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The Total Economic Impact™ Of Google Cloud Vertex AI

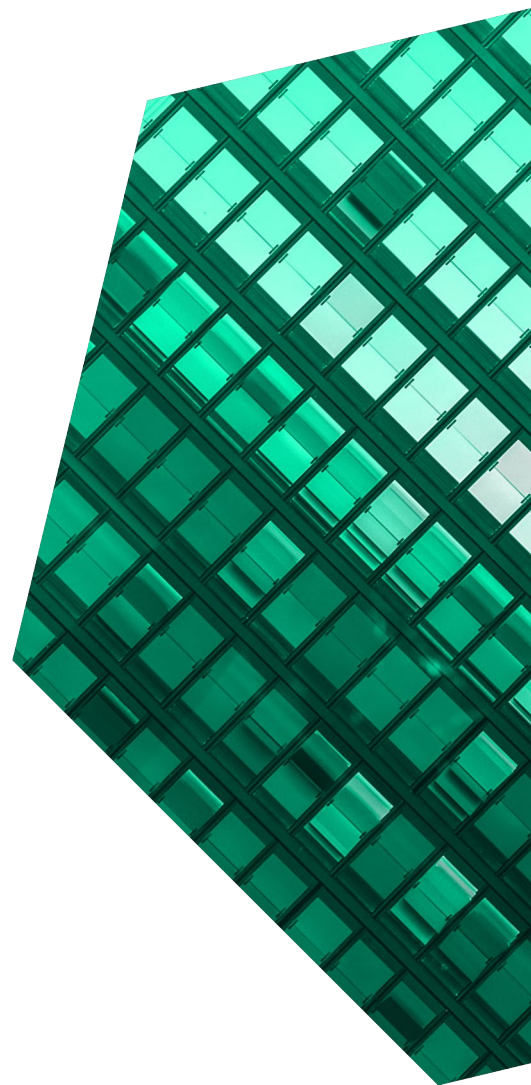
Cost Savings And Business Benefits
Enabled By Google Cloud Vertex AI

FEBRUARY 2023

Table Of Contents

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Executive Summary	1
The Google Cloud Vertex AI Customer Journey ..	7
Key Challenges	7
Investment Objectives	9
Composite Organization	10
Analysis Of Benefits	11
Increased Efficiency: Data Collection, Extraction, And Preparation	11
Increased Efficiency: Model Building/Training/Experimentation	14
Faster Model Explainability	17
Faster Model Deployment	18
Model Monitoring Time Savings	20
Incremental Profit Due To Improved Model Performance	22
Business User Operational Efficiency	25
Cost Savings From Retiring Legacy Solutions	27
Unquantified Benefits	29
Flexibility	29
Analysis Of Costs	31
Vertex AI Platform Usage Fees	31
Implementation And Ongoing Management	32
Training Fees	33
Financial Summary	35
Appendix A: Total Economic Impact	36
Appendix B: Endnotes	37



ABOUT FORRESTER CONSULTING

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Executive Summary

Artificial intelligence (AI) solutions are critical to business strategy, but many firms struggle to deploy, monitor, and govern AI models in production applications.¹ Google Cloud Vertex AI serves as a platform that helps enterprises democratize AI and accelerate the end-to-end machine learning (ML) model lifecycle from data preparation to deployment and monitoring. Vertex AI drives collaboration, productivity, and governance for data teams, resulting in more AI-driven decisions and the ability to operationalize AI for real business value.

[Google Cloud Vertex AI](#) is a fully managed machine learning platform that makes it easier to build, train, and deploy machine learning models and AI applications. Developers, data scientists, and ML engineers can fast track ML deployments with minimal infrastructure management and access developer tools and built-in ML operations (MLOps) tools and workflows.

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 Google Cloud Vertex AI.² The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Vertex AI on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed seven representatives from five organizations with experience using Vertex AI. The interviewees' organizations were a mix of digital-native and

KEY STATISTICS



Return on investment (ROI)
397%



Net present value (NPV)
\$14.74M

traditional enterprises and consisted of growth companies and established enterprises. All organizations had established ML operations and dedicated ML teams. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single [composite organization](#), which is a traditionally structured, ML-mature organization with \$20 billion in annual revenue.

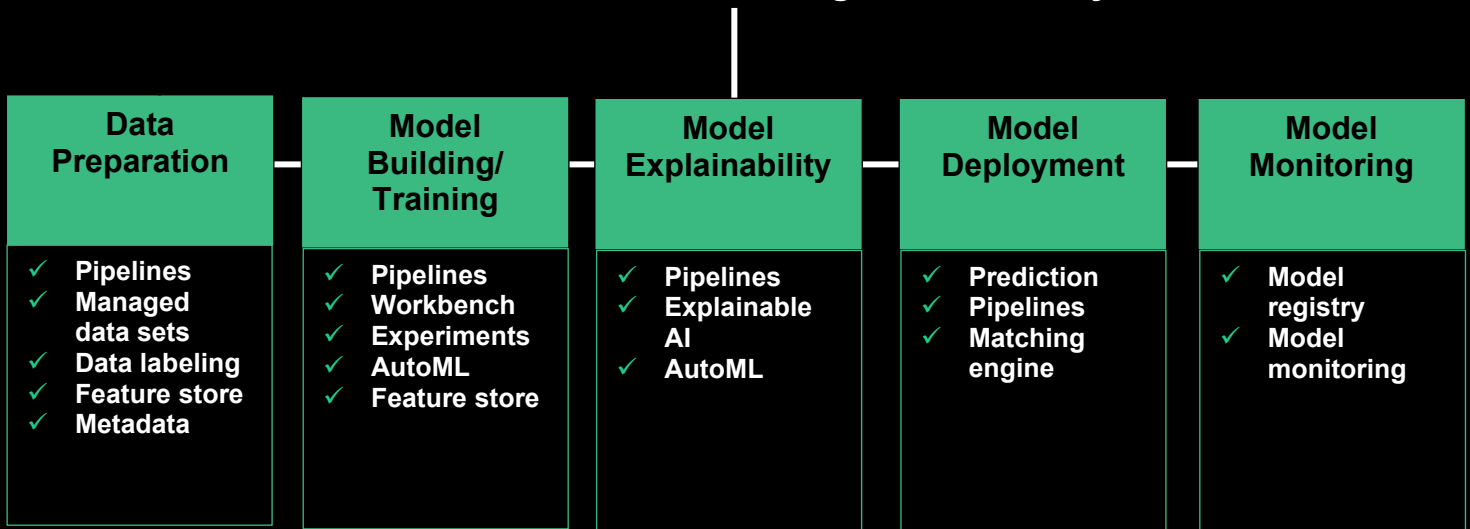
Prior to using Vertex AI, interviewees' organizations leveraged third-party point solutions, open source tools, homegrown cloud solutions, and/or costly, siloed on-premises ML solutions in an attempt to accelerate intelligent outcomes. However, this disconnected environment stifled collaboration and made tasks within the ML lifecycle — from data preparation to ongoing monitoring — labor-intensive and time-consuming. These issues delayed pushing models to production, decreased the number of

Time saved per model
using Vertex AI

64%



Vertex AI Features In Use Along The ML Lifecycle*



*Based on data from the interviews

models deployed, and led to poorly performing models overtime, hindering innovation and business impact.

By investing in Vertex AI, interviewees' organizations had access to a fully managed and integrated ML platform for building, training, deploying, and managing ML models. Organizations streamlined the ML lifecycle through improved integrations, increased automation, and the ability to create new ML projects and orchestrate the pipelines necessary to deploy them. This increased productivity across a range of users, including data scientists, engineers, and business end users; enabled organizations to offload costly legacy solutions; and led to greater revenue through faster time to value, improved model quality, and the ability to expand the use of ML throughout the organization.

KEY FINDINGS

Quantified benefits. The three-year, risk-adjusted present value (PV) quantified benefits for the composite organization totaled US\$18.4 million. Individual quantified benefits include:

- **Improved efficiencies in the ML model lifecycle valued at \$4.5 million.** Vertex AI accelerated each step of the composite organization's ML model lifecycle, from data preparation to model monitoring. It moves faster due to easy integrations with data, access to open source ML frameworks, and connectivity to other Google Cloud capabilities, such as BigQuery and Dataproc. Vertex AI also provides the composite organization with purpose-built features for automating and scaling ML, such as Pipelines, AutoML, and training. Additionally, by consolidating on the same platform and utilizing capabilities like Workbench and Feature Store, the composite organization's data teams can collaborate more effectively, improve visibility, and begin sharing and reusing model components, which further improves productivity. Features such as Metadata and Explainability increased traceability and transparencies into ML workflows, while Model Monitoring enables business users to take part in the ML lifecycle.
- With Vertex AI, the composite organization experiences five ML model lifecycle benefits,

which are broken down individually in the Benefits section. The composite organization:

- Improves productivity around data preparation by 70%.
 - Enhances efficiencies around model creation, training, and tuning by 70%
 - Sees 60% faster model explainability.
 - Reduces deployment times by 40%
 - Decreases time spent on model monitoring by 60% while reallocating the task to more ML-nascent employees.
- **An increase in incremental profit by \$7.6 million due to new and improved ML insights.** Vertex AI accelerates the time to value of data-driven insights, increases the volume and quality of ML models deployed, and introduces new avenues of revenue while enhancing existing ones, ultimately improving business outcomes for the composite organization. By Year 3, 0.5% of the composite organization’s annual revenue is attributed to ML modeling improvements with Vertex AI.
 - **A 5% rise in business user operational efficiency coupled with a 14x increase in users affected by Year 3.** Vertex AI enables business users to implement AI into their workstreams through the automation of day-to-day processes, improving productivity. This benefit scales as Vertex AI usage expands and ultimately saves the composite organization \$1.2 million.
 - **The retiring of legacy solutions resulting in \$5.1 million in savings.** Once Vertex AI is adopted, the composite organization decommissions legacy on-premises and third-party point solutions, reducing legacy licensing, infrastructure, maintenance, and support costs.

“We had two main goals. Firstly, we wanted to give data scientists the tools they need to understand data faster while making sure we don’t overspend on the resources they consume when they build models. And secondly, ensure they could take those models and put them into production and into experiments as quickly as possible while ensuring quality. Time to value at low cost is extremely important to us, and Vertex AI has helped us improve that immensely.”

VP, analytics, software

Unquantified benefits. Benefits that provided value for the interviewees’ organizations but were not quantified in this study include:

- **Scaling ML while maintaining headcount.** Vertex AI made it easy for the interviewees’ organizations to democratize ML, reducing the need to hire additional resources as the need for ML insights and efficiencies scaled.
- **Enhanced employee acquisition and retention.** Access to the features and capabilities of Vertex AI served as a selling point in recruiting efforts and a key advantage for retaining employees.
- **Improved compliance, governance, and security.** Built in security controls and continuous activity logging improved transparency, traceability, security in the interviewees’ organizations.

Costs. Three-year, risk-adjusted PV costs for the composite organization totaled \$3.7 million. Individual costs include:

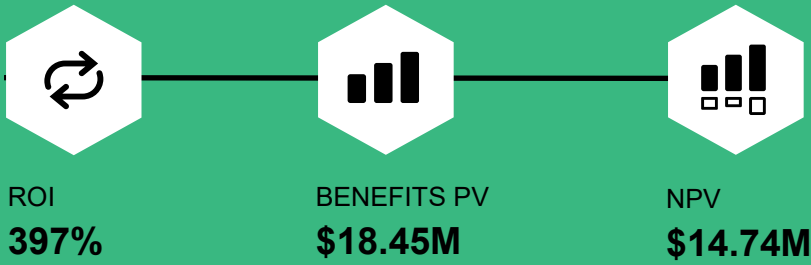
- **Platform usage fees totaling \$3 million.** Vertex AI pricing is based on machine-learning computation, processing time, and data storage consumption. An organization's costs vary depending on its characteristics, needs, use cases, and Vertex AI features in use. The composite organization's usage fees with Vertex AI are lower than the costs associated with an on-premises environment of a similar size.
- **Implementation and ongoing management costs totaling \$406,000.** The composite organization incurs professional service fees during implementation for planning, change management, integration, and training. Internally, a product manager, data scientists, and engineers are involved in initial implementation. Engineers dedicate minimal time to ongoing management of the platform.

- **Training fees totaling \$281,000.** Minimal training is required for data scientists, engineers, and business users to become proficient using Vertex AI. For the composite organization, 50 FTEs are trained to use Vertex AI by Year 1. This increases to 300 FTEs by Year 3

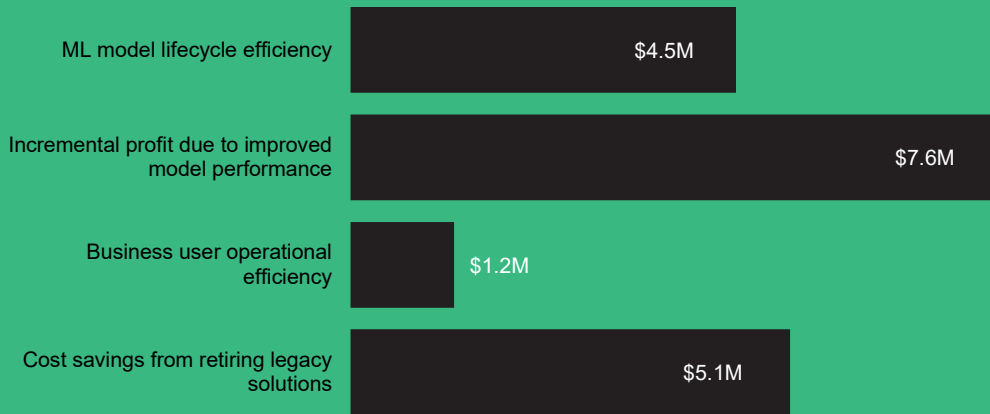
The representative interviews and financial analysis found that a composite organization experiences benefits of \$18.45 million over three years versus costs of \$3.71 million, adding up to a net present value (NPV) of \$14.74 million and an ROI of 397%.

Vertex AI's dashboarding, visualization, logging, monitoring, and metrics are all tied together seamlessly. It makes the platform easy to use for anyone.

— VP, analytics, software



Benefits (Three-Year)



ML model lifecycle efficiencies include:

- Increased efficiency: Data collection, extraction, and preparation.
- Increased efficiency: Model building, training, and experimentation.
- Faster model explainability.
- Faster model deployment.
- Model monitoring time savings.

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in Google Cloud Vertex AI.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Google Cloud Vertex AI can have on an organization.

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 study to determine the appropriateness of an investment in Vertex AI.

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.



DUE DILIGENCE

Interviewed Google stakeholders and Forrester analysts to gather data relative to Vertex AI.



INTERVIEWS

Interviewed seven representatives at organizations using Vertex AI to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

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



FINANCIAL MODEL FRAMEWORK

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



CASE STUDY

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

The Google Cloud Vertex AI Customer Journey

Drivers leading to the Vertex AI investment

Interviews			
Role	Industry	Organization Characteristics	Vertex AI Usage
Senior manager	Retail	Revenue: \$100B Employees: 500,000	Number of users: 500 Models: 200
Product manager, ML	Retail	Revenue: \$100B Employees: 500,000	Number of users: 500 Models: 200
Global strategy director	Insurance	Revenue: \$50B Employees: 50,000	Number of users: 300 Models: 300
Director, digital global	Financial services	Revenue: \$15B Employees: 50,000	Number of users: 300 Models: 100
Principal architect	Financial services	Revenue: \$2B Employees: 10,000	Number of users: 60 Models: 40
VP, analytics	Software	Revenue: \$200M Employees: 1,000	Number of users: 60 Models: 250
VP, ML	Software	Revenue: \$200M Employees: 1,000	Number of users: 60 Models: 250

KEY CHALLENGES

Prior to investing in Vertex AI, the interviewees' organizations' environments ranged from using a variety of point solutions, static analysis software, open source applications, and homegrown cloud tools to using siloed, on-premises solutions. The interviewees' organizations looked to be more data driven to drive key outcomes. However, their existing technology stacks proved to be more hindrances than assets, as they were difficult to manage, scale, and use for collaboration. The interviewees noted how their organizations struggled with common challenges, including:

- **Siloed tools.** Organizations either lacked the tooling to fully unlock the potential of their data and knowledge or were inhibited by the complexities of multiple, disjointed tooling. The product manager, ML, at a retail organization said: "Every business area had its own set of servers, so everything was independently isolated on premise. Therefore, different teams were at different levels of ML maturity and at

"It was hard for us to find the data, know how to use it once we found it, and actually trust it. When you're getting data from so many sources, how do you know what's actually real?"

Senior manager, retail

different levels in terms of the efficiencies they were getting from their solutions."

- **Labor-intensive data preparation.** Without a solution that integrated siloed data sources, creating data pipelines required a lot of manual work. The global strategy director at the insurance organization said: "Our data was extremely fragmented across our organization, and we had a mix of different data storage solutions, some on-premises, some in the cloud. Finding data, extracting it, cleaning it, and

combining it with other data sources to transform it was a huge undertaking that involved a lot of emailing of spreadsheets. We really wanted to automate this work to ease the process.”

“We could build a model, but a major roadblock was getting it approved by our risk management team. We had no explanations around potential issues in the model to ease this process.”

Director, digital global, financial services

- **Inefficiencies around model creation, deployment, and maintenance.** Organizations struggled to execute on machine learning insights quickly and accurately, as they didn’t have the features and capabilities in place to ensure model success. Interviewees reported that model training took a lot of time. Additionally, the complexities of their models made it difficult for teams to provide adequate explainability for the models being created. These issues made it difficult to push models to the production state. Finally, if a model was deployed, ongoing monitoring proved difficult for data teams as their time was constrained as business grew. The director, digital global at a financial services organization said: “Model maintenance took a long time. Typically, we liked to develop solutions and then hand them over to business teams for ongoing management. That didn’t work in this case because they didn’t have the expertise to work with models based on the systems we had in place.”

- **Inability to keep up with business needs.** The complexity of legacy ML environments slowed the progress of existing projects at best and blocked them at worst. This limited interviewees’ organizations’ ability to meet demand. The senior manager at a retail organization said: “We needed to get the necessary data to support our customers quicker than we were able to, while ensuring optimal quality and support. This just wasn’t an option with a fragmented data setup.” The global strategy director at an insurance organization echoed these concerns, saying: “We experienced a lot of latency when it came to running different queries. The inability to share information across the organization inhibited our ability to move quickly. This was especially an issue for things that require real-time business decision-making like pricing sophistication.”

“By the time we would get certain models to production, it would be six months too late. For something like pricing sophistication, that can have a huge impact in terms of costs to your organization.”

Global strategy director, insurance

- **Inhibited collaboration and innovation.** With different technology across departments — and even within departments — and a lack of an overarching collaboration tool, data science, engineering, and business-facing teams were forced to work independently on projects. The director, digital global at a financial services organization explained: “Previously, a data scientist would just build something and hope it worked. But if it didn’t, there was no way to

ensure the errors would be fixed, as no one would follow up and communications would just get lost.”

Creating effective ML models that drive business outcomes required collaboration among data scientists, engineers, and business stakeholders. Without the right tools to collaborate, data scientists’ teams could not effectively create models and iterate over them alongside other teams without long review cycles. Additionally, without adequate documentation, data science teams risked having models without transparency and traceability, forcing them to spend substantial amounts of time explaining the models or remaking them. This lack of communication added to a longer time to deployment, fewer models developed, and suboptimal model performance

would just further silo our teams and create an even bigger headache for managing those resources. We needed a centralized platform. Otherwise, costs would increase while innovation would decrease.”

“We liked how Vertex AI gave you the opportunity to use the full-on platform, or pick and choose which features may be valuable to your organization, such as Pipelines and Feature Store. We liked that we have the ability to glue the different parts together ourselves.”

VP, ML, software

“As a [Google Cloud Platform] (GCP) customer, Vertex AI appealed to us because it really introduces an AI/ML platform that is Google-managed into our environment.”

Principal architect, financial

- **Costly legacy solutions limited the ability to scale.** The licensing, operational, and/or maintenance costs associated with on-premises, homegrown, and open-source legacy solutions were high. This, paired with siloed tools, limited interviewees’ organizations’ ability to scale ML workloads. The director, digital global at a financial services organization noted: “Scaling with our existing solutions was almost impossible cost-wise at the rate we were growing. Additionally, expanding use on legacy solutions

INVESTMENT OBJECTIVES

The interviewees’ organizations searched for a solution that could:

- Introduce standardization and reusability for ML workloads across the organization to enhance overall efficiencies within the ML workflow and enable scalability.
- Improve time to market while increasing models to production and ensuring accuracy to keep up with business demand.
- Improve visibility and transparency within a ML workflow, uplift cross-team collaboration, and democratize ML.
- Enable organizations to focus on innovation instead of the ML architecture.
- The ability to pick and choose features based on organizational need.

After a request for proposal (RFP) and business case process evaluating multiple vendors using a select group of individuals and a specific use case, the interviewees' organizations chose Vertex AI and began deployment.

“In our RFP, Vertex AI scored higher in terms of ease of tech integration, core capabilities, pricing, ease of use, and reputation.”

Global strategy director, insurance

COMPOSITE ORGANIZATION

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

Description of composite. The composite organization is a global, traditional enterprise with \$20 billion in annual revenue and 50,000 employees. The organization is an existing GCP customer and is ML mature, meaning its data science and machine learning teams create both simple and sophisticated or complex models; continuously train and serve models; and are open to experimentation and advanced analytics. As a data-forward organization, it uses machine learning models in both business-facing and internal processes.

Before investing in Vertex AI, the composite organization leveraged custom, legacy on-premises machine-learning solutions, as well as point solutions for specific use cases, such as statistical and

predictive analysis, that were siloed throughout the enterprise. Its highly fragmented tool set for data science and machine learning coupled with disparate data sets in different parts of the organization made making sense of their data and making it actionable difficult. The composite organization wants a solution that speeds up its own operations within the AI model lifecycle as well as easily operationalizes its work to provide downstream value.

Deployment characteristics. The composite organization moves to Vertex AI incrementally over three years. By the end of Year 1, it transitions 50 users to the platform, consisting of data scientists; data, ML, and DevOps engineers; and business users. The organization realizes the positive benefits after initially deploying Vertex AI, justifying further adoption across the organization. In Years 2 and 3, the composite organization expands Vertex AI usage to existing and new data science and business teams. By Year 3, 300 users are onboarded to Vertex AI, consisting of 60% data scientists, 30% data/ML/DevOps engineers, and 10% business users. The benefits the composite organization experiences scale as internal usage of Vertex AI increases.

Key Assumptions For The Composite Organization

- **\$20 billion revenue**
- **GCP customer**
- **ML mature**
- **Vertex AI users:**
 - **Year 1: 50**
 - **Year 2: 150**
 - **Year 3: 300**
- **Projects/models created using Vertex AI:**
 - **Year 1: 50**
 - **Year 2: 150**
 - **Year 3: 350**

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	Increased efficiency: Data collection, extraction, and preparation	\$198,000	\$742,500	\$2,425,500	\$3,366,000	\$2,615,950
Btr	Increased efficiency: Model building, training, and experimentation	\$116,325	\$380,700	\$1,036,350	\$1,533,375	\$1,199,003
Ctr	Faster model explainability	\$25,920	\$77,760	\$181,440	\$285,120	\$224,147
Dtr	Faster model deployment	\$8,942	\$34,279	\$104,328	\$147,550	\$114,843
Etr	Model monitoring time savings	\$24,975	\$96,390	\$336,285	\$457,650	\$355,022
Ftr	Incremental profit due to improved model performance	\$432,000	\$2,160,000	\$7,200,000	\$9,792,000	\$7,587,318
Gtr	Business user operational efficiency	\$82,125	\$328,500	\$1,149,750	\$1,560,375	\$1,209,971
Htr	Cost savings from retiring legacy solutions	\$990,000	\$1,980,000	\$3,465,000	\$6,435,000	\$5,139,669
Total benefits (risk-adjusted)		\$1,878,287	\$5,800,129	\$15,898,653	\$23,577,070	\$18,445,923

INCREASED EFFICIENCY: DATA COLLECTION, EXTRACTION, AND PREPARATION

Evidence and data. Optimizing the time of data science teams was a primary need for all interviewees' organizations, and the data preparation phase was consistently cited as the biggest time sink. The data preparation step included most of the lower-value activities in the ML lifecycle that were also the most labor-intensive, such as data gathering, reconciliation, and cleaning. In fact, the project manager, ML, at a retail organization said this step was 60% of the full project in their legacy state. Introducing Vertex AI into the organizations' ML environments significantly sped up this initial phase of the ML lifecycle.

- The principal architect at a financial services organization noted it cut down the time it takes to ingest data from 20 hours to 6 hours.

- The director, digital global at the other financial services organization noted it took three weeks, 100% of the time, for two data scientists and two data engineers to gather the data into a centralized place and an additional week to clean it. With Vertex AI, the interviewee's organization shaved off three weeks from this process.
- The global strategy director at an insurance organization said they reduced the time spent on this phase by 40% initially, and this scaled overtime as adoption of the platform increased internally.

Interviewees attributed the increased efficiency in this phase to:

- **Seamless integrations.** Data teams spent significantly less time provisioning infrastructure and data pipelines to feed into Vertex AI due to greater access and interoperability with other

data solutions. With Vertex AI, users had a view into all their data from a singular location.

- The principal architect at a financial services organization said: “Vertex AI has a very neat integration with BigQuery. I can have a BigQuery data set, import it to Vertex AI as a Vertex AI data set, do a couple clicks, and create an ML model. It’s all automated, which allows us to move forward in the ML process faster.”
- The director, digital global at a financial services organization explained: “Our data scientists used to spend a lot of time going back and forth to understand the current state of the data, and our data engineers had to build solutions to help data scientists inject the data into the framework. The weeks we spent on this were almost completely shaved off.”
- The product manager, ML at a retail organization stated: “Before, we needed a developer to manually connect data tables so we could look at them and understand the data. Vertex AI introduced data readiness.”

“We’ve seen 80% productivity gains from just having everything in one place. Data sourcing and pipelines have become a lot more streamlined than they were before.”

VP, ML, software

- **Improved collaboration across data teams and data reusability.** Data scientists and data engineers collaborated more effectively by consolidating and accessing data from the same platform. They could spend less time searching for data and preparing it, and they spent more time on activities that drove business outcomes. Interviewees mentioned that managed data sets and shared notebooks within Workbench especially reduced siloed work and improved efficiency. Furthermore, Feature Store, Pipelines, and Metadata introduced the idea of reusability into the interviewee’s organizations.

The global strategy director of an insurance organization said: “We used to have data scientists and engineers spreading out and doing their own thing, not really sharing models or communication. The platform has definitely helped fix this problem and, while we’ve already seen the benefits of reusability, that could save up to 70% of the time spent on this step in the future.”

- **Advanced features.** Organizations highlighted features, such as the Annotation tool (accurately extract and classify content within a document), Data Labeling (generate highly accurate labels

“Previously, our data scientists were so siloed that we had multiple people sourcing data in different ways from the same places without even knowing. It was messy. Vertex AI significantly improved efficiencies here.”

Principal architect, financial services

for data collections to train models), and as key tools for streamlining data preparation.

The global strategy director of an insurance organization shared: “We didn’t have access to these types of tools before. Now, we have them, and they’re all integrated so we can access them from one place.”

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

- Data is gathered for 50 projects in Year 1. This grows to 350 projects by Year 3.
- Data scientists spend 250 hours annually and data engineers spend 100 hours annually on average on data collection, extraction, and preparation in the legacy state.
- With Vertex AI, the composite organization reduces the time spent on this phase by 40% in Year 1. This number rises to 70% by Year 3 as adoption, usage, and the number of reusable components increases within the organization.
- The average hourly rate of a data scientist FTE is \$64.
- The average hourly rate of a data engineers FTE is \$60.
- Forrester conservatively estimates that 50% of the total time saved per business user FTE is applied directly back to value-generating tasks, and it is therefore included in the benefit calculation. Individual employees may apply additional time savings toward professional development, training, and work-life activities which are not included in the benefit analysis.

Risks. Increased efficiency in the data collection, extraction, and preparation phase may vary depending on the following:

“Vertex AI provides connections to different data sources to build a 360-degree view. And, as we created data sets within the platform, we can give that visibility to the whole team. And, with Pipelines and Metadata, if another line of business is working on a similar problem, they can just reuse the data.”

Director, digital global, financial services

- The particular ML use cases and their size, scope, and complexity.
- The number of projects work on with Vertex AI.
- The Vertex AI features in use and platform adoption internally.
- The skills set of Vertex AI users.
- Prior state benchmarks.
- The fully burdened salaries of affected users.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$2.6 million.

Increased Efficiency: Data Collection, Extraction, And Preparation					
Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Number of projects annually	Composite	50	150	350
A2	Time data scientists spent annually on data collection, extraction, and preparation per project in prior environment (hours)	Interviews	250	250	250
A3	Time data engineers spent annually on data collection, extraction, and preparation per project in prior environment (hours)	Interviews	100	100	100
A4	Time saved on data collection, extraction, and preparation per FTE per project with Vertex AI	Interviews	40%	50%	70%
A5	Data scientist hourly rate (fully burdened)	Composite	\$64	\$64	\$64
A6	Data engineer hourly rate (fully burdened)	Composite	\$60	\$60	\$60
A7	Productivity recapture	TEI standard	50%	50%	50%
At	Increased efficiency: data collection, extraction, and preparation	$((A2*A5)+(A3*A6))*A1*A4*A7$	\$220,000	\$825,000	\$2,695,000
	Risk adjustment	↓10%			
Atr	Increased efficiency: data collection, extraction, and preparation (risk-adjusted)		\$198,000	\$742,500	\$2,425,500
Three-year total: \$3,366,000			Three-year present value: \$2,615,950		

INCREASED EFFICIENCY: MODEL BUILDING/TRAINING/EXPERIMENTATION

Evidence and data. Vertex AI streamlined model development and training for the interviewees’ organizations by standardizing best practices across data teams, introducing prebuilt models and Auto-ML into their ML environments, and using Pipelines to apply MLOps strategies to automate processes. Shared notebooks with Workbench, reusable Pipelines with Metadata, and reusable features with Feature Store further improved operations.

- Before adopting Vertex AI, the principal architect noted it took their financial services organization three weeks to create and train a model. With Vertex AI, it took them 18 hours. According to the principal architect: “The game changer is AutoML. We like to experiment when we’re

training a model before we sign off on it and take it to production. With Vertex AI, we can do that quicker because we don’t have to sit down and code. You can just create data set, create a model, let it run, and have it the next day.”

- The director, digital global at another financial services organization noted the organization took 150 hours on average for model building and training in their legacy setup. By using Vertex AI, they reduced this by 60%. The director, digital global noted: “We can leverage whichever type of model we would like to make, whether [natural language processing] (NLP), image, or video processing, within the AutoML framework instead of spending the time to build it ourselves. Also, with Vertex AI Experiments, it’s easy for us to track and determine which model is the best for our use case.”

- The global strategy director at an insurance organization noted their data scientists spent a majority of their time for three to four weeks — depending on model complexity — to build and train a model. Data engineers were consulted for a fraction of that time. So far, they reduced that time by 50%. The global strategy director believed they reduced that time by another 30% as they continue to reuse models. They said, “Workbench provides more visibility into what other data scientists are doing to see if aspects can be reused for another model and Feature Store allows us to share different elements of the models and make small tweaks depending on particular needs.”
- The product manager, ML from a retail organization noted their organization has extended ML capabilities to business users. By using AutoML, these employees created models as solutions to problems that would not have been solved in the legacy state due to data scientist capacity restraints and lower prioritization of these models compared to others. The product manager, ML said, “Vertex AI has really helped us democratize ML throughout the organization.”

“We can now shift our focus away from writing code for model training and towards inspecting the data, understanding trends, and creating better data sets. The precision our models is quite superior compared to before.”

Principal architect, financial services

“For custom models, with the platform’s self-serve and drag-and-drop dashboard, data scientists can go from 0 to writing code in minutes.”

VP, analytics, software

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

- Fifty models are built using Vertex AI in Year 1. This grows to 350 models by Year 3.
- Data scientists spend 100 hours and data engineers spend 50 hours on average on model building/training/experimentation in the legacy state.
- With Vertex AI, the composite organization reduces the time spent on this phase by 55% in Year 1. This number rises to 70% by Year 3 as adoption, usage, and the number of reusable components increases within the organization.
- The average hourly rate of a data scientist FTE is \$64.
- The average hourly rate of a data engineers FTE is \$60.
- Forrester conservatively estimates that 50% of the total time saved per business user FTE is applied directly back to value-generating tasks, and it is therefore included in the benefit calculation. Individual employees may apply additional time savings toward professional development, training, and work-life activities which are not included in the benefit analysis.

Risks. Increased efficiency in the model building, training, and experimentation phase may vary depending on the following:

- The particular ML use cases and their size, scope, and complexity.
- The number of models built with Vertex AI.
- The Vertex AI features in use and platform adoption internally.
- The skills set of Vertex AI users.

- Prior state benchmarks.
- The fully burdened salaries of affected users.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.2 million.

Increased Efficiency: Model Building, Training, And Experimentation					
Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Number of models built annually	Composite	50	150	350
B2	Time data scientists spent annually on model building, training, and experimentation per project in prior environment (hours)	Interviews	100	100	100
B3	Time data engineers spent annually on model building, training, and experimentation per project in prior environment (hours)	Interviews	50	50	50
B4	Time saved on model building, training, and experimentation per FTE per project with Vertex AI	Interviews	55%	60%	70%
B5	Data scientist hourly rate (fully burdened)	Composite	\$64	\$64	\$64
B6	Data engineer hourly rate (fully burdened)	Composite	\$60	\$60	\$60
B7	Productivity recapture	TEI standard	50%	50%	50%
Bt	Increased efficiency: model building, training, and experimentation	$((B2*B5)+(B3*B6))*B1*B4*B7$	\$129,250	\$423,000	\$1,151,500
	Risk adjustment	↓10%			
Btr	Increased efficiency: model building, training, and experimentation (risk-adjusted)		\$116,325	\$380,700	\$1,036,350
Three-year total: \$1,533,375			Three-year present value: \$1,199,003		

FASTER MODEL EXPLAINABILITY

Evidence and data. Previously, interviewees' organizations found it challenging to explain how ML models reached decisions. A lack of transparency and explanations into model results made it difficult for relevant stakeholders to understand the underlying mechanisms of model decision-making and the associated risks to impacted populations. This was a particular issue for the financial services organizations, as they must demonstrate replicability of results or answer to regulatory audit requests. "Transparency into how a model delivers predictions is critical to understanding the contributing variables driving the results and moving models to production," said the principal architect.

With Vertex AI and Explainable AI in particular, the interviewees' organizations built trust and confidence in their models with robust explanations into their model predictions. And integrations with AutoML tables and Workbench made this data easily visible across the organizations. Faster explainability meant interviewees' organizations could ultimately audit and validate models faster as well.

"Explainable AI made it ten times faster to get approval from our Model Risk Management Group. We can't put any model into production without that approval, but this feature made it much easier for them to understand model predictions and made them more confident in the reliability of our models."

Director, digital global, financial services

"Vertex AI helps us turn a black box into something we have visibility into."

Senior manager, retail

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

- Fifty models are built using Vertex AI in Year 1. This grows to 350 models by Year 3.
- Of these models, 50% are tested each year.
- Previously, data scientists spent 60 hours on evaluating models for explainability.
- With Vertex AI, the composite organization reduces the time spent on this phase by 60%.
- The average hourly rate of a data scientist FTE is \$64.
- Forrester conservatively estimates that 50% of the total time saved per business user FTE is applied directly back to value-generating tasks, and it is therefore included in the benefit calculation. Individual employees may apply additional time savings toward professional development, training, and work-life activities which are not included in the benefit analysis.

Risks. Faster model explainability may vary depending on the following:

- The particular ML use cases and their size, scope, and complexity.
- The number of models built with Vertex AI.
- The increase in model quality and number of models tested.
- The Vertex AI features in use and platform adoption internally.

- The skills set of Vertex AI users.
- Prior state benchmarks.
- The fully burdened salaries of affected users.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$224,000.

Faster Model Explainability					
Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Number of models built annually	Composite	50	150	350
C2	Models tested annually	Interviews	50%	50%	50%
C3	Time spent on explainability process per model in prior environment (hours)	Interviews	60	60	60
C4	Time saved on explainability process per model with Vertex AI	Interviews	60%	60%	60%
C5	Data scientist hourly rate (fully burdened)	Composite	\$64	\$64	\$64
C6	Productivity recapture	TEI standard	50%	50%	50%
Ct	Faster model explainability	$C1 \times C2 \times C3 \times C4 \times C5 \times C6$	\$28,800	\$86,400	\$201,600
	Risk adjustment	↓10%			
Ctr	Faster model explainability (risk-adjusted)		\$25,920	\$77,760	\$181,440
Three-year total: \$285,120			Three-year present value: \$224,147		

FASTER MODEL DEPLOYMENT

Evidence and data. Interviewees reported that having Vertex AI enabled them to deploy models more efficiently. They attributed this to the ease of integrations with the platform’s easy-to-use UI, Pipelines, Prediction, and Model Registry as key components to streamlining this step.

- The principal architect from a financial services industry organization said: “Building models is one thing, but deploying into other systems and making those integrations is a whole other thing. Vertex AI’s UI allows us to deploy models in a few clicks, cutting the time spent on this step by 60%.”
- The product manager, ML noted their retail organization reduced the time to deployment by

50%, stating, “Model Registry allows us to deploy a model to an endpoint directly from the registry.”

- The director, digital global at a financial services organization explained, “Just having a comprehensive AI/ML solution where everything is in the same place and everyone knows what’s going on decreases the barriers to actually deploying a model into the real world.”
- Once in the production environment, interviewees at a software organization highlighted the benefits of Matching Engine. The VP, analytics noted: “Matching Engine is really good for shortlisting things based on matching. With the subsets, you can fine-tune and find things more applicable to your audience for recommendations. It’s a massively scalable tool with low latency that’s fully managed by Google.

We've really ramped up usage of this recently and look forward to continuing to in the future."

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

- Fifty models are built using Vertex AI in Year 1. This grows to 350 models by Year 3.
- Of these models, 18% are deployed in Year 1. This increases to 30% by Year 3, as models become more robust and explainable.
- Previously, an engineer spent 80 hours on model deployment
- With Vertex AI, the composite organization reduces the time spent on the deployment phase by 40%.
- The average blended hourly rate of a data/ML/DevOps engineer FTE is \$69.
- Forrester conservatively estimates that 50% of the total time saved per business user FTE is applied directly back to value-generating tasks, and it is therefore included in the benefit calculation. Individual employees may apply additional time savings toward professional development, training, and work-life activities which are not included in the benefit analysis.

Risks. Faster model deployment may vary depending on the following:

“Vertex AI Prediction’s framework has been especially useful for deploying custom models to different endpoints.”

Director, digital global, financial services

- The particular ML use cases and their size, scope, and complexity.
- The number of models built with Vertex AI.
- The number of models pushed to the deployment phase.
- The Vertex AI features in use and platform adoption internally.
- The skills set of Vertex AI users.
- Prior state benchmarks.
- The fully burdened salaries of affected users.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$115,000.

Faster Model Deployment					
Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Number of models built annually	Composite	50	150	350
D2	Models deployed annually	Interviews	18%	23%	30%
D3	Time spent on deployment per model in prior environment (hours)	Interviews	80	80	80
D4	Time saved on deployment per model with Vertex AI	Interviews	40%	40%	40%
D5	Data/ML/DevOps engineer blended hourly rate (fully burdened)	Composite	\$69	\$69	\$69
D6	Productivity recapture	TEI standard	50%	50%	50%
Dt	Faster model deployment	D1*D2*D4*D5	\$9,936	\$38,088	\$115,920
	Risk adjustment	↓10%			
Dtr	Faster model deployment (risk-adjusted)		\$8,942	\$34,279	\$104,328
Three-year total: \$147,550			Three-year present value: \$114,843		

MODEL MONITORING TIME SAVINGS

Evidence and data. Interviewees claimed that Vertex AI allows data teams to maintain the increased number of models in production due to the efficiencies gained from working in a share environment with a complete log of all actions with Workbench, and continuous and proactive monitoring of model performance with Model Monitoring. These features simplified the process of maintaining models over time, which allowed several of the interviewees’ organizations to reallocate this task from engineers and tenured data scientists to junior data scientists and business users.

- The principal architect at a financial services organization said: “We used to have to invest in advanced engineers to monitor models. And even with that, we couldn’t monitor for some things like data drift. With Vertex AI, we can monitor models extremely well and monitor all types.”

“With Model Monitoring, the users leveraging the outcomes of the models can now monitor the models too.”

Director, digital global, financial services

- The global strategy director at an insurance organization explained, “In the before state, very experienced data scientists or higher-skilled engineers were in charge of monitoring models. Our goal was to use junior data scientists or skilled data analysts and business users to take over this step. We’ve been able to do that because Model Monitoring continuously monitors and alerts us when something deviates. Junior resources can look at the dashboards and reports and understand the outliers, and they

have been increasingly taking over this stage over time.”

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

- Fifty percent of the models deployed annually are monitored for 150 hours per year. Models deployed in the second half of the year would be monitored for a shorter period and are therefore not included in this calculation.
- In the legacy state, a data scientist or data/ML/DevOps engineers conducted model monitoring.
- The average blended hourly rate of a data scientist/data/ML/DevOps engineer FTE is \$70.
- With Vertex AI, model monitoring is conducted by a mix of data scientists and business users. They also spend 40% less time on monitoring than employees in the legacy state in Year 1. This increases to 60% by Year 3 as adoption and ease of use increases over time.
- The average blended hourly rate of a data scientist/business user FTE is \$50.

Risks. Model monitoring time savings may vary depending on the following:

“People effort for monitoring has decreased by 60% over time. And we no longer have to have engineers dedicated to this step.”

Principal architect, financial services

- The number of models monitored per year.
- The Vertex AI features in use and platform adoption internally.
- The skills set of Vertex AI users.
- Prior state benchmarks.
- The fully burdened salaries of affected users.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$355,000.

Model Monitoring Time Savings					
Ref.	Metric	Source	Year 1	Year 2	Year 3
E1	Number of models monitored annually	$D1 \cdot D2 \cdot 50\%$	5	17	53
E2	Time data scientists/data engineers spent on model monitoring per project in prior environment (hours)	Interviewees	150	150	150
E3	Data scientist/data/ML/DevOps engineer blended hourly rate (fully burdened)	Composite	\$67	\$67	\$67
E4	Reduction in time spent on model monitoring with Vertex AI	Interviews	40%	50%	60%
E5	Data scientist/business user/data analyst blended hourly rate (fully burdened)	Composite	\$50	\$50	\$50
Et	Model monitoring time savings	$E1 \cdot ((E2 \cdot E3) - (E2 \cdot (1 - E4) \cdot E5))$	\$27,750	\$107,100	\$373,650
	Risk adjustment	↓10%			
Etr	Model monitoring time savings (risk-adjusted)		\$24,975	\$96,390	\$336,285
Three-year total: \$457,650			Three-year present value: \$355,022		

INCREMENTAL PROFIT DUE TO IMPROVED MODEL PERFORMANCE

Evidence and data. Google Cloud Vertex AI provided the interviewees' organizations with the AI infrastructure needed to increase model throughput, accuracy, and quality, while enabling them to create new, more complex models than they were able to in their legacy environment. A greater volume of models coupled with a higher model success rate and new avenues for model types drove increased incremental profit and better business outcomes. Interviewees reported that Vertex AI:

- **Improved time to value of ML insights and increased volume of ML models put into production.** Using the automation, collaboration, and reusability capabilities provided by Vertex AI, interviewees' organizations accelerated the ML lifecycle and scale models in production. Instead of creating one ML model that drove increased revenue in a year, the organizations released multiple ML models over the same period.
 - The product manager, ML at a retail organization noted the organization used Feature Store as a common repository of reusable and standardized customer data to use as predictors in their Recommendation, Visual AI, and Search models. Feature Store supported \$2 billion worth of their online data portfolio. The product manager, ML, said: "The single, seamless experience Vertex AI provides improves data science productivity and reduces our overall time to deliver models by as much as 50%. And the models we build with Vertex AI generate hundreds of millions in revenue."
 - The global strategy director at an insurance organization explained: "Sharing features, data, and model components across different teams using

"For insurance models like pricing sophistication related to auto accidents, if it takes you six months to deploy a model, you've lost a lot of money that you could have brought in by increasing pricing faster, and you would already have to start working on the next iteration of it."

Global strategy director, insurance

Vertex AI Pipelines, having collaboration sessions, and just having everyone on the same page as we push to the finish line has decreased our time to market from four to six months to two to three months. Model utilizing reusable assets can be pushed out in less than a month. We've also pushed 30% more models to production in the same time period."

- The VP, ML at a software organization stated: "Our rate of experimentation has gone up from 0.5 per week to five per week. People can do a lot more in the same amount of time."
- **Increased model accuracy.** Vertex AI enabled data scientists to create more robust models and maintain ongoing model integrity through frequent retraining.
 - The global strategy director noted their insurance organization more accurately detected fraud to ensure they were not unnecessarily losing revenue. They said: "Insurance fraud is 10% of all our claims.

Vertex AI enabled us to build out better fraud modeling capabilities to detect fraud before we accidentally fulfill the claim and pay the customer for something that has been stolen under the same insurance policy for the sixth time.”

- The same organization increased its pricing accuracy significantly. By improving their insights with Vertex AI and continuously updating their models based on new data in real time, the global strategy director noted the organization increased the revenue brought in through pricing justification by 30%. They explained: “We now had access to centralized, up-to-date data on our customers, enabling us to move our prices up and down dynamically. Vertex AI provided the building blocks to improve model accuracy, and this feeds into our pricing sophistication solution. We can also aggregate or segment data as needed to create different pricing for different customer groups, which further drives revenue in different markets and improves our competitiveness.”
- The principal architect at a financial services organization cited Vertex AI Training as the reason their existing ML models and new models remain accurate over time for document processing as format changes or data drift occurs, as they are able to continuously train models easily with additional documents over time.
- **Introduced new revenue streams and augmented existing sources.** The interviewees’ organizations applied ML to new use cases while enhancing existing ones and tapped into additional revenue that may have previously never been uncovered.

“It takes one week to create most models, down from four weeks. We can also create 30 to 40 models per year. We used to only be able to create three to four.”

VP, analytics, software

- The senior manager at a retail organization said: “We have citizen data scientists working on all sorts of things our data scientists have not had time to tackle themselves. For instance, we have analysts building recommendation models for add-ons to a specific purchase to generate additional revenue within their specific departments. We’ve seen an additional 15% attachment increase due to one of these models, which when fully scaled can bring in \$20 million in revenue.”
- The director, digital global noted their financial services organization created chatbots using ML models trained on Vertex AI to respond to clients faster. Chatbots also optimized salespeople’s efforts by prioritizing whom they should speak to and when, based on the customer’s need. “We were able to filter through requests that would likely generate revenue to the appropriate people rather than having salespeople speak with everyone and lose valuable time,” said the director, digital global. Their organization increased the revenue generated through those streams by 10% over time.

- **Boosted sales through improved customer experience.** By increasing the number and efficacy of customer-facing models and uplifting the ease of service, organizations could increase order frequency.
 - The VP, ML at a software organization explained that improving their rate of experimentation with Vertex AI by 10x increased the revenue they were able to generate by at least 5x due to deeper insights. “Improved recommendation systems translate to people spending more time on our website and looking at a lot more content they would actually need, driving higher revenue,” stated the interviewee.
 - A retailer developed visual AI models using Vertex AI Vision to allow customers to buy directly from an image on their website without manual tagging. The organization saw \$6 million in incremental revenue with this addition.

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

- Two percent of the organization’s revenue is affected by Vertex AI in Year 1. This grows to 10% by Year 3 as adoption and usage of the platform expands within the organization.
- The organization realizes a 1.5% increase in revenue in Year 1. This grows to 5% by Year 3 as users continue to refine their models and uncover new insights.
- The composite organization’s operating margin is 8%.

“We can apply models developed using Vertex AI to sort customers into audiences. This allows us to more quickly identify a customer’s needs and personalize their journey by offering them information on products and services that would matter the most, increasing our sales while improving their satisfaction.”

Senior manager, retail

Risks. Incremental profit due to improved model performance may vary depending on the following:

- The number of direct revenue-impacting models developed annually.
- The Vertex AI features in use and platform adoption internally.
- The skills set of Vertex AI users and their ability to create and refine ML models and derive insights from data.
- The organization’s operating margin.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$7.6 million.

Incremental Profit Due To Improved Model Performance					
Ref.	Metric	Source	Year 1	Year 2	Year 3
F1	Annual revenue	Composite	\$20,000,000,000	\$20,000,000,000	\$20,000,000,000
F2	Percent of revenue affected by Vertex AI-based models	Composite	2%	5%	10%
F3	Percentage increase in revenue due to new and improved insights with Vertex AI	Interviews	1.5%	3.0%	5.0%
F4	Subtotal: Increased revenue due to Vertex AI	F1*F2*F3	\$6,000,000	\$30,000,000	\$100,000,000
F5	Operating margin	TEI standard	8%	8%	8%
Ft	Incremental profit due to improved model performance	F4*F5	\$480,000	\$2,400,000	\$8,000,000
	Risk adjustment	↓10%			
Ftr	Incremental profit due to improved model performance (risk-adjusted)		\$432,000	\$2,160,000	\$7,200,000
Three-year total: \$9,792,000			Three-year present value: \$7,587,318		

BUSINESS USER OPERATIONAL EFFICIENCY

Evidence and data. The automation of manual, repeated tasks resulted in operational efficiencies for interviewees’ organizations.

- The director, digital global noted their financial services organization created a chatbot to answer basic questions around a client’s portfolio using models trained on Vertex AI Pipelines to accelerate the creation process. If the client’s need was more advanced, the chatbot initiated the conversation with a customer service representative to complete the inquiry. Implementing a chatbot using a model training and constantly monitoring using Pipelines has improved the efficiency of FTEs involve in this process by 15%. Additionally, with Pipelines storing workflow artifacts with Vertex AI Metadata, the financial services organization easily reused this pipeline and created more chatbots for other departments over time.
- The same organization reduced the time it took for check processing (i.e., sending physical checks to a specific facility to validate the check value of a customer and process the payment)

from hours to minutes. The director, digital global, said: “We’ve used AutoML to create models to transform this process into an automated one, so the business users no longer have to do the data and payment processing manually. And having Pipelines has made it easier for us to deploy this process in the real world. We get up to 200 million physical checks per year, so this is a huge time savings for our operations folks.”

- Similarly, the principal architect noted their financial services organization used Google Document AI in conjunction with Vertex AI Vision and AutoML NLP to craft models specific to mortgage documents that needed to be processed. The platform also helped them manage multiple versions of the models that would extract, classify, and store metadata at scale. This system reduced processing time from 10 minutes to 10 seconds and increased the number of documents processed in the same amount of time by 30%.

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

“Our business users can repurpose their time to other activities that could uplift customer experience, drive additional revenue, or improve efficiencies internally.”

Director, digital global, financial services

- In the first year, 50 business users are affected by automation built using Vertex AI. This number grows to 700 as automations are deployed to different workstreams.
- Affected business users save 2 hours per week with the automation introduced using Vertex AI.
- The business user average fully burdened rate is \$73,000.

- Forrester conservatively estimates that 50% of the total time saved per business user FTE is applied directly back to value-generating tasks, and it is therefore included in the benefit calculation. Individual employees may apply additional time savings toward professional development, training, and work-life activities which are not included in the benefit analysis.

Risks. Business user operational efficiency may vary depending on the following:

- The particular ML use cases and their size, scope, and complexity.
- Prior state benchmarks.
- The fully burdened salaries of affected users.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.2 million.

Business User Operational Efficiency					
Ref.	Metric	Source	Year 1	Year 2	Year 3
G1	Number of business users affected by Vertex AI	Composite	50	200	700
G2	Percent improvement in operational efficiency due to automation with Vertex AI	Composite	5%	5%	5%
G3	Business user FTE yearly rate (fully burdened)	Composite	\$73,000	\$73,000	\$73,000
G4	Productivity recapture	TEI standard	50%	50%	50%
Gt	Business user operational efficiency	$G1 \times G2 \times G3 \times G4$	\$91,250	\$365,000	\$1,277,500
	Risk adjustment	↓10%			
Gtr	Business user operational efficiency (risk-adjusted)		\$82,125	\$328,500	\$1,149,750
Three-year total: \$1,560,375			Three-year present value: \$1,209,971		

COST SAVINGS FROM RETIRING LEGACY SOLUTIONS

Evidence and data. By implementing Vertex AI into their ML environments, interviewees' organizations decommissioned legacy on-premises and third-party point solutions in favor of a more scalable, cost-efficient, pay-for-what-you-use cloud licensing model. In doing so, organizations reduced administration, maintenance, and supposed costs associated with the solutions as well.

- The global strategy director noted their insurance organization saw 50% cost savings from centralizing to a common ML solution across their organization. Its savings approached the high-digit single millions over time.
- The senior manager at a retail organization noted their organization made updates to its search engine while reducing costs by utilizing Feature Store to store and serve ML features. The organization discovered that it had significantly increased revenue per search while cutting out \$500,000 per year in third-party vendor costs with the switch to Vertex AI. The senior manager explained: "We're a huge organization, so we have a lot of third-party services. But Vertex AI allows us to shutter those as we onboard more teams to the platform. The platform's offerings are so expansive that over time, centralizing to one platform enterprisewide is much cheaper, and we don't need all these different tools for different steps of the ML lifecycle for different teams within the enterprise."
- The same interviewee highlighted the cost-effectiveness of scaling with Vertex AI: "As a managed, cloud-based platform, Vertex AI reduces total cost of ownership. For instance, if we generate a model and train it on 40 kilobytes of data, we can easily expand it out to 6 gigabytes of data without having to worry about configuring server clusters."

"With our on-premises solutions, we continuously had to expand our infrastructure as our business grew. And that added more complexity and effort in terms of managing the environment as well. With Vertex AI, we can pay for what we need and don't have to worry about maintaining the platform."

Director, digital global, financial services

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

- The composite organization saves \$1 million of its on-premises and third-party point solution licensing and infrastructure in Year 1. This increases to \$3.5 million by Year 3 as the organization decommissions more of the legacy environment and avoids the infrastructure costs increases associated with growing needs in an on-premises environment.
- The costs to support the legacy environment that is decommissioned in Year 1 is \$100,000. This increases to \$350,000 by Year 3 as more of the legacy environment is decommissioned.

Risks. Cost savings from retiring legacy solutions may vary depending on the following:

- License fees and associated infrastructure fees of legacy solutions.
- The rate of decommissioning legacy solutions.
- The maintenance effort associated with maintaining existing solutions.

- Salaries, types, and number of FTEs managing legacy solutions.
- Legacy solution deployment setup (e.g., on-premises vs. the cloud).

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$5.1 million.

Cost Savings From Retiring Legacy Solutions					
Ref.	Metric	Source	Year 1	Year 2	Year 3
H1	Avoided license and infrastructure fees	Interviews	\$1,000,000	\$2,000,000	\$3,500,000
H2	Avoided legacy solution management and maintenance costs	Interviews	\$100,000	\$200,000	\$350,000
Ht	Cost savings from retiring legacy solutions	H1+H2	\$1,100,000	\$2,200,000	\$3,850,000
	Risk adjustment	↓10%			
Htr	Cost savings from retiring legacy solutions (risk-adjusted)		\$990,000	\$1,980,000	\$3,465,000
Three-year total: \$6,435,000			Three-year present value: \$5,139,669		

UNQUANTIFIED BENEFITS

Interviewees mentioned the following additional benefits that their organizations experienced but were not able to quantify:

- Scaling ML while maintaining headcount.** Vertex AI, with its easy-to-use UI, automation capabilities, and wide breadth of features, made it easy for the interviewees to upskill junior data scientists and decrease the dependency on highly skilled resources. Additionally, the platform helped data teams add value to their organizations at rates that would normally be achieved using larger teams. The data architect at a financial services organization said: “Previously, our biggest inhibitor in increasing our ML maturity was lacking the people we needed to move forward our ideas. Existing teams didn’t have the bandwidth or they didn’t have the skill sets in-house to create all the types of models we wanted. We would need to hire more resources. AutoML helps anyone create any type of model, such as image or video classification. With that, we no longer have to sit on our ideas and wait to hire specialized resources, we can act on them immediately and scale fast.”

“Vertex AI, reduces the barriers to understanding and utilizing ML, regardless of a person’s skillset.”

Product manager, ML, retail

“Vertex AI, as an AI/ML platform, provides visibility into the checks and balances that go into protecting your data in real time, and we have a continuous data trail. We no longer have to depend on people to provide that security and trackability for us.”

Senior manager, retail

- Enhanced employee acquisition and retention.** Interviewees reported that data teams felt empowered with Vertex AI in their toolkit, which reduced turnover. According to the director, digital global at a financial service organization: “Team members are happier because they are able to spend less time on menial tasks or things they don’t want to do. They like the environment, so they don’t want to leave.”

For an insurance organization, having Vertex AI helped with recruiting efforts. The global strategy director said: “It’s extremely hard to attract data science talent in the insurance space. If we can help data scientists understand we’re an ML leader in the insurance space because we’re investing heavily in modern ML tools that work, we see more interest from better talent.”

- Improved compliance, governance, and security.** Vertex AI provided the transparency, traceability, and security needed to manage risk and satisfy regulators. The global strategy director at an insurance organization said: “It’s easy to see how our data is being used or the way models are being used for decision-making. With built-in security controls and audit logs, we’re more confident in working with our data.”

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer

might implement Vertex AI and later realize additional uses and business opportunities, including:

- **Increasing innovation through experimentation.** Vertex AI reduced the barriers to experimentation for the interviewees' organizations. The principal architect at a financial services organization shared: "Vertex AI allows us to conduct exploratory analysis easier, faster, and better without getting into the nuts and bolts of writing code. We also have the flexibility to analyze anything and experiment more, which can lead to new insights down the line."
- **Expanding the Vertex AI feature set.** Interviewees' organizations looked to adopt more of the features under the Vertex AI umbrella to further increase efficiencies for data teams. The director, digital global at a financial services organization said, "Google is always releasing new features, and we're always looking for ways we can streamline work for our employees."
- **The advantages of managed infrastructure.** Vertex AI's capabilities ran on a fully managed infrastructure, reducing the labor hours spent on maintenance compared to the unmanaged infrastructure in the legacy environment. Additionally, infrastructure usage was customized based on organizational performance and budget needs, further optimizing costs. Interviewees noted that, as they retire more of their legacy stack, their management costs will continue to reduce without inhibiting innovation with ML.
- **Further operationalizing and democratizing ML.** Vertex AI provided the capabilities and extensibility necessary for low- to mid-maturity ML organizations to increasingly adopt MLOps practices into their organizations and further build out ML pipelines at scale. Organizations also aimed to increase the number and skill set of citizen data scientists with Vertex AI. The principal architect at a financial services organization said, "We're slowly starting to get

business users to try creating models and, so far, they love it. We get a lot of feedback around AutoML, and the fact that they can visualize their own data, run the models, and see the results."

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
Itr	Vertex AI platform usage fees	\$0	\$770,000	\$1,210,000	\$1,760,000	\$3,740,000	\$3,022,314
Jtr	Implementation and ongoing management	\$309,320	\$31,574	\$39,468	\$47,362	\$427,724	\$406,226
Ktr	Training fees	\$11,689	\$46,460	\$116,298	\$174,447	\$348,894	\$281,104
	Total costs (risk-adjusted)	\$321,009	\$848,035	\$1,365,766	\$1,981,809	\$4,516,618	\$3,709,644

VERTEX AI PLATFORM USAGE FEES

Evidence and data. Vertex AI pricing is based on machine-learning computation, processing time, and data storage consumption. Pricing varied depending on each organization's characteristics, needs, use cases, and Vertex AI features in use. For further pricing information, please speak with a sales specialist.

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

- The composite organization pays \$700,000 in usage fees to Google in Year 1.
- Deployment expands as the organization introduces more users and use cases to

the platform and creates more models. The organization pays \$1.1 million and \$1.6 million in usage fees in Years 2 and 3, respectively.

Risks. Vertex AI platform usage fees may vary depending on the following:

- Variance in compute, processing time, and storage consumption
- Variance in Vertex AI features in use.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$3.0 million.

Vertex AI Platform Usage Fees						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
I1	Vertex AI license, compute, and storage fees	Composite		\$700,000	\$1,100,000	\$1,600,000
It	Vertex AI platform usage fees	I1	\$0	\$700,000	\$1,100,000	\$1,600,000
	Risk adjustment	↑10%				
Itr	Vertex AI platform usage fees (risk-adjusted)		\$0	\$770,000	\$1,210,000	\$1,760,000
Three-year total: \$3,740,000				Three-year present value: \$3,022,314		

IMPLEMENTATION AND ONGOING MANAGEMENT

Evidence and data. Before adopting Vertex AI, the interviewees' organizations performed a proof of concept (POC) to ensure the platform and the features in use met their needs. Following, interviewees' organizations relied on internal labor and third-party services to plan and implement, train users, and integrate data sources and tooling. The extent of professional services and training required vary by organization.

- Implementation and deployment reportedly required up to one month of calendar time but only up to two full weeks in terms of person-hours during that period. According to the global strategy director at an insurance organization: "Implementation involved IT folks as well as a product manager. Business users were sometimes involved in an oversight capacity depending on the use case. Besides internal labor, our implementation partner was instrumental in getting Vertex AI up and running smoothly. They helped kick off some work before fully passing over the reins, which was helpful considering how big our enterprise is and how cross-organizational this platform is."
- Several interviewees also noted internal labor needed for ongoing maintenance, such as upgrades, testing, integration, oversight, and onboarding new users and features. However, as a Google-managed platform, these fees were minimal compared to the management costs associated with legacy ML technologies.
- The global strategy director at an insurance organization said: "We have a couple of engineers spending time making updates and dealing with changes on the platform. However, as the platform is Google-managed, this is pretty minimal. Most of the time they spend associated with ongoing management relates to growing usage and integrating tools."

“Ongoing management time is focused around educating people, onboarding them, and creating reusables, our own Software Development Kits (SDKs) that new teams who want to onboard to Vertex AI can easily use. It’s more value-add work which is great, and management is not a big deal at all as the infrastructure is managed by Google.”

Principal architect, financial services

- The VP, ML at a software organization said: "Data scientists and data engineers were in charge of ongoing maintenance while also expanding usage. When we were implementing new features, a data scientist would ramp users up and we could then deprecate our old system once everyone moved over."

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

- The composite organization spends \$250,000 on professional services in the initial period to support planning, change management, implementation, integration, and user training
- A team of six, consisting of a product manager, data scientists, and engineers, dedicate 50% of their time to initial implementation during the one-month process. The FTE blended hourly rate is \$65.
- Two engineers dedicate 10% of their time to ongoing management of the platform. This

increases to 3 FTEs by Year 3 as the number of users and features in use rises.

- The average FTE blended hourly rate is \$69.

Risks. Implementation and ongoing management may vary depending on the following:

- The size, scope, and complexity of operations.
- The available capacity and skill sets of teams.

- The salaries of FTEs.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$406,000.

Implementation And Ongoing Management						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
J1	Professional services fees: Implementation and training	Composite	\$250,000			
J2	Number of employees	Interviews	6.0	2.0	2.5	3.0
J3	Time dedicated to Vertex AI implementation and ongoing management per FTE (hours)	Interviews	80	208	208	208
J4	FTE blended hourly rate (fully burdened)	Composite	\$65	\$69	\$69	\$69
Jt	Implementation and ongoing management	J1+(J2*J3*J4)	\$281,200	\$28,704	\$35,880	\$43,056
	Risk adjustment	↑10%				
Jtr	Implementation and ongoing management (risk-adjusted)		\$309,320	\$31,574	\$39,468	\$47,362
Three-year total: \$427,724			Three-year present value: \$406,226			

TRAINING FEES

Evidence and data. User training on Vertex AI varies according to user profile, but interviewees noted that it only took hours for users to become proficient in using the solution.

- The principal architect at a financial services organization said: “We did a train-the-trainer type approach. With this approach, we’ve been able to increase tool adoption immensely while improving our onboarding technique. We only need a couple days with good training documentation to onboard anyone and everyone to Vertex AI.”

“Trainings for core users, such as data scientists and engineers, were usually a couple hours a day for a week.”

Product manager, ML, retail

- Google cloud provided a variety of training materials interviewees leveraged for onboarding and ad hoc needs.

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

- Three hundred users are onboarded onto Vertex AI over three years. The amount onboarded increases year over year.
- Of these users, 60% are data scientists. Data scientists spend 20 hours on trainings to become proficient in using the solution.
- Thirty percent of users are engineers. Engineers spend 16 hours on trainings to become proficient in using the solution.
- The remaining 10% of users are business users. Business users spend 4 hours on training to become proficient in using the solution for their needs.
- The average hourly rate of a data scientist FTE is \$64.

- The average blended hourly rate of a data/ML/DevOps engineers in \$69.
- The average hourly rate of a business user FTE is \$35.

Risks. Training fees may vary depending on the following:

- The number, skill set, roles, and prior experience of users being trained on Vertex AI.
- The salaries of FTEs.

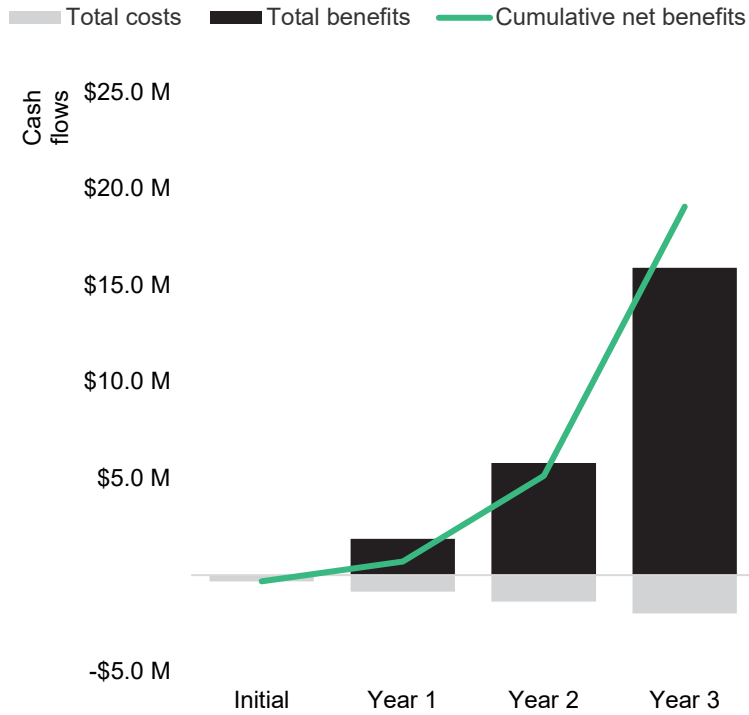
Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV of \$281,000.

Training Fees						
Ref	Metric	Source	Initial	Year 1	Year 2	Year 3
K1	Net-new FTEs trained on Vertex AI	Composite	10	40	100	150
K2	Net-new FTE trained: Data scientists	K1*60%	6	24	60	90
K3	Hours spent on training per data scientist	Interviews	20	20	20	20
K4	Data scientist hourly rate (fully burdened)	Composite	\$64	\$64	\$64	\$64
K5	Net-new FTE trained: Data/ML/DevOps engineers	K1*30%	3	12	30	45
K6	Hours spent on training per data/ML/DevOps engineer	Interviews	16	16	16	16
K7	Data/ML/DevOps engineer blended hourly rate (fully burdened)	Composite	\$69	\$69	\$69	\$69
K8	Net-new FTE trained: Business users	K2*10%	1	2	6	9
K9	Hours spent on training per business user	Interviews	4	4	4	4
K10	Business user hourly rate (fully burdened)	Composite	\$35	\$35	\$35	\$35
Kt	Training fees	$(K2 \cdot K3 \cdot K4) + (K5 \cdot K6 \cdot K7) + (K8 \cdot K9 \cdot K10)$	\$11,132	\$44,248	\$110,760	\$166,140
	Risk adjustment	↑5%				
Ktr	Training fees (risk-adjusted)		\$11,689	\$46,460	\$116,298	\$174,447
Three-year total: \$348,894			Three-year present value: \$281,104			

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 and NPV for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI and NPV 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	(\$321,009)	(\$848,035)	(\$1,365,766)	(\$1,981,809)	(\$4,516,618)	(\$3,709,644)
Total benefits	\$0	\$1,878,287	\$5,800,129	\$15,898,653	\$23,577,070	\$18,445,923
Net benefits	(\$321,009)	\$1,030,253	\$4,434,363	\$13,916,844	\$19,060,452	\$14,736,279
ROI						397%

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: “Implement ModelOps To Operationalize AI,” Forrester Research, Inc., August 13, 2020.

² Total Economic Impact is a methodology developed by Forrester Research that enhances a company’s technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

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