



samsara

THE STATE OF CONNECTED OPERATIONS

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



# Contents

**Introduction**

**Executive Summary**

**Chapter 1:** The state of AI in physical operations today

**Chapter 2:** Implementation benefits and barriers

**Chapter 3:** The future of AI

**Worksheet:** AI Partner Preparedness Guide

**About Samsara**

**Methodology**





**For organisations 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 revolutionise the world. Although much of the public discourse has centred around generative AI, applications of AI within the world of physical operations are often overlooked.

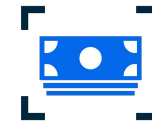
Leaders of the organisations that power the global economy – across industries including manufacturing, construction, utilities, state and local government, and more – are looking to cut through the noise and understand how AI can help them in practical ways. Given that these industries drive more than 40% of the global gross domestic product (GDP), even incremental AI-driven improvements to safety, efficiency and employee productivity stand to revolutionise 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 seven countries, revealing how AI is already revolutionising how these organisations operate and how they are on the cusp of an unprecedented period of transformation.**





# Executive Summary



## **ORGANISATIONS ARE INVESTING IN ARTIFICIAL INTELLIGENCE (AI) TO STAY COMPETITIVE**

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



## **HIGHEST ROI FROM AI IS IN SAFETY AND PRODUCTIVITY**

100% of organisations 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 PRIORITISING RESPONSIBLE AI**

Of those already using AI or planning to do so in the next one to two 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 organisation is already using AI and, of those, 90% say their employees feel positive about it.

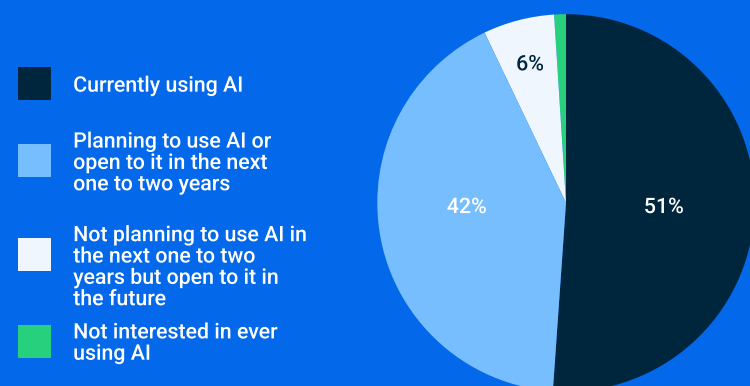




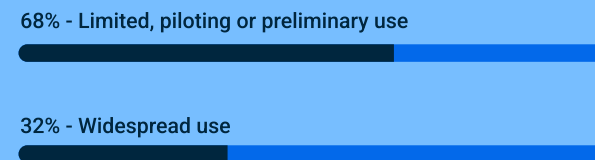
# Adoption is accelerating: 51% use AI now and 93% predict they will by 2026.

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

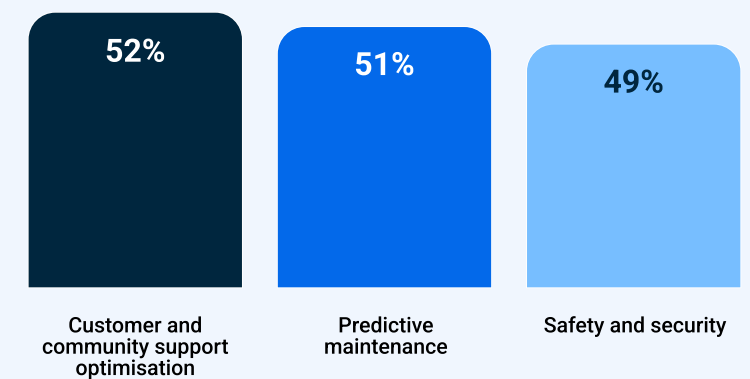
## Current use of AI



## Level of AI adoption



## Top AI use cases

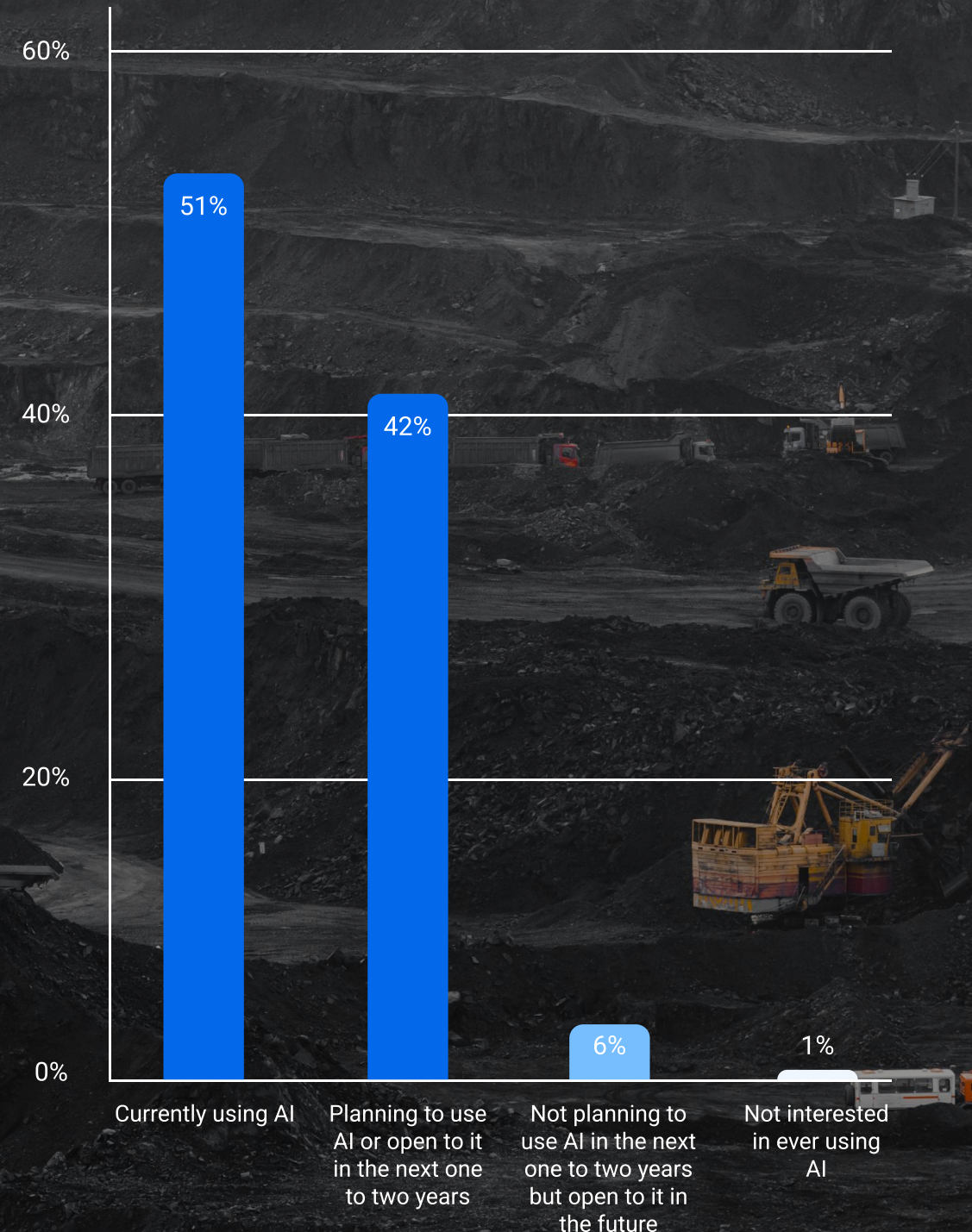




# Leaders in physical operations are taking a measured approach to adoption, but they see the value in AI.

More than two in three leaders (68%) describe their organisation 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 two years, indicates that leaders no longer see AI as “too new to try”.

CURRENT USE OF AI



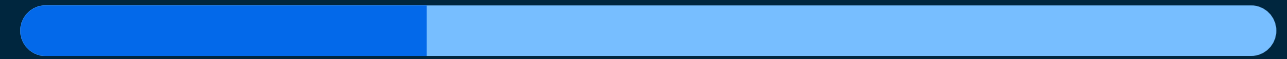


## AI MATURITY

**Just 32% of leaders consider AI "widespread" in their organisation 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 organisations 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.

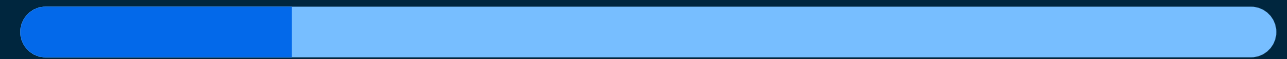
**32%** **Widespread:** AI is used across departments and employees are trained on how to use it



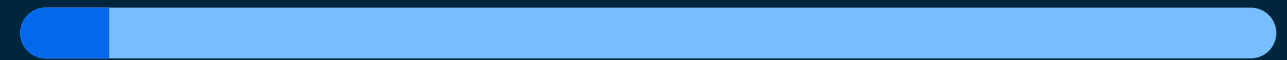
**39%** **Limited:** A few departments and/or employees are currently using it



**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



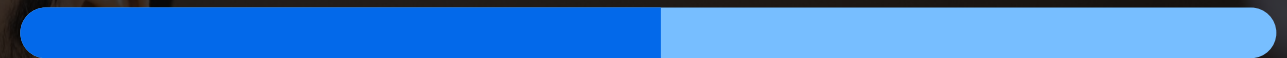
## How is AI being used within physical operations today?

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

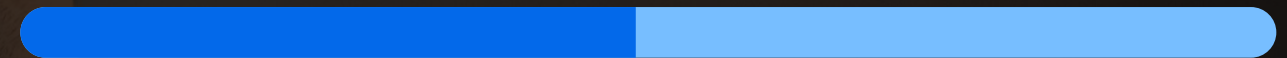
52% Customer & community support optimisation



51% Predictive maintenance



49% Safety & security



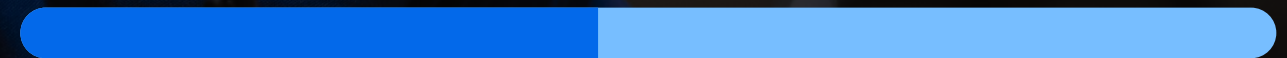
49% Driver assistance systems



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**

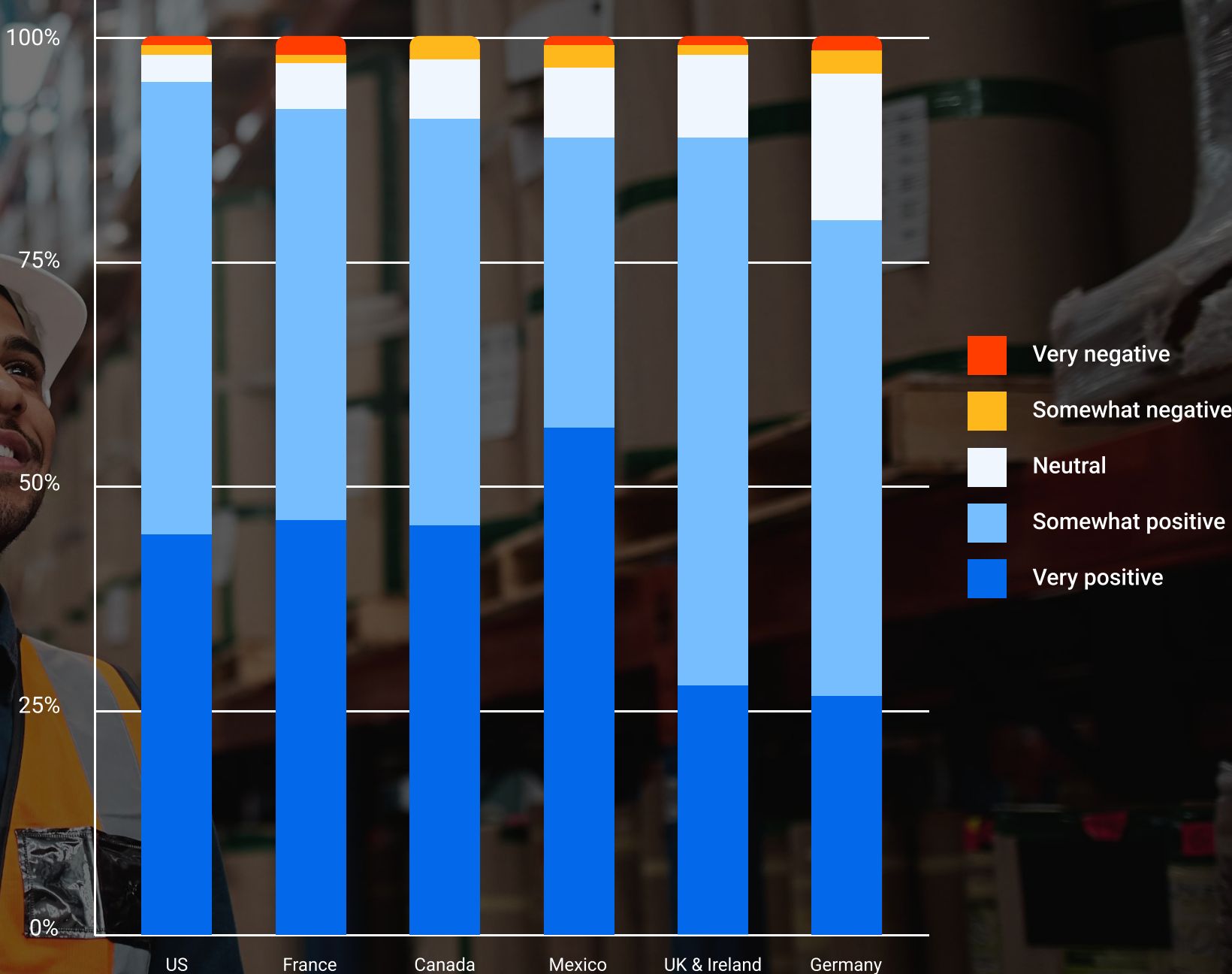
Compliance Officer, Fagan & Whalley



EMPLOYEE PERCEPTION OF AI

# 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 benefitting employees' day-to-day lives by enhancing workplace safety and efficiency.

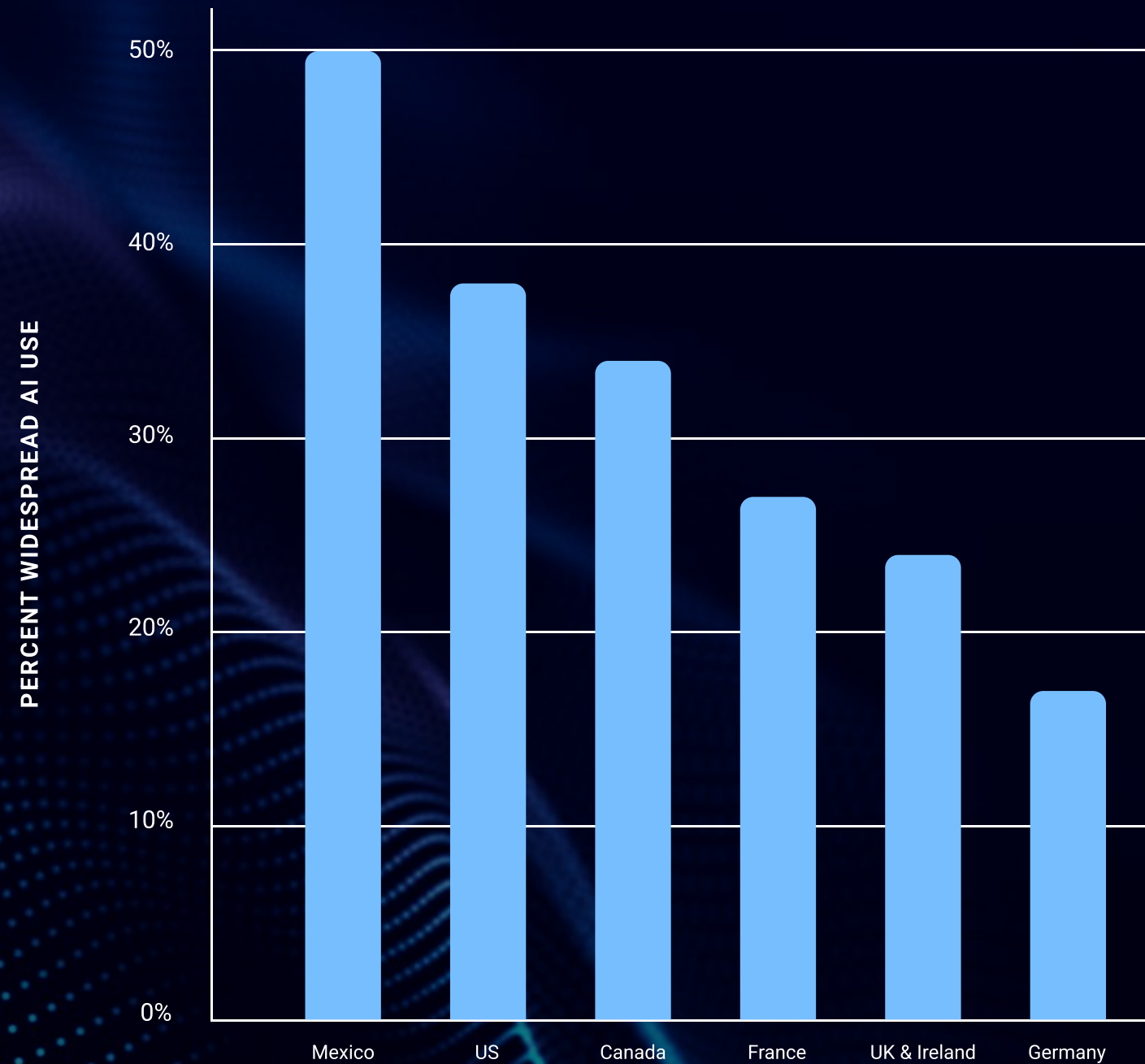




# Mexico and North America lead the way in AI maturity.

A notable 50% of leaders in Mexico say AI use is “widespread” within their organisation, meaning AI is used across departments and employees are trained on how to use it. This is 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.

GLOBAL AI MATURITY





**The increasing complexity of transportation logistics operations, especially security, prompted us to implement artificial intelligence (AI) tools. This has enabled us to optimise 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.**

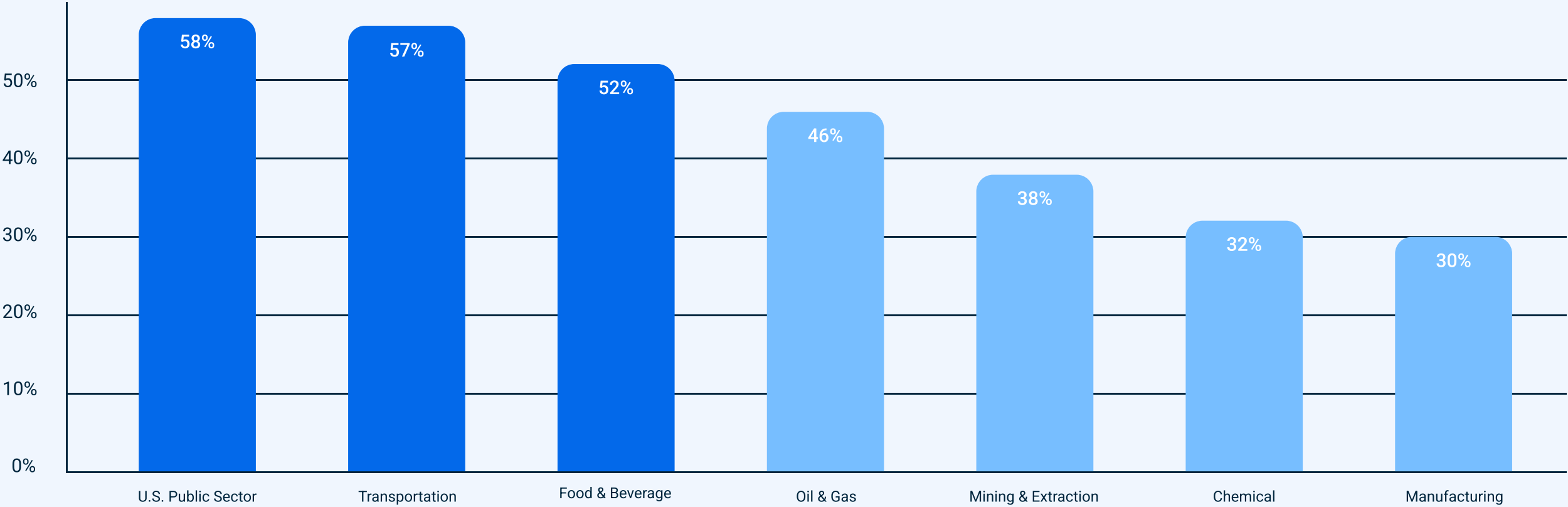
**JULIO ENCINAS**

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 organisation. 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 organisation. 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 programmes.



WIDESPREAD AI USE BY INDUSTRY



## CHAPTER 2

# Implementation benefits and barriers:

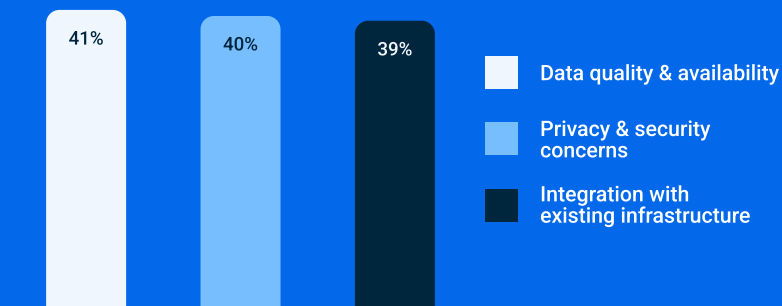
**100% of organisations currently using  
AI report benefits and responsible  
implementation remains top of mind.**



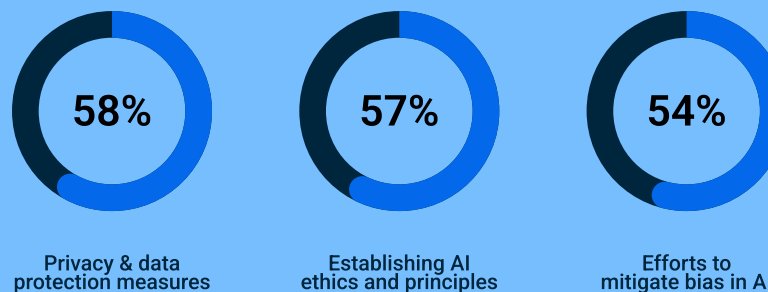
# Leaders are focused on deploying AI responsibly and they're already seeing the benefits.

For organisations 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



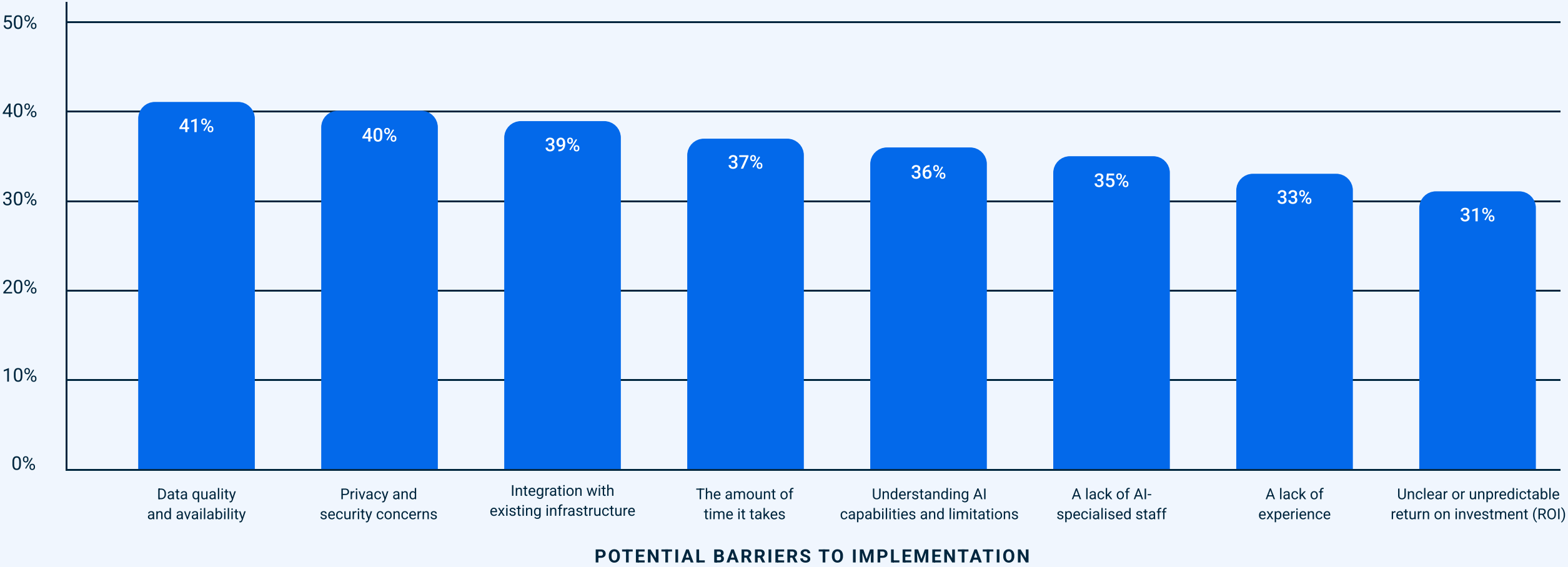
## Top three benefits of AI





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

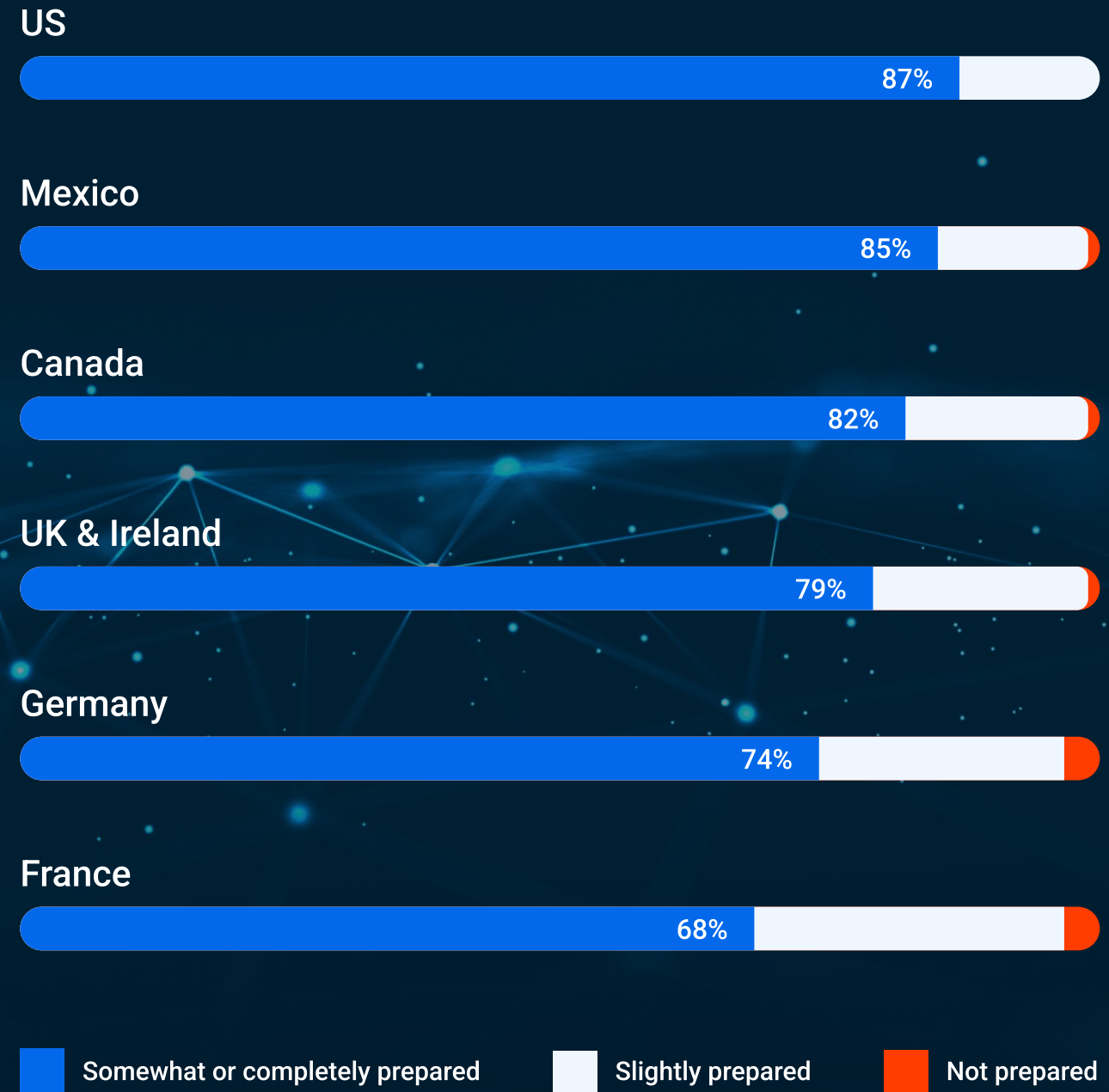
The top three reported barriers to implementing AI technology solutions are data quality and availability (41%), privacy and security concerns (40%) and integration with existing infrastructure (39%). This was true across all regions surveyed. What were leaders least concerned with? Unclear or unpredictable return on investment (ROI), suggesting that while organisations 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 organisation is taking action to ensure responsible deployment of AI. North American organisations report the highest levels of preparedness, but Europe is not far behind, even with more stringent regulations in play.

## PREPAREDNESS FOR AI REGULATORY FRAMEWORKS



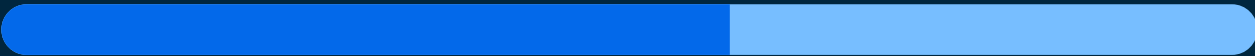


ACTIONS TAKEN TO ENSURE AI IS DEPLOYED RESPONSIBLY

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

Of leaders already using AI, the majority report that their organisation 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 organisations are taking a measured and thoughtful approach to AI implementation, focusing on addressing legal and ethical risk before tackling logistics and rollout.

**58%** Privacy and data protection measures



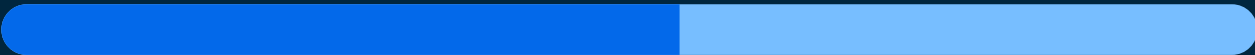
**57%** Establishing AI ethics and principles



**54%** Efforts to mitigate bias in AI



**54%** Transparency and explainability initiatives



**51%** Employee AI training





**AI is commercialised, but adoption will take a back seat if deployments aren't safe and ethical.**

**JAMES PAYNE**  
CTO, Roto-Rooter



# **It's never too early: all organisations are taking action to ensure responsible deployment of AI.**

Of the organisations that are already using AI or plan to in the next one to two years, 100% have taken steps to ensure that any future deployment is done responsibly. This indicates that organisations are taking the idea of "responsible AI" seriously and are taking action prior to adoption and implementation.

100%



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

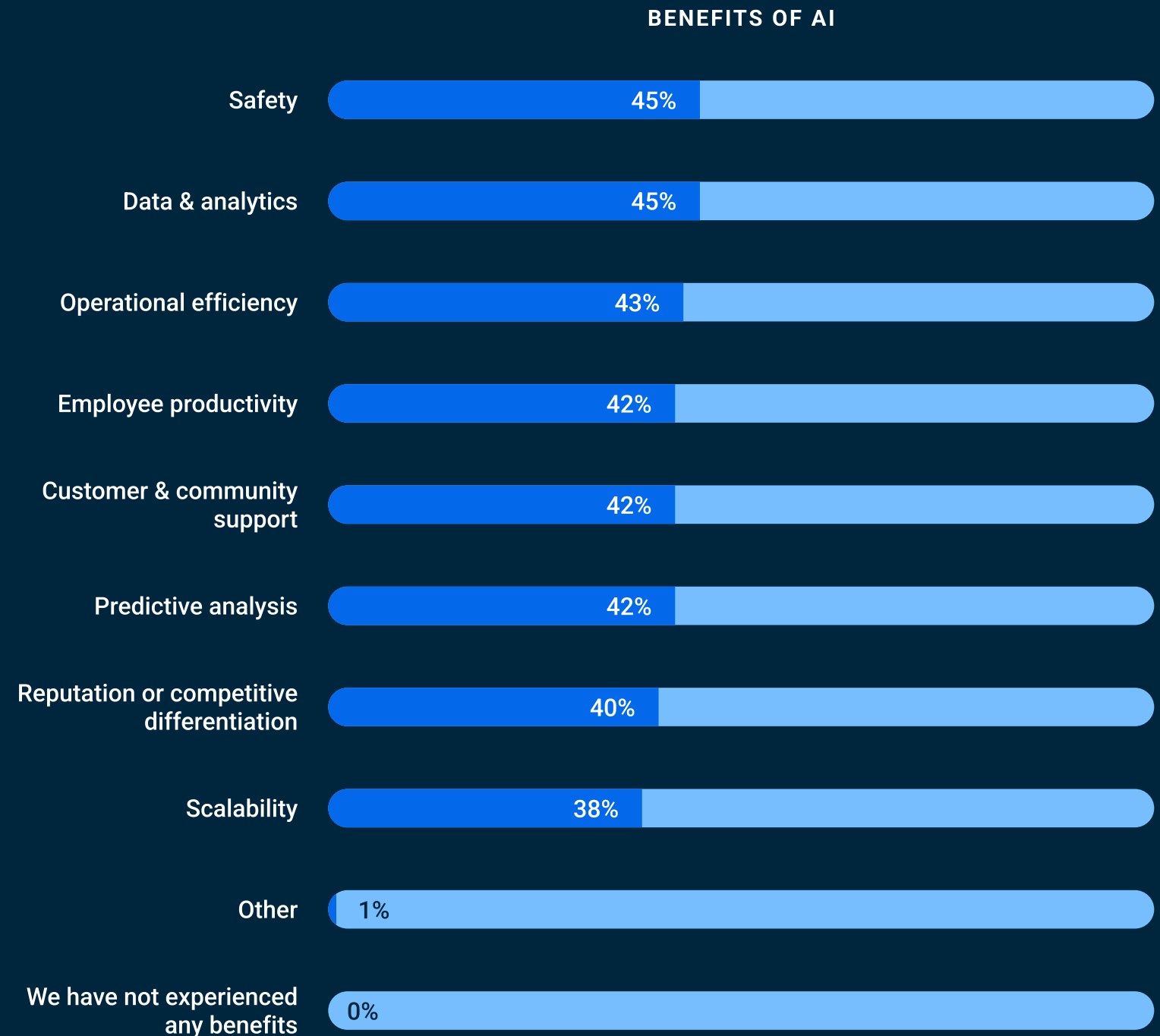
**LAWRENCE SCHOEB**

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 organisations 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 organisations 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 organisation.



## CHAPTER 3

### The future of AI:

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

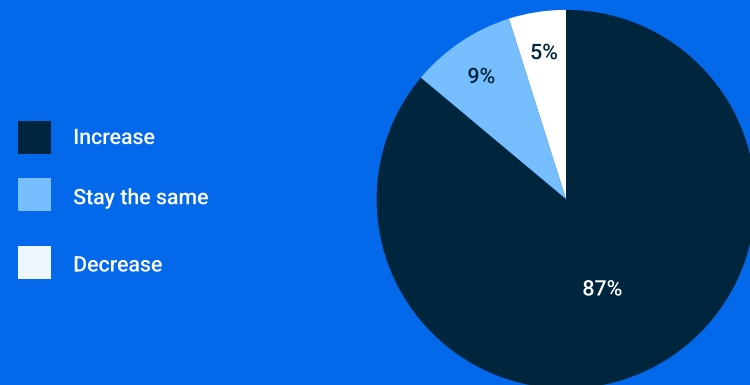




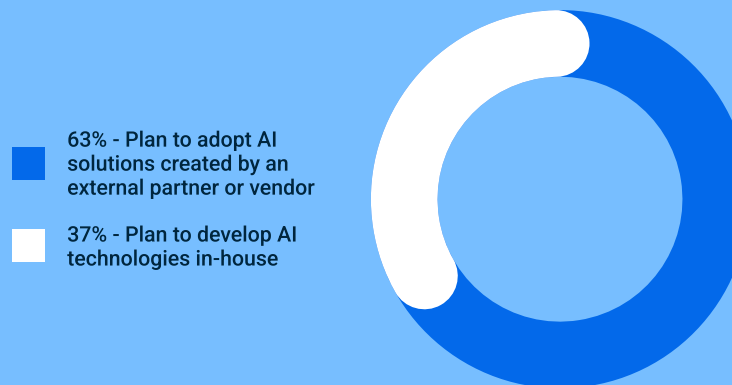
# Investment in AI is increasing and leaders plan to tap external technology partners for AI expertise.

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 three important factors when selecting an AI technology partner

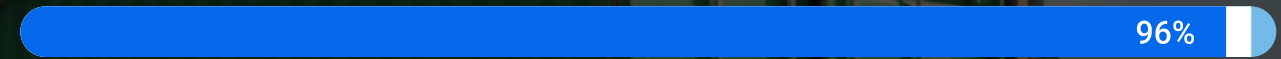


# Investment in AI is increasing around the world.

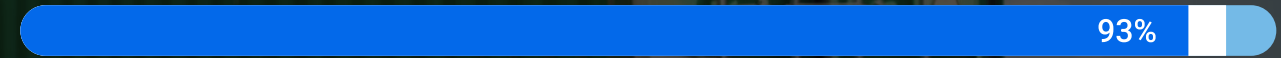
94% of leaders believe their organisation needs to invest in AI technology solutions so they are not left behind, and that is reflected in the ambitious planned investment around the world. 87% of organisations expect to increase investments in AI in the next year. North American organisations are most 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

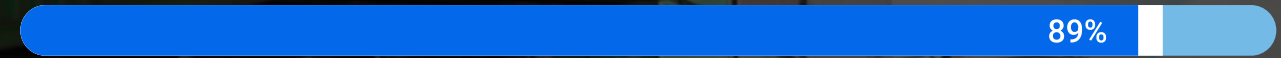
US



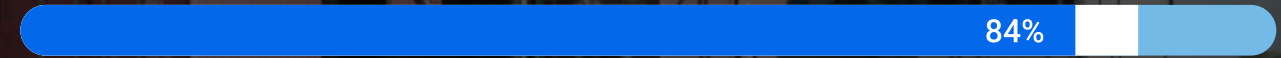
Canada



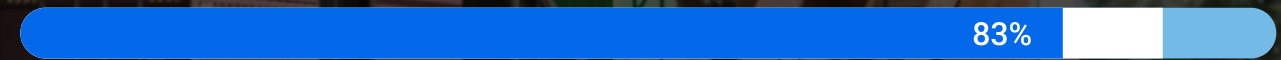
UK & Ireland



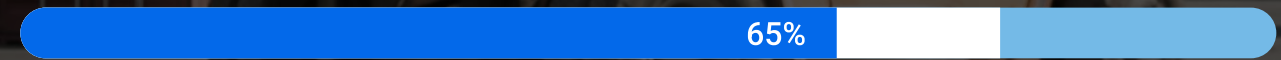
Mexico



France



Germany



■ Increase    ■ Decrease    ■ Stay the same



**Organisations 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 organisation 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 organisation, 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.

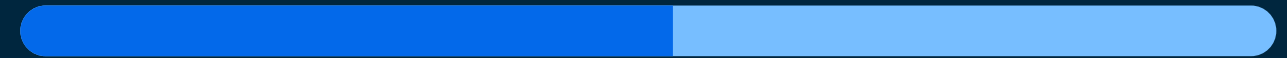
Over a third of leaders report that a lack of AI-specialised staff could be a barrier to more widespread implementation within their organisation. This, along with other [implementation hurdles](#), could be informing the list of factors they're prioritising when it comes to evaluating AI solutions from 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 prioritise AI partners who can show evidence of ROI, higher than the global average.

## MOST IMPORTANT FACTORS WHEN SELECTING AN AI TECHNOLOGY PARTNER

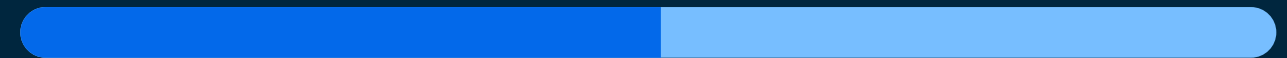
**52%** Ability to integrate with our existing systems



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



**51%** Security and privacy compliance



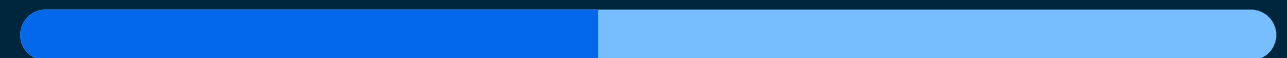
**50%** Technical knowledge



**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 specialised engineers. I want to know how the insights from that data can help my business.**

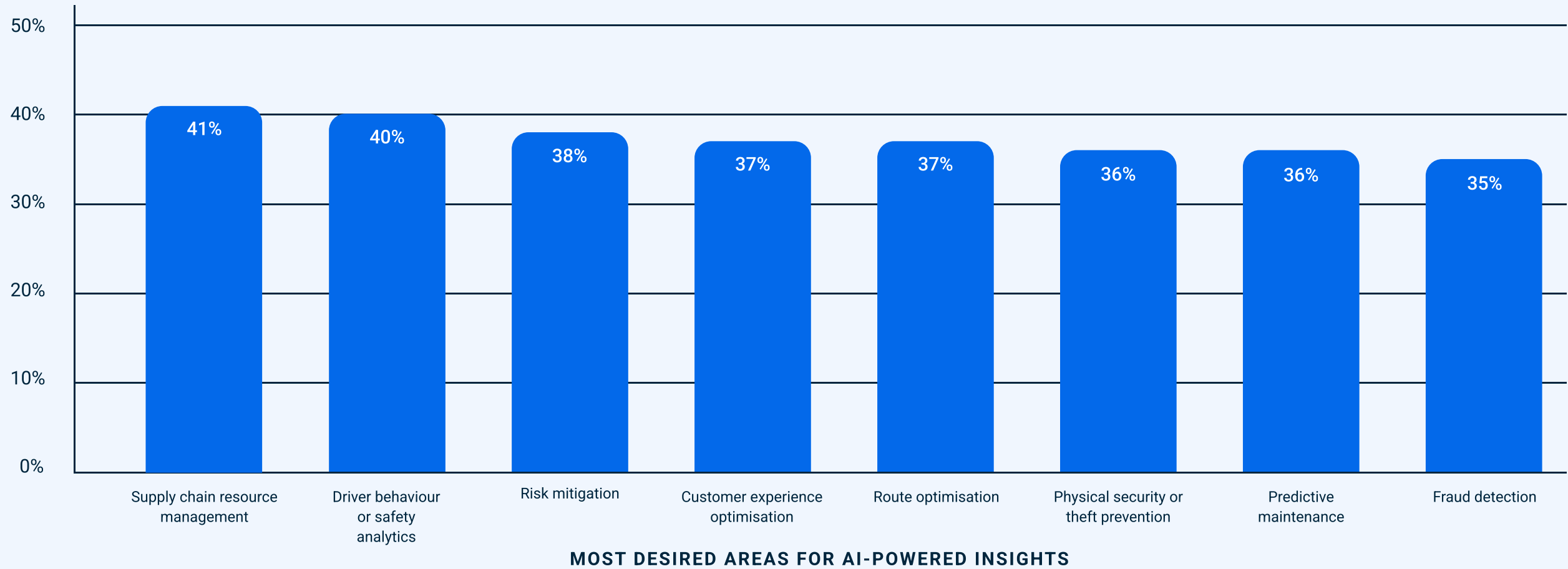
**JOE MORALES**

Distribution Systems Manager, Messer Americas



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

While organisations 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 organisation the most in five years are supply chain resource management (41%), driver behaviour or safety analytics (40%) and risk mitigation (38%). Many of these desired outcomes overlap with the benefits currently reported by organisations using AI, suggesting that 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, revolutionising the decision-making process across industries, making them more informed and responsive.**

**EVAN WELBOURNE**

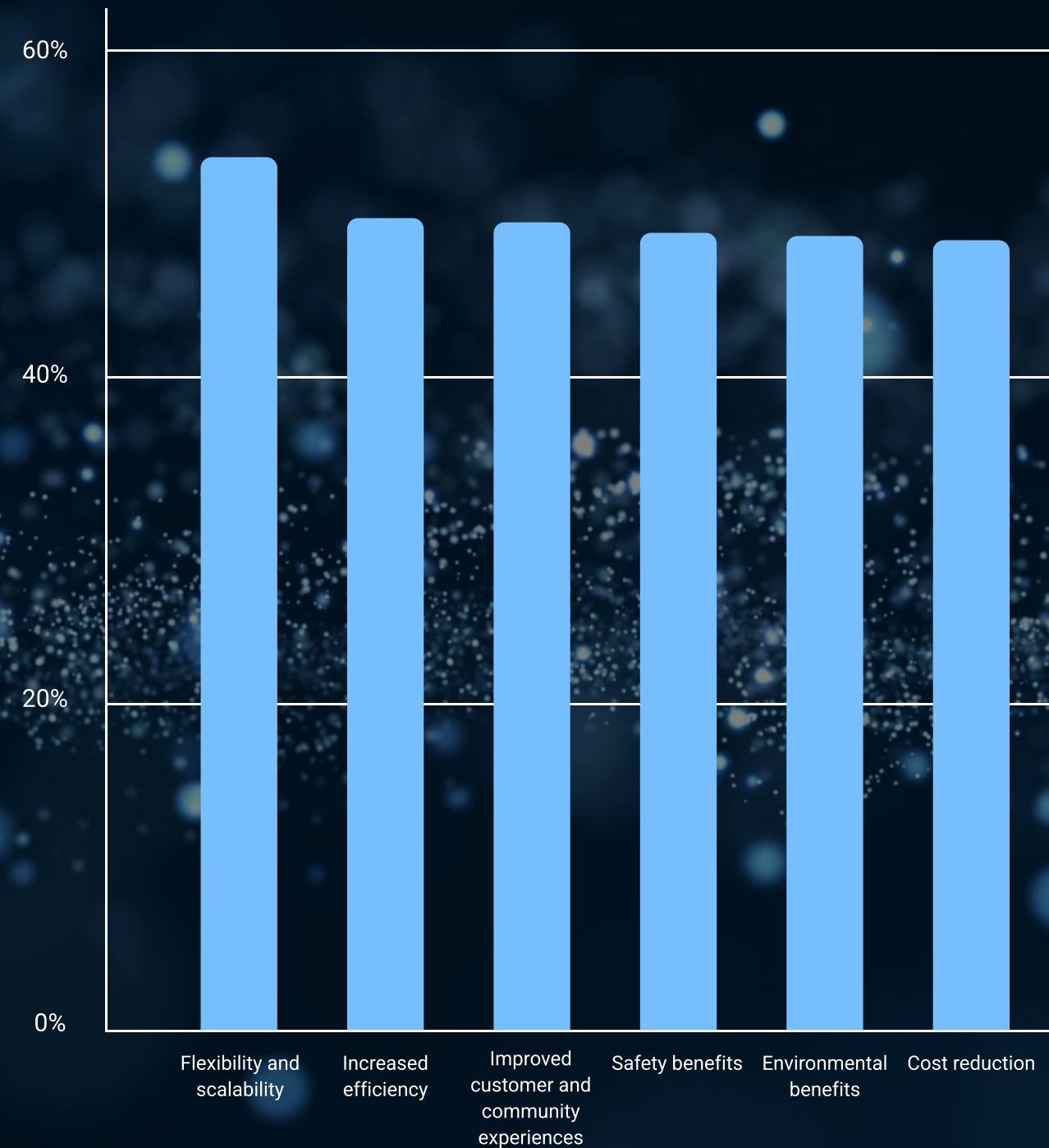
Head of AI and Data, Samsara



# 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 organisations. 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.

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

If you answered YES to any of the questions above, your organisation 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 organisation 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 organisation do to prepare for a successful implementation?



# Methodology

This survey was conducted by an independent research firm, Wakefield Research, between 5 April and 14 April 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 organisations 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 that 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 obtain 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 organisations 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 organisations 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 digitised



**200K+**

crashes prevented\*



**1B+**

kilograms of carbon emissions saved\*

\*Samsara has partnered with customers to help prevent an estimated 200,000+ crashes (October 2022–October 2023) and stop over 1 billion kilograms of carbon emissions 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).





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