Artificial Intelligence Index Report 2025

Policy Highlights

Stanford University
Human-Centered
Artificial Intelligence

Steering Committee

Staff and Researchers

Research Manager and Editor in Chief

Nestor Maslej, Stanford University

Research Associate

Loredana Fattorini, Stanford University

Affiliated Researchers

Elif Kiesow Cortez, Stanford Law School Research Fellow
Julia Betts Lotufo, Researcher
Anka Reuel, Stanford University
Alexandra Rome, Researcher
Angelo Salatino, Knowledge Media Institute, The Open University
Lapo Santarlasci, IMT School for Advanced Studies Lucca

Graduate Researchers

Emily Capstick, Stanford University
Njenga Kariuki, Stanford University

Undergraduate Researchers

Malou van Draanen Glismann, Stanford University
Armin Hamrah, Claremont McKenna College
Sukrut Oak, Stanford University
Ngorli Fiifi Paintsil, Stanford University
Andrew Shi, Stanford University

Supporting Partners

Google

Open Philanthropy

NSF

OpenAI

QUID

Analytics and Research Partners

accenture

Center for Research on Foundation Models

Digital Policy Alert

CSET
CENTER for SECURITY and EMERGING TECHNOLOGY

CSTA

EPOCH AI

GitHub

IFR International Federation of Robotics

KAPOR FOUNDATION

Lightcast

LinkedIn

McKinsey & Company

PIT-UN

RAISE Health
Responsible AI for Safe and Equitable Health

studyportals

The following is a selective summary of key AI Index report highlights that are particularly relevant to policymakers and other policy audiences. The full AI Index Report 2025 is available at hai.stanford.edu/ai-index/2025-ai-index-report.

1. Public sector still lags behind industry in frontier AI development as computation needs continue to soar.

Industry continues to make significant investments in AI and strengthen its lead in notable AI model development. Nearly 90% of notable models originated from industry in 2024 compared to 60% in 2023 (see Figure 1).

This dominance persists despite substantial global public investment in AI—**led, in 2023, by the United States, with $831 million in public spending on AI-related contracts** (see Figure 2)—and **academia remaining the leading institutional producer of highly cited (top 100) AI publications** over the past three years.

Large-scale industry investment is continuing to drive model scaling and performance gains as **AI models are continuing to become more computationally demanding and energy intensive** (see Figure 3): The training compute for notable AI models is doubling approximately every five months, dataset sizes for training LLMs every eight months, and the power required for training annually.

Number of notable AI models by sector, 2003–24

Source: Epoch AI, 2025 | Chart: 2025 AI Index report

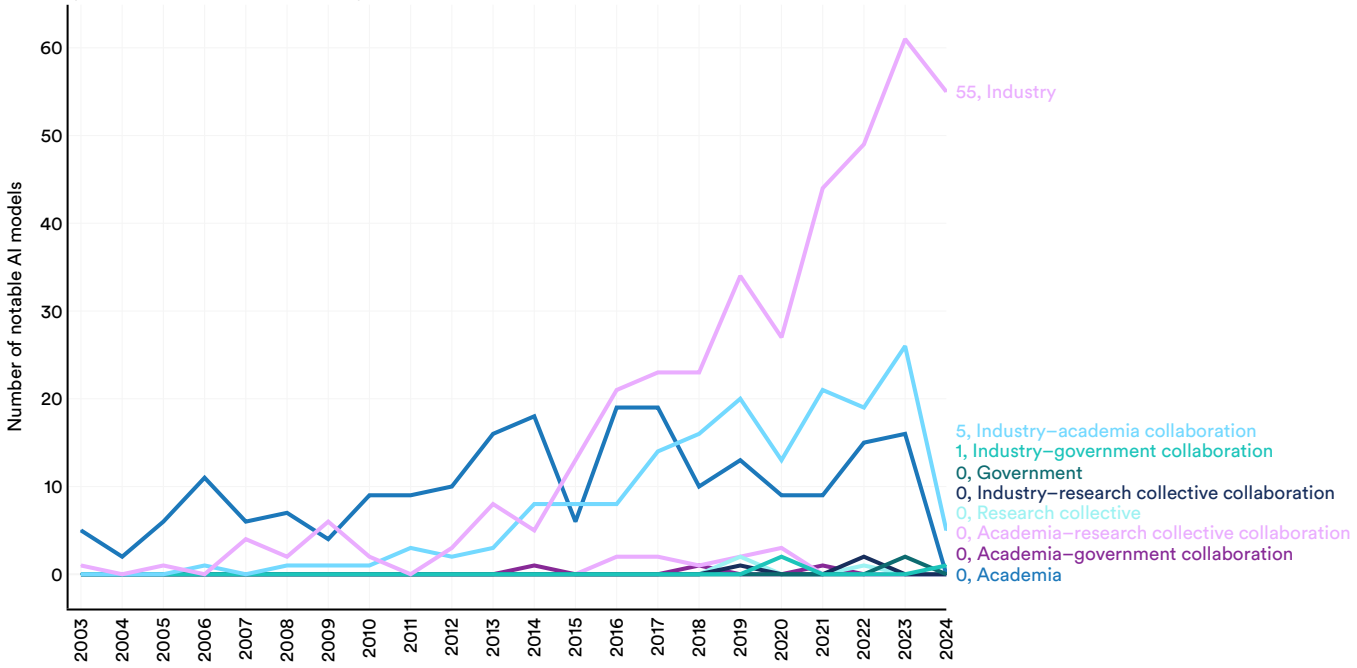

Figure 1

Public spending on AI-related contracts in select countries, 2023

Source: AI Index, 2025 | Chart: 2025 AI Index report

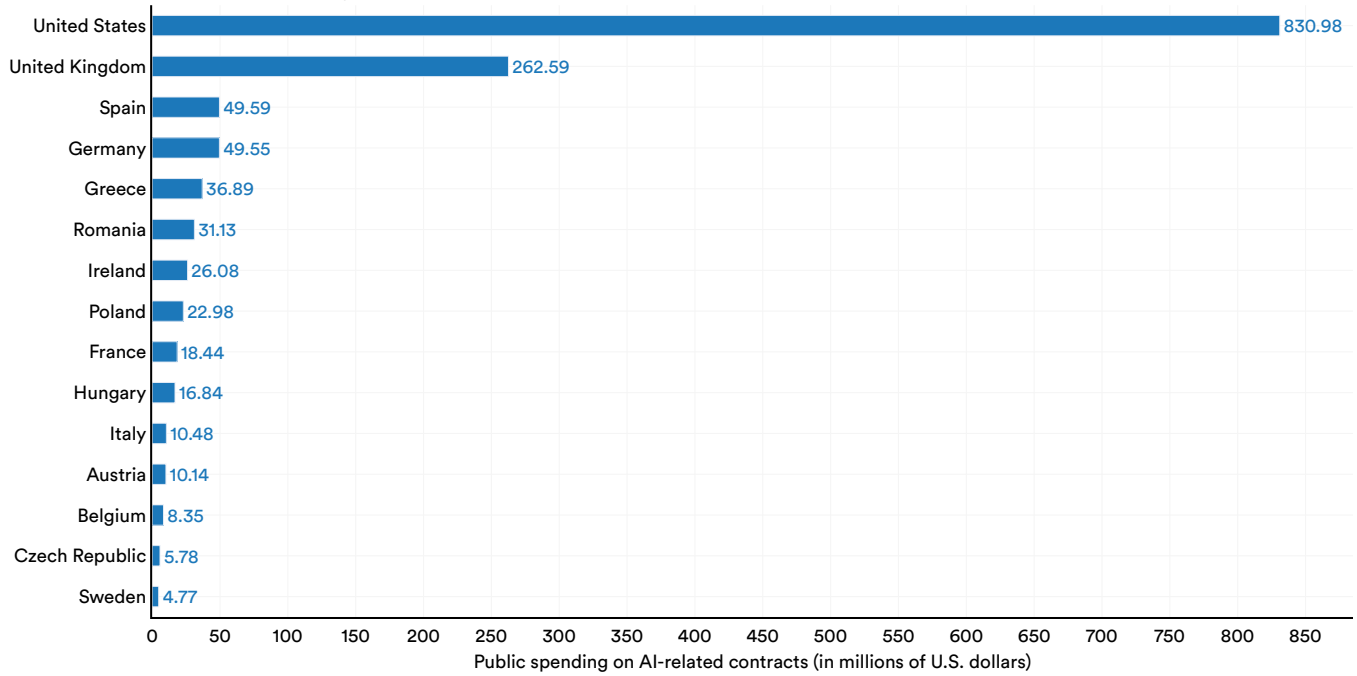

Figure 2

Training compute of notable AI models by domain, 2012–24

Source: Epoch AI, 2025 | Chart: 2025 AI Index report

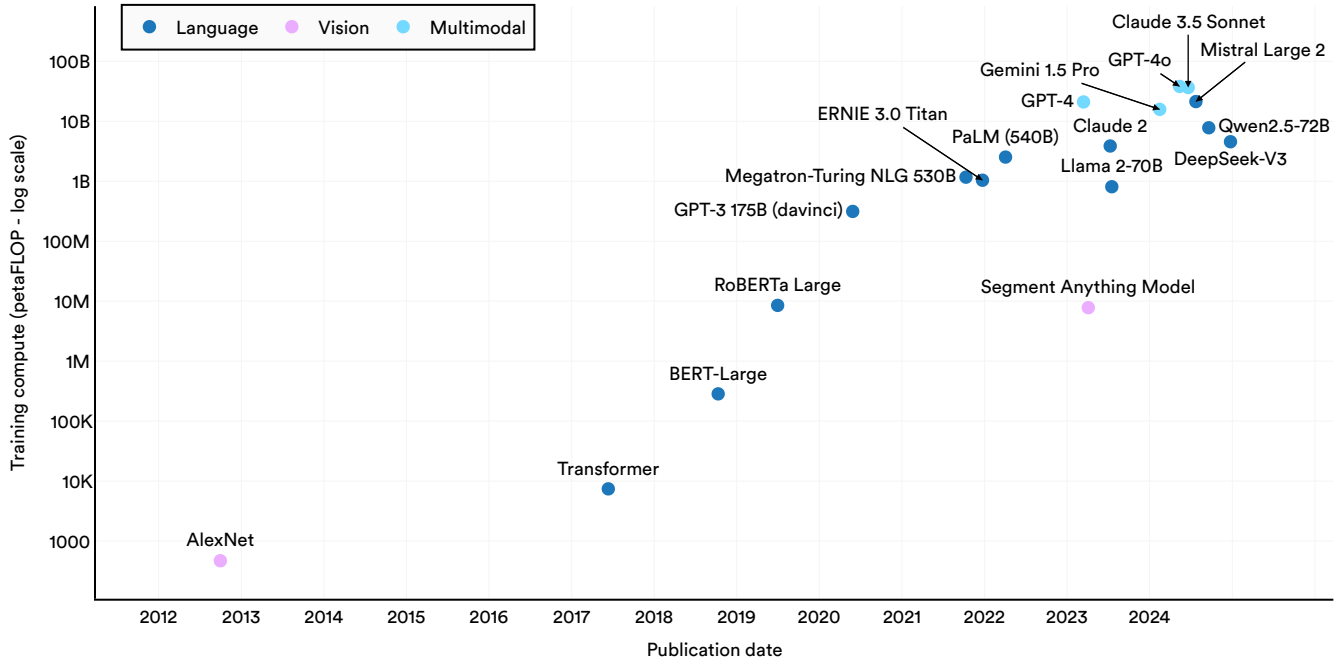

Figure 3

2. Remarkable technical performance jumps are accompanied by gaps in standardized evaluation methods.

AI model performance is converging at the frontier. The AI landscape is becoming increasingly competitive with high-quality models now available from a growing number of developers. Illustratively, in the last year, the gap between the top and 10th-ranked model narrowed from 11.9% to just 5.4% on the Chatbot Arena leaderboard (see Figure 4).

In particular, **open-weight models are catching up.** The performance gap between leading open-weight models and their closed-weight counterparts has narrowed to 1.70% on the Chatbot Arena leaderboard as of February 2025 (see Figure 5).

AI is mastering new benchmarks faster than ever. Model performance on benchmarks that test the limits of increasingly capable AI systems (e.g., MMMU, GPQA, SWE-bench) saw remarkable improvements from 2023 to 2024, ranging from 19 to 67 percentage points. This is pushing researchers to continually propose more challenging benchmarks (e.g., Humanity's Last Exam, FrontierMath, BigCodeBench).

However, **research has shown that many benchmarks are poorly constructed,** underscoring the need for standardized benchmarking to ensure reliable AI evaluation and to prevent misleading conclusions about model performance (see Figure 6). **Evaluating AI systems with responsible AI criteria is still uncommon,** and benchmarks aimed at **evaluating the factuality and truthfulness of models have failed to gain widespread adoption.**

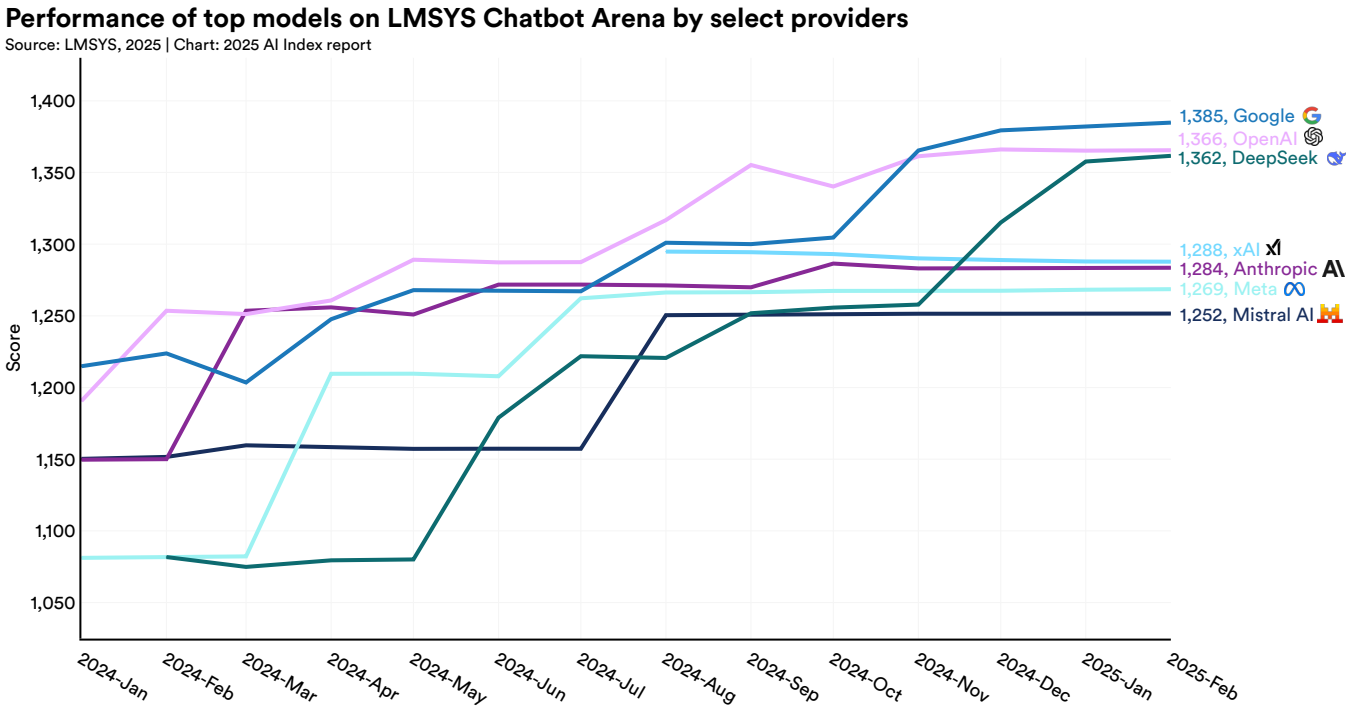

Figure 4

Performance of top closed vs. open models on LMSYS Chatbot Arena

Source: LMSYS, 2025 | Chart: 2025 AI Index report

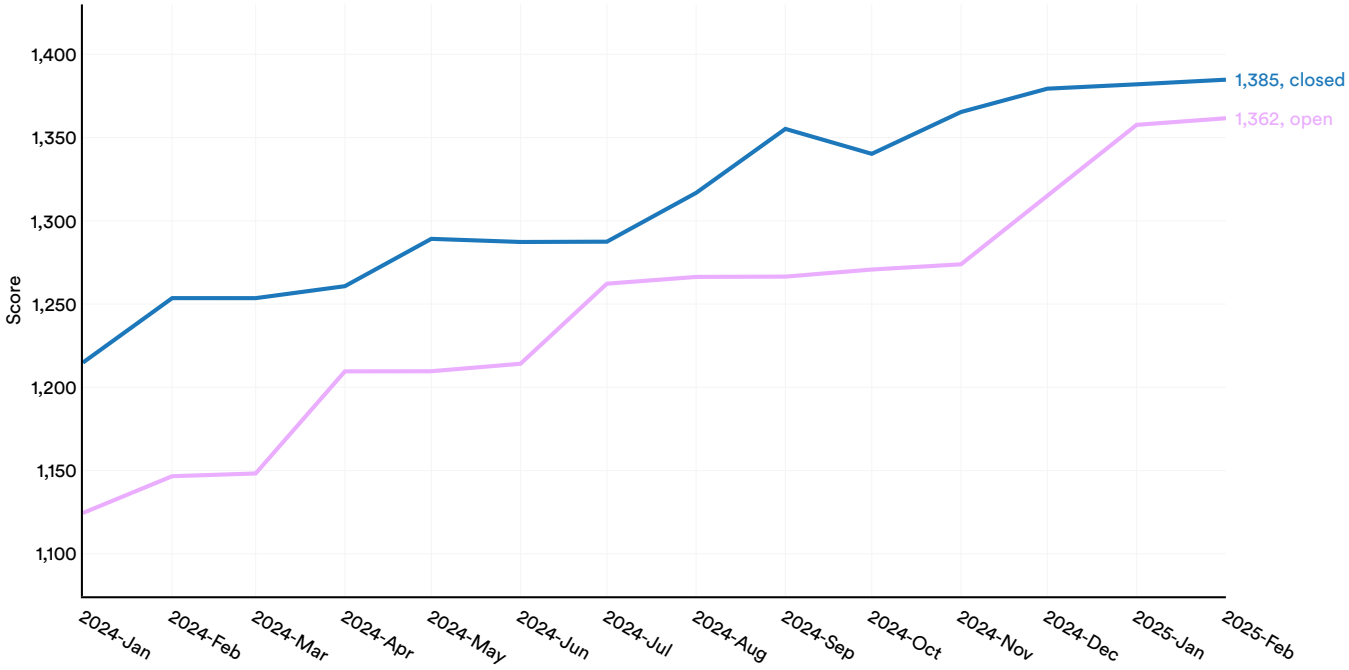

Figure 5

Design vs. usability scores across select benchmarks

Source: Reuel et al., 2024 | Chart: 2025 AI Index report

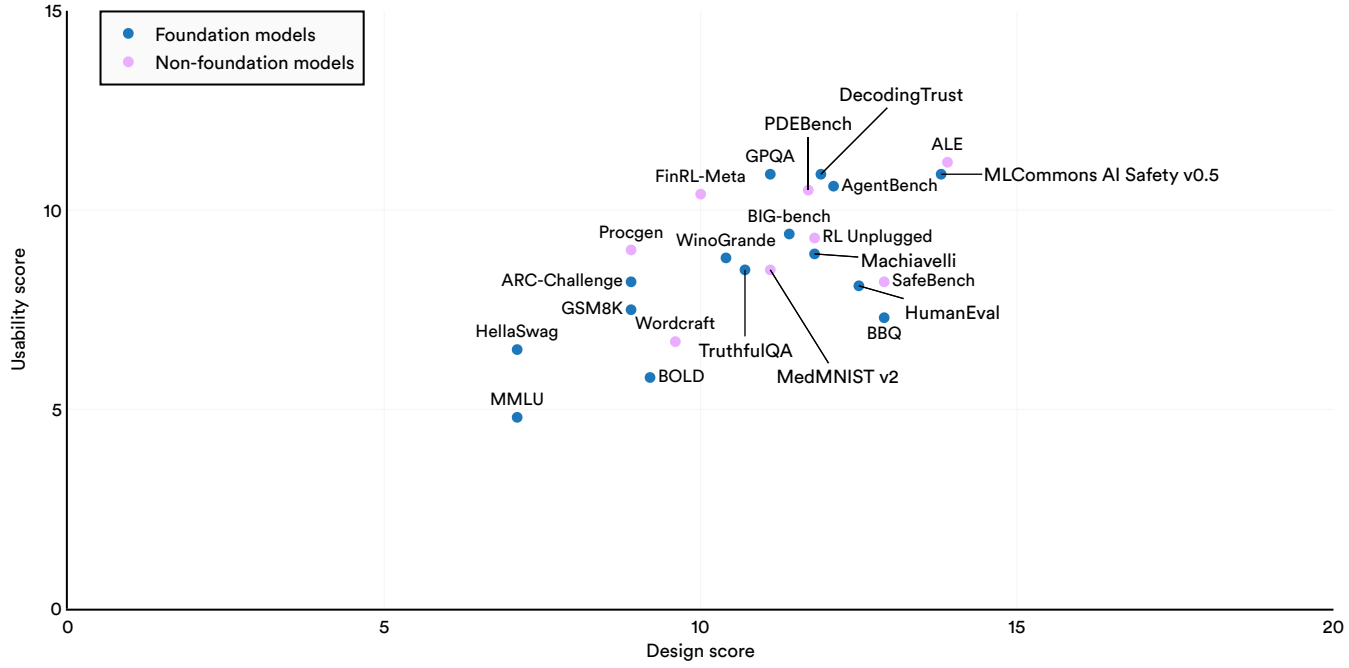

Figure 6

3. While the United States continues to lead in many aspects of AI development, competition from China is intensifying.

The United States continues to surpass China and Europe as the leading source of top AI models (40 notable U.S.-developed AI models in 2024, see Figure 7), the **leading contributor of top-100 cited AI publications** (173 from 2021 to 2023), and the **leading source of private AI investment** ($109 billion in 2024).

However, **the gap between Chinese and U.S. model performance on important benchmarks has narrowed substantially** (to less than 10 percentage points across the board by the end of 2024, see Figure 8), and **China leads in AI research publication totals,** with 23.2% of global AI publications and 22.6% of global AI research citations.

While North America is maintaining its lead in organizations' use of AI, other regions are gaining ground. Greater China demonstrated one of the most significant year-over-year growth rates, with a 27 percentage point increase in organizational AI use, closely followed by Europe, which registered a 23 percentage point increase (see Figure 9).

Number of notable AI models by select geographic areas, 2003–24

Source: Epoch AI, 2025 | Chart: 2025 AI Index report

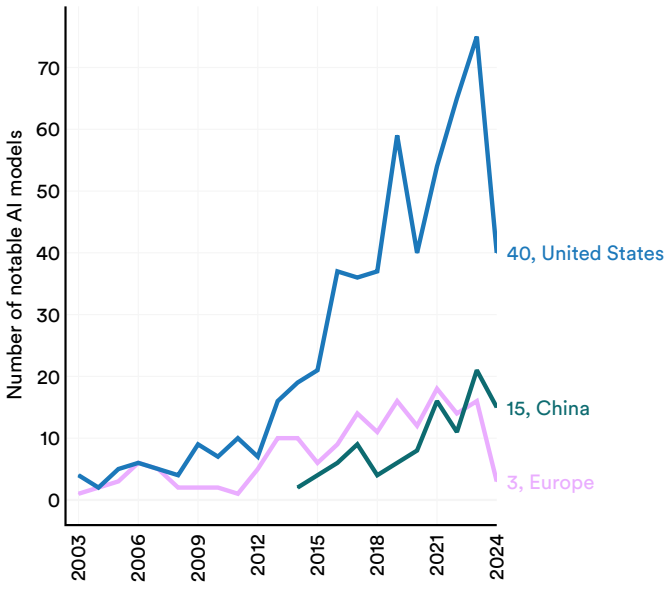

Figure 7

Performance of top United States vs. Chinese models on select benchmarks

Source: AI Index, 2025 | Chart: 2025 AI Index report

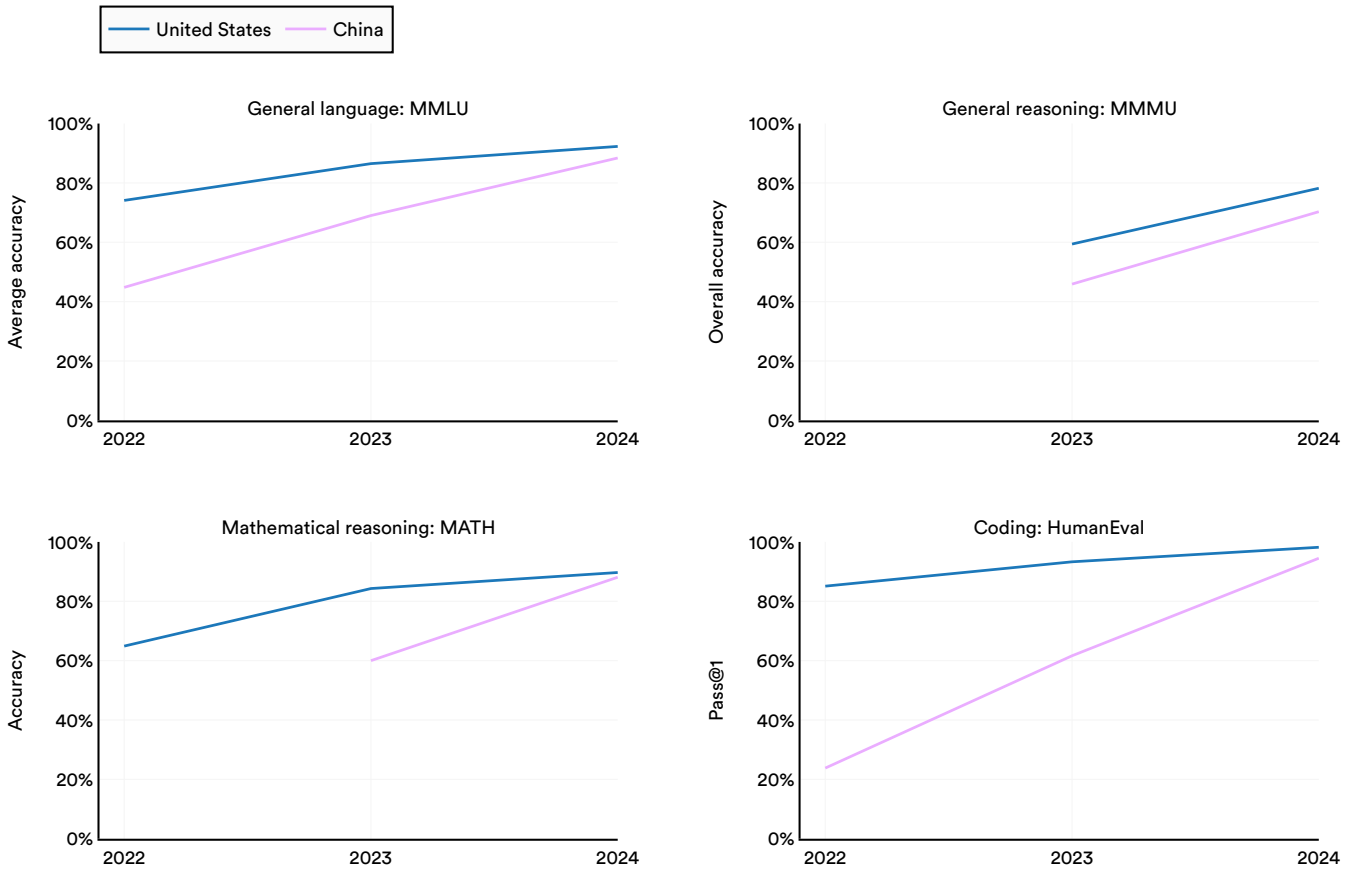

Figure 8

AI use by organizations in the world, 2023 vs. 2024

Source: McKinsey & Company Survey, 2024 | Chart: 2025 AI Index report

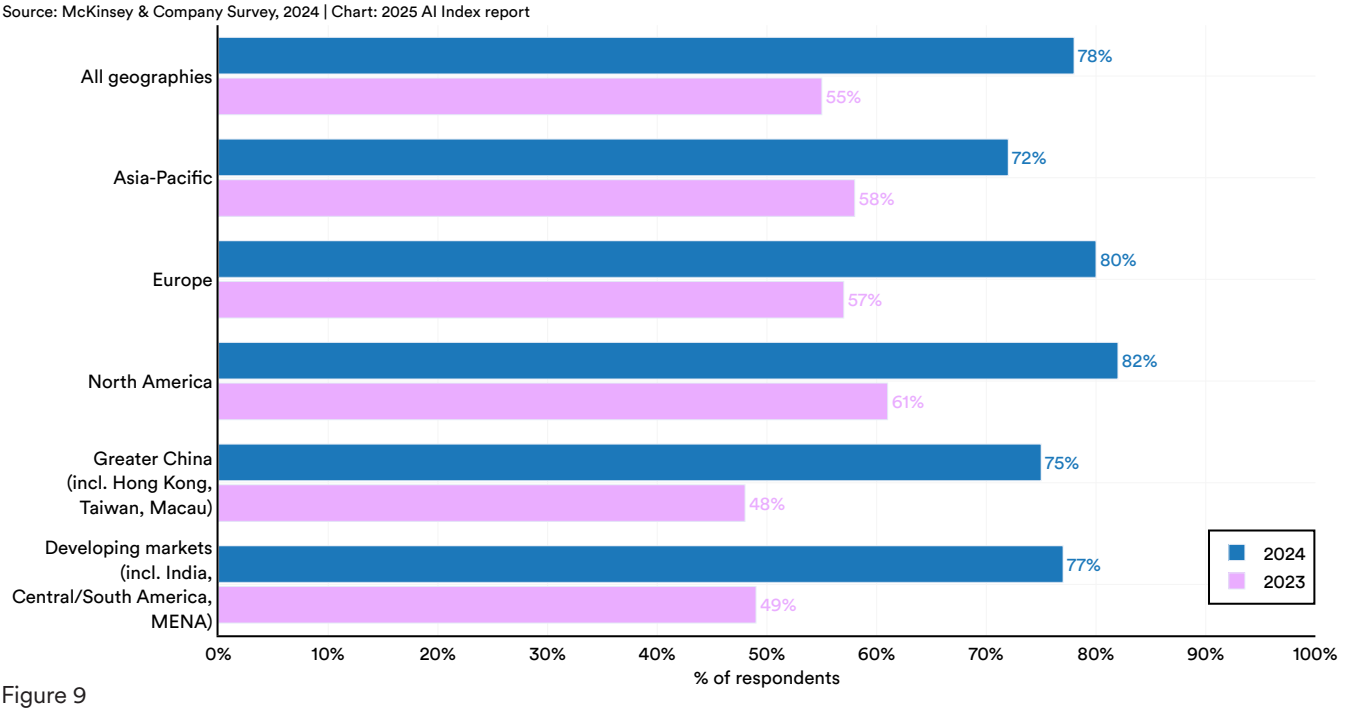

Figure 9

4. Governments are stepping up on AI—with regulation and investment —amid growing evidence of AI's economic opportunities, increasing AI incidents, and mounting public distrust.

AI is beginning to deliver financial impact across business functions as the technology continues to boost productivity and bridge skill gaps. Recent research confirms that AI can have a positive impact on productivity and often helps narrow skill gaps. Businesses report cost savings, especially across functions like service operations, supply chain management, and software engineering—even as most are still in the early stages of adoption.

Governments across the world are investing in AI infrastructure at scale. Canada, for example, announced a $2.4 billion AI infrastructure package, while China launched a $47.5 billion fund to boost semiconductor production.

In the United States, **the number of introduced AI-related federal regulations more than doubled in 2024;** 59 AI-related regulations came from 42 unique agencies. **U.S. states are leading the way on AI legislation amid slowing progress at the federal level** (see Figure 11): In 2024, the number of state-level AI-related laws passed more than doubled from 2023, while the number of proposed bills at the federal level grew by just 29.2%.

This policy action is set against the backdrop of **continually increasing reports of AI-related incidents** (see Figure 12) and a **significant decrease globally in public confidence that AI companies protect personal information and that AI systems are unbiased.**

Cost decrease and revenue increase from generative AI use by function, 2024

Source: McKinsey & Company Survey, 2024 | Chart: 2025 AI Index report

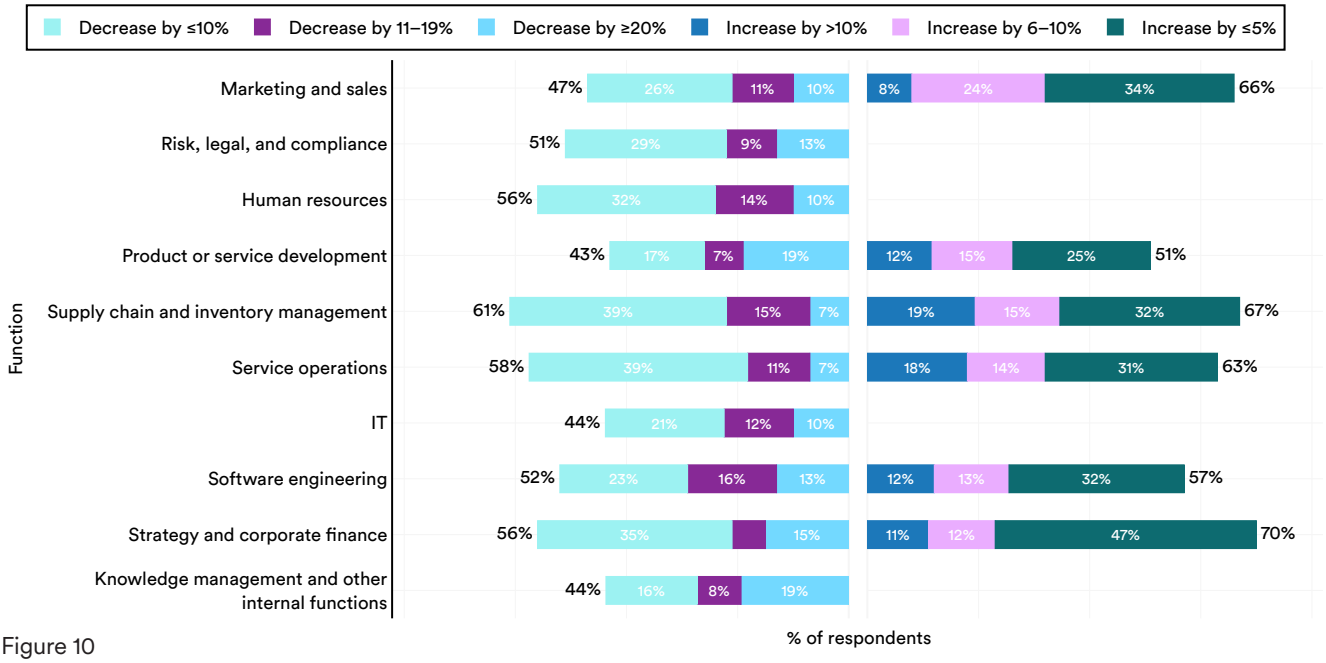

Figure 10

Number of state-level AI-related bills passed into law in the United States by state, 2016–24 (sum)

Source: AI Index, 2025 | Chart: 2025 AI Index report

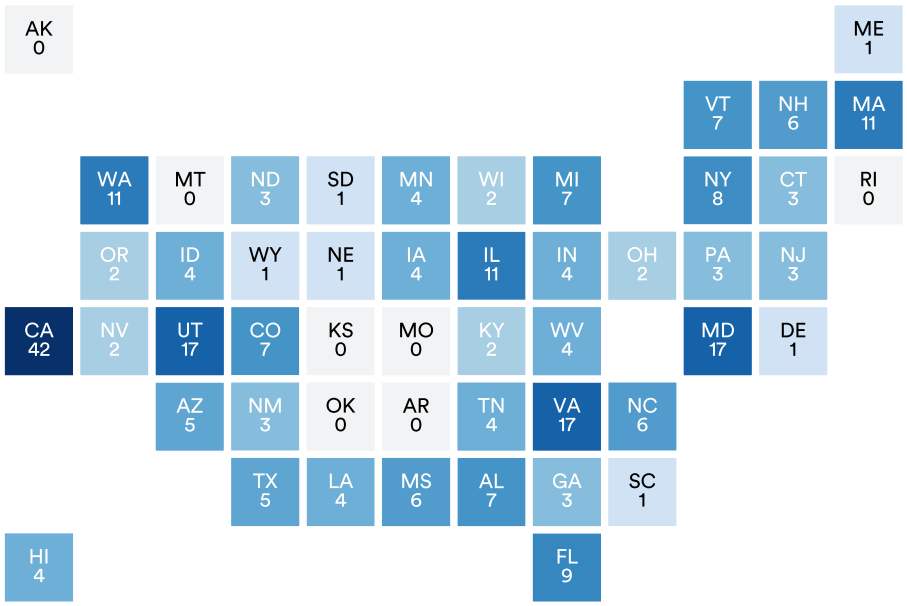

Figure 11

Number of reported AI incidents, 2012–24

Source: AI Incident Database (AIID), 2024 | Chart: 2025 AI Index report

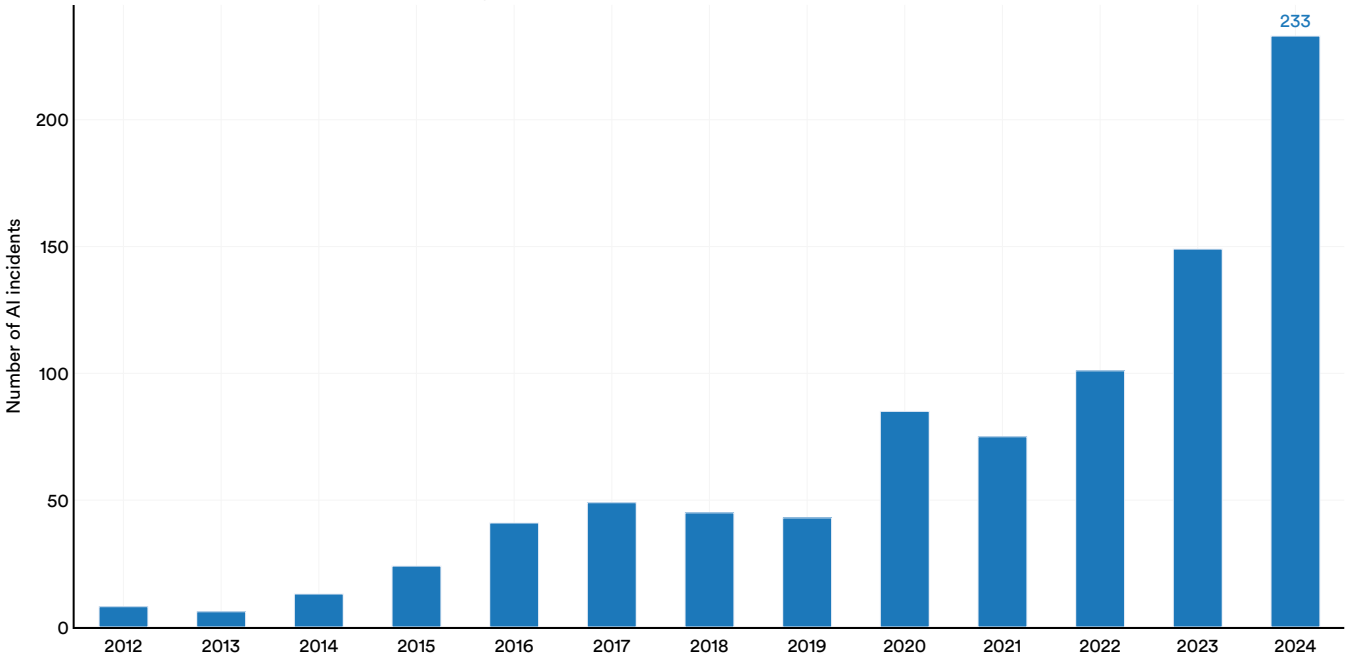

Figure 12

Stanford University
Human-Centered
Artificial Intelligence