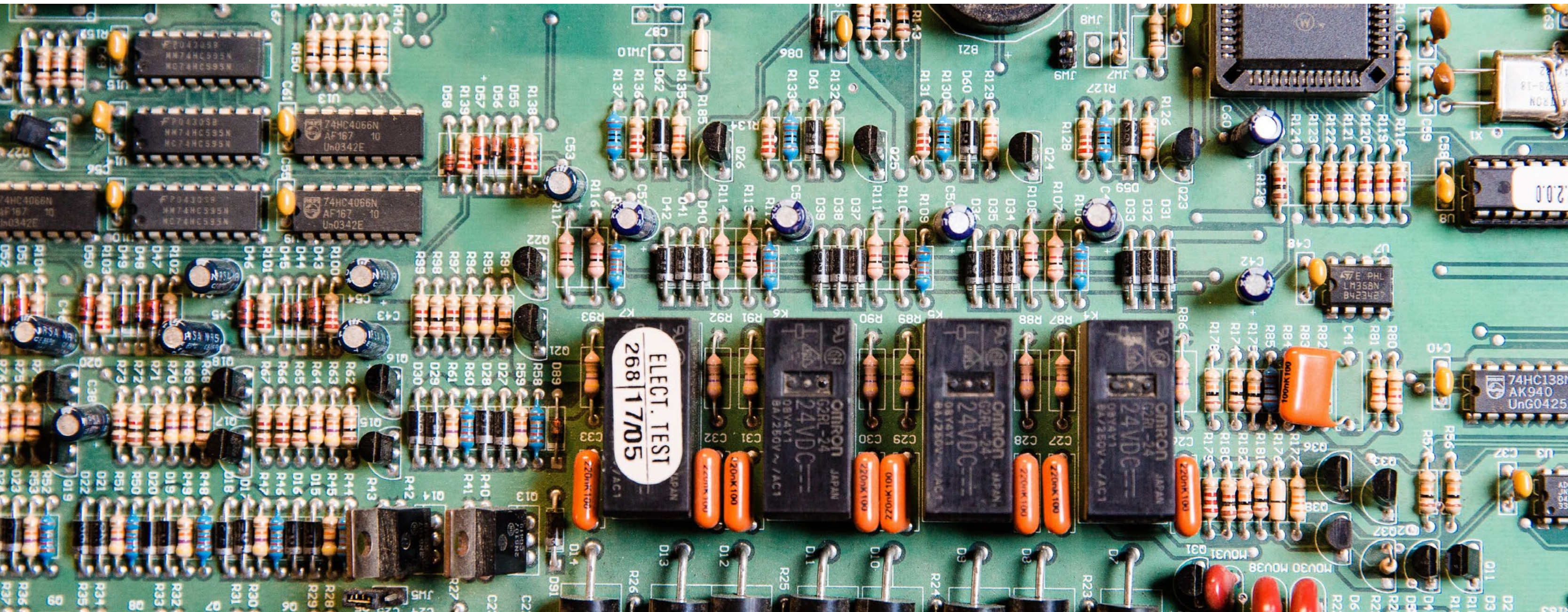


# Machine learning at a glance: highlights from Google Cloud research





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**“This is what is keeping business leaders awake at night: how to harvest and make sense of their data for competitive advantage. Machine learning is allowing companies to **surface the untapped value** in their data.”**

**Fausto Ibarra**, director of global product management for Google Cloud Platform





# Introduction

Computer scientists have been seriously exploring artificial intelligence — the idea that machines can mimic the cognitive functions of the human brain — for more than 60 years. No longer the stuff of science fiction, AI now has practical applications across industries and functions, and businesses are adopting it for everything from marketing personalization and image classification to supply-chain optimization and fraud detection. One technique in particular forms the backbone of many organizations' AI strategies: machine learning (ML), which uses large volumes of data to train sophisticated algorithms to self-improve. ML enables businesses to make sense of the unprecedented amounts of data now available to them, unlocking insights and efficiencies that can deliver competitive advantage.

For more than a decade, Google has been working to make ML solutions more powerful, accessible, and secure, developing open-source tools and cloud-based services that can help businesses solve complex problems. In addition to publishing groundbreaking scientific research of its own, Google regularly commissions independent studies on vital aspects of the evolving ML landscape, including enterprise adoption rates, typical use cases, expected and achieved benefits, and success factors. Below, Google has put together some of its most compelling recent findings to guide you on your journey, whether you're new to ML or want to get more value from your existing program.





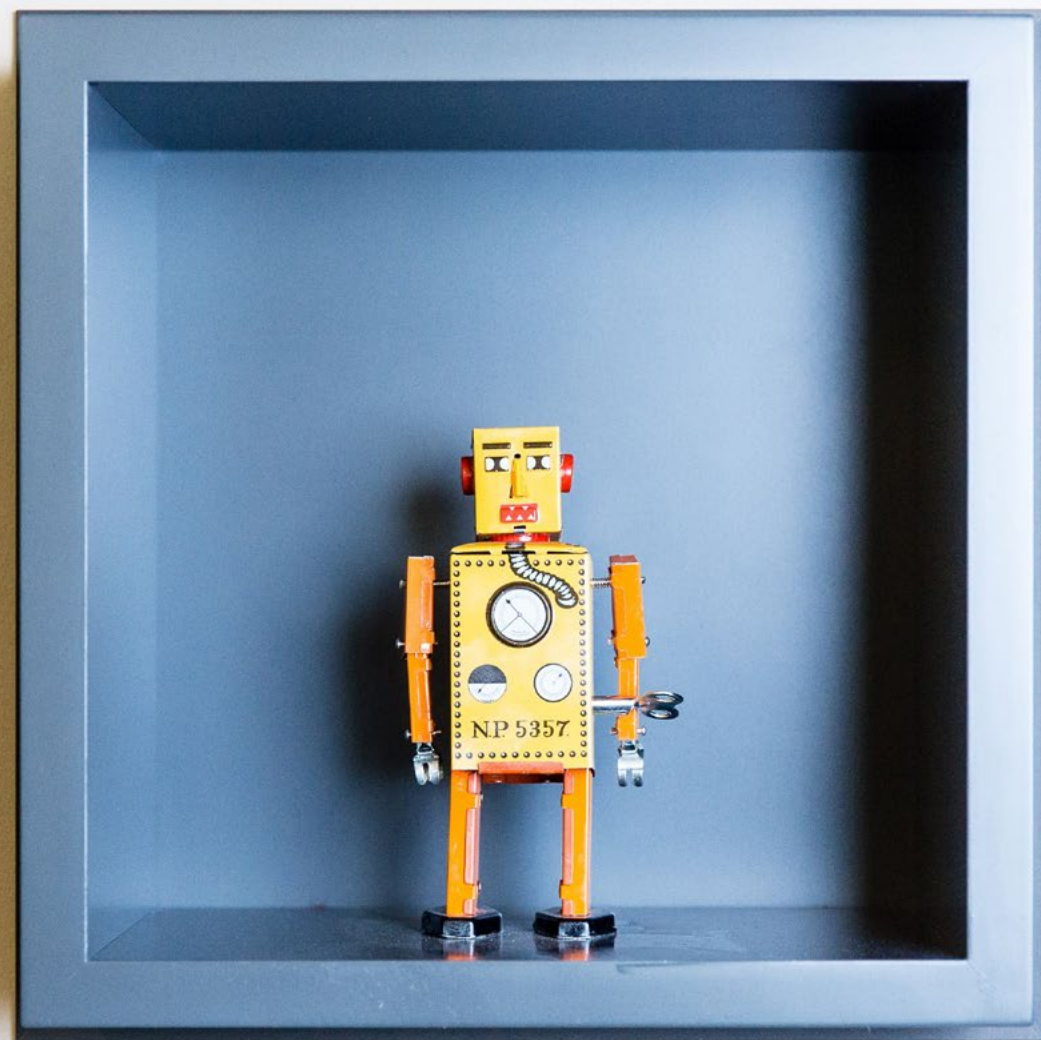


# Adoption: the ML train is leaving the station, with most businesses on board.

The majority of today's businesses are investing in ML, according to our research. Use cases vary widely by industry, but several key applications — including process automation and customer behavior analysis — are common. ML adopters are seeing an especially high degree of impact from predictive analytics, a category of techniques that use data to assess the likelihood of future outcomes and help businesses solve complex problems.



# (Almost) everybody's **doing it**



# 60%

of business and  
technology leaders  
have already  
implemented an  
ML strategy.



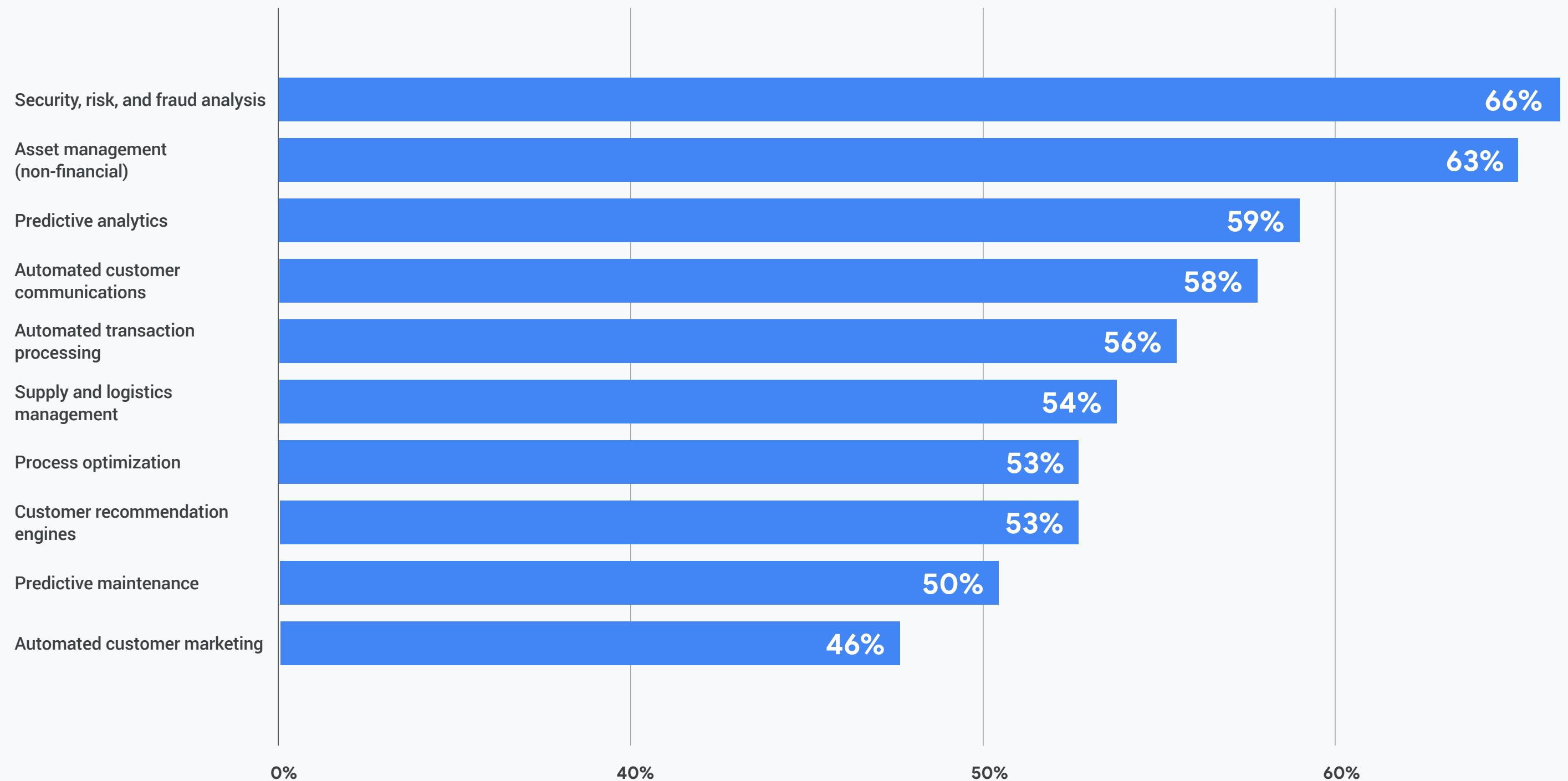
# Newbies vs. **old pros**



of current implementers  
are in the early stages  
of their ML strategies.

# Use cases, from analysis to automation

Early adopters say they're using ML for...





# A considerable slice of the budget pie



of early adopters  
report that more than  
15% of their IT budget  
is devoted to ML.



# Top applications **by industry**

## Healthcare

- Predictive modeling
- Process automation
- Customer behavior analysis

## Financial services

- Predictive analytics
- Risk analysis
- Fraud detection

## Manufacturing

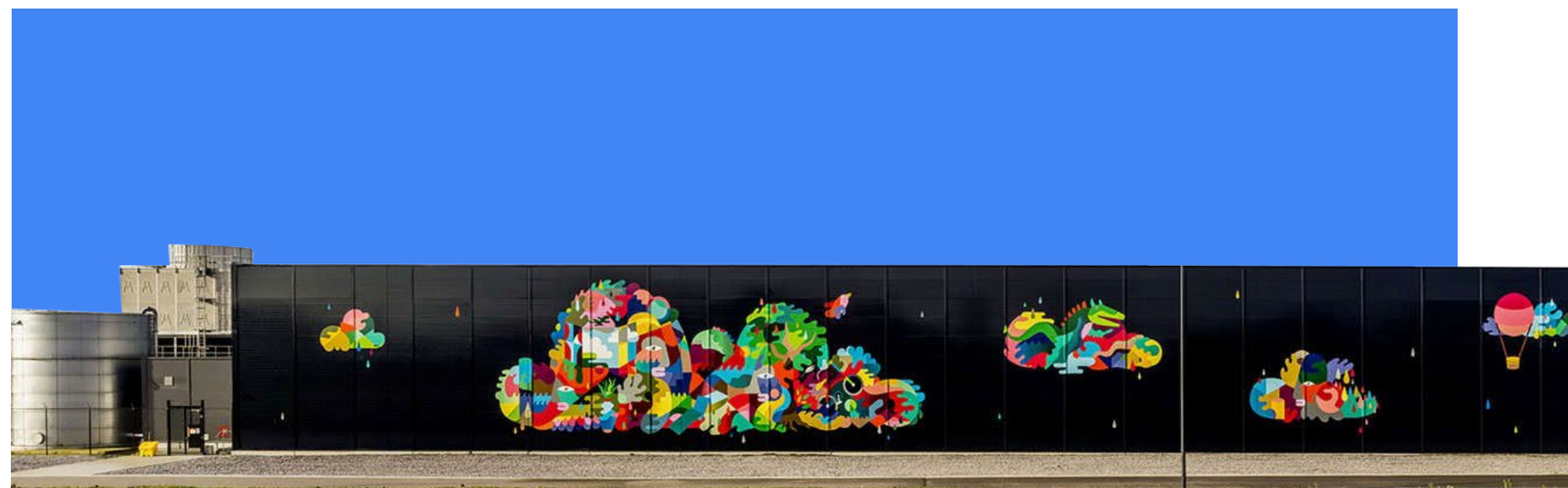
- Humidity and climate control
- Process automation
- Market trend analysis

## Retail

- Credit risk assessment
- Supply chain management
- Customer behavior analysis

## Media & gaming

- Recommendation engines
- Process automation
- Customer behavior analysis





# Praise for predictive analytics



of executives say predictive analytics is the ML branch most impacting their organizations today.

**Runners-up:** text classification or mining, fraud detection, e-commerce, and behavior or sentiment analysis



**“The **sky’s the limit** here.  
There is almost nothing  
we do that can’t benefit  
from intelligence and  
learning capabilities.”**

CIO of a \$1 billion real estate firm



**“Machine learning is not just a new way of building software. It’s enabling new business capabilities at the most strategic levels, such as new services, processes, and business models.”**

**George Gilbert**, big data and analytics analyst  
for Wikibon Research





# Benefits:

## ML is making businesses **more competitive,** efficient, and secure.

Across industries and use cases, organizations that have implemented ML report demonstrable return on investment and substantial business benefits ranging from better, faster data analysis to improved efficiency and cost savings. The vast majority of early adopters — nearly 90 percent, according to one study — believe that ML provides a competitive advantage, and more than half of business leaders who participated in another survey expect that ML will determine their companies' future success. It's also worth noting that most early adopters say that ML enhances their cybersecurity efforts. Google has experienced this effect firsthand at Google Cloud, where it uses AI-powered methods to identify vulnerabilities and thwart attacks.





# A hefty payoff, **fast**

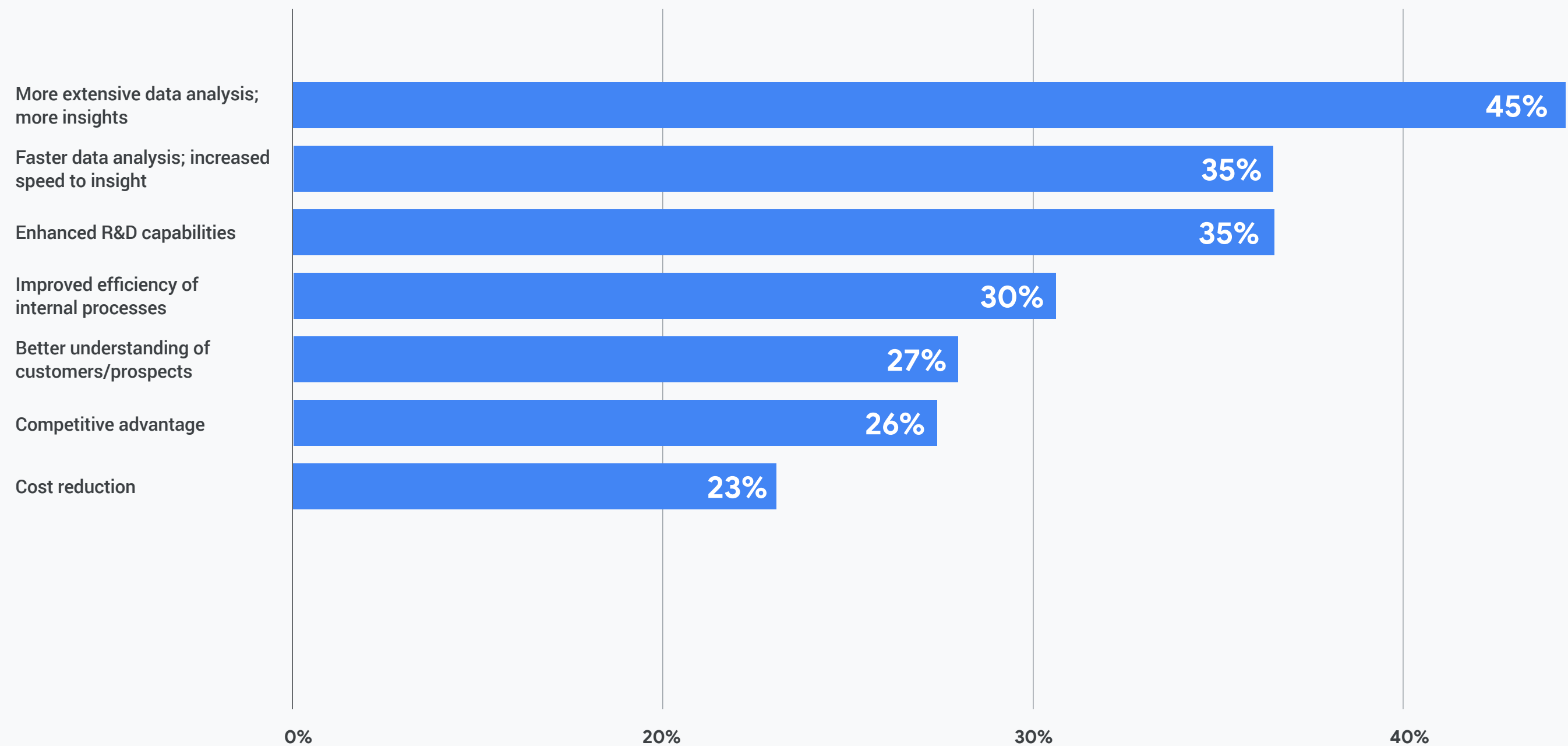


ROI of most standard ML projects in the first year



# The upshot of ML, from insights to efficiency

Early ML adopters say they've already gained...



# Getting ahead with ML

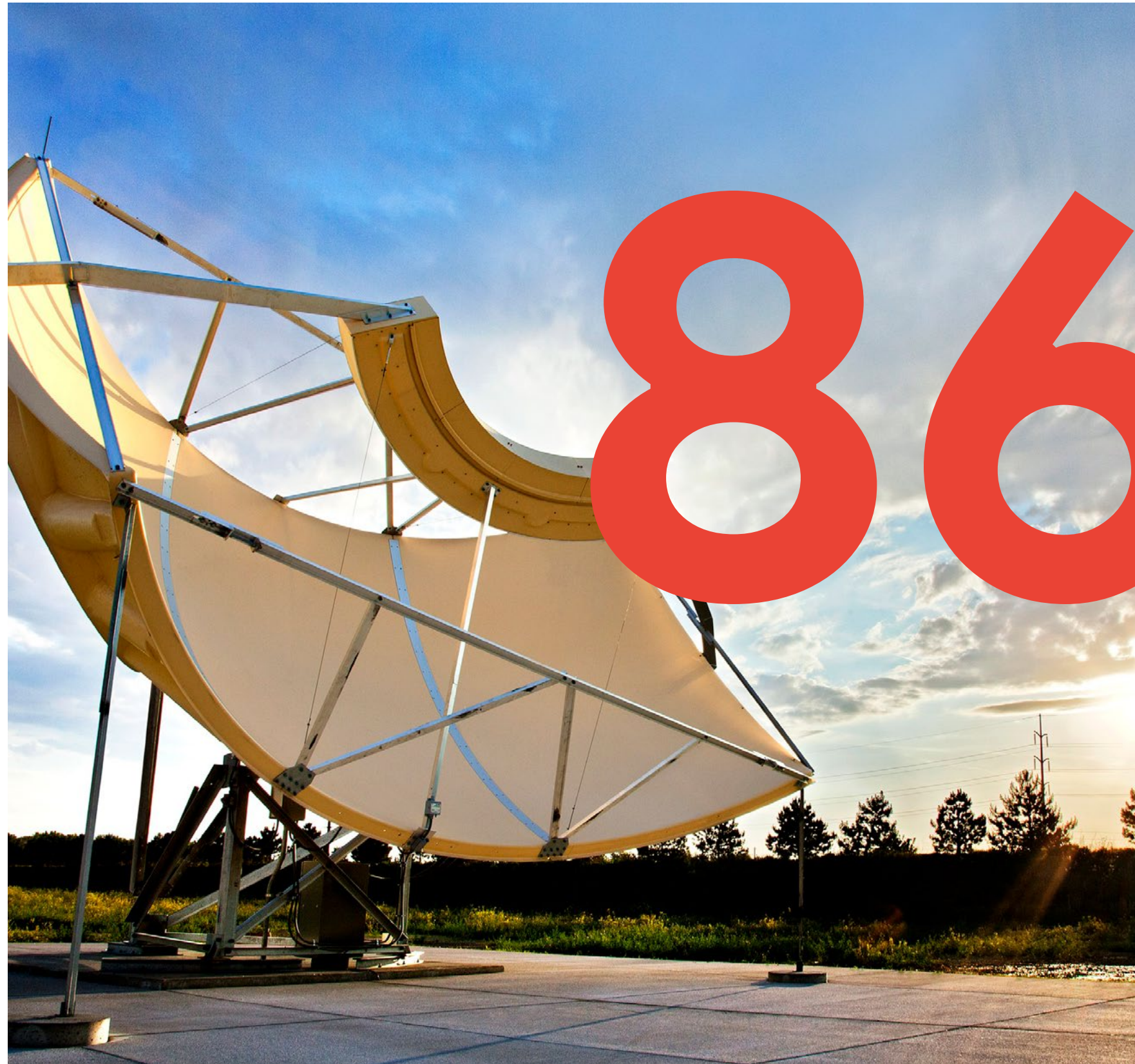


of early adopters agree  
that ML can provide a  
competitive advantage.

"Pictured: Fei-Fei Li, chief scientist  
of ML and AI at Google Cloud"



# Staying safer with ML



of early adopters say  
that ML enhances their  
cybersecurity efforts.



# Cutting costs with ML



81%

of early adopters agree  
that ML technology  
can drive down costs.



**“One hundred percent of any company’s future success depends on adopting machine learning. [Companies] need to anticipate what customers want, and machine learning is **absolutely essential** for that.”**

**Brandon Purcell**, senior analyst  
at Forrester Research







# Getting started: Businesses are looking to the cloud as a critical first step to **succeeding with ML.**

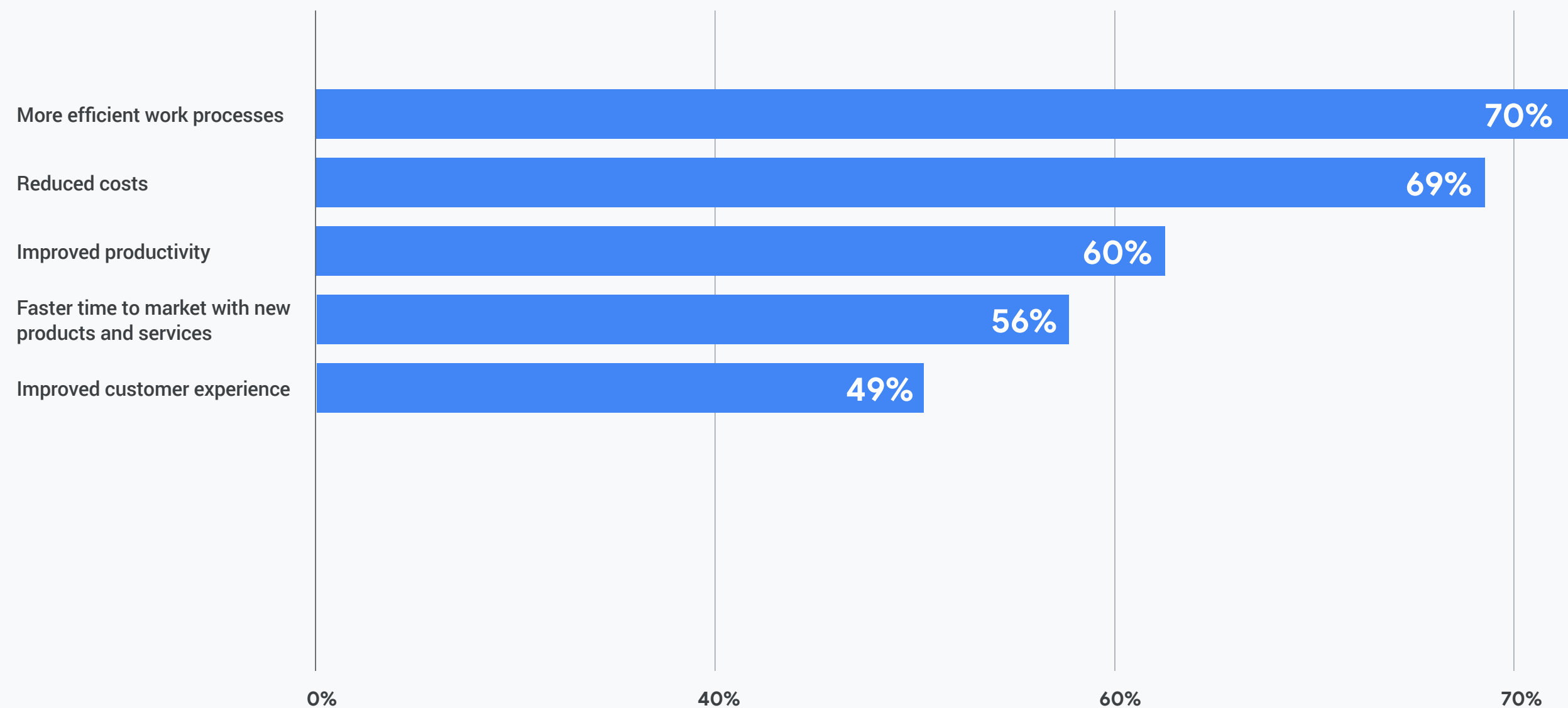
ML typically requires elastic computing resources, massive processing power, and deep expertise. As a result, companies are increasingly turning to cloud providers for not only scalable virtual machines and data storage, but also managed services and application programming interfaces (APIs) that help make ML accessible to all. Google's research shows that migration of ML to the cloud yields a number of business benefits, including increased efficiency and reduced costs; it also suggests that the lion's share of ML workloads will soon be deployed in the cloud. This upward trend dovetails with a larger surge in cloud adoption, fueled by modern businesses' need for agility and openness as well as IT decision-makers' growing confidence in cloud security. As a Google Cloud partner, we advise organizations hoping to harness the power of ML to take the first step by moving their data and workloads to the cloud.





# The case for **cloud ML**

By moving their ML workloads to the cloud, organizations have benefited from...



# More intelligence, for less



64%

of business leaders say reduced costs influence their decisions regarding cloud computing investments in machine learning.



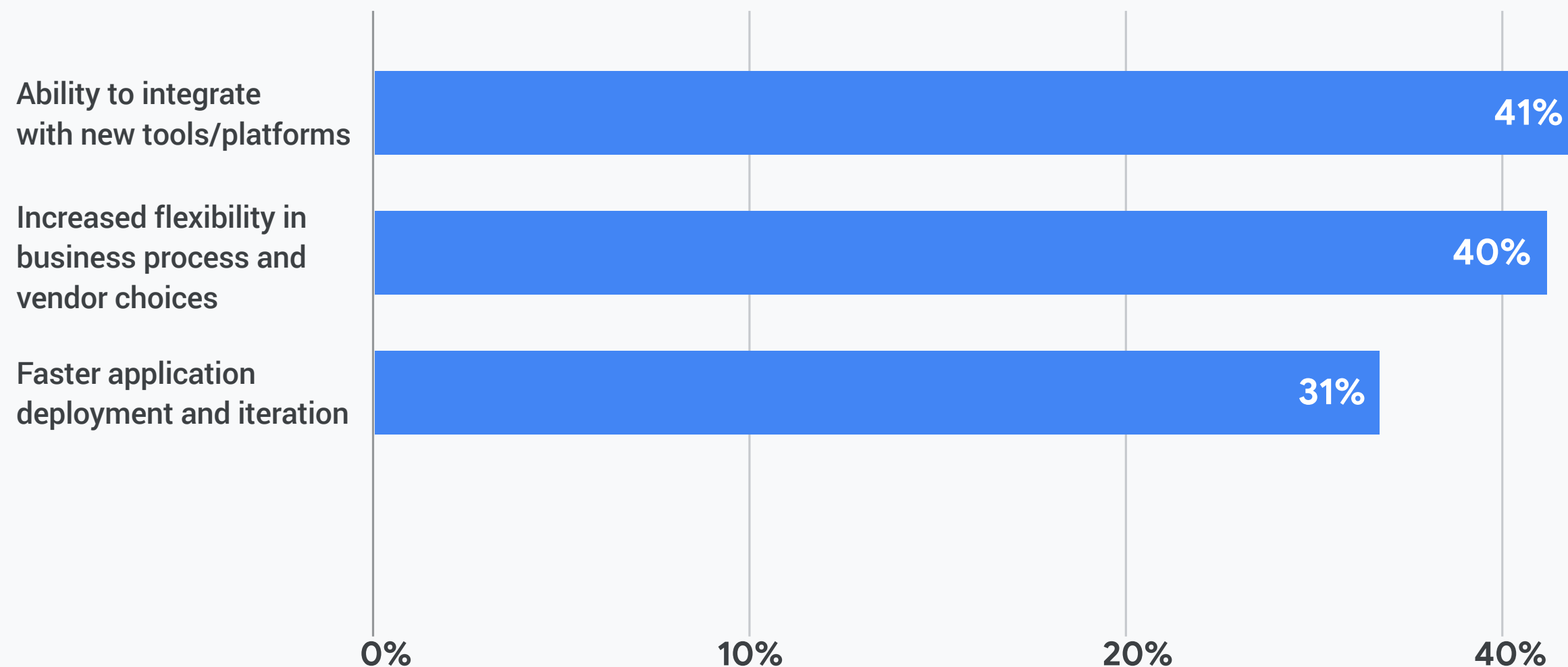
# Mass migration for ML



of ML workloads will  
be deployed in the  
cloud by 2019.

# More workloads, **more benefits**

IT and business executives deploy their ML/AI workloads in the cloud because it offers...



Their growing reliance on the cloud to increased need for agility/speed to market (45%), increased confidence in cloud security (44%), and cost savings (34%).



**“AI remains a field with high barriers. It requires rare expertise and resources few companies can afford on their own. That’s why **cloud is the ideal platform for AI**. That’s also why we’re making huge investments in cloud AI and ML in the form of powerful, easy-to-use tools that will give every cloud customer an onramp into this field.”**

**Fei-Fei Li**, chief scientist of ML and AI at Google Cloud

# Conclusion

In multiple studies, Google's research partners have demonstrated that ML offers significant business benefits to the substantial — and rapidly growing — number of organizations that are using it to turn data into insights. Indeed, ML has become essential to modern businesses' ability to compete and survive. Google has held that belief for a long time, and forward-thinking business and IT leaders clearly share it.

There's also evidence that companies can build more effective and affordable ML programs when they take advantage of cloud providers' scalable infrastructures, managed services, and APIs. In other words, when it comes to embracing ML techniques for the first time or extending your existing strategy into the cloud, your choice of technology partner matters — and you'll have a distinct advantage if you work with a seasoned pioneer like Google Cloud.

**Contact Zenoss to  
begin the discussion at  
[www.zenoss.com](http://www.zenoss.com)**

Realize the full benefits of machine learning with a Google Cloud partner and gain real insights for your business.



# Appendix

“Machine Learning: The New Proving Ground for Competitive Advantage,” a study conducted by MIT Technology Review in partnership with Google Cloud, 2017. [\(link\)](#)

“Machine Learning is Delivering ROI for Early Adopters,” a study conducted by IDG and commissioned by Google Cloud, 2017. [\(link\)](#)

Qualitative interviews of ML adopters, conducted by M-Brain and commissioned by Google Cloud, 2017.

“To the Cloud and Beyond: Big Data in the Age of Machine Learning,” a study conducted by Harvard Business Review Analytic Services and sponsored by Google Cloud, 2017. [\(link\)](#)

“Business impacts of machine learning,” a study conducted by Deloitte Access Economics and sponsored by Google Cloud, 2017. [\(link\)](#)

Survey data from “To the Cloud and Beyond: Big Data in the Age of Machine Learning,” a study conducted by Harvard Business Review Analytic Services and sponsored by Google Cloud, 2017. [\(link\)](#)

“Behind the Growing Confidence in Cloud Security,” a study conducted on behalf of Google Cloud in association with MIT SMR Custom Studio, September 2017. [\(link\)](#)

Day 1 keynote at Google Cloud Next ‘17. [\(link\)](#)