Development effort reduced for SAP releases/updates (risk-adjusted)		$323,190	$323,190	$323,190

Improved Supply Chain Management Efficiency

Google Cloud has significantly greater compute and processing power when compared to legacy on-premises infrastructure. Interviewees described lost revenue and supply chain challenges driven by slow and error-prone legacy infrastructure, affecting both labor resources and the supply chain itself. For interviewed organizations in industries reliant on fluid and reliable supply chains, such as manufacturing, retail, and healthcare, these impacts were particularly costly. After moving SAP to Google Cloud, interviewed organizations no longer experienced these errors or delays.

An IT director in food and beverage described: "We used to experience batch-processing issues quite often, and it was disastrous. When things process overnight and something goes wrong at 2 a.m., my team would need to go in and triage before it impacts the supply chain. And the challenge was that anything could create a problem: connectivity of the data center, issues at the factory, synchronization from a VPN. It was hard to diagnose and hard to manage. In the last nine months since we moved to Google Cloud, we have had zero of these issues."

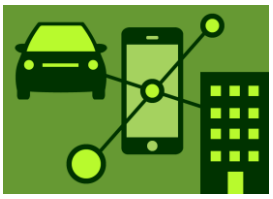
Based on the customer interviews and survey data, Forrester assumes for the composite analysis:

- The composite organization experienced at least two delays per month with its legacy on-premise solution.
- Of these delays, 15% significantly impacted delivery or caused long delays in the supply chain.
- The cost of minor delays that affected only affected labor cost the composite organization $10,000 per delay.
- The cost of major delays that affected large parts of the supply chain cost the composite organization $75,000 per delay.
- After migrating SAP to Google Cloud, these delays are eliminated.

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

- The number of delays caused by slow batch processing with the legacy on-premises system.
- The frequency of problems that would significantly impact delivery or cause delays.
- The labor cost of minor delays.
- The supply chain cost impact of major delays.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of $1,060,891.



Improve supply chain efficiency through better network performance and connectivity.

Improved Supply Chain Management Efficiency: Calculation Table					
REF.	METRIC	CALCULATION	YEAR 1	YEAR 2	YEAR 3
F1	Issues or delays caused by slow, error-prone batch processing with previous solution	2/month	24	24	24
F2	Frequency issues would cause significant delays/impact delivery	Interviews	15%	15%	15%
F3	Cost of minor delays — labor	Interviews	$10,000	$10,000	$10,000
F4	Cost of major delays — supply chain impact	Interviews	$75,000	$75,000	$75,000
F5	Financial impact of minor delays	F1*(1-F2)*F3	$204,000	$204,000	$204,000
F6	Financial impact of major delays	F1*F2*F4	$270,000	$270,000	$270,000
Ft	Improved supply chain management efficiency	F5+F6	$474,000	$474,000	$474,000
	Risk adjustment	↓10%			
Ftr	Improved supply chain management efficiency (risk-adjusted)		$426,600	$426,600	$426,600

Unquantified Benefits

In addition to the quantified benefits highlighted above, the interviewed organizations described other benefits of migrating and running their SAP infrastructure on Google Cloud that were not specifically quantified in this study. Please find a description of these benefits here:

- **Improved communication, data quality, and access across the organization**. Interviewed organizations noted that since migrating SAP to Google Cloud, the number of people accessing and using data (and analytics reports) has significantly increased. The ability for workers to communicate and share data remotely has also improved the collaboration between office and field workers. A manager of branch operations in the industrial manufacturing industry noted: "The biggest cultural change is folks now have more of an interest in being accurate when inputting data into SAP because they know they are actually going to use it. Overall data quality has definitely gone up, and everybody has much more of a hand in the data accuracy now."
- **Flexibility afforded by Google Cloud's pure-cloud infrastructure.** Interviewees described two kinds of flexibility enabled by migrating SAP to Google Cloud: business flexibility related to cost containment and strategic decision making, and developer flexibility related to developer resources.

  Businesses are no longer tied to costly, complex on-premises infrastructure and can more easily and securely manipulate data, update processes, and scale operations on Google Cloud. This flexibility makes it easier for organizations to navigate the ebbs and flows of business cycles and is especially helpful for industries with seasonal booms or unpredictable spikes in business.

  The ease with which developers can spin up and down new environments for testing and development has reduced the time it takes to roll out new applications, features, and reporting capabilities. A technical development manager in the CPG industry said "Something that would have taken maybe 3-4 months to get everything done now takes less than a week."

  Additionally, organizations felt that moving their SAP infrastructure to Google Cloud afforded the business more flexibility because they were

> "The biggest cultural change is folks now have more of an interest in being accurate when inputting data into SAP because they know they are actually going to use it. Overall data quality has definitely gone up, and everybody has much more of a hand in the data accuracy now."
>
> *Manager of branch operations, industrial manufacturing/sales*

Improve communication and data usage across the organization.

able to apply Google Cloud's analytics tools to more of their organizational data, using the data and insights to inform strategic decions making.

- **Leveraging Google Cloud partners to help manage and accelerate deployment.** Interviewed organizations worked with recommended Google Cloud partner organizations, often at no additional cost, to manage certain aspects of their migrations to Google Cloud. The technical development manager for a CPG firm described the partner that helped with data migration: "They have an agent that we installed on our local landscape that would send a replication of the on-premises server up to a staging area on Google Cloud. This allowed us to quickly take care of any potential issues, then move the system from on-prem to Google Cloud overnight with no disruption to our business."

Flexibility

The value of flexibility is unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement SAP on Google Cloud and later realize additional uses and business opportunities, including:

- **Improved analytics capabilities with Google Cloud and Google Analytics offerings.** Interviewees explained how Google Cloud's robust suite of products, including BigQuery and Google Data Studio, has allowed them to significantly improve their analytics capabilities, as well as improve speed and accessibility of data and analytics tools across their organizations. Additionally, seamless integration with other analytics products has made it easy for organizations to use the tools with which they are most comfortable, and those tools can work across data sets to produce consolidated reports.

  Some organizations also noted the high costs of certain data storage solutions and leveraged Google Cloud as a more cost-effective way to store critical data.

- **Google Cloud's technical leadership and innovations.** Interviewees appreciated that they could leverage all the latest innovations from Google Cloud automatically and without any additional cost or effort. An SAP product owner in the retail industry noted: "We benefit from any technical innovation in the infrastructure area because Google Cloud is doing that for us. So, whenever there's new hardware available or new processes or whatever, I don't have to run the specific project to migrate from A to B."

  An IT director in the food and beverage industry said: "SAP is only one of the things in the Google ecosystem. We are using the G Suite, Google Scripts, Google Cloud SQL, and we have Google Chromebooks. It's a very agile mechanism, and we are now able to resolve issues and act faster when, for example, our marketing team wants to roll out a new promotion with regional coupons."

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

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so.

Improve analytics capabilities across data sets and reduced data storage costs.

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
Gtr	Google Cloud fees	$0	$1,800,000	$1,800,000	$1,800,000	$5,400,000	$4,476,334
Htr	Implementation and ongoing support	$975,127	$345,107	$89,957	$89,957	$1,500,147	$1,430,791
	Total costs (risk-adjusted)	$975,127	$2,145,107	$1,889,957	$1,889,957	$6,900,147	$5,907,125

Google Cloud Fees

Pricing for Google Cloud is flexible and can be finely tuned to accommodate specific requirements around compute, storage, and related services. Additionally, interviewed organizations negotiated individual contracts for their Google Cloud deployments that often included SAP- as well as non-SAP-related infrastructure.

Interviewees highlighted contract terms such as committed use discounts and sustained use discounts as helping justify the initial investment, with the understanding that the discounts would eventually expire.

For the purposes of this study, the composite organization pays $1.8 million per year for its SAP infrastructure on Google Cloud. This annual cost includes compute, storage, and services related to running SAP BI on HANA, SAP ERP, and storing SAP customer records on Google Cloud. This cost does not consider any of the discounts that interviewed organizations mentioned above.

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 be a PV of more than $5.9 million.

Google Cloud Fees: Calculation Table

REF.	METRIC	CALCULATION	INITIAL	YEAR 1	YEAR 2	YEAR 3
G1	Google Cloud fees	Composite	0	$1,800,000	$1,800,000	$1,800,000
Gt	Google Cloud fees	Composite	$0	$1,800,000	$1,800,000	$1,800,000
	Risk adjustment	0%				
Gtr	Google Cloud fees (risk-adjusted)		$0	$1,800,000	$1,800,000	$1,800,000

Implementation And Ongoing Support

Interviewed organizations noted that, to fully migrate their SAP infrastructure to Google Cloud, they needed to upgrade some of their base SAP licenses, incurring some upfront costs. Additionally, there was a significant amount of effort dedicated to testing before any migrations were completed to ensure a smooth transition to Google Cloud and minimal disruption to the business. The SAP infrastructure team received upfront and ongoing training from Google related to migrating and running SAP on Google Cloud.

Google also provided resources and recommended partners for organizations to work with during the migration process to help with specific aspects of the migration.

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

Based on customer interviews, for the composite organization, Forrester assumes:

- There is a $100,000 cost to upgrade existing SAP systems to be deployable on Google Cloud.
- A team of 10 FTEs spends six months on the initial testing and migration. This decreases to a team of four FTEs spending half their time in Year 1 and 1 FTE spending half their time providing general support in subsequent years.
- The 15-person SAP team requires 16 hours of initial training and then receives 4 hours of training per year to review new capabilities and best practices and roadmap for the future.

To account for variance in the size and nature of an organization's SAP deployment on Google Cloud, Forrester adjusted this cost upward by 5%, yielding a three-year risk-adjusted total PV of $1,430,791.

Six months
Initial implementation and deployment time

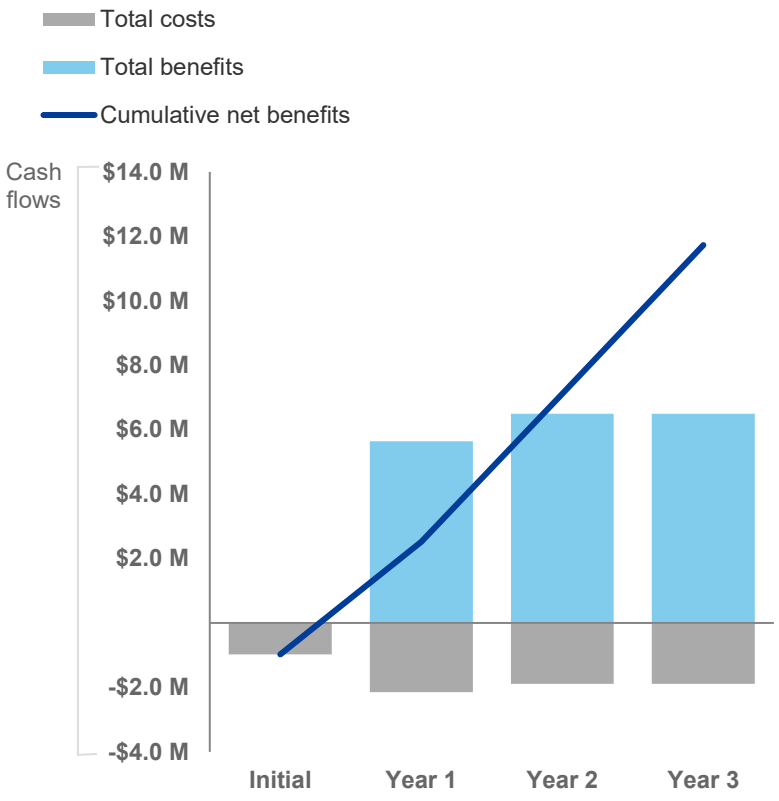
Implementation And Ongoing Support: Calculation Table

REF.	METRIC	CALCULATION	INITIAL	YEAR 1	YEAR 2	YEAR 3
H1	Cost to upgrade SAP to move to Google Cloud	Composite	$100,000			
H2	IT FTE working on migration, maintenance	Composite	10	4	1	1
H3	Time dedicated to SAP	Composite	50%	50%	50%	50%
H4	Fully burdened salary — IT	E4	$162,000	$162,000	$162,000	$162,000
H5	FTEs required for training	Composite	15	15	15	15
H6	Training hours	Composite	16	4	4	4
H7	Labor costs	(H2*H3*H4)+ (H5*H6*(H4/2,080))	$828,692	$328,673	$85,673	$85,673
Ht	Implementation and ongoing support	H1+H7	$928,692	$328,673	$85,673	$85,673
	Risk adjustment	↑5%				
Htr	Implementation and ongoing support (risk-adjusted)		$975,127	$345,107	$89,957	$89,957

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	($975,127)	($2,145,107)	($1,889,957)	($1,889,957)	($6,900,147)	($5,907,125)
Total benefits	$0	$5,639,827	$6,494,827	$6,494,827	$18,629,482	$15,374,403
Net benefits	($975,127)	$3,494,721	$4,604,871	$4,604,871	$11,729,335	$9,467,278
ROI						160%
Payback period (months)						<6

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SAP On Google Cloud: Overview

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

Google Cloud

Rely on Google Cloud for SAP, today and tomorrow

No matter where you are, no matter what your industry, Google Cloud can help ensure your business-critical operations run smoothly on SAP with Google Cloud.

Reduce risks, increase uptime, and free up working capital with Google Cloud's SAP Business Continuity Program. Working closely with Google Cloud's experienced partner community, Google Cloud will ease the lift-and-shift of your on-premises or hosted SAP environments with simple, no-cost migrations. Gain a future-proof digital business platform with integrated artificial intelligence, machine learning, and advanced analytics that deliver deep insights for all who need them.

Get the performance, compute power, flexibility, scalability, availability, and security you need for your current and future business needs with SAP on Google Cloud.

Business Continuity

Keep your critical financial, supply chain, and customer systems up and running with zero-downtime infrastructure upgrades, premier cloud networking, and white-glove site reliability engineering and support services.

Economic Value

Save 30% to 60% in operating costs compared to on-prem. Leverage Google Cloud's Cloud Acceleration Program to cover migration costs. Pay only per use for nonproduction workloads such as DR, test, and QA.

> We're all in the midst of an extraordinary moment — not only for our teams, colleagues, and customers, but for the world at large. All over the world, businesses and users depend on Google Cloud to help them stay connected and get work done. And we take this responsibility very seriously."
>
> **Thomas Kurian**
> CEO, Google Cloud

Google Cloud

Smart infrastructure built for simplicity, security, and scale

- Ease migration and speed deployments with automation templates.
- Reduce risk with premium cloud network performance.
- Drive near-zero platform downtime for SAP environments with Live Migration.
- Flex with the speed of your business with demand-based autoscaling.
- Fortify your environment with five layers of data protection and AI-enhanced security.

Digital business platform for unmatched competitive advantage

- Innovate faster with Google's ecosystem of technologies.
- Analyze all SAP and non-SAP data quickly and at petabyte scale using BigQuery.
- Enable all users to drive business insights with integrated, self-serve AI/ML technologies.
- Explore new capabilities with faster data operations on a cutting-edge, open architecture.
- Enhance customer experiences with Google innovations like Maps, Android, and others.

Commitment to solving your toughest business problems

- Experience exceptional response times and support for continuous innovation.
- Deliver flawless peak shopping seasons and management of complex supply chains.
- Accelerate your digital transformation with Google Cloud's wide range of partner solutions.
- Leverage the Cloud Acceleration Program (CAP) with migration incentives.
- Lean on Google Cloud for up to six months of initial free infrastructure for your SAP landscape.

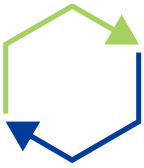
Appendix A: Total Economic Impact

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.

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Appendix B: Supplemental Material

Related Forrester Research

"The Public Cloud Market Outlook, 2019 To 2022," Forrester Research, Inc., July 2, 2019

"Where To Adjust Tech Budgets In The Pandemic Recession," Forrester Research, Inc., May 19, 2020

Appendix C: Endnotes

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[1] Source: "Cloud Powers The Modern Adaptive Enterprise," Forrester Research, Inc., October 11, 2019.