

Machine learning at a glance: highlights from Google Cloud research

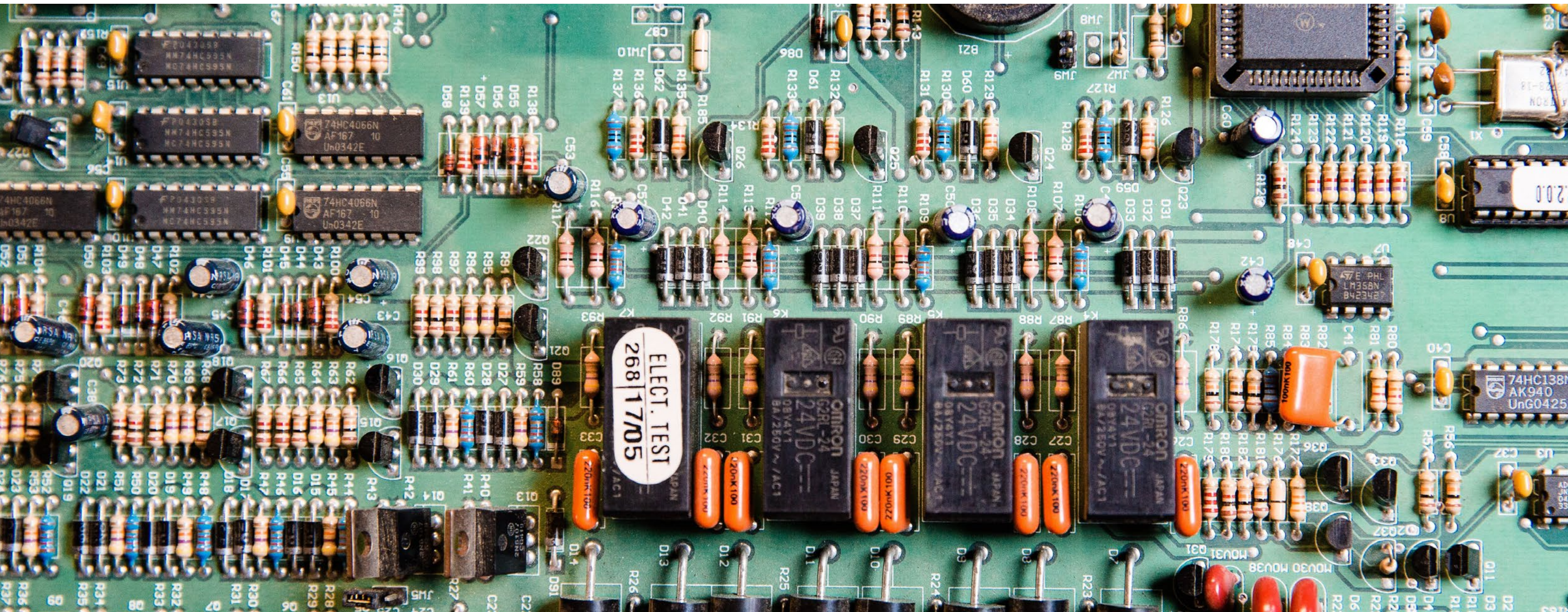


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“This is what is keeping business leaders awake at night: how to harvest and make sense of their data for competitive advantage. Machine learning is allowing companies to **surface the untapped value in their data.”**

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.



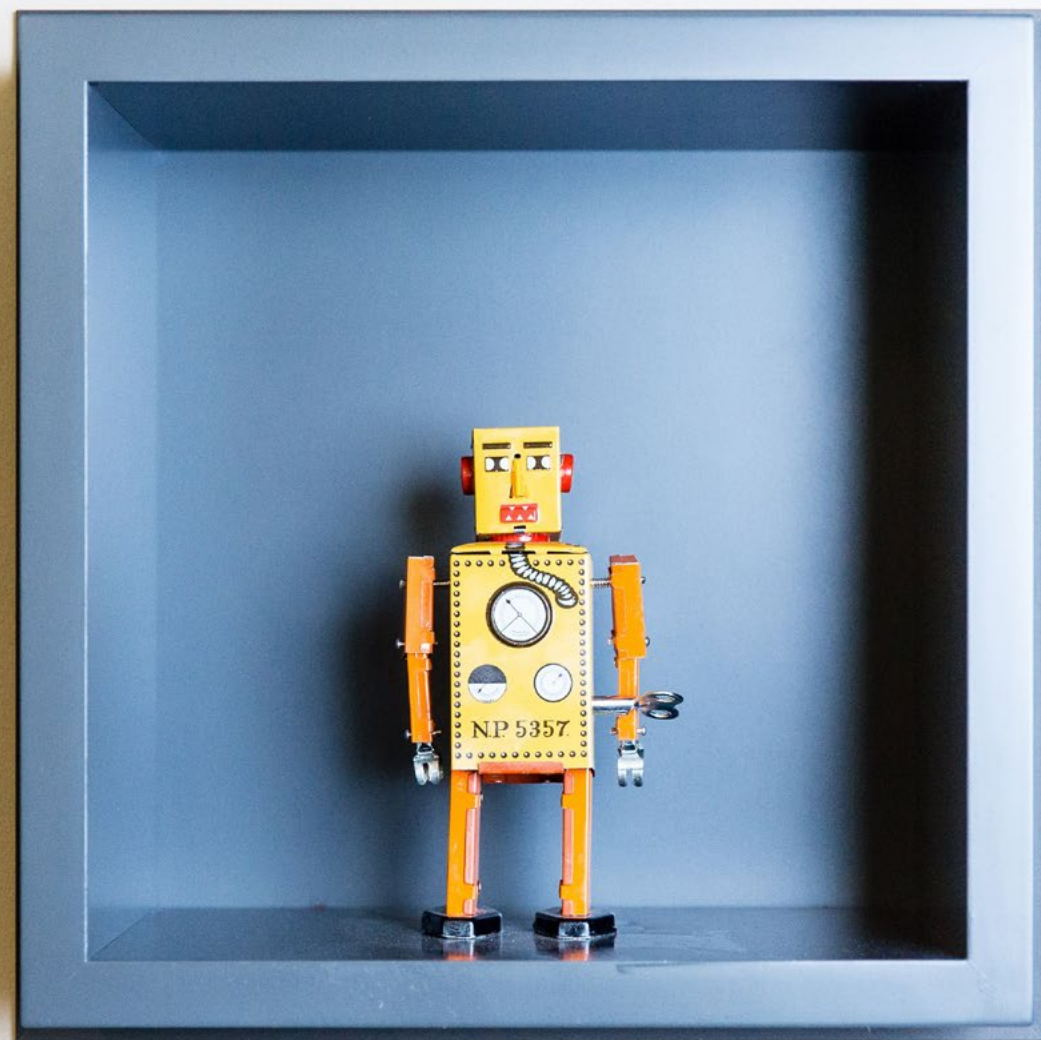


Adoption: the ML train is leaving the station, with most businesses on board.

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.

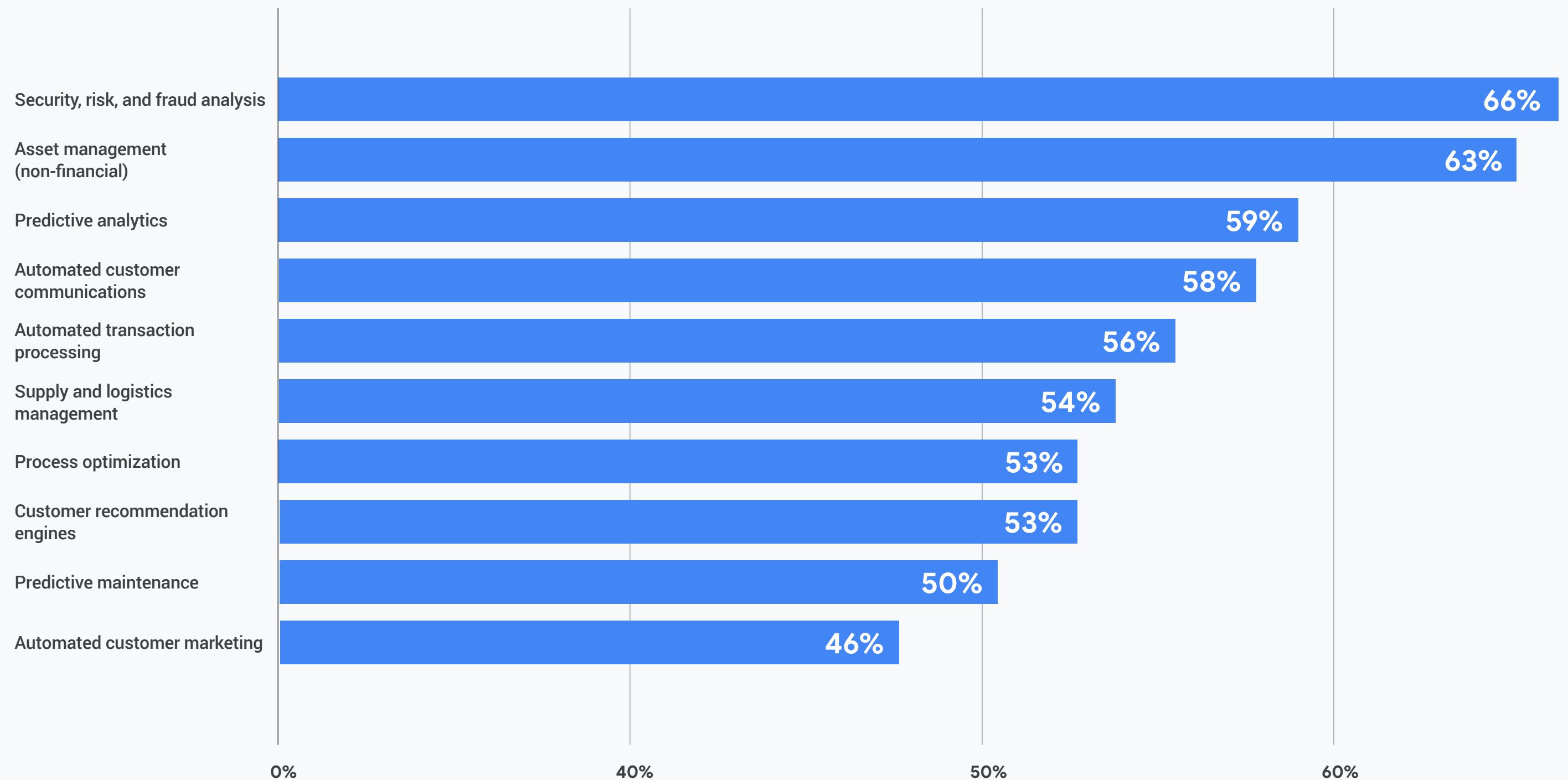
Newbies vs. **old pros**



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

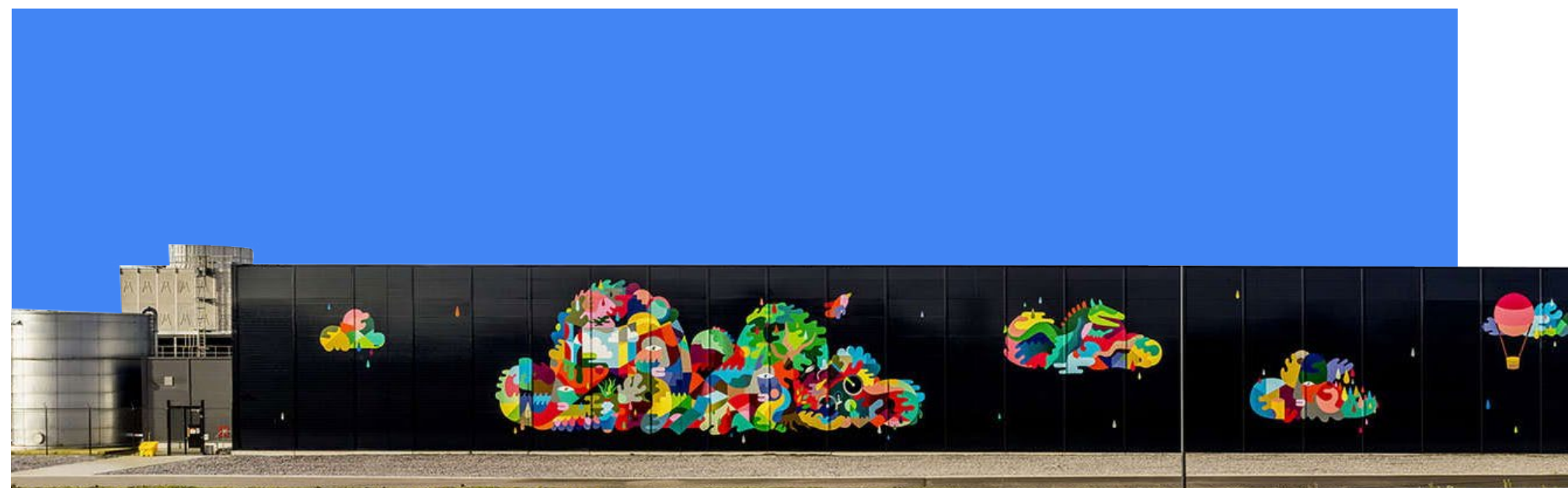
- Humidity and climate control
- Process automation
- Market trend analysis

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

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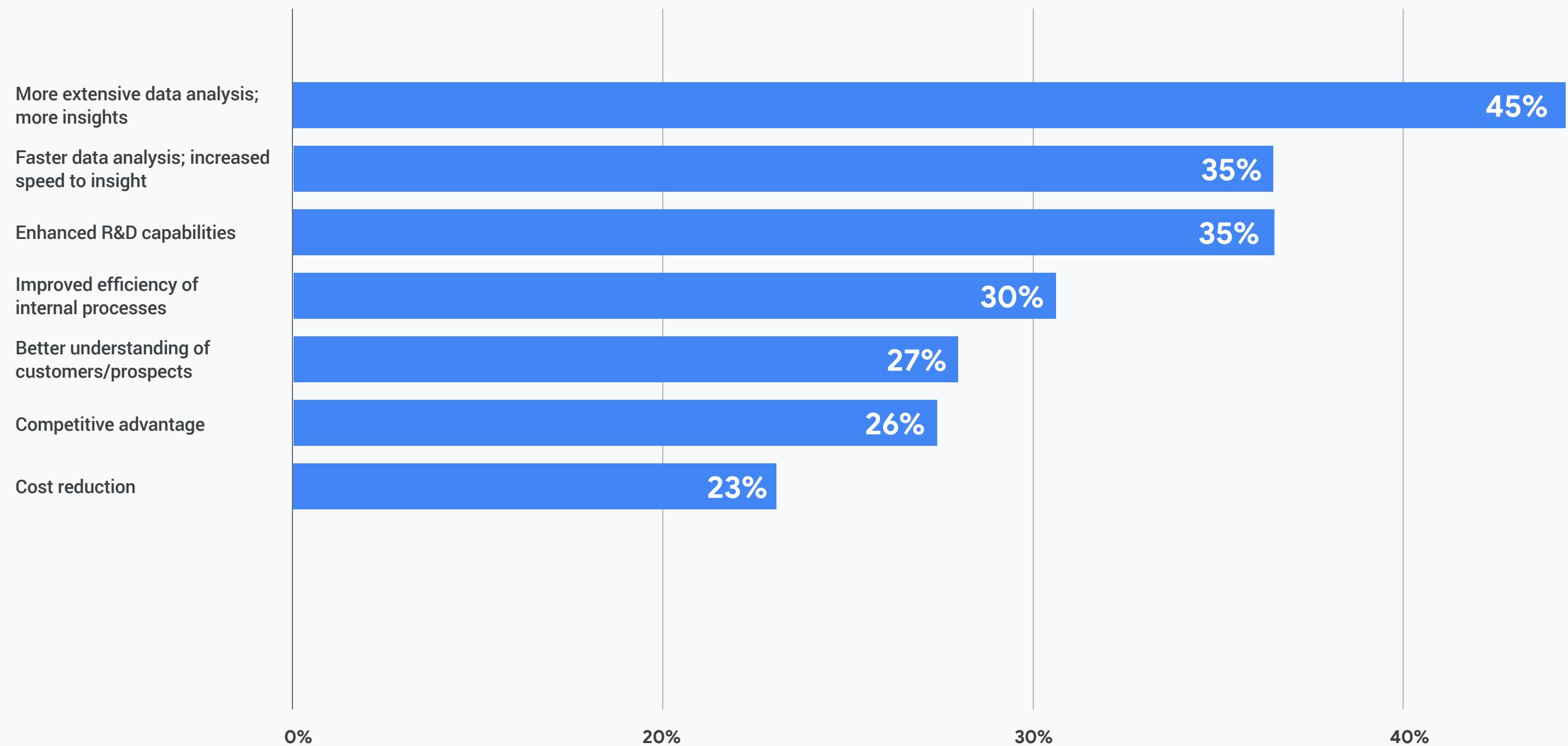
A hefty payoff, **fast**



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





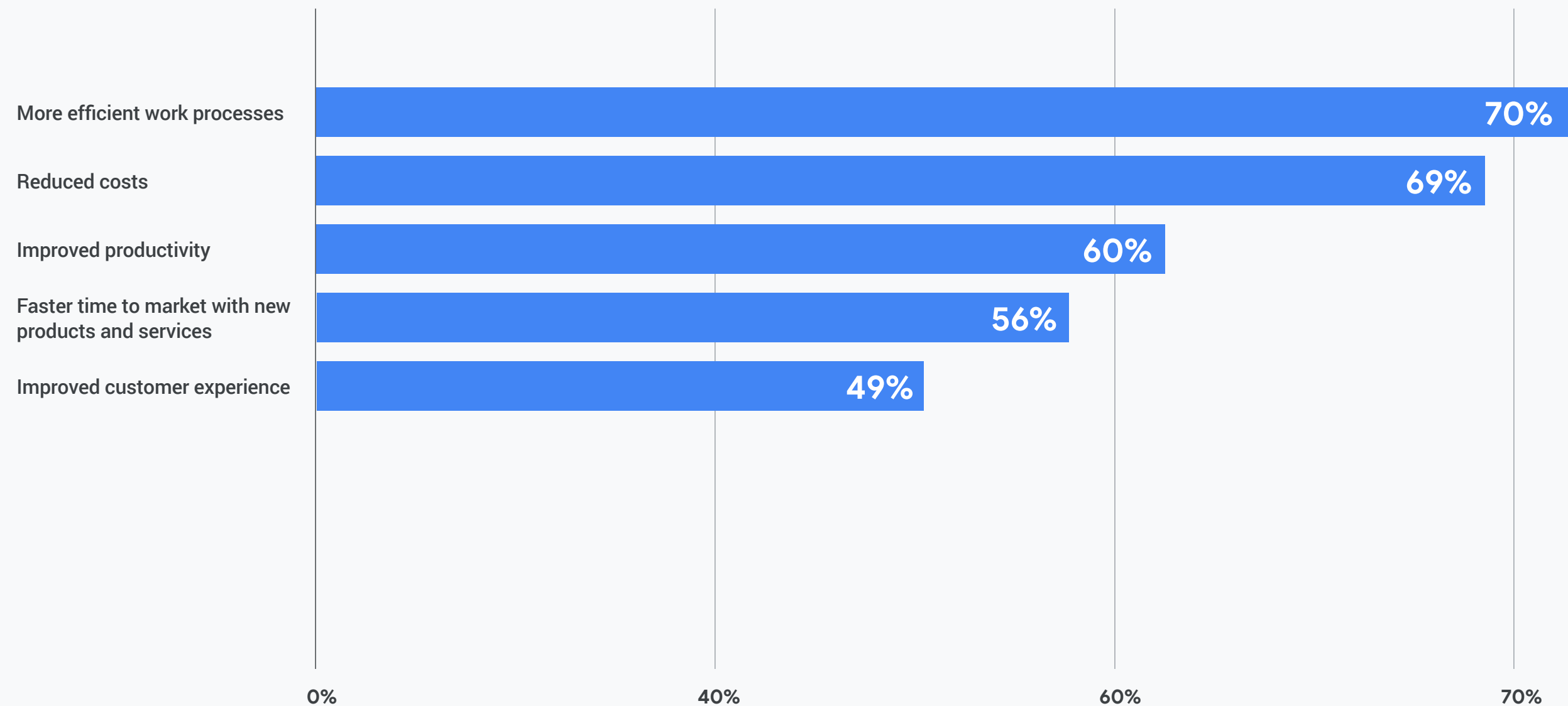
Getting started: Businesses are looking to the cloud as a critical first step to **succeeding with ML.**

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.

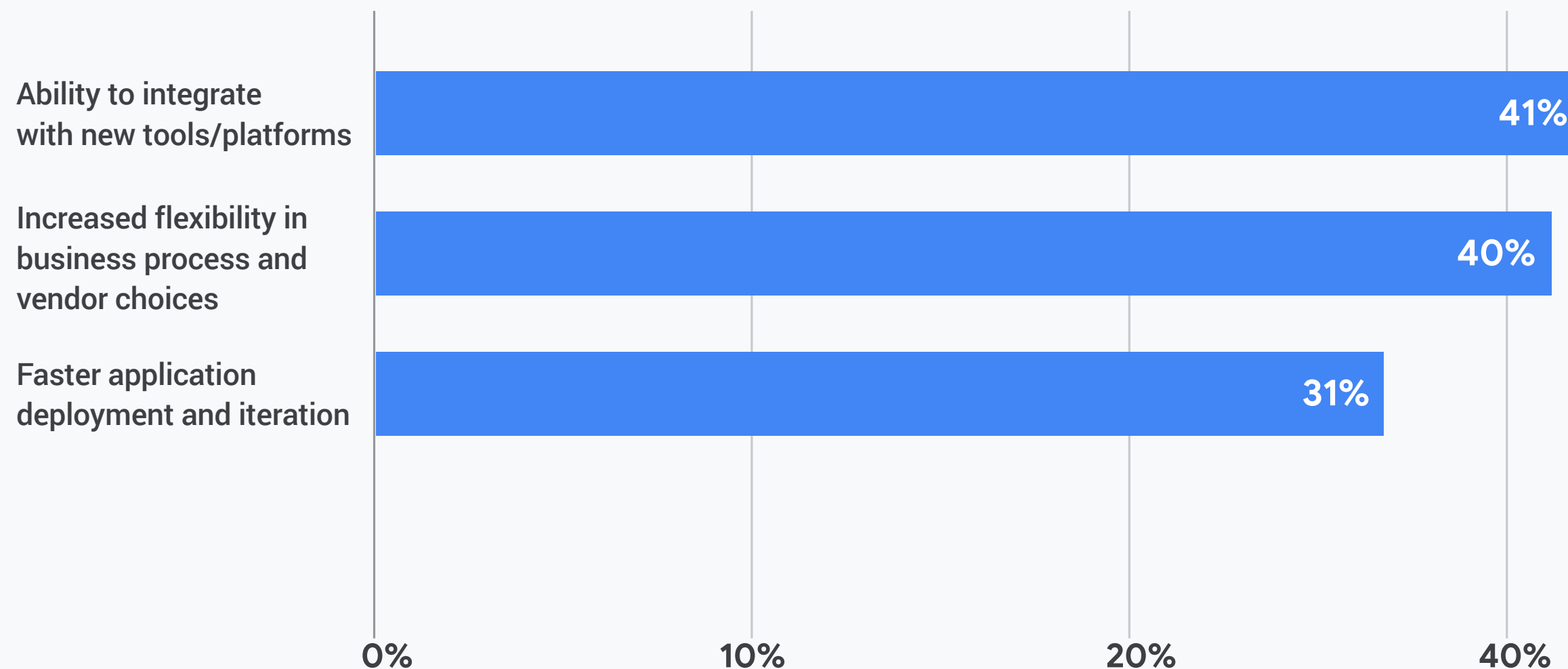
Mass migration for ML



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 [Partner Name] to
begin the discussion at
[Partner Email or website]**

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. [\(link\)](#)