



THE STATE OF CONNECTED OPERATIONS

Smarter, Faster, Safer: The AI Revolution in Physical Operations

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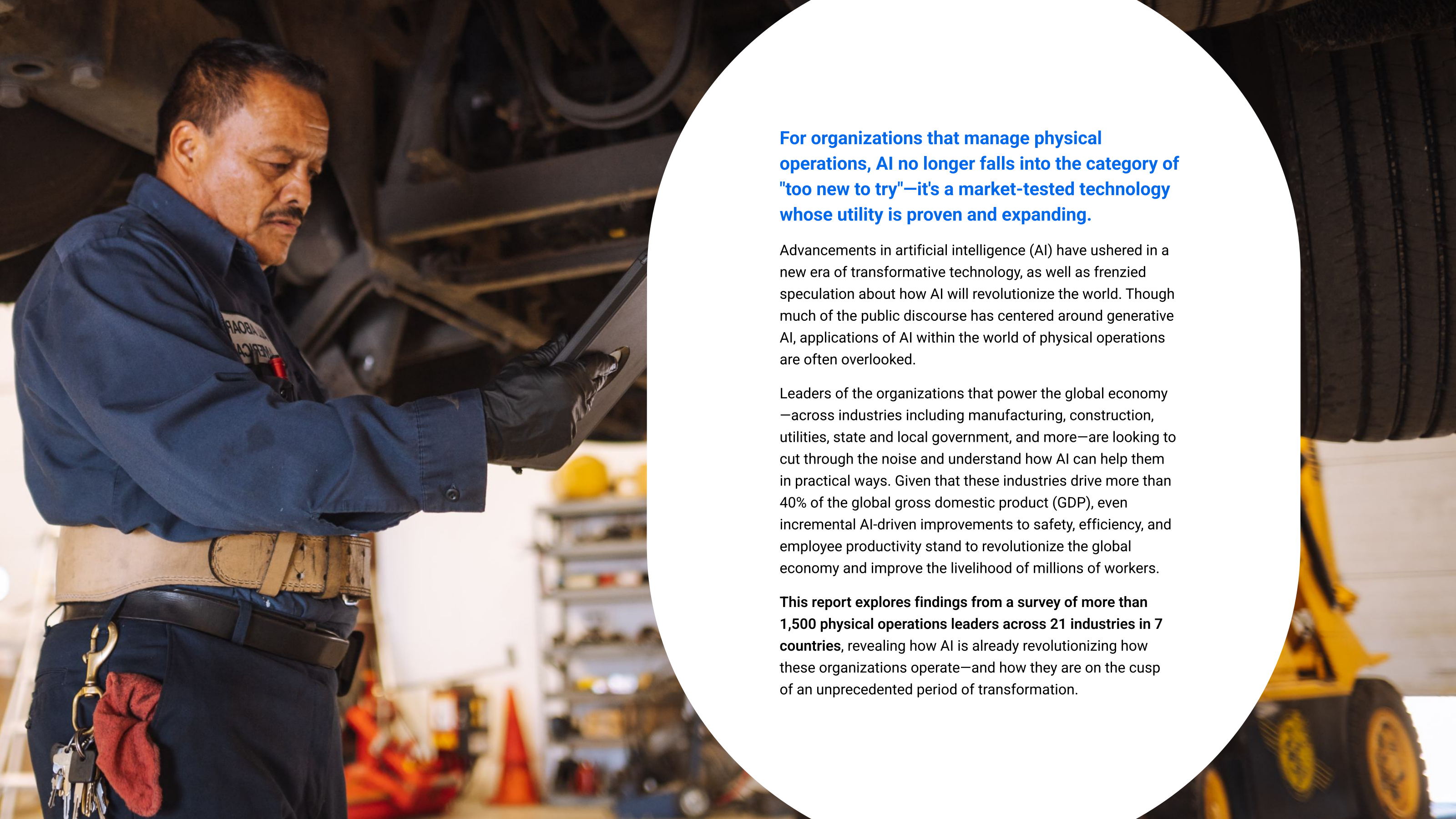
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For organizations that manage physical operations, AI no longer falls into the category of "too new to try"—it's a market-tested technology whose utility is proven and expanding.

Advancements in artificial intelligence (AI) have ushered in a new era of transformative technology, as well as frenzied speculation about how AI will revolutionize the world. Though much of the public discourse has centered around generative AI, applications of AI within the world of physical operations are often overlooked.

Leaders of the organizations that power the global economy—across industries including manufacturing, construction, utilities, state and local government, and more—are looking to cut through the noise and understand how AI can help them in practical ways. Given that these industries drive more than 40% of the global gross domestic product (GDP), even incremental AI-driven improvements to safety, efficiency, and employee productivity stand to revolutionize the global economy and improve the livelihood of millions of workers.

This report explores findings from a survey of more than 1,500 physical operations leaders across 21 industries in 7 countries, revealing how AI is already revolutionizing how these organizations operate—and how they are on the cusp of an unprecedented period of transformation.



Executive Summary



ORGANIZATIONS ARE INVESTING IN ARTIFICIAL INTELLIGENCE (AI) TO STAY COMPETITIVE

94% of leaders believe their organization needs to invest in AI technology solutions so they are not left behind, and more than half (51%) are already using AI. 87% of organizations report that they will increase investments in AI in the next year.



HIGHEST ROI FROM AI IS IN SAFETY AND PRODUCTIVITY

100% of organizations using AI report they have experienced benefits, including improved safety (45%) and employee productivity (42%). Of those already using AI, 90% say their employees feel positive about it—and sentiment is positive across industries and regions.



LEADERS ARE PRIORITIZING RESPONSIBLE AI

Of those already using AI or planning to in the next 1-2 years, 58% are implementing privacy and data protection measures. 63% plan to adopt AI solutions created by an external technology partner, and leaders care most about a partner's ability to integrate with existing systems (52%) and security and privacy compliance (51%).

CHAPTER 1

The state of AI in physical operations today:

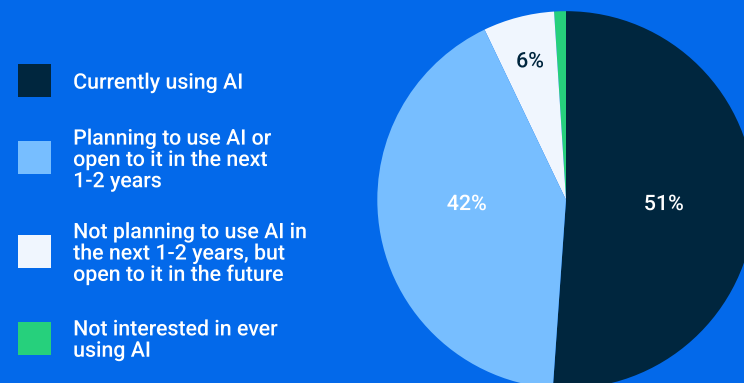
More than half (51%) of leaders say their organization is already using AI—and of those, 90% say their employees feel positive about it.



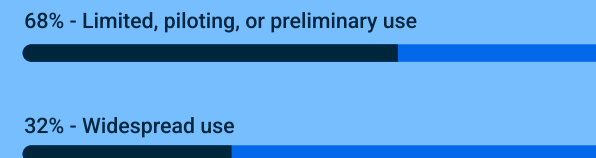
Adoption is accelerating: 51% use AI now, and 93% predict they will by 2026.

93% of leaders say their organization is either already using AI, has plans to implement it, or is open to using it in the next 1-2 years—which indicates that by 2026, AI may be commonplace within physical operations. However, the majority of leaders report that their organization is currently using AI in a limited, preliminary, or piloting capacity. This means for most, the focus today is on how to adopt AI in a thoughtful and measured way.

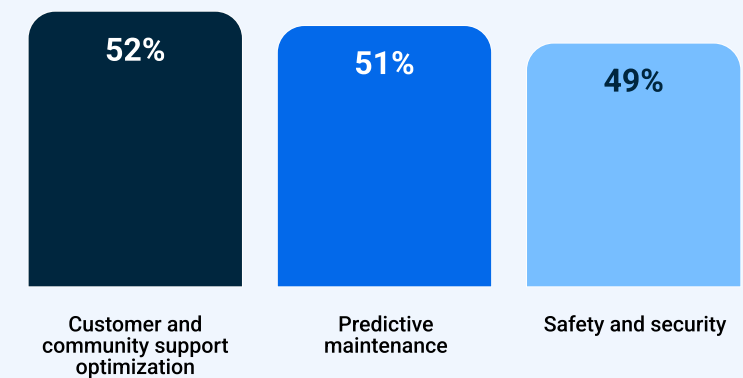
Current use of AI



Level of AI adoption

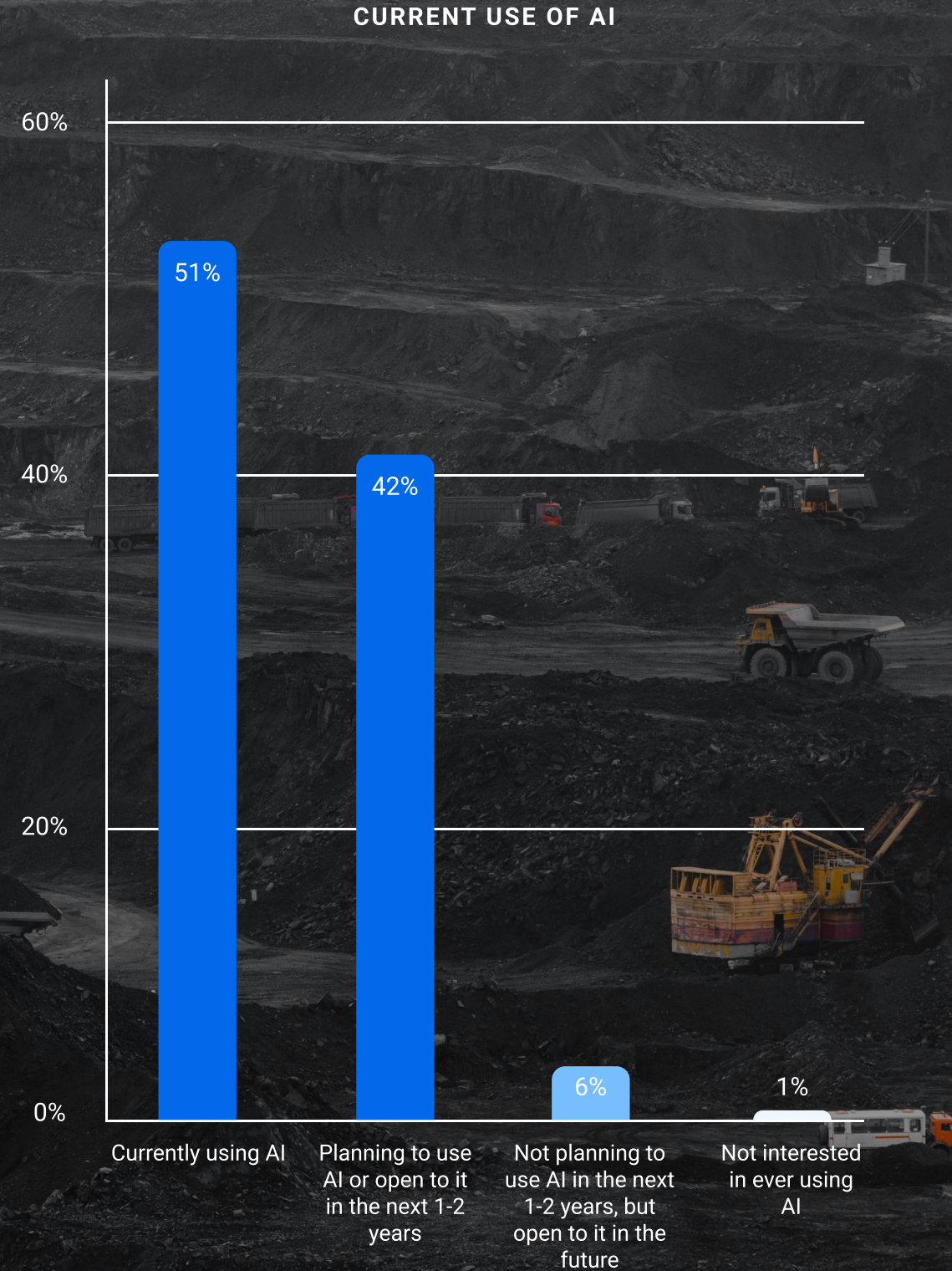


Top AI use cases



Leaders in physical operations are taking a measured approach to adoption, but they see the value in AI.

More than 2 in 3 leaders (68%) describe their organization as cautious about adopting new technology, doing so only once it is market-tested, if there is a need, or rarely. The fact that 51% are already using AI—and an additional 42% are planning to or open to it within the next 2 years—indicates that leaders no longer see AI as “too new to try.”

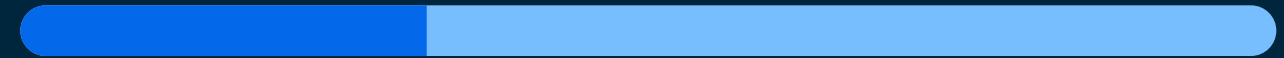


Just 32% of leaders consider AI "widespread" in their organization, and most are in an early maturity stage.

While AI is becoming more commonplace in physical operations, the technology is still largely in its implementation infancy. 68% of organizations currently using AI are using it in a limited, preliminary, or piloting capacity. This indicates that most are in the early stages of uncovering the potential of this technology.

AI MATURITY

32% **Widespread:** AI is used across departments and employees are trained on how to use it



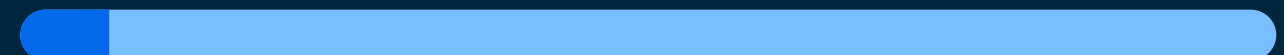
39% **Limited:** A few departments and/or employees are currently using it



22% **Piloting:** We are testing out a few specific use cases with a small group of employees



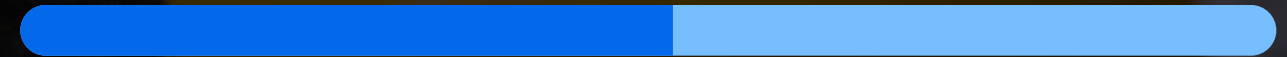
6% **Preliminary:** We have not yet begun using our AI solutions



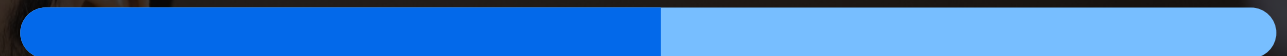
How is AI being used within physical operations today?

Of those already using AI, the top use cases are customer and community support optimization, predictive maintenance, and safety and security, as well as driver assistance systems such as dash cams. These use cases will likely expand as AI technology continues to develop.

52% Customer & community support optimization



51% Predictive maintenance



49% Safety & security



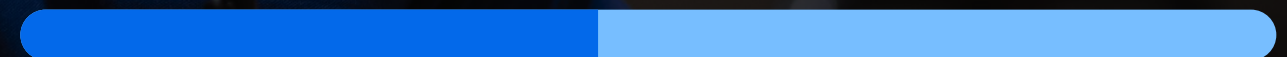
49% Driver assistance systems



48% Traffic management software



46% Assisted decision-making





Driver safety is a key benefit of AI technology. For example, our training and compliance team can assess how aware a driver is of an obstacle on the road ahead, which lets us delve deeper to tailor our driver training. That's a big part of our wider commitment to making UK roads safer, and of our mission of continued improvement.

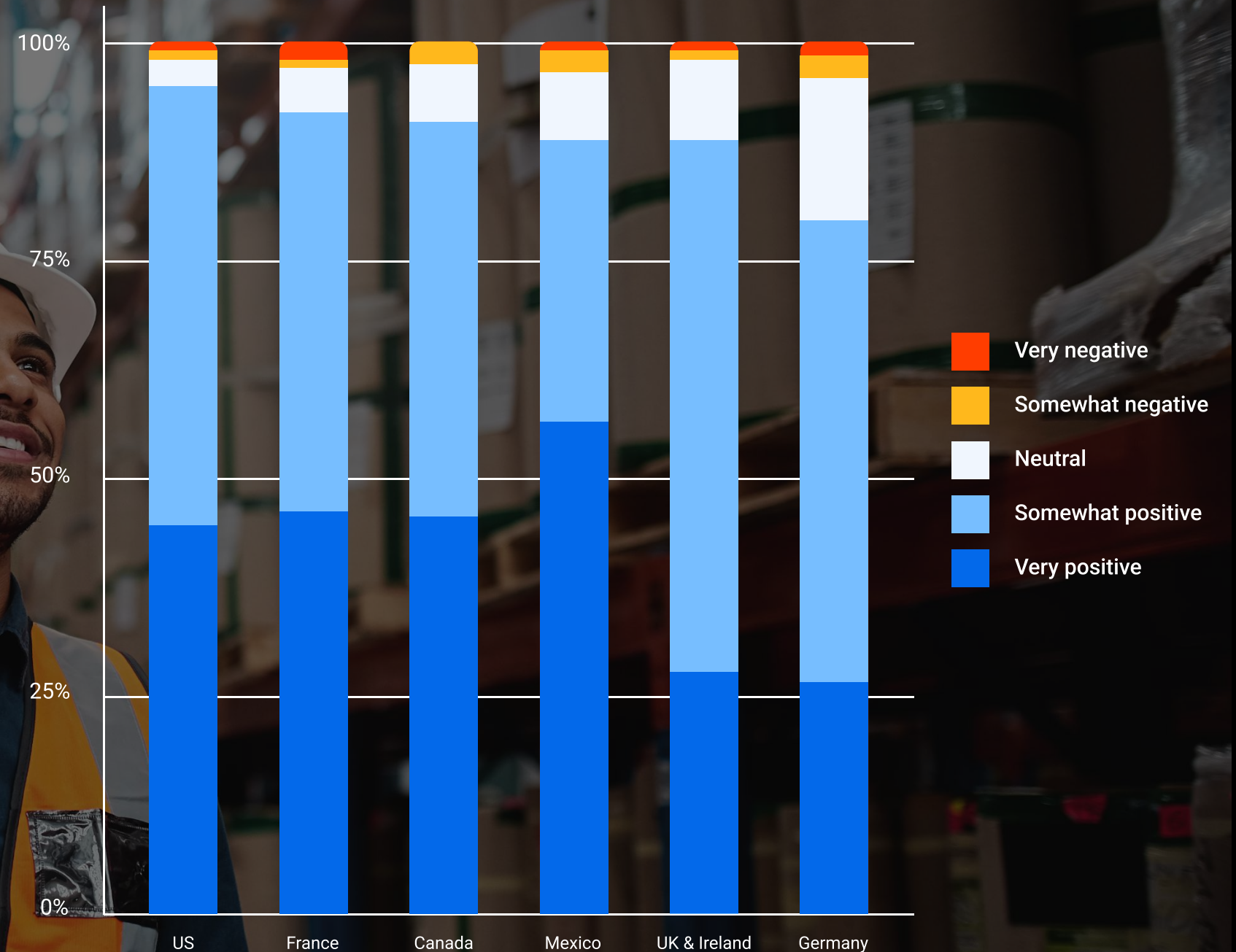
OLIVIA FAGAN

Compliance Officer, Fagan & Whalley

Leaders report strong buy-in: 90% say employees feel positive about using AI.

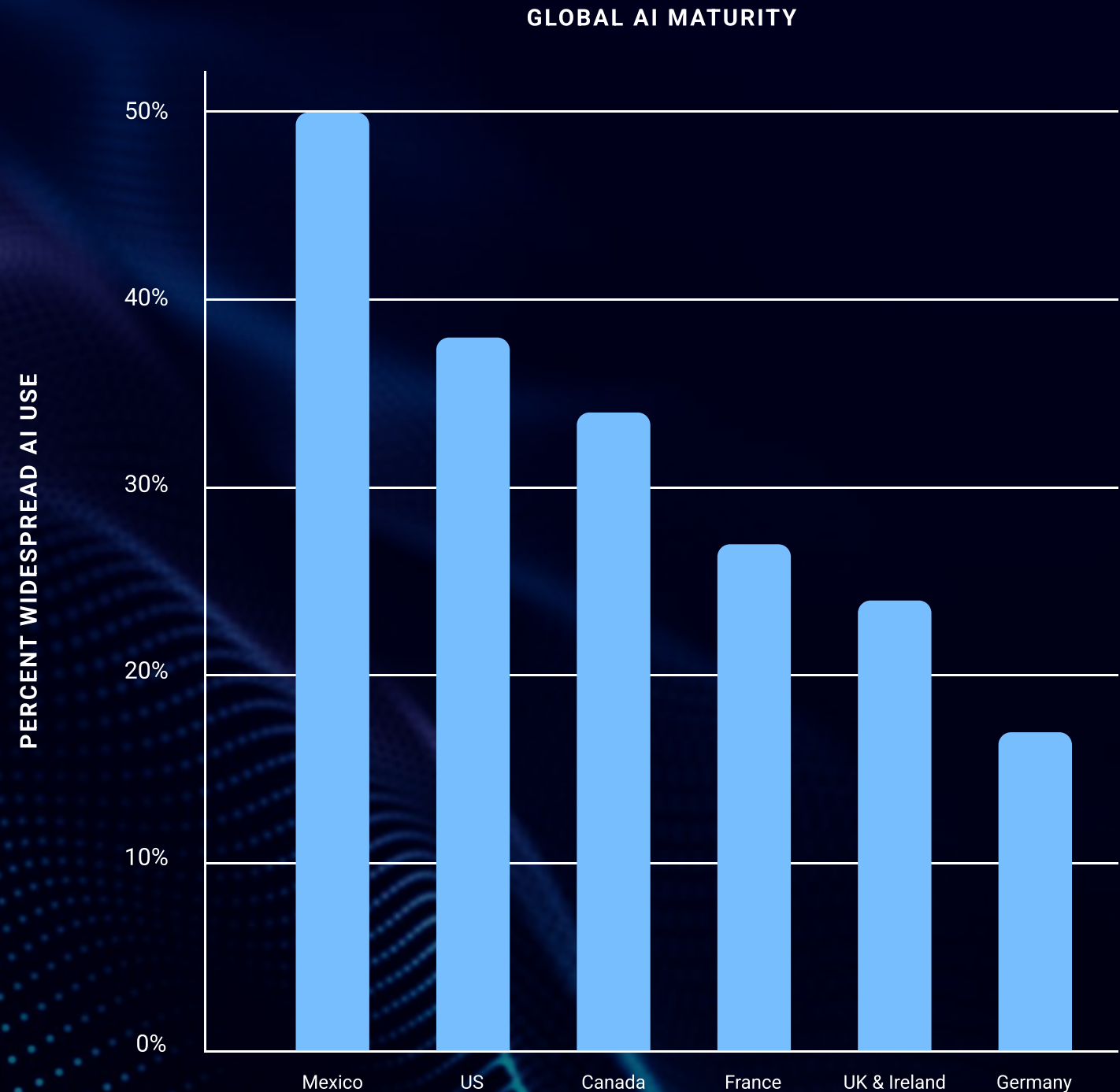
In all countries surveyed, the vast majority of leaders say their employees feel positive about using AI technology. Sentiment is highest in the U.S. (95%), France (92%), and Canada (91%)—but is notably high across the board. This may be due to the reported benefits of AI; AI solutions are directly benefiting employees' day-to-day lives by enhancing workplace safety and efficiency.

EMPLOYEE PERCEPTION OF AI



Mexico and North America lead the way in AI maturity.

A notable 50% of leaders in Mexico say AI use is “widespread” within their organization, meaning AI is used across departments and employees are trained on how to use it—higher than any other country surveyed. Canada (34%) and the U.S (38%) are not far behind, which may be due to the fact that 41% of North American leaders say they are quick to invest in the latest technology solutions, compared to 24% of European leaders. However, 80% of European leaders report that they plan to increase their investments in AI in the next year, suggesting it won't be long until adoption is widespread regardless of region.



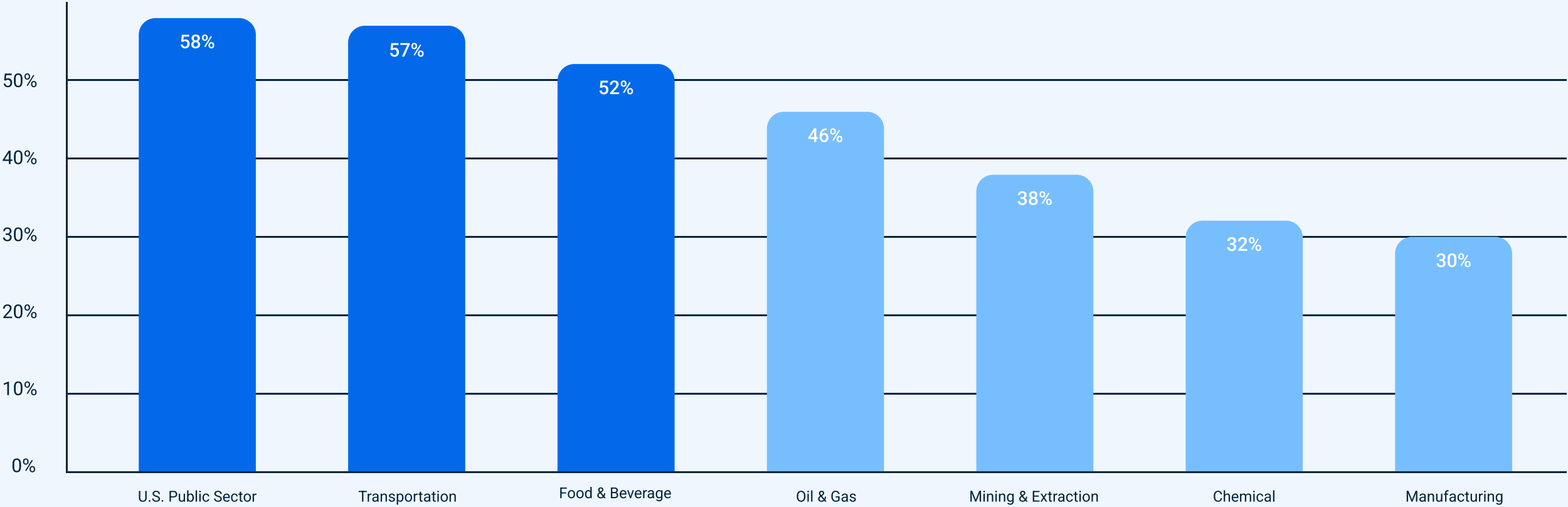
The increasing complexity of transportation logistics operations, especially security, prompted us to implement artificial intelligence (AI) tools. This has enabled us to optimize our operational strategies through predictive analytics, and to strengthen security through proactive threat detection. These advances have strengthened our market position and generated considerable added value for our customers.

JULIO ENCINAS

Director of Strategic Development and Engineering, Mexicana Logistics

Transportation, food and beverage, and the U.S. public sector are ahead of the adoption curve.

Just 32% of all leaders surveyed globally—across both the private and public sector—report that AI use is “widespread” within their organization. However, some industries appear to be ahead of the curve. More than half of transportation (57%) and food and beverage (52%) leaders report that AI use is “widespread” within their organization. This high level of AI maturity may be reflective of these industries’ ambitious safety goals—an area where AI is already delivering significant ROI. An even greater majority (58%) of U.S. public sector leaders report “widespread” AI use, which could be partially due to the availability of public grants to support technology programs.



WIDESPREAD AI USE BY INDUSTRY

CHAPTER 2

Implementation benefits and barriers:

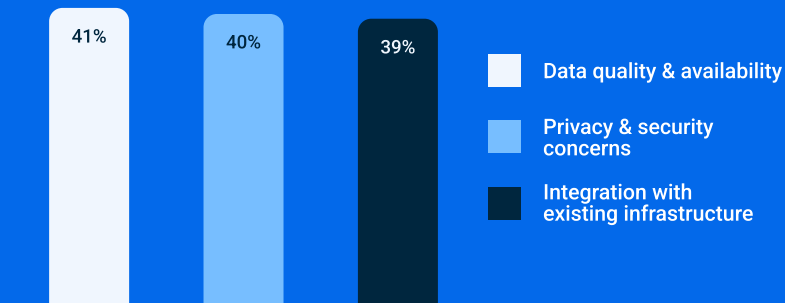
**100% of organizations currently using
AI report benefits, and responsible
implementation remains top of mind.**



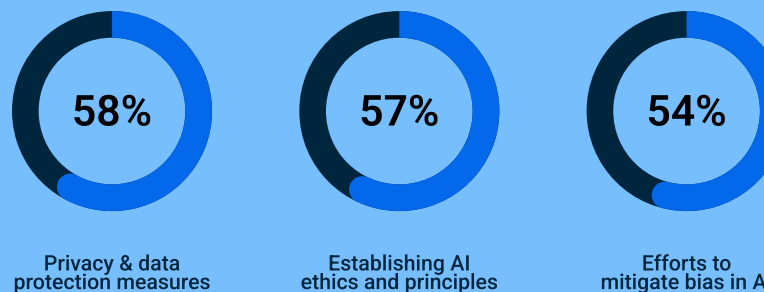
Leaders are focused on deploying AI responsibly—and they're already seeing the benefits.

For organizations using AI, the benefits—including improved safety (45%) and employee productivity (42%)—are clear. Leaders are actively addressing potential implementation blockers—such as privacy, data quality, and data protection—and taking action to ensure responsible deployment.

Potential barriers to implementation



Top actions to ensure responsible deployment

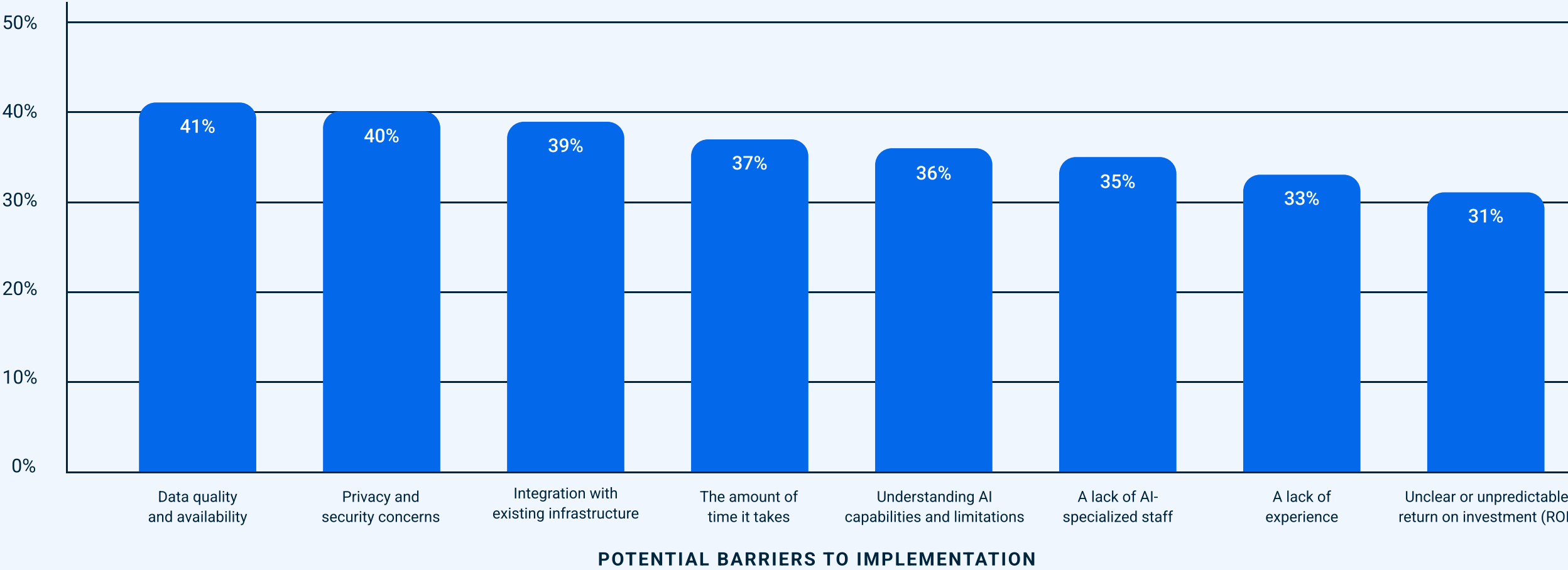


Top 3 benefits of AI



Leaders are mindful of data quality, privacy, and security.

The top three reported barriers to implementing AI technology solutions are data quality and availability (41%), privacy and security concerns (40%), and integration with existing infrastructure (39%). This was true across all regions surveyed. What were leaders least concerned with? Unclear or unpredictable return on investment (ROI), suggesting that while organizations know responsible AI deployment will require effort, they are confident about its benefits.

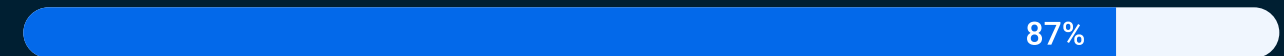


Most leaders feel prepared for upcoming AI regulatory frameworks.

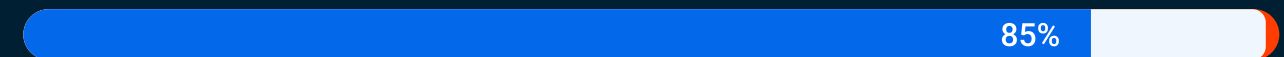
With AI regulatory frameworks on the horizon, the majority of leaders feel somewhat or completely prepared. This may be a reflection of the fact that of the leaders that currently use AI or plan to in the next two years, 100% say their organization is taking action to ensure responsible deployment of AI. North American organizations report the highest levels of preparedness, but Europe is not far behind—even with more stringent regulations in play.

PREPAREDNESS FOR AI REGULATORY FRAMEWORKS

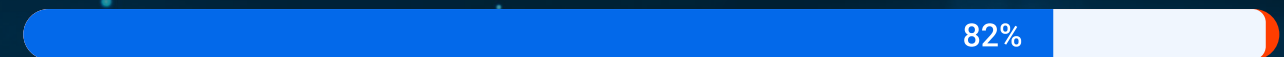
US



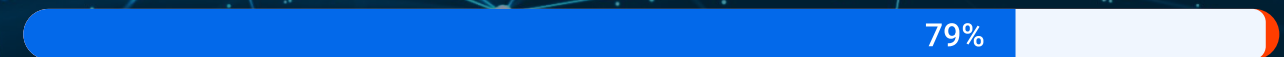
Mexico



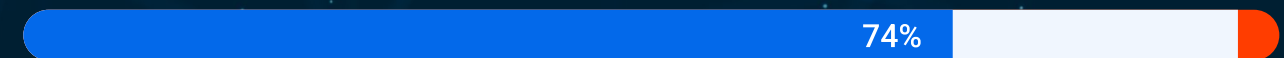
Canada



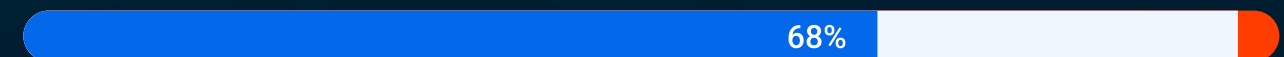
UK & Ireland



Germany



France

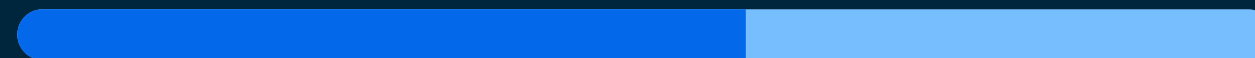


How are leaders preparing? 58% are implementing privacy and data protection measures.

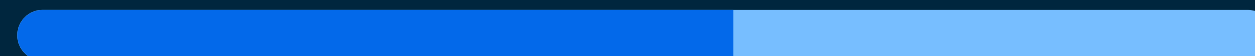
Of leaders already using AI, the majority report that their organization is currently deploying privacy and data protection measures (58%), establishing AI ethics and principles (57%), and making efforts to mitigate bias in AI (54%). These priorities indicate that organizations are taking a measured and thoughtful approach to AI implementation, focusing on addressing legal and ethical risk before tackling logistics and rollout.

ACTIONS TAKEN TO ENSURE AI IS DEPLOYED RESPONSIBLY

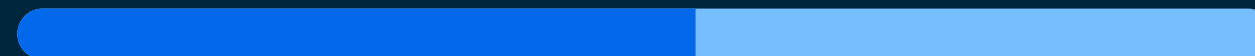
58% Privacy and data protection measures



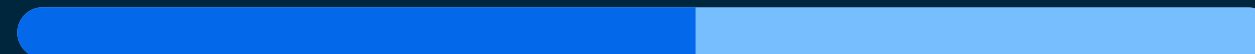
57% Establishing AI ethics and principles



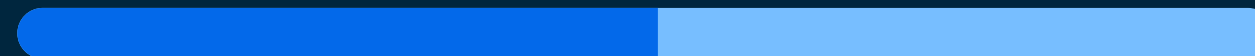
54% Efforts to mitigate bias in AI



54% Transparency and explainability initiatives



51% Employee AI training



**AI is commercialized but adoption will take a
backseat if deployments aren't safe and ethical.**

JAMES PAYNE
CTO, Roto-Rooter

It's never too early: All organizations are taking action to ensure responsible deployment of AI.

Of the organizations that are already using AI or plan to in the next 1-2 years, 100% have taken steps to ensure that any future deployment is done responsibly. This indicates that organizations are taking the idea of “responsible AI” seriously and are taking action prior to adoption and implementation.

100%



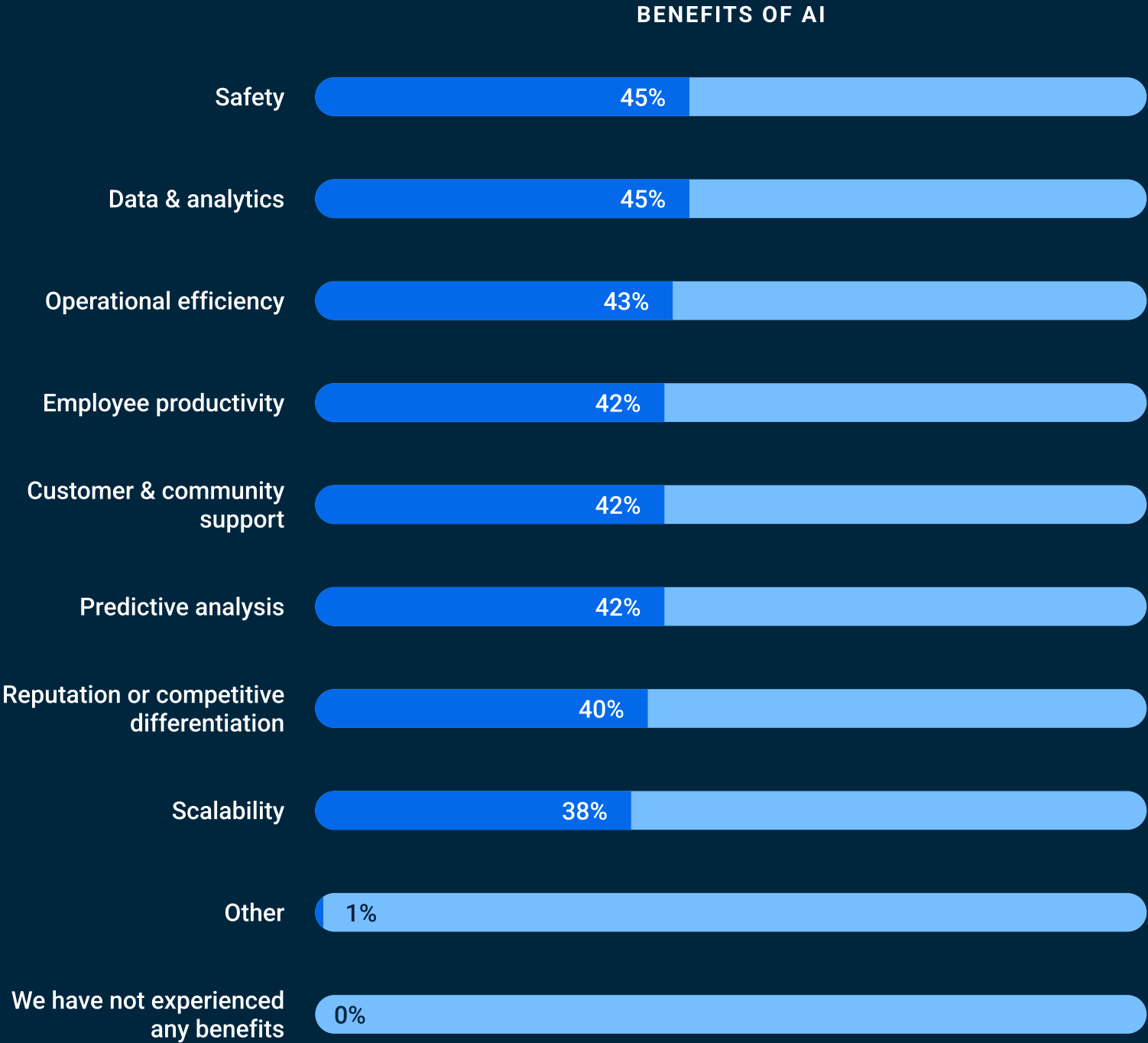
As organizations evaluate AI technology providers, they should prioritize those whose AI development is deeply rooted in responsible innovation. This focus helps ensure the technology itself is trustworthy, and therefore reliable to help business leaders meet their goals and objectives.

LAWRENCE SCHOEB

Data Protection Officer, Privacy & Ethics Board Chair, Samsara

Investments in AI are paying off: Leaders report clear benefits across safety, productivity, and more.

Of the organizations that are already using AI—regardless of how they are using it or where they are in their implementation journey—100% report at least one benefit from their investment in the technology. This indicates that even organizations at the very beginning of their AI journey are seeing results. The top-reported benefits were improved safety (45%), data & analytics (45%), and operational efficiency (43%)—and nearly every benefit was reported by 40% or more of leaders, indicating that the ROI for AI can be quite broad and impactful for various departments within an organization.



CHAPTER 3

The future of AI:

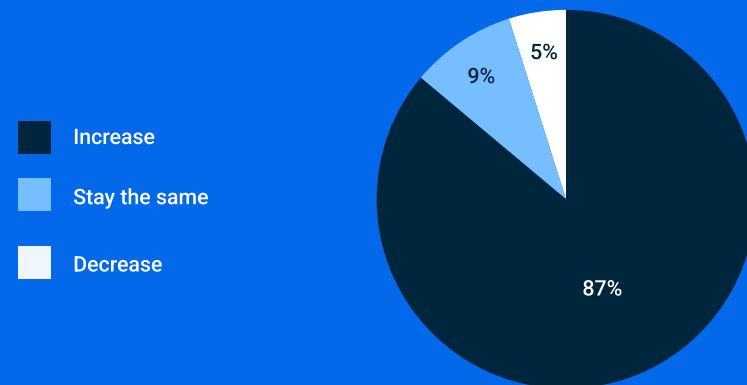
Leaders believe investing in AI will keep them competitive, and 87% expect to increase their investments in the next year.



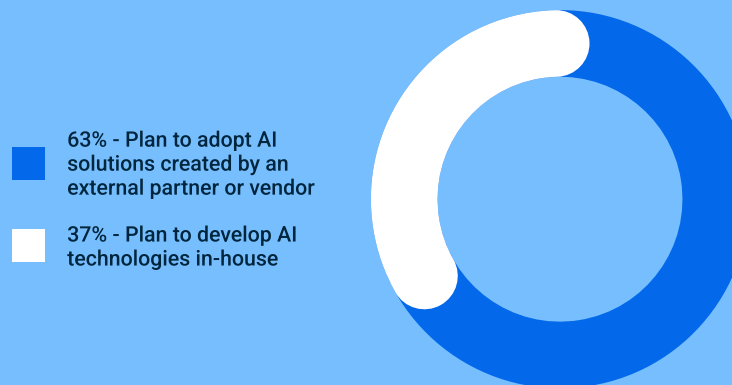
Investment in AI is increasing, and leaders plan to tap external technology partners for AI expertise.

The majority plan to work with external partners to buy AI solutions rather than building them in-house. Looking ahead, leaders anticipate more ROI from their AI investment, and most will seek AI partners with extensive expertise and capabilities.

Planned AI investment in the next year



Build vs. Buy



Top 3 important factors when selecting an AI technology partner



Investment in AI is increasing around the world.

94% of leaders believe their organization needs to invest in AI technology solutions so they are not left behind, and that is reflected in the ambitious planned investment around the world. 87% of organizations expect to increase investments in AI in the next year. North American organizations are most likely to be increasing their investment in AI solutions, with other countries not far behind, showing a positive upward trajectory across the globe.

AI INVESTMENTS IN THE NEXT YEAR

US

96%

Canada

93%

UK & Ireland

89%

Mexico

84%

France

83%


Germany

65%

■ Increase

■ Decrease

■ Stay the same

The background is a dark blue gradient. On the left, there are large, overlapping semi-circular shapes in a lighter blue. On the right, there is a network of thin blue lines connecting several small, glowing blue dots. The text is centered in the middle of the slide in a white, bold, sans-serif font.

Organizations are always searching for the next ‘big thing,’ but as a mentor said to me years ago, you need to be able to look around the corner before the corner is looking at you. The ability to stay ahead of what your organization should be investing in is one of the most important factors that will help you succeed.

KEVIN J THOMAS

Vice President, Global Environmental, Health, Safety,
Physical Security (EHSS), & Asset Protection, Sysco

Buy over build: 63% will lean on external partners to develop AI solutions.

41% of leaders say an IT leader is spearheading adoption of AI within their organization, but the majority don't plan to develop AI in-house. Only 37% are developing AI solutions in-house; the vast majority (63%) are relying on external partners or vendors. 94% of leaders also say they seek out or consider AI expertise a "nice to have" in any external technology partner, reflecting the growing importance of AI expertise within the physical operations space.

63%

Plan to adopt AI solutions created by an external partner or vendor

37%

Plan to develop AI technologies in-house

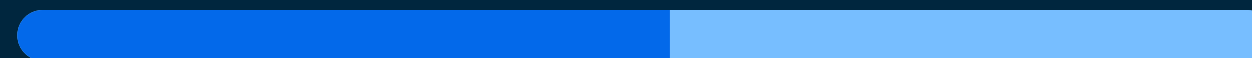


Leaders have clear standards—and priorities—for AI partners.

Over one-third of leaders report that a lack of AI-specialized staff could be a barrier to more widespread implementation within their organization. This, among other [implementation hurdles](#), could be informing the list of factors they're prioritizing when it comes to evaluating AI solutions from external partners. Most want partners to have the ability to integrate with existing systems (52%), access to large scale data sets to train AI models (52%), and strong security and privacy compliance (51%)—suggesting their prospective partners will need to clear a high bar. In Mexico and Germany, over half of leaders noted that they prioritize AI partners who can show evidence of ROI, higher than the global average.

MOST IMPORTANT FACTORS WHEN SELECTING AN AI TECHNOLOGY PARTNER

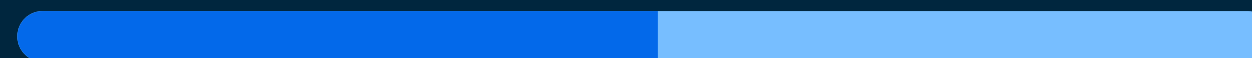
52% Ability to integrate with our existing systems



52% Access to large scale data sets to train AI models



51% Security and privacy compliance



50% Technical knowledge



49% Evidence of return on investment (ROI)



46% Experience within my industry





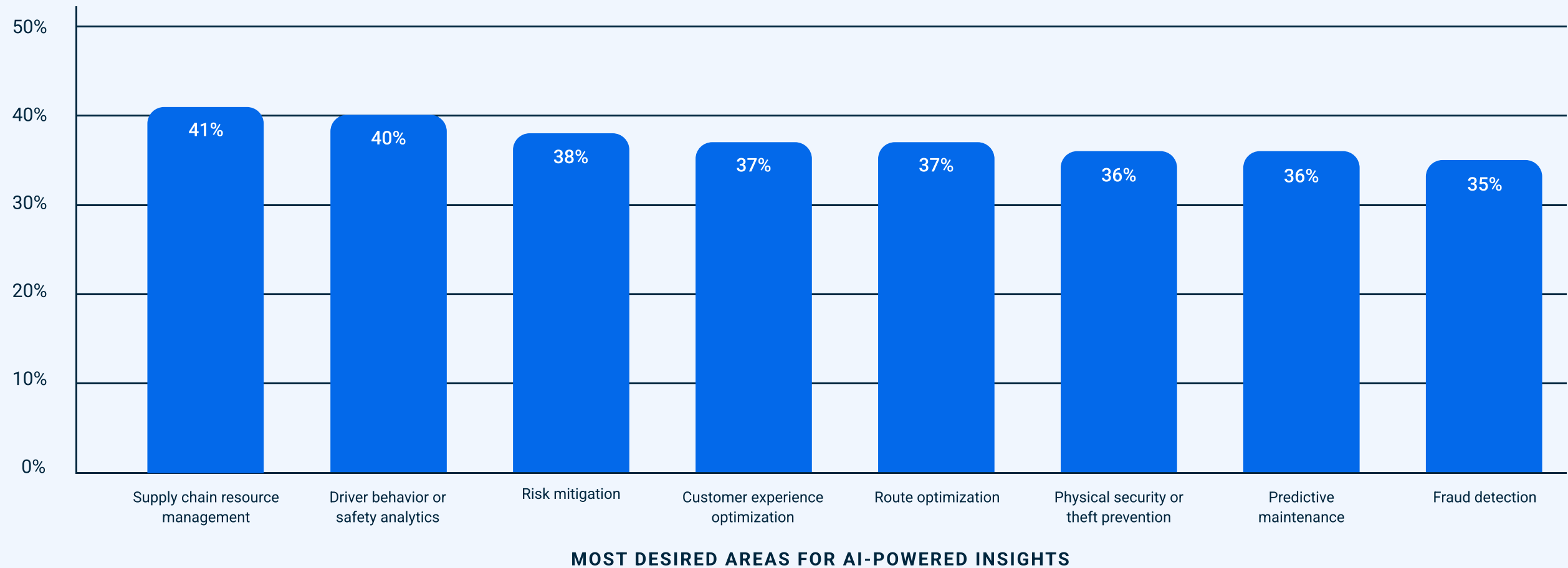
As we're preparing to implement more AI, we're looking to partners in the AI industry to help us understand some of the more advanced use cases. AI partners have more data and specialized engineers. I want to know how the insights from that data can help my business.

JOE MORALES

Distribution Systems Manager, Messer Americas

In 5 years time, leaders want AI to deliver even more efficiency and safety benefits.

While organizations using AI are already reporting positive ROI, leaders have high hopes for the future. The top three areas where leaders say AI-powered insights will benefit their organization the most in five years are supply chain resource management (41%), driver behavior or safety analytics (40%), and risk mitigation (38%). Many of these desired outcomes overlap with the benefits currently reported by organizations using AI, suggesting leaders plan to expand and deepen early benefits.



In the age of AI, the challenge isn't just collecting information, but transforming it into actionable insights. AI will be indispensable in converting high-level questions and goals into clear, actionable responses, revolutionizing the decision-making process across industries, making them more informed and responsive.

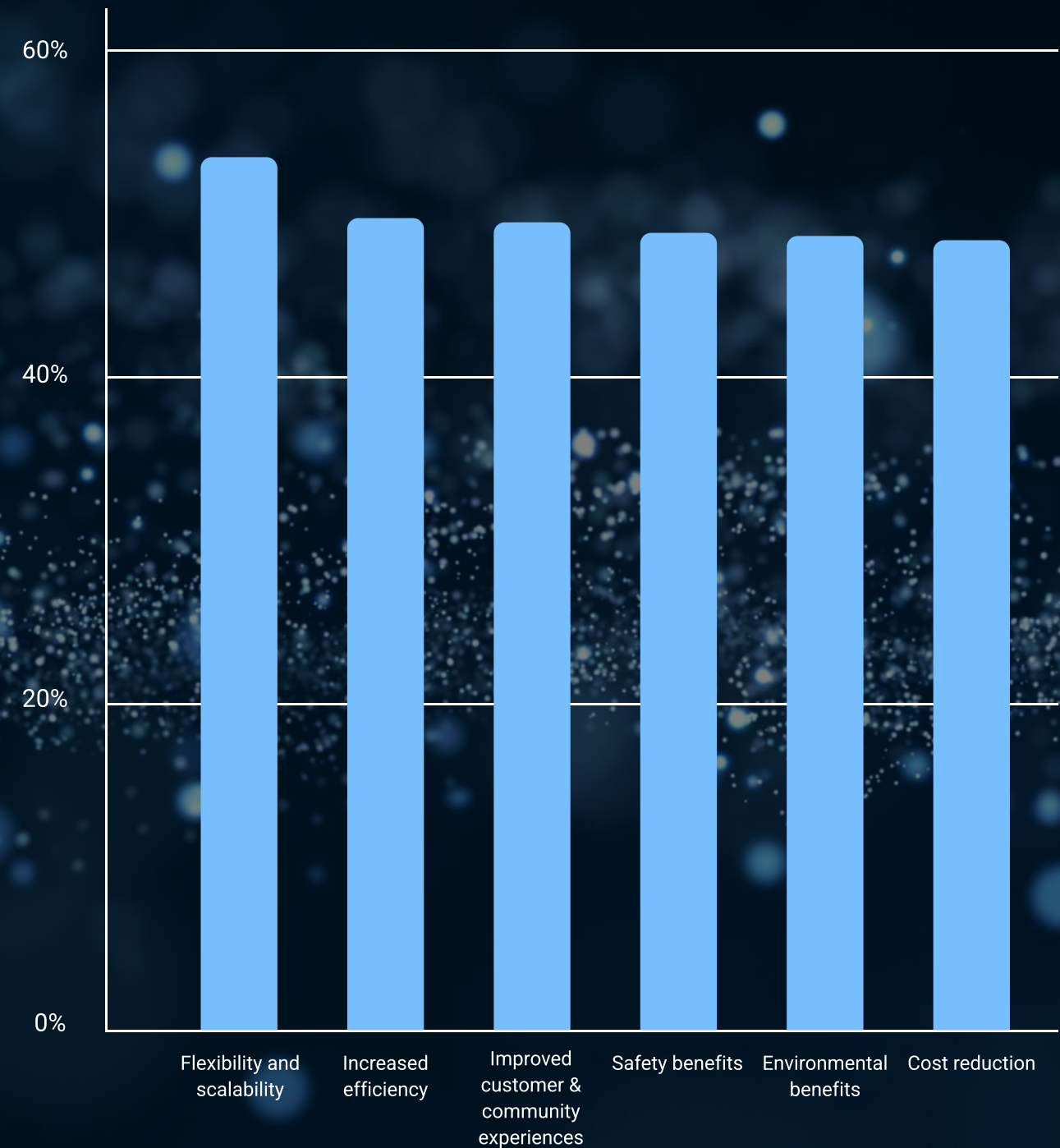
EVAN WELBOURNE

Head of AI and Data, Samsara

The future of autonomous vehicles: Interest is driven by improved flexibility, scalability, and efficiency.

Currently, adoption of autonomous vehicles (AVs) within physical operations appears to be mostly limited to off-highway vehicles, such as robotic forklifts and remotely-operated yard trucks. Still, interest in and expectations for AVs are high; the majority of leaders who already use or plan to use AVs named flexibility and scalability (54%), increased efficiency (50%), and improved customer and community experiences (50%) as the outcomes that would most benefit their organizations. However, only 22% of leaders expect AVs to be standard in their industry in the next two years, indicating a longer horizon for adoption.

TOP DESIRED BENEFITS OF AVS





Complex terminal environments have inherent exposures. Our proprietary Aviro360 technology uses AI to automate repetitive tasks, and our remote operations program removes employees from the operational environment to reduce potential for harm. Today, we're investing in remote operations, but we have not ruled out the potential for autonomous operations.

WARRICK NANCE

VP of Safety, Training & Operations Excellence, ConGlobal

AI Partner Preparedness Guide

Use this worksheet to prepare for conversations with external AI partners.

SECTION 1

Evaluate your areas for opportunity.

1. Predictive analysis: Do you have unexpected maintenance costs?	Yes	No
2. Asset security: Do you have asset security or theft issues?	Yes	No
3. Data & analytics: Do you struggle to manage an operational data overload?	Yes	No
4. Operational efficiency: Does your safety team spend too much time collecting, reviewing, and triaging safety incidents?	Yes	No
5. Safety: Do you notice a significant delay between risky driving behavior and coaching?	Yes	No
6. Competitive differentiation: Do you worry that your competitors offer services or solutions you lack the staff or bandwidth to match?	Yes	No

If you answered YES to any of the questions above, your organization could benefit from AI. Bring these concerns to your AI partner so you can tailor solutions to fit your needs.

SECTION 2

Questions to ask a prospective AI partner.

1. What data is your AI trained on? Will my data be used to train your models?
2. How do you ensure the quality of your AI solution?
3. What steps is your organization taking to ensure data privacy and security?
4. Can your AI integrate with my existing infrastructure and technology?
5. Is your solution specific to my industry?
6. Who are some of your customers and what results have they achieved with your solution?
7. Based on your experience, what can my organization do to prepare for a successful implementation?



Methodology

This survey was conducted by an independent research firm, Wakefield Research, between April 5 and April 14, 2024. 1,550 operations leaders were surveyed across seven countries: the United States, Mexico, the United Kingdom, Ireland, France, Germany, and Canada. This survey consisted of 20 questions and was conducted online, in either the English language or translated into a local language across markets. Global results have been aggregated across all responses to provide an average.

The respondents were executives with a minimum seniority of director at organizations with 500 or more employees and 150 or more owned or leased vehicles, powered assets, and/or unpowered assets. Respondents worked in the following industries and had responsibility in one or more of the business areas listed below:

- **Industries:** Building & facility management, chemical, construction, field services, food & beverage, logistics, manufacturing, mining & extraction, moving & storage, oil & gas, retail, telecommunications, transportation, utilities & energy, warehousing, waste management, wholesale, or public sector.
- **Responsibilities (one or more):** Compliance, field service management, fleet management, IT/technology/data, logistics, maintenance, operations, safety/health/environment, security, and/or service operations.

The survey included an oversample to increase the total number of U.S. public sector respondents to 100, and the addition of the following qualifying titles for U.S. public sector respondents: risk management, city manager/administrator/mayor.

The information provided in this report is for general informational purposes only. Samsara does not guarantee you will achieve any specific results if you follow any advice in the report. It may be advisable for you to consult with a professional such as a lawyer, accountant, architect, business advisor, or professional engineer to get specific advice that applies to your specific situation.

About Samsara

Samsara (NYSE: IOT) is the pioneer of the Connected Operations™ Cloud, which is a platform that enables organizations that depend on physical operations to harness Internet of Things (IoT) data to develop actionable insights and improve their operations. With tens of thousands of customers across North America and Europe, Samsara is a proud technology partner to the people who keep our global economy running, including the world’s leading organizations across construction, transportation and warehousing, field services, manufacturing, retail, logistics, and the public sector. The company's mission is to increase the safety, efficiency, and sustainability of the operations that power the global economy.

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9T+

data points processed



230M+

workflows digitized



200K+

crashes prevented*



2.3B

pounds of carbon emissions saved*

*Samsara has partnered with customers to help prevent an estimated 200,000+ crashes (October 2022 - October 2023) and save ~2.3 billion pounds of carbon emissions from entering the atmosphere (estimate based on year-over-year reduction in idling rates per monthly available hours for cohort of 2,500+ Samsara customers observed during Q1-Q3 CY22).





samsara