

A Forrester Total Economic Impact™
Study Commissioned By Google
September 2018

The Total Economic Impact™ Of Google Chrome OS With G Suite

Cost Savings And Business Benefits
Enabled By Chrome OS With G Suite

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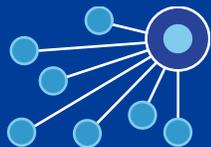
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Executive Summary

Benefits And Costs



Security cost avoidances:

\$1,632,295



Improved user productivity:

\$3,984,364



Chrome OS with G Suite
subscription cost:

\$2,959,354

Google provides a cloud-native operating system and productivity suite that helps its customers improve security, increase productivity, and strengthen employee experience (EX). Google commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Chrome OS with G Suite. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Chrome OS with G Suite on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed and surveyed several customers with multiple years of experience using Chrome OS with G Suite. Many of these customers have been moving to more cloud-based apps and needed seamless access to their tools and data across multiple devices. Chrome OS with G Suite was purpose-built for the cloud and enables organizations to improve user productivity and user mobility and reduce downtime while operating in a secure environment.

Cloud allows for new workforce technology strategies that balance cost, security, and EX goals (including scalability and anywhere/real-time access). Forrester found in a recent survey that 81% of companies have a cloud-first strategy or are prioritizing cloud to support business needs.¹

For IT decision makers, cost and security lead the list of big-picture goals: 70% say reducing cost is a high or critical priority, while 69% say the same for increasing security. Cloud can address these concerns while also driving a better employee experience. Employee experience contributes to better customer experience and supports key goals like talent retention, higher quality, and larger top-line revenue growth.² Cloud increases employee experience by empowering workers to access their digital assets and experiences at any time, from any device, anywhere they happen to be.

Key Findings

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

- › **With Chrome OS with G Suite, updates are invisible to employees, reducing downtime by 30 minutes on average per week.** As a cloud-connected operating system and productivity suite, Chrome OS and G Suite are always up to date. This reduces the need for employees to manually reboot and install updates. Overall, the time saved by employees led to \$2,92 million of recouped productivity over three years.
- › **With Chrome OS with G Suite, updates are automatic, reducing the risk of endpoint security issues by 20% and avoiding an average of \$656,000 a year in security breach avoidance.** Forrester surveyed 34 companies using Chrome OS with G Suite and found that, compared to their old environments before Chrome OS, the average annual cost of breaches or incidents was 78% higher. These savings resulted in a three-year security cost avoidance of \$1.6 million.



ROI
359%



Benefits PV
\$19.4 million



NPV
\$15.2 million



Payback
< 6 months

- › **A 15.5% improvement in help desk efficiency resulted in \$249,971 in savings over three years.** After investing in Chrome OS with G Suite, the interviewed organizations noted savings from both a reduction in call volumes to the help desk and the time to remediate issues. One interviewee said: “We had an army of people supporting our previous operating system across our corporate environment and stores. Our operating system that runs the registers is outdated and brittle, requiring a much greater effort to support.”
- › **With Chrome OS + G Suite, organizations saved an average of \$100 per user on legacy solutions.** By eliminating their previous solution license costs for operating systems and productivity suites, the interviewed companies experienced an average annual savings of \$100 per user. In addition to license costs, one interviewed organization noted the value of leveraging G Suite to avoid purchasing an off-the-shelf workflow product. Overall cost savings for the legacy OS and productivity suites were nearly \$1.8 million.
- › **Utilizing machine learning and other productivity enablers led to over \$3.9 million in day-to-day activities savings.** Interviewed and surveyed G Suite with Chrome OS users reported significant savings through Gmail Quick Reply, Quick Access in Drive, and other machine learning capabilities. These savings, together with day-to-day productivity enablers using G Suite, supported a 10-minute daily average time savings for Chrome OS with G Suite users.
- › **Leveraging G Suite enabled employees to access documents and emails anytime, anywhere, saving \$8.8 million.** Furthermore, employees utilized Hangouts’ meeting capabilities and document sharing in meetings to streamline meetings, saving an average of 3 minutes at the start of every meeting. Hangouts also enabled employees to meet virtually rather than in-person, reducing corporate travel by \$350,000 per year. Over three years, the savings from utilizing G Suite was more than \$8.8 million.

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

- › **With prebuilt policies and auto-updates, Chrome OS with G Suite reduces the burden on IT management teams.** Organizations previously spent up to 50 hours a week managing previous operating systems and productivity suites. One interviewee said, “Thinking back, the amount of time we used to spend to build the packets, deploy them, and fix the things that were broken, we just don’t have to do that anymore.”
- › **Chrome OS has built-in compliance capabilities that help to streamline the audit process.** Google maintains and adheres to many of the security standards required across industries. For example, Chrome OS can connect to a variety of virtual private networks (VPNs) used to secure organizational communications. As such, this ensures organizations stay compliant while reducing the effort needed for internal and external audits.

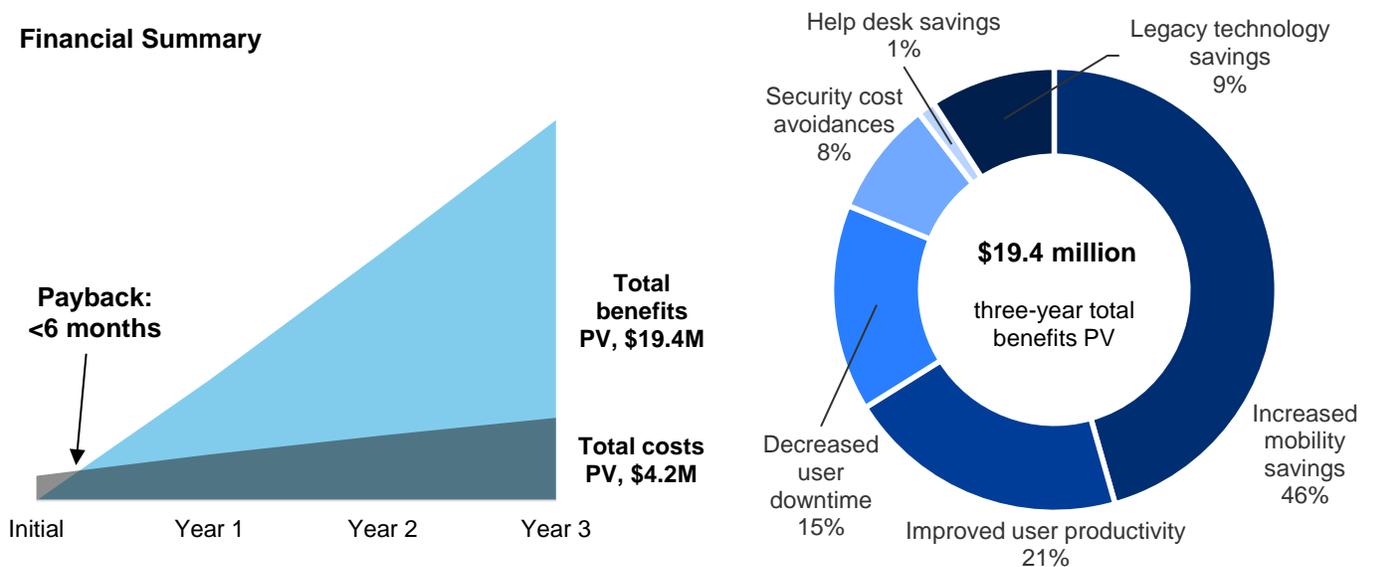
Costs. The interviewed organizations experienced the following risk-adjusted PV costs:

- › Chrome OS and G Suite license subscription fees amounted to \$2,959,354. The average cost per user for Chrome OS with G Suite is \$170 per year.

- › **Implementation and configuration lasted six months and cost \$586,500.** On average, six internal FTEs needed six months to implement, test, and integrate Chrome OS and G Suite into their existing environments. Additionally, some organizations hired a professional service provider to assist in the effort at an average cost of \$35,000 per month or \$210,000 overall.
- › **Change management and training occurred in parallel to implementation and cost \$679,650.** On average, employees required 1 hour for training in the new Chrome OS and G Suite environments. With the popularity of G Suite in personal use, many employees found Google to be more intuitive than their previous systems. This helped to keep the training cost and time to a minimum.

Forrester's interviews with six existing customers and survey of 66 additional Chrome OS with G Suite user organizations found that an organization based on these interviewed organizations experienced benefits of \$19.4 million over three years versus costs of \$4.2 million, adding up to a net present value (NPV) of \$15,186,161 and an ROI of 359%.

Financial Summary



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

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing Google Chrome OS with G Suite.

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 Chrome OS with G Suite can have on an organization:



DUE DILIGENCE

Interviewed Google stakeholders and Forrester analysts to gather data relative to Chrome OS with G Suite.



CUSTOMER INTERVIEWS

Interviewed six organizations and surveyed 66 more using Chrome OS with G Suite 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 Google Chrome OS with G Suite'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 Google Chrome OS with G Suite.

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.

In some cases, Google provided the customer names for the interviews but did not participate in the interviews.

The Chrome OS With G Suite Customer Journey

BEFORE AND AFTER THE CHROME OS WITH G SUITE INVESTMENT

Interviewed Organizations

For this study, Forrester surveyed 66 organizations and conducted six interviews with Google Chrome OS with G Suite customers. Interviewed customers include the following:

INDUSTRY	HEADQUARTERS	NUMBER OF EMPLOYEES	NUMBER OF USERS	REVENUE
Healthcare	United States	3,000	3,000	Private
Nonprofit research	United States	1,400	5,200	Private
Manufacturing	United States	50,000	30,000	\$7 billion
Retail	United States	200,000	35,000	\$15 billion
Manufacturing	Europe	80,000	70,000	\$30 billion
Business services	United States	5,000	5,000	\$5 to \$10 million

Key Challenges

Historically, cost- and security-related concerns and challenges have come before those specific to employee experience and collaboration. A recent Forrester survey and study confirmed that reducing cost and improving endpoint security were the top two priorities for organizations in the next 12 months. Furthermore, when asked, “What challenges does your IT organization face with the devices/OS that support workforce productivity at your organization?” 45% of respondents had concerns about the security of older devices and operating systems. Forrester concluded that over 70% of employees utilize the web browser to access productivity suite applications and email.³ The interviewed organizations along with the surveyed companies shared similar challenges prior to investing in Chrome OS with G Suite. These challenges included:

- › Improving usability and employee experience.
- › Improving IT productivity.
- › Improving speed and user productivity.

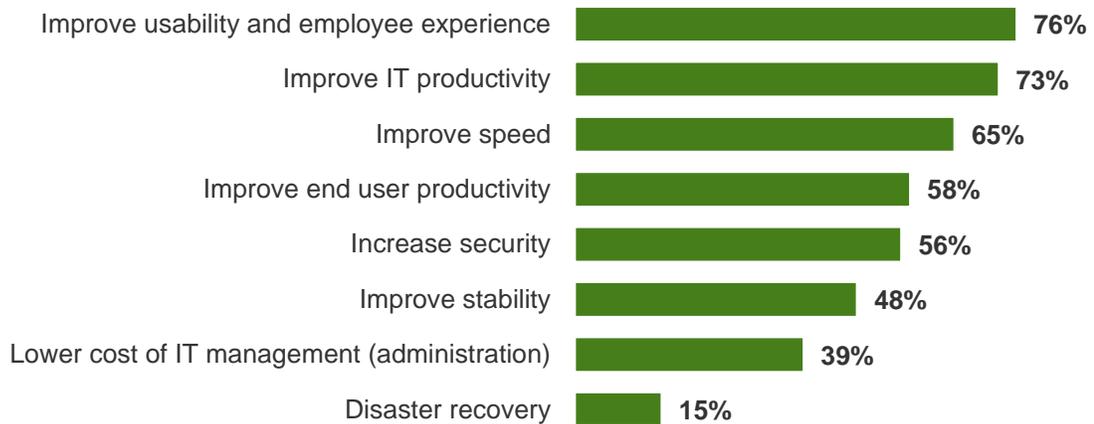
Our survey identified a handful of other objectives organizations wished to overcome as illustrated in the following table.

“We’ve struggled with maintaining our operating system environment, and when you’re not continuously optimizing, you get a lot of bloat and legacy technology, creating technical debt that is not sustainable at scale.”

Architect, retail company



“What drove your organization to move to Chrome devices?”



Base: 66 Google Chrome OS with G Suite users

Source: A commissioned study conducted by Forrester Consulting on behalf of Google, February 2018

Solution Requirements

As employees spend more time using cloud apps, the browser has become a central access point for communication and collaboration. In fact, 62% of organizations interviewed listed expanding the use of cloud-based applications for employees as a critical or high priority. In addition, 67% of employees rely much more heavily on a web browser to do their jobs than they did two years ago.⁴ The interviewed and surveyed organizations searched for a solution that could:

- › Increase their use of cloud infrastructure and platforms.
- › Expand their use of cloud-based applications for employees.

Cloud computing opens the door for strategies that require fewer compromises between cost, security, or EX.⁵ These requirements led the companies to invest in and deploy Chrome OS with G Suite.

Key Results

The interviews and surveys revealed that key results from the Chrome OS with G Suite investment include:

- › **Improved security.** One of the major security benefits came from the devices on which Chrome OS operates on. These devices essentially are zero state, meaning they are difficult to hack and can be shared between employees without the risk of data leaking out or getting into the wrong hands. Furthermore, as a cloud-based operating system, many of the inherent risks to localized security issues were avoided. This included updates, patching, identify management, and local storage data theft. Chrome OS and G Suite comes with security features and capabilities built in by default.
 - One customer found it easier to manage the adoption of GDPR as Google already incorporated many of the policies and procedures required.
 - Another customer was much less affected by recent phishing scams within the Chrome client environments as compared to

“We’re seeing a lot of improvement in spam management, security controls, and other things Google is implementing.”

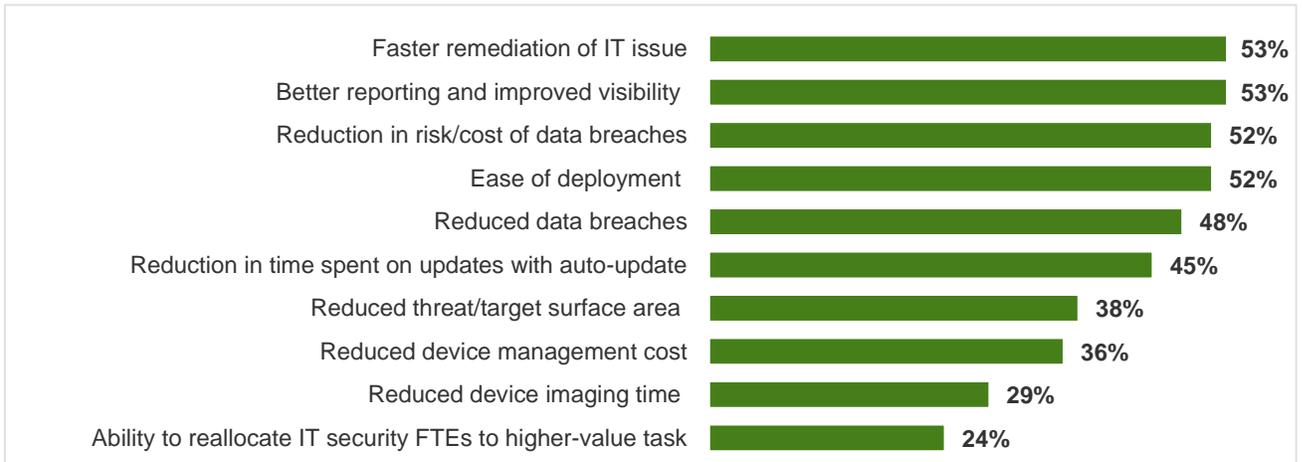
Head of collaboration and knowledge management, manufacturing



other environments. With Gmail, the customer realized marked improvement in spam management and security controls.

- Other security efficiencies experienced by the surveyed customers included better reporting and visibility, reduced threat/target surface area, and reduced device imaging time. For a full list of improvements, see the table below.

“Which of the following IT and security efficiencies has your organization achieved due to your



Base: 66 Google G-Suite with Chrome OS users

Source: A commissioned study conducted by Forrester Consulting on behalf of Google, February 2018

- › **Improved employee experience.** One Forrester study reported that 73% of IT decision makers consider employee experience a top priority when making decisions on business applications. This is important as 69% of surveyed employees said if they are feeling positive and/or happy, it has noticeable improvement on their quality of work. This means that a positive employee experience depends on the employees' ability to be productive.⁶

Organizations surveyed reported several different employee experience improvements, including machine learning and AI to reduce repetitive tasks, like tracking down documents on the web, reformatting presentations, or performing calculations within Sheets. Quick Replies, Snooze, and other embedded features in Gmail have also impacted employee experience, making dealing with emails more efficient. In addition to machine learning and AI, other employee experiences were improved using G Suite. One customer said, “Hangouts revolutionized our meetings by creating a much smoother start process for meetings.” The customer added that discovery ensures everyone has the right documents at the right time, which helps meetings start quickly.

“Mobility isn’t us putting all of the apps and data on my device; it’s all these cloud applications and the experiences being decoupled from my device allowing me to be mobile across all of my different devices.”

Architect, retail company



› **Reduced costs with greater productivity.** The greatest benefit of adopting Chrome OS with G Suite is the cost savings from improved productivity throughout the organization. More than 71% of survey respondents said employee productivity improved overall. While each organization may experience different use cases of savings, the interviewed companies identified some common improvements, including:

- Greater access to files and data from anywhere, anytime.
- Document collaboration, sharing, and version control.
- Reduced downtime for users.
- Reduced IT management workload.

“I can really work from anywhere: the train, the plane, or even the beach”

Head of collaboration and knowledge management, manufacturing



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 companies that Forrester interviewed and surveyed and 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:

Description of composite. The composite organization is a global business with regional offices and locations across multiple countries. The organization has 50,000 total employees, 35% of whom (or 17,500) are considered knowledge workers, who need to be on a connected device and access company data and information to conduct day-to-day business activities. Of those 17,500 knowledge workers, 7,000 are Chrome OS with G Suite users operating on Chromebooks.

In total, the composite organization has 75,000 endpoints, which consist of desktops, kiosks, tablets, laptops, and mobile devices. The composite organization deployed Chrome as its default browser three years ago to support its corporate objective of a cloud-first strategy.

Deployment characteristics. The composite organization’s employees leveraged Chrome OS with G Suite as its main point of entry into all its cloud-based web applications. As such, these 7,000 employees used Chromebooks, which allowed them to have laptop-level mobility with the use of wireless hotspots. Being cloud-based enabled the IT teams to manage and maintain Chrome OS and G Suite through a centralized Google Admin Console where they could deploy custom rules, settings, and policies across their employee base.



Key assumptions

50,000 employees

17,500 knowledge workers

7,000 Chrome OS with G Suite users

75,000 total endpoints with Chrome browser default

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	Decreased user downtime	\$1,175,720	\$1,175,720	\$1,175,720	\$3,527,160	\$2,923,842
Btr	Security cost avoidances	\$656,370	\$656,370	\$656,370	\$1,969,110	\$1,632,295
Ctr	Help desk savings	\$78,101	\$104,135	\$123,661	\$305,897	\$249,971
Dtr	Legacy technology savings	\$855,000	\$630,000	\$630,000	\$2,115,000	\$1,771,262
Etr	Improved user productivity	\$1,244,880	\$1,659,840	\$1,971,060	\$4,875,780	\$3,984,364
Ftr	Increased mobility savings	\$2,765,084	\$3,686,779	\$4,378,050	\$10,829,912	\$8,849,931
	Total benefits (risk-adjusted)	\$6,775,155	\$7,912,844	\$8,934,860	\$23,622,859	\$19,411,665

Benefit 1: Decreased User Downtime

With Chrome OS with G Suite, updates are automated, and applications are always up to date, decreasing the impact on users. Previously, users would have to wait for their systems to download updates and reboot, but with Chrome OS, there is no downloading or rebooting. This makes the update process invisible to users and gives them time back in their days to be more productive.

In addition to updates, localized issues are a thing of the past with Chrome OS with G Suite. Historically, when a there was a network or server down, it would affect a segment of users or region, but with Google's cloud-based OS, there are very few localized impacts, further reducing user downtime. When there are impacts to devices, users can simply log into another Chrome OS device and instantly access everything they had before with minimal downtime.

For the composite organization, Forrester assumes that:

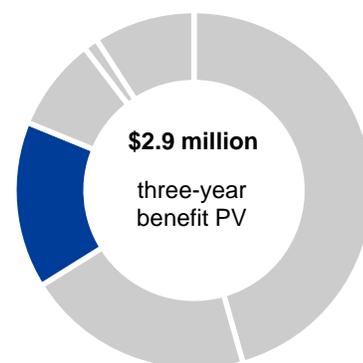
- › Users avoided 30 minutes of downtime per week.
- › Employees consistently captured 20% of the downtime avoided for productive work.
- › The average fully loaded hourly labor rate for the 7,000 Chrome OS with G Suite users was \$38 per hour.

Decreased user downtime will vary with:

- › The previous environment architecture and the number of updates and localized issues that occur on a regular basis.
- › The amount of time saved that is utilized toward productive work.
- › The fully loaded compensation of employees.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of \$2,923,842.

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 more than \$19.4 million.



Decreased user downtime: **15%** of total benefits

Benefit 1: Decreased User Downtime: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Total number of Chrome OS with G Suite users		7,000	7,000	7,000
A2	Reduced downtime per user per week	Hours	0.5	0.5	0.5
A3	Percent of time savings captured for productive work		20%	20%	20%
A4	Average FTE hourly rate fully loaded (rounded)	$\$80,000/2,080$	\$38.00	\$38.00	\$38.00
At	Decreased user downtime	$A1*(A2*52)*A3*A4$	\$1,383,200	\$1,383,200	\$1,383,200
	Risk adjustment	↓15%			
Atr	Decreased user downtime (risk-adjusted)		\$1,175,720	\$1,175,720	\$1,175,720

Benefit 2: Security Cost Avoidances

Operating in the cloud provides many security advantages for organizations. Utilizing Chrome OS with G Suite reduces the risk of endpoints being out of date or not meeting industry standards. Chrome OS, with automated updates, provides users with the latest security patches to further secure their systems. Furthermore, Chrome OS runs cloud-based applications versus local executable files, making it more secure than previously used endpoints. One customer explained how the organization was less impacted by phishing scams that had been going around after adopting Chrome OS with G Suite.

Additional security features are built into G Suite and Gmail to reduce the risk of users opening infected emails or accidentally spreading exploits. One customer said, "We're seeing a lot of improvement in spam management, security controls, and other things Google is implementing."

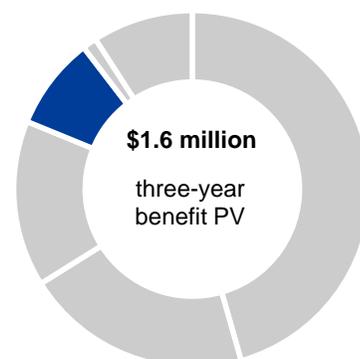
Forrester assumes that:

- › Prior to investing in Google, the composite organization experienced an average of 99 security incidents each year.
- › The average cost of a security incident for remediation as well as business impact was \$39,000.
- › After deploying Chrome OS with G Suite, the organization realized a 20% reduction in the number of incidents or breaches.

Security cost avoidances will vary with:

- › The average number of security incidents experienced each year.
- › The extent and complexity of the incidents and the scale of impact it has on the business.
- › The type of incidents experienced by organizations and if they're endpoint related or not.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of \$1,632,295.



Security cost avoidances: 8% of total benefits



20% reduction in security incidents or breaches per year

Benefit 2: Security Cost Avoidances: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Average number of breaches or incidents per year prior to investing in Google		99	99	99
B2	Percent reduction in the number of breaches or incidents per year		20.0%	20.0%	20.0%
B3	Average cost of breach or incident		\$39,000	\$39,000	\$39,000
Bt	Security cost avoidances	$B1*B2*B3$	\$772,200	\$772,200	\$772,200
	Risk adjustment	↓15%			
Btr	Security cost avoidances (risk-adjusted)		\$656,370	\$656,370	\$656,370

Benefit 3: Help Desk Savings

Many surveyed organizations reported time savings associated with faster remediation and fewer user issues, resulting in an estimated 15.5% improvement. These reductions of user issues were a byproduct of operating in the cloud and the quality of Chrome OS with G Suite. One customer said after adopting G Suite, “Everything just works, 95% of the time, everything just works as expected.”

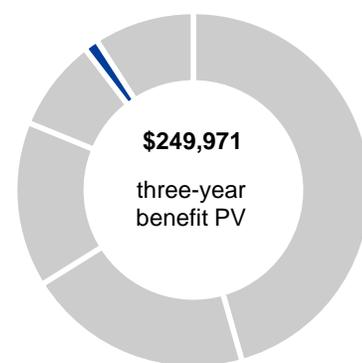
Forrester assumes that:

- › The composite organization had spent 500 hours per week on help desk issue remediation for OS, email, and other productivity applications prior to adopting Chrome OS with G Suite.
- › The composite organization experienced a 15.5% decrease in time needed to support these issues.
- › Adoption of these productivity features and machine learning capabilities started at 60% in the first year and grew to 95% by Year 3.
- › An average fully loaded hourly labor rate for a help desk IT admin is \$38.

Help desk savings will vary with:

- › The average number of incidents and the complexity of those issues reported to the help desk associated with Chrome OS and G Suite.
- › The average labor rate for help desk staff.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of \$249,971.



Help desk savings: **1%**
of total benefits

Benefit 3: Help Desk Savings: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Hours per week for average help desk remediation time on OS, email, and other		500	500	500
C2	Percentage of improved efficiency remediating issues through G Suite and Chrome		15.5%	15.5%	15.5%
C3	Hourly fully burden rate of IT administrator (rounded)	\$80,000/2,080	\$38.00	\$38.00	\$38.00
C4	Adoption rate		60%	80%	95%
Ct	Help desk savings	$(C1*52)*C2*C3*$ C4	\$91,884	\$122,512	\$145,483
	Risk adjustment	↓15%			
Ctr	Help desk savings (risk-adjusted)		\$78,101	\$104,135	\$123,661

Benefit 4: Legacy Technology Savings

After adopting Chrome OS with G Suite, organizations avoided refreshing operating system and productivity suite licenses. One interviewed organization creatively used Sheets and Forms to avoid purchasing an expensive software. The interviewee said, “We worked a day or two, and we developed a whole suite of tools for them in Google Sheets and using Google Forms and that allowed them to automate the whole process.”

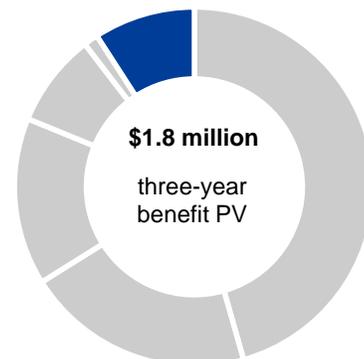
For the composite organization, Forrester assumes that:

- › The previous cost per user of operating system and productivity suite licenses was \$100 per year, on average.
- › A one-time cost avoidance yielded \$250,000 in savings during the three-year period.

Legacy technology savings will vary with:

- › The type of licenses or the cost model with an organization’s previous operating system and productivity suite.
- › An organization’s software needs and the cost of the software that could be avoided by utilizing Google’s G Suite.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of \$1,771,262.



Legacy technology savings: **9%** of total benefits

Benefit 4: Legacy Technology Savings: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
D1	Legacy technology subscription cost savings per user		\$100	\$100	\$100
D2	Number of users		7,000	7,000	7,000
D3	Other legacy application cost avoidances		\$250,000	\$0	\$0
Dt	Legacy technology savings	$D1*D2+D3$	\$950,000	\$700,000	\$700,000
	Risk adjustment	↓10%			
Dtr	Legacy technology savings (risk-adjusted)		\$855,000	\$630,000	\$630,000

Benefit 5: Improved User Productivity

Chrome OS with G Suite offers many productivity features and capabilities to help employees maximize the use of their time and focus less on repetitive tasks and more on delivering value. These features even include the use of machine learning and AI to aid in the completion of computing tasks. One customer said, "They've had a huge impact on how the average person works." The interviewee added that Quick Reply in emails and functionality like Snooze have made a big difference from a productivity perspective. Another customer discussed the benefits of document sharing: "If I think back to the old days of having an email, you're sending a document for review, and you're making notes, and you're making corrections, and sending it to the next guy. In the type of work that I do, I'm saving at least an hour a day by having everything accessible through the tools with Google."

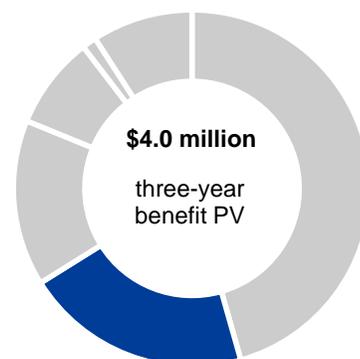
For the composite organization, Forrester assumes that:

- › Employees saved on average 10 minutes per day with machine learning and other day-to-day productivity features.
- › Employees consistently captured 20% of the time saved for productive work.
- › Adoption of these productivity features and machine learning capabilities started at 60% in the first year and grew to 95% by Year 3.
- › The average fully loaded hourly labor rate for the 7,000 Chrome OS with G Suite users was \$38.

Improved user productivity will vary with:

- › The number of users who adopt these features and capabilities.
- › The amount of time saved that is utilized toward productive work.
- › The fully loaded compensation of employees.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of \$4.0 million.



Improved user productivity: **21%** of total benefits

Benefit 5: Improved User Productivity: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
E1	Minutes per day saved with machine learning and day-to-day activities		10	10	10
E2	Percent of time savings captured for productive work		20%	20%	20%
E3	Average FTE hourly rate fully loaded (rounded)	\$80,000/2,080	\$38.00	\$38.00	\$38.00
E4	Total number of Chrome OS with G Suite users		7,000	7,000	7,000
E5	Adoption rate		60%	80%	95%
Et	Improved user productivity	$E1/60 * E2 * E3 * E4 * (2,080/8) * E5$	\$1,383,200	\$1,844,267	\$2,190,067
	Risk adjustment	↓10%			
Etr	Improved user productivity (risk-adjusted)		\$1,244,880	\$1,659,840	\$1,971,060

Benefit 6: Increased Mobility Savings

By deploying Google's solution, organizations experienced true mobility. One customer said, "Mobility isn't us putting all of the apps and data on my device; it's all these cloud applications and the experiences being decoupled from my device allowing me to be mobile across all of my different devices." Another customer said: "What proved Google to me was when my CIO called and said he needed a report right away — this was just after we deployed — and I was traveling on a train at the time. Previously, I would have had to attempt to connect to Wi-Fi and VPN into our network, a low probability with the connection on those trains, but with Google, I was able to send a link to the file within 5 seconds of hanging up." This example and others like it demonstrate how organizations become cloud-enabled businesses after adopting Chrome OS with G Suite on cloud-native portable devices like Chromebooks or utilizing G Suite with their mobile phones.

Additional mobility benefits came from utilizing Google Hangouts Meet to host virtual meetings instead of in-person meetings. One customer said: "If we couldn't meet, we used Hangouts to meet and share documents and co-edit. Without Google, we absolutely wouldn't get our work done." Another customer discussed employees' ability to work remotely, saying, "I can really work from anywhere, the train, the plane, or even the beach." And 77% of surveyed employees agree with the statement: "I prefer technologies that give me greater flexibility in how and where I do my job."⁷

To value mobility savings, Forrester identified and averaged consistent time savings and productivity-driving benefits across the interviewed and surveyed organizations. Based on this, the composite organization experienced the following benefits:

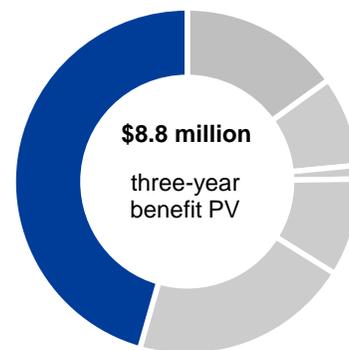
- › Ten minutes per day saved by accessing documents anytime, anywhere.
- › Twelve minutes per day saved using Hangouts for meetings and collaborating in live documents. This is based on an average of four meetings per day per employee and an average time savings of 3 minutes per meeting due to quicker starts and better access to the right documents and versions to review.

For these benefits, Forrester assumes employees consistently captured 20% of the time saved for productive work. Forrester further assumes adoption of these mobility capabilities started at 60% in the first year and grew to 95% by Year 3.

At an average fully loaded hourly labor rate for 7,000 Chrome OS with G Suite users of \$38, the composite organization saved from \$2.8 million to \$4.4 million per year.

In addition to the time savings, the composite organization experienced a decrease in the amount of corporate travel as Hangouts and document sharing enabled employees to be as effective virtually as they were in person. This travel reduction resulted in roughly \$350,000 per year of savings.

While increased mobility is an overall benefit for organizations, there are some risks both quantitative and qualitative to fully achieving these benefits.



Increased mobility savings: **46%** of total benefits



Increased mobility saves 22 minutes per day by using Chrome OS with G Suite.

- › The amount of time savings can vary based on the number of meetings each employee has in a day, the impact or cultural change that takes place to utilize Hangouts vs. in-person meetings, and the level of adoption and need for document sharing in meetings.
- › Organizations may see a variation of corporate travel savings based on the original amount of travel required in the company.
- › Working from anytime and anywhere can be a large productivity driver but, as one customer mentioned, can sometimes come at a cost. The cultural change can lead to an *always-on* working culture than can impact employee morale and turnover. Alternatively, Forrester's research found that 69% of employees believe that "being able to use technology to access company resources gives them a better work/life balance."⁸

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.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of \$8,849,931.

Benefit 6: Increased Mobility Savings: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
F1	Minutes per day saved by accessing documents anywhere, anytime		10	10	10
F2	Minutes per day saved using Hangouts and G Suite document sharing	3 minute per meeting*4 meetings per day	12	12	12
F3	Percent of time savings captured for productive work		20%	20%	20%
F4	Average FTE hourly rate fully loaded (rounded)	\$80,000/2,080	\$38.00	\$38.00	\$38.00
F5	Total number of Chrome OS with G Suite users		7,000	7,000	7,000
F6	Adoption rate		60%	80%	95%
F7	Annual time savings for document access	$(F1+F2)/60 * F3 * F4 * F5 * F6 * (2080/8)$	\$3,043,040	\$4,057,387	\$4,818,147
F8	Annual corporate travel savings		\$350,000	\$350,000	\$350,000
Ft	Increased mobility savings	$F7+F8 * F6$	\$3,253,040	\$4,337,387	\$5,150,647
	Risk adjustment	↓15%			
Ftr	Increased mobility savings (risk-adjusted)		\$2,765,084	\$3,686,779	\$4,378,050

Flexibility

The value of flexibility is clearly 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 Chrome OS with G Suite and later realize additional uses and business opportunities, including the following:

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.

- › **Further investment in meeting room resources can leverage Google Hangouts Meet to drive greater benefits.** While the composite organization didn't invest in meeting room resources, organizations could realize additional savings in the avoidance of refreshing hardware and paying for software licenses in their video conferencing meeting rooms. One interviewed organization transformed its meeting spaces into a more open layout while leveraging Google Hangouts Meet and its existing hardware, avoiding expansion costs and technology refresh costs.
- › **Shared devices, kiosks, and digital signage are all ways to extend Chrome OS with G Suite's capabilities.** The composite organization did not initially invest in these applications, but they would provide added benefit. For further benefit information, please reference Forrester's TEI studies for Google Chrome on shared devices and kiosks and digital signage.

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
Gtr	Chrome OS with G Suite subscription fees	\$0	\$1,190,000	\$1,190,000	\$1,190,000	\$3,570,000	\$2,959,354
Htr	Implementation and configuration cost	\$586,500	\$0	\$0	\$0	\$586,500	\$586,500
Itr	Change management and training costs	\$679,650	\$0	\$0	\$0	\$679,650	\$679,650
	Total costs (risk-adjusted)	\$1,266,150	\$1,190,000	\$1,190,000	\$1,190,000	\$4,836,150	\$4,225,504

Cost 1: Chrome OS With G Suite Subscription Fees

The subscription fees for the Chrome OS and G Suite platforms offset some of the legacy technology savings benefits. Google charges these fees on a monthly basis for G Suite and an annual basis for Chrome OS. Chrome Enterprise is a version of Chrome OS for business and provides the following key features over Chrome OS: managed Google Play (beta), managed Chrome extensions and browser management, printer management, Active Directory integration, flexible cloud-based fleet management, single sign-on support, public and ephemeral sessions and kiosks modes, managed networks and proxies, managed OS updates, theft prevention, and 24x7 enterprise support. These features, along with G Suite, enable many of the security benefits and other usability savings covered in this report.

- › The annual cost of Chrome Enterprise is \$50 per device per year.
- › The monthly cost of G Suite can range from \$5 to \$25 per user based on the type of license required.

For this study, Forrester assumes that:

- › The average license needed by the composite organization for G Suite was the business license at a cost of \$10 per user per month.
- › The composite organization had 7,000 Chrome Enterprise and G Suite users.

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 \$4.2 million.



Chrome Enterprise license cost of \$50 per device per year
G Suite license cost of \$10 per user per month

Cost 1: Chrome OS With G Suite Subscription Fees: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
G1	Chrome OS with G Suite subscription cost per user			\$170	\$170	\$170
G2	Number of users			7,000	7,000	7,000
Gt	Chrome OS with G Suite subscription fees	G1*G2		\$1,190,000	\$1,190,000	\$1,190,000
	Risk adjustment	0%				
Gtr	Chrome OS with G Suite subscription fees (risk-adjusted)		\$0	\$1,190,000	\$1,190,000	\$1,190,000

Cost 2: Implementation And Configuration Cost

The cost to implement depends on the size of the implementation and the number of users. For the composite organization, Forrester assumes that implementation lasted six months. During this time, six full-time resources were dedicated to the deployment along with a Google-recommended third-party integrator.

For this study, Forrester assumes that:

- › The monthly cost of the third-party integrator averaged \$35,000.
- › The fully loaded labor rate for an internal IT FTE was \$100,000.

The implementation and configuration costs will vary with:

- › The complexity of the deployment and the project timeline.
- › The cost of resources within an organization and the third-party integrator chosen, if necessary.

To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year risk-adjusted total PV of \$586,500.



Six months
Total implementation and deployment time

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.

Cost 2: Implementation And Configuration Cost: Calculation Table

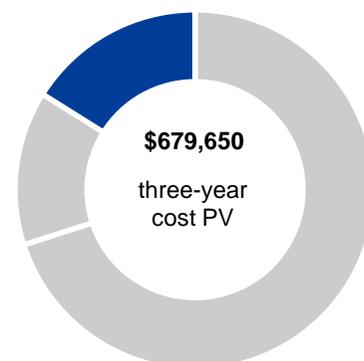
REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
H1	Implementation time	Months	6			
H2	Internal resources required	FTEs	6			
H3	Annual fully burden rate of IT administrator		\$100,000			
H4	Professional service fees per month		\$35,000			
Ht	Implementation and configuration cost	$(H1*H2*H3/12 \text{ months})+(H4*6 \text{ months})$	\$510,000	\$0	\$0	\$0
	Risk adjustment	↑15%				
Htr	Implementation and configuration cost (risk-adjusted)		\$586,500	\$0	\$0	\$0

Cost 3: Change Management And Training Costs

One of the greatest risks to fully realizing the benefits of Google Chrome OS with G Suite is lack of use and adoption. The interviewed organizations all described a cultural shift that took place as they deployed Chrome OS with G Suite. This cultural change, as with any user technology, was met by three types of users.

- › The champions, who are quick to adopt, innovate, and get creative about how they utilize the new technology.
- › The skeptics, who aren't so sure about the new technology and are slower to adopt, but when they do, they quickly realize the benefits of the new system and become champions.
- › Lastly, the laggards; these employees are set in their ways, don't want to change the way they work, and typically resist adoption and learning a new technology.

All three groups can present challenges and opportunities, so it's



Change management and training costs: **16%** of total costs

important to hire a good change management team and ensure that proper training and support are provided throughout the deployment.

Forrester assumes that:

- › The composite organization hired a third-party change management team at a cost of \$42,500 per month for six months.
- › Users receive 1 hour of formal training and can schedule follow-on training as needed.

The change management and training cost will vary with:

- › The culture of an organization and employees' willingness to adopt new technologies.
- › The number of hours provided for formal training and the follow-on support.

To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year risk-adjusted total PV of \$679,650.

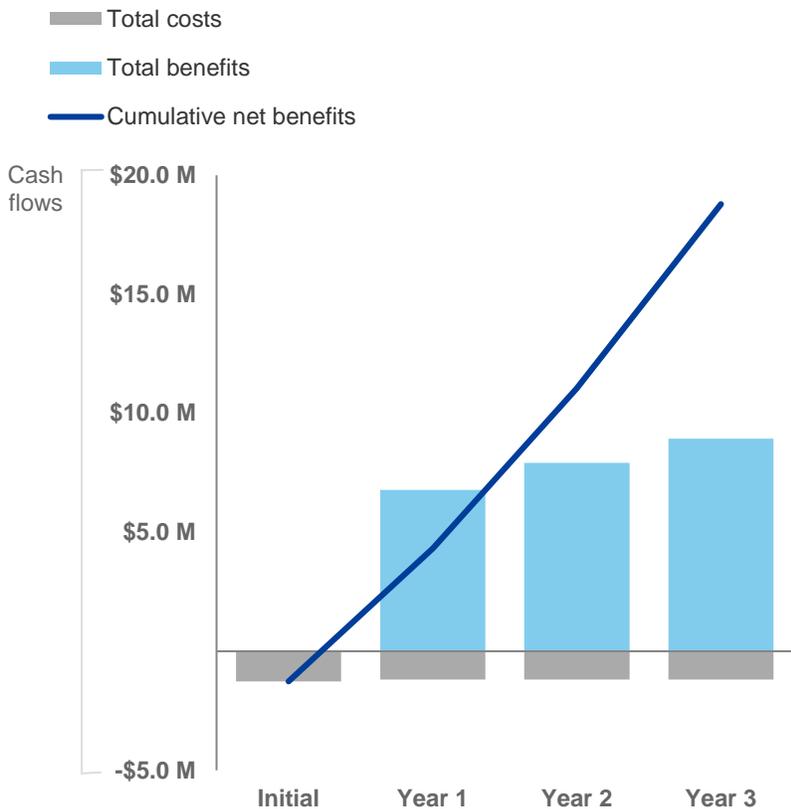
Change Management And Training Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
I1	Months for change management		6			
I2	Change management costs per month		\$42,500			
I3	Change management services	I1*I2	\$255,000			
I4	Number of employees trained		7,000			
I5	Average FTE hourly rate fully loaded		\$48.00			
I6	Hours of training per worker		1			
I7	Internal training costs	I4*I5*I6	\$336,000			
I _t	Change management and training costs	I1+I6	\$591,000	\$0	\$0	\$0
	Risk adjustment	↑15%				
I _{tr}	Change management and training costs (risk-adjusted)		\$679,650	\$0	\$0	\$0

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



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



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

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$1,266,150)	(\$1,190,000)	(\$1,190,000)	(\$1,190,000)	(\$4,836,150)	(\$4,225,504)
Total benefits	\$0	\$6,775,155	\$7,912,844	\$8,934,860	\$23,622,859	\$19,411,665
Net benefits	(\$1,266,150)	\$5,585,155	\$6,722,844	\$7,744,860	\$18,786,709	\$15,186,161
ROI						359%
Payback period						< 6 months

Google Chrome OS with G Suite: Overview

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

CHROME ENTERPRISE

Chrome Enterprise includes Google's managed Chrome OS offering for enterprise customers.

Chrome OS is a cloud-native operating system running on a variety of form factors including Chromebooks, Chromeboxes, and Chromebases. It features built-in security, and provides regular, automatic updates that run in the background to keep devices up-to-date. It boots quickly and provides a continuous experience across devices, and enables user access to enterprise applications via the web, managed Google Play store, or third-party virtualization providers.

Chrome OS can be paired with the Chrome Enterprise license which can be purchased for an annual, per device fee to manage Chrome devices in addition to enabling third party integrations with EMM and identity providers.

For more information, visit www.chrome.com/os

G SUITE

G Suite is a suite of cloud-based productivity apps designed to help enterprises transform the way they work.

For more information, visit www.gsuite.google.com

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: “Rethink Technology In The Age Of The Cloud Worker,” a commissioned study conducted by Forrester on behalf of Google, May 2018.

² Source: “The Employee Experience Imperative,” Forrester Research, Inc., December 15, 2017.

³ Source: “Rethink Technology In The Age Of The Cloud Worker,” a commissioned study conducted by Forrester on behalf of Google, May 2018.

⁴ Source: Ibid. Base: 468 global information workers who use cloud apps at least weekly for work. Base: 1,060 enterprise technology decision makers in nine countries who oversee workforce devices and cloud applications.

⁵ Source: “Rethink Technology In The Age Of The Cloud Worker,” a commissioned study conducted by Forrester on behalf of Google, May 2018.

⁶ Source: Ibid.

⁷ Source: Ibid.

⁸ Source: Ibid.