

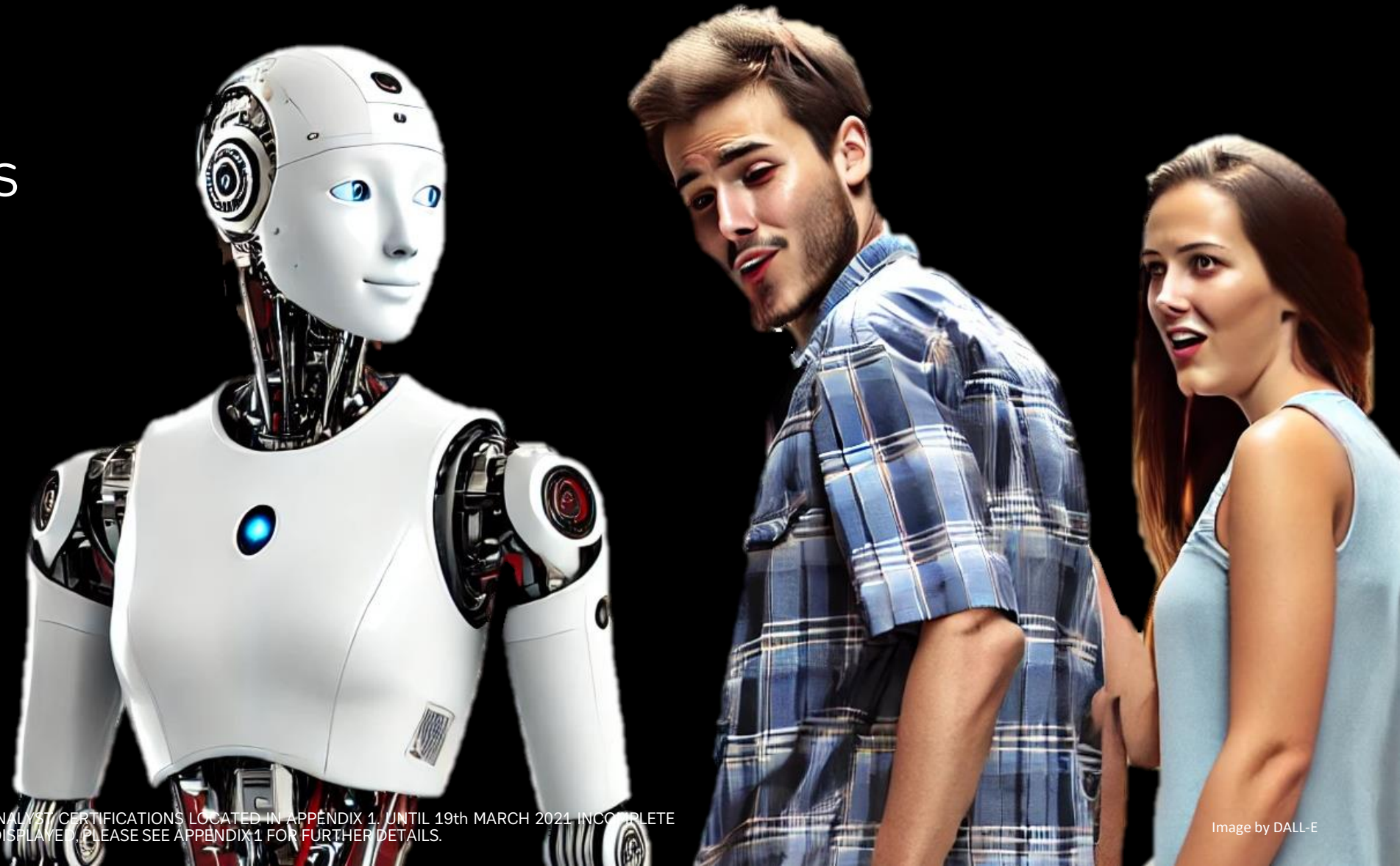


AI in 2025: 25 themes in 25 memes

January 30, 2025

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A picture is worth 1,000 words



If a picture is worth 1,000 words, this chartbook should save you from reading 25,000 of them.

That counts for something in a week when so many millions of words have been written about the surprise arrival of China's DeepSeek AI model.

AI has come of age in the era of the meme – and it turns out memes are one of the best ways of explaining where it is going.

This chartbook has five sections with five key themes each:

1. Technology: moving beyond large language models (LLMs)
2. The business of AI: the money magnet
3. AI in enterprises: still multiple hurdles
4. Jobs outlook: keeping up the good work
5. The future: FOMO trumps safety fears

AI is not just a popular subject for memes. It can also interpret and create memes itself.

We instantly generated the meme on this page using imgflip's ChatGPT-based AI Meme Generator and the prompt "Create a meme about how good AI is at creating memes".

Getting even more meta, we asked a competing AI chatbot to interpret it. Claude 3.5 Sonnet snapped back that the image was "playfully mocking both groups by suggesting they're equally amateur at making memes".



Source: Author, in collaboration with imgflip's AI Meme Generator

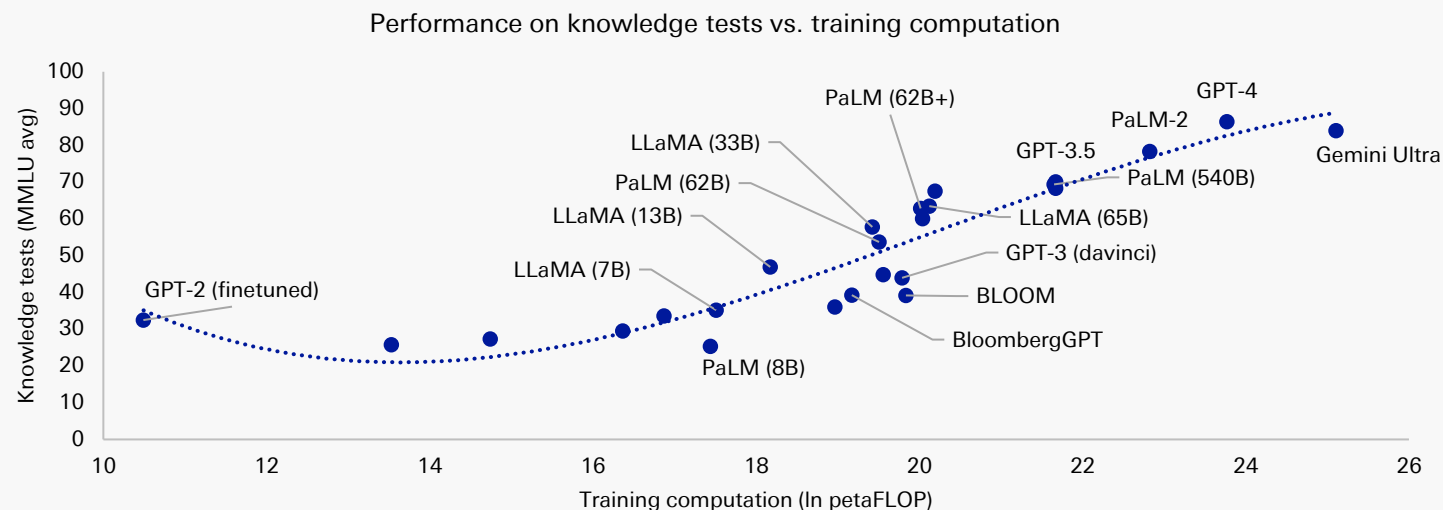
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1. A week is a long time in AI
2. Bigger isn't always better
3. Agents are coming to the rescue... at a cost
4. It's back to the future on advertising
5. Energy demand is surging

1.1 A week is a long time in AI



- China's DeepSeek open-source small language model burst onto the scene this month, apparently trained at perhaps one tenth of the cost of comparable models.
- It ignited concern about how much of the AI investment boom is justified, suggesting that:
 1. The latest hardware may no longer be essential for innovation.
 2. AI models for most uses will shrink and become commodities.
 3. Despite restricted access to chips, China is not lagging the US after all.For more, see [DeepSeek AI: Why drive a Tesla Model X when a BYD will do?](#)
- But a week is a long time in AI: Microsoft has now been reported to be investigating whether a group linked to DeepSeek took data from OpenAI without authorisation. And Alibaba unveiled its own Qwen 2.5 Max model, saying it outperforms DeepSeek and Meta's Llama.

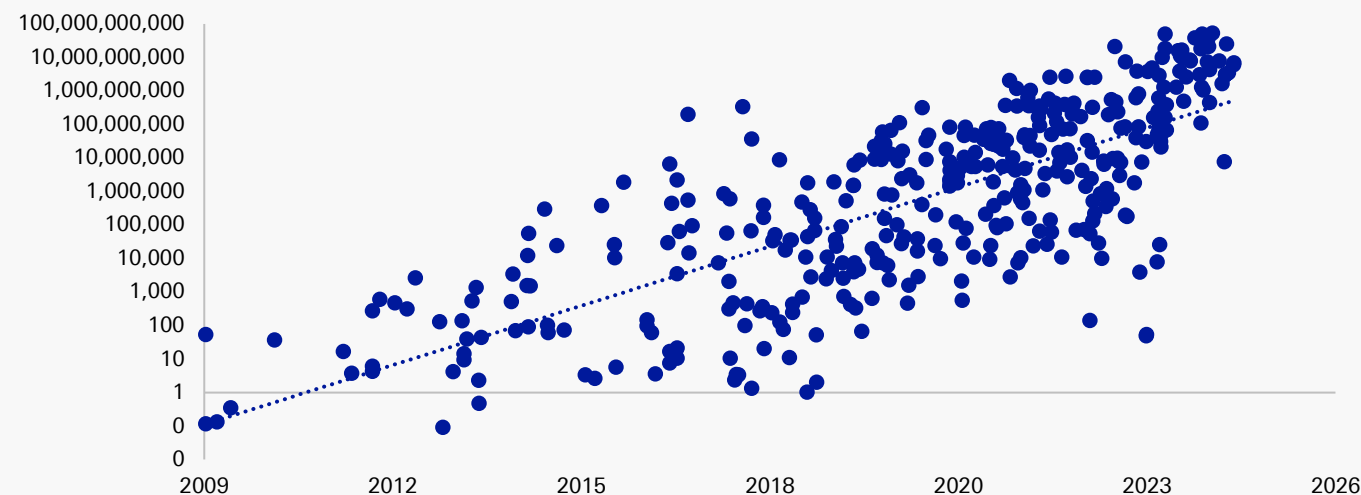
Source: Author, using imgflip; Our World in Data, Deutsche Bank. Note: The values for training computation are estimates and come with some uncertainty, especially for models for which only minimal information has been disclosed, such as GPT-4.

1.2 Bigger isn't always better



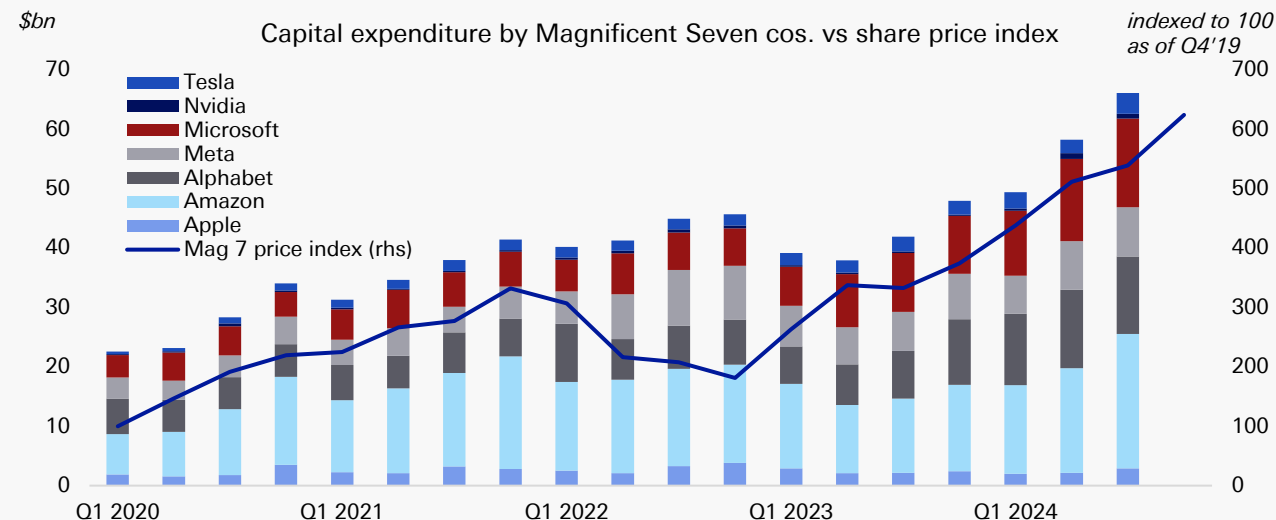
Source: Author, using imgflip; Our World in Data, Deutsche Bank.

Computation in the training of notable AI systems (in total petaFLOP)



- Critics say generative AI is “hitting a wall”, with diminishing returns for more compute. OpenAI and rivals have yet to significantly improve on GPT-4, launched in March 2023.
- Instead the industry is focusing on squeezing more value out of models, often optimising the “inference” stage. For example, OpenAI’s o1 series takes time to reason step-by-step.
- There is also a move to smaller models like DeepSeek that can run in phones, computers and cars without needing to connect to the cloud, making them faster, more robust, more secure – and cheaper – for many applications than huge, generalist, multimodal models.

1.3 Agents are coming to the rescue – at a cost



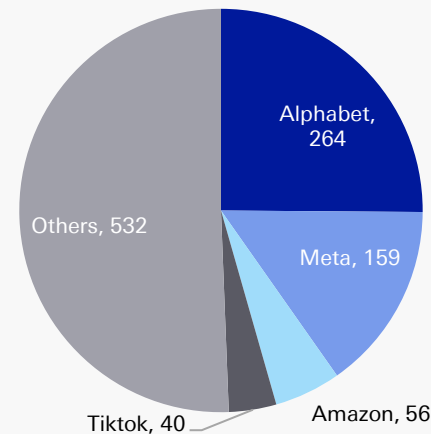
- AI agents are evolving from basic chatbots to autonomous systems that enable computers to perform tedious multi-step tasks 24/7, such as filing expense reports. That should further increase the hyperscalers' need to invest in computing power.
- Major players have begun rolling out agents. OpenAI launched a preview of Operator last week and CEO Sam Altman said the first AI agents may "join the workforce" this year.
- Microsoft's Satya Nadella has said Software as a Service (SaaS) may be superseded as agents act directly with underlying data rather than through an interface like Excel.

Source: Author, using imgflip.com; Bloomberg Finance LP, Deutsche Bank

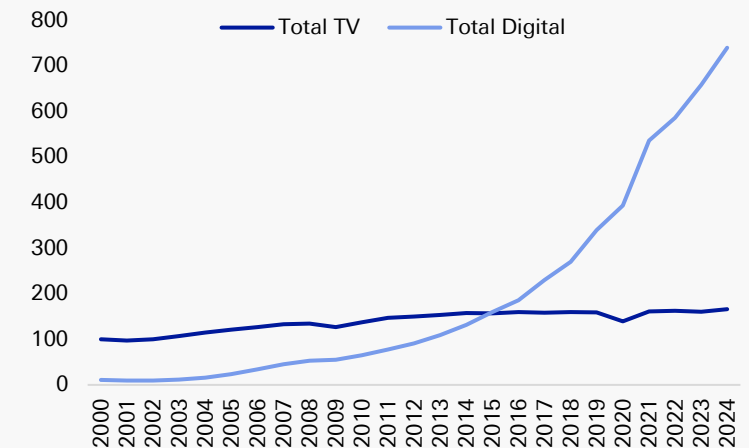
1.4 It's back to the future on advertising



Four goliaths of global advertising spend
(2024 forecast, \$bn)



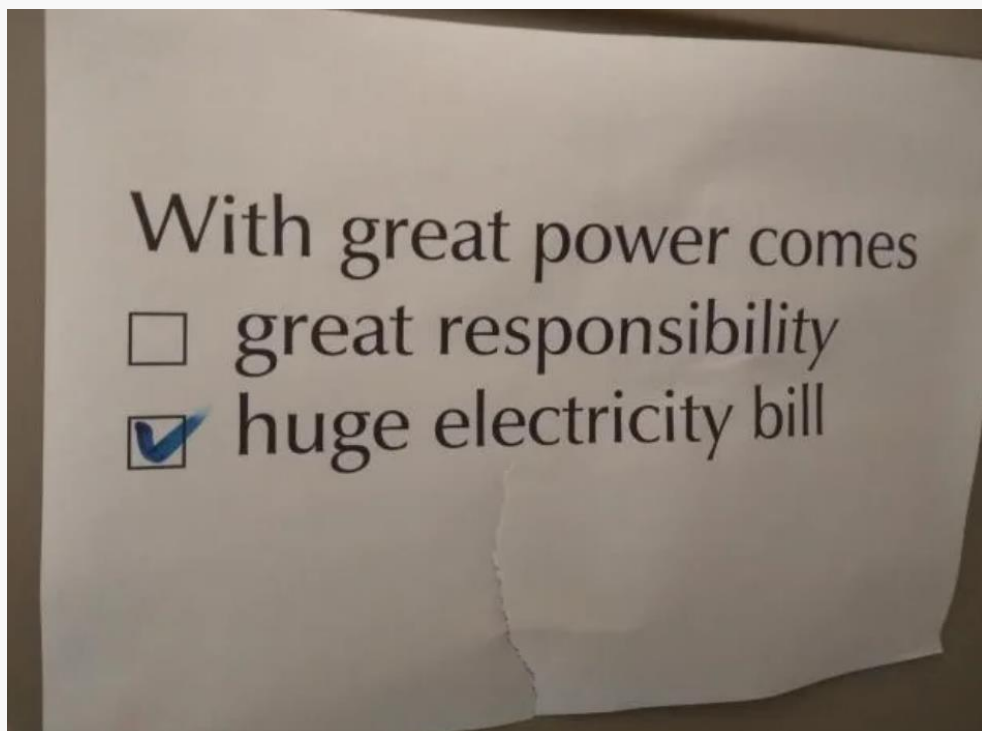
Global advertising revenue by channel, \$m



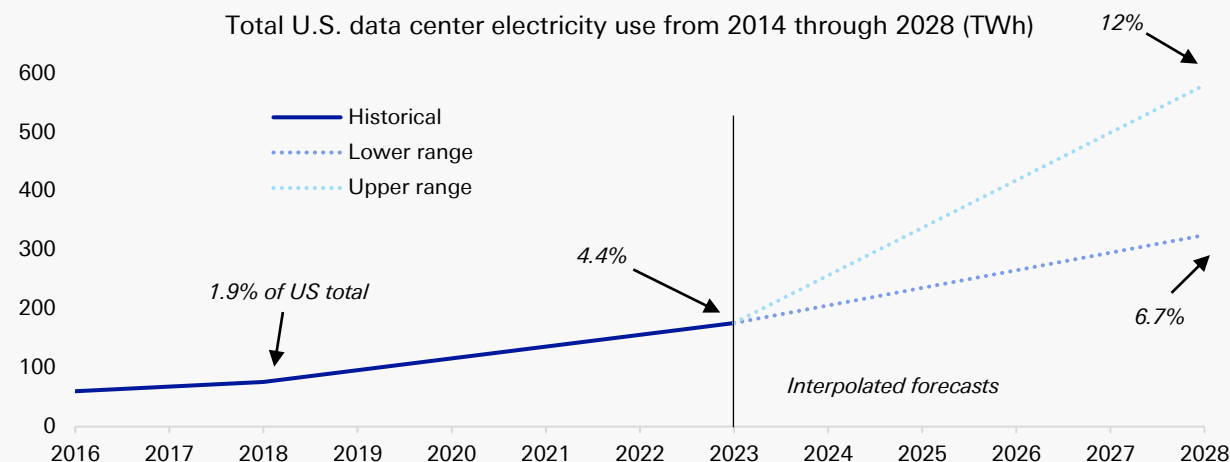
- Just as subscription models seemed to be the future, as popular for ChatGPT as for news articles, advertising business models may be coming back in vogue.
- AI-powered search engine Perplexity began experimenting with ads on its platform in November and even OpenAI has said it is now considering an ad model.
- Meta is showing how spending on AI can benefit its advertising model. In the fourth quarter, sales rose by fifth, driven in part by an automated product promotion tool.

Source: Author, in collaboration with imgflip's AI Meme Generator; [GroupM](#), Deutsche Bank.

1.5 Energy demand is surging



Source: Via [koehnsen](#) on 9gag; Lawrence Berkeley National Laboratory, Deutsche Bank.



- AI applications are leading to surging demand for energy. Whether the proliferation of smaller models like DeepSeek affects that remains to be seen.
- Data centers consumed about 4.4% of total US electricity in 2023 and are expected to consume as much as 12% by 2028, the Department of Energy said.
- Hyperscalers, led by Amazon's AWS, Microsoft's Azure, Alphabet's Google Cloud and Meta, are driving demand for renewable energy. They are also trying to increase capacity by investing in small modular reactors, restarting old reactors and betting on new technology such as fusion.

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1. Nvidia has been the standout winner (for now)
2. Investment pours into data center picks and shovels
3. AI startups are a magnet for funding
4. Acqui-hires signal cautious consolidation
5. The economy doesn't live on AI alone

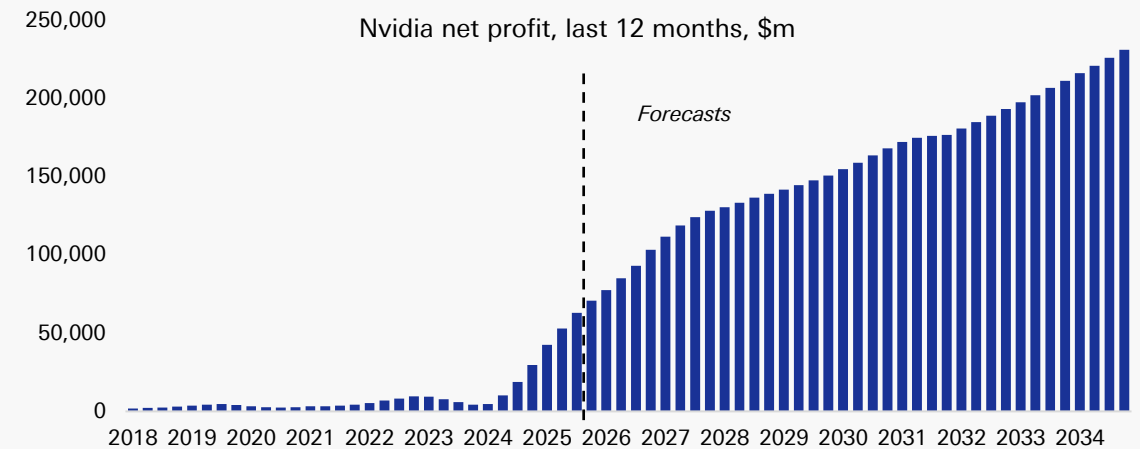
2.1 Nvidia has been the standout winner (for now)



Found a picture of me in 2001 not buying Nvidia stock for \$0.51



Source: Via [koehnsen](#) on 9gag; Bloomberg Finance LP, Deutsche Bank.



- Nvidia's stock rose almost 10 times from the launch of ChatGPT on Nov 30, 2022, to Fri, Jan 24, making it the world's most valuable company at \$3.6bn.
- Its 17% pullback on Mon, Jan 27, cost almost \$600bn in market capitalisation, the biggest ever single-day loss in a stock's market cap in absolute terms.
- Nvidia has a 90%-plus market share in cutting-edge AI semiconductors as well as the industry-standard CUDA software. But it faces challenges from rivals like AMD as well as customers like Google developing their own tailored chips.

2.2 Investment pours into data center picks and shovels



Nvidia during the AI boom



"We're selling GPUs like shovels in a gold rush!"

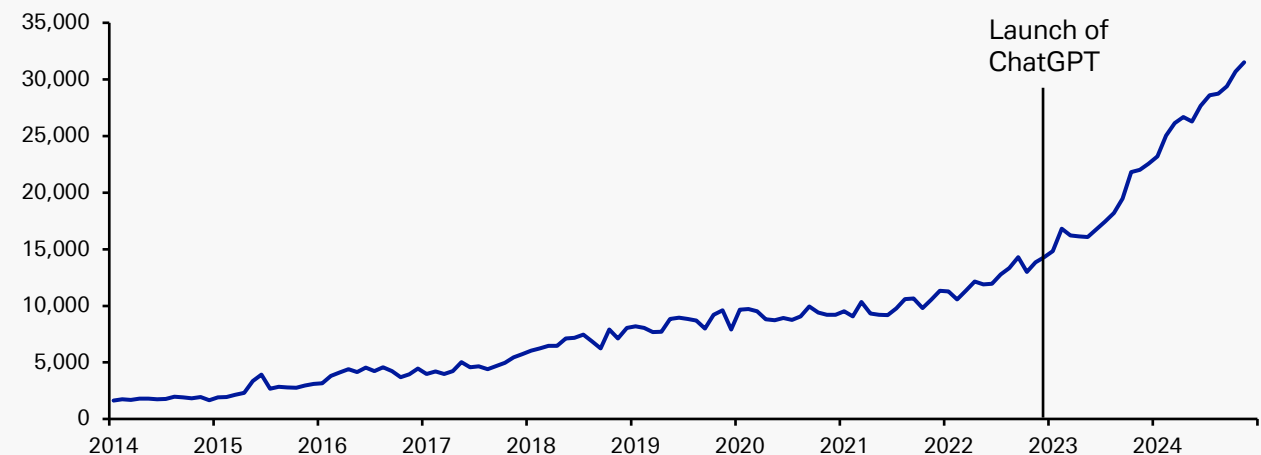
Everyone else during the AI boom



"Wait, where's the gold?"

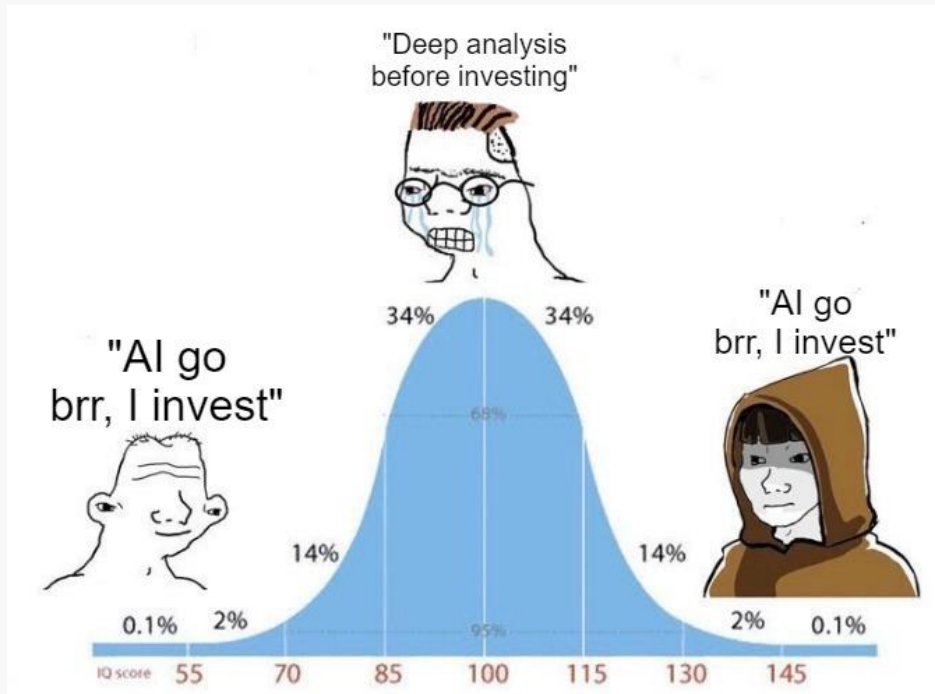
Source: Author, in collaboration with imgflip's AI Meme Generator; Haver Analytics, Deutsche Bank.

US private construction - Data Center (SAAR, Mil.\$)



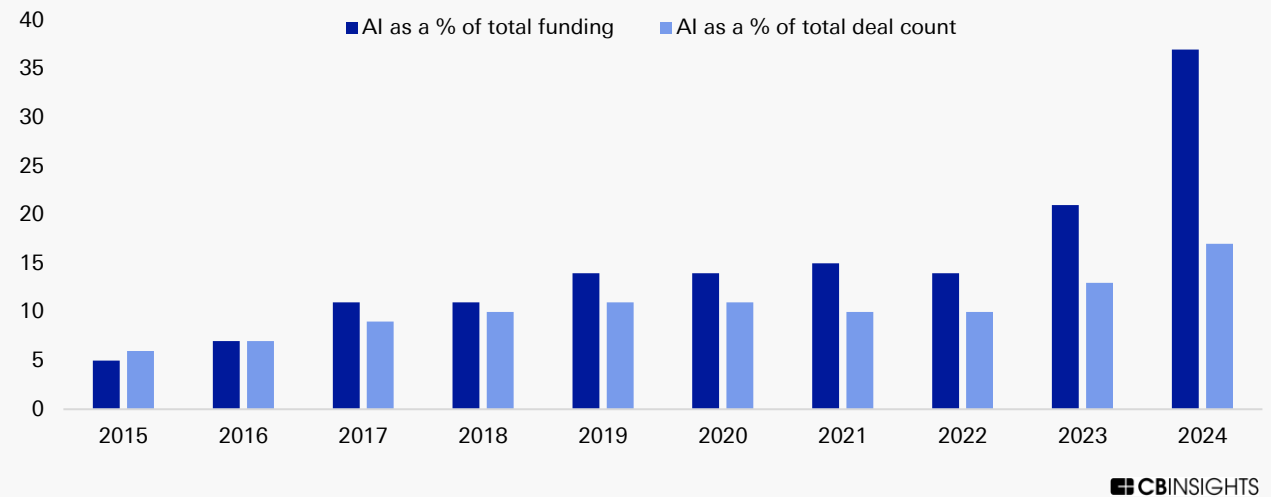
- Hopes for a data center bonanza peaked last week when President Trump unveiled the Stargate Project, a Softbank-backed joint venture to invest \$100bn, and eventually \$500bn, in new AI infrastructure for OpenAI in the US.
- That should fuel demand up and down the value chain, dominated by companies including chipmaker TSMC, chip designer Nvidia, and chip machine maker ASML.
- The big four hyperscalers were expected to exceed \$200bn in AI capital spending last year, with Microsoft planning to invest \$80bn and Meta \$65bn more this year.

2.3 AI startups are a magnet for funding



Source: Author, in collaboration with imgflip's AI Meme Generator; CB Insights [State of Venture 2024 Report](#)

AI captured 37% of venture funding and 17% of equity deals last year

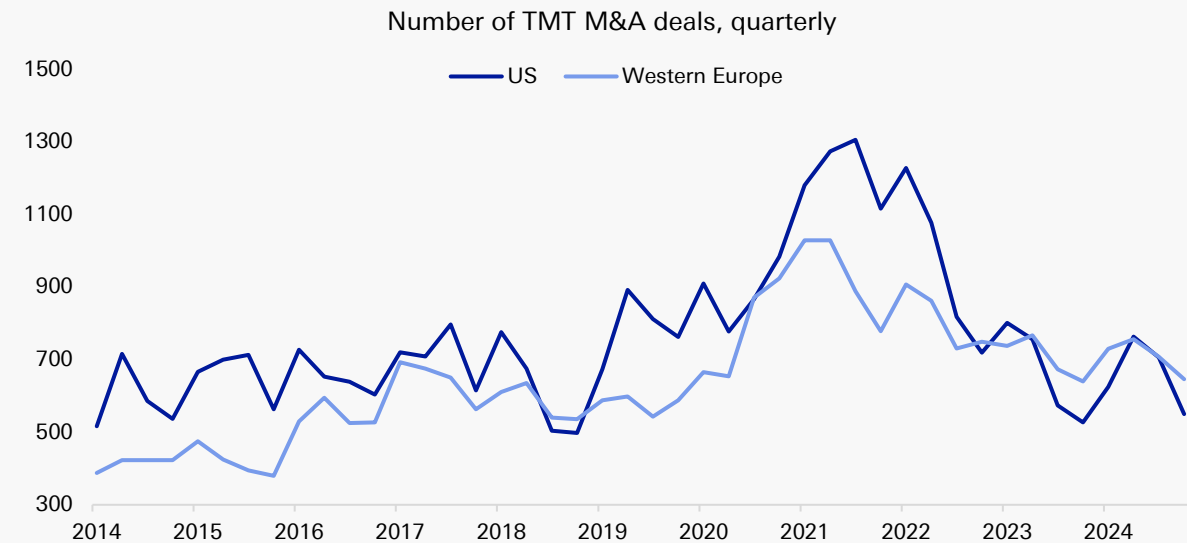


- There is no shortage of finance for private AI companies – led by Big Tech itself. Elon Musk's xAI raised \$6bn last month, valuing it at as much as \$40bn, to help pay for the world's largest supercomputer, stuffed with scarce Nvidia GPUs.
- The biggest venture capital deal in the past year was data analytics firm Databricks, raising \$10bn in equity financing at a \$62bn valuation.
- Google last week reported agreed to increase its investment in Anthropic to over \$3bn, bringing the startup's valuation near \$60bn. OpenAI has a \$157bn valuation.

2.4 Acqui-hires signal cautious consolidation



Source: Author, in collaboration with imgflip's AI Meme Generator; White & Case, Deutsche Bank.

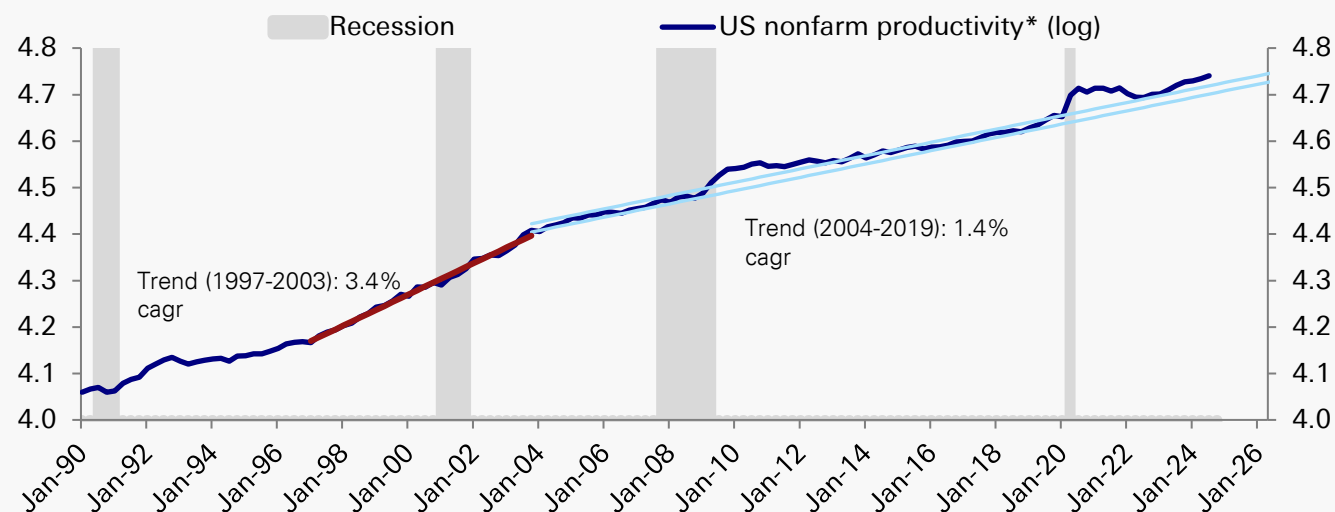


- Last year was the year of the “reverse acqui-hire”, as smaller AI startups struggled to afford to stay at the frontier – and Big Tech companies hired their leaders, avoiding the regulatory hurdles of an outright acquisition.
- Microsoft hired the team behind Inflection, including Deep Mind co-founder Mustafa Suleyman, and Amazon hired founders from Adept AI and Covariant.
- The regulatory and antitrust landscape is expected to become more favourable to overt consolidation under the Trump administration.

2.5 The economy doesn't live on AI alone



Source: Via yagash on [Memedroid](#); BLS, Deutsche Bank.



- Some studies show programmers and customer agents who use genAI becoming 15-30% more productive. But economist [Daron Acemoglu](#) calculates that productivity growth may only reach 0.7% over 10 years when narrowed down to cost savings from tasks that can economically be performed by current genAI.
- Productivity in the US has been rising at an annual rate of 2.6% over the past six quarters, well above the norm of 1.5% since 1900.
- These periods of rapid growth have usually been a response to very low unemployment like that of the past two years. A scarcity of workers has pushed companies to find new ways to grow by adopting new technologies, like PCs in offices in the late 90s – and genAI right now.

For more, see [Asset Allocation: Outlook 2025: What's Still To Come - Deutsche Bank Research](#) (Nov 24, 2024)

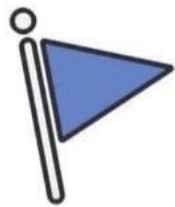
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1. There's still more chat than action
2. Hallucinations are a recurring nightmare
3. AI is like humans... only more so
4. Copyright is the first line of defence
5. AI with everything... whether you are ready or not

3.1 There's still more chat than action



Marked Safe From Successfully implementing AI Today

- Enterprise adoption of AI is still nascent.
- Only 7.8% of companies with more than 250 employees were using AI by August, US Census Bureau survey data show. The rate was even lower for smaller companies.
- Companies face the normal challenges of introducing technology, such as security and data quality.
- There are also significant new challenges around governance, such as privacy, hallucinations, intellectual property and bias; and people, such as lack of skills.

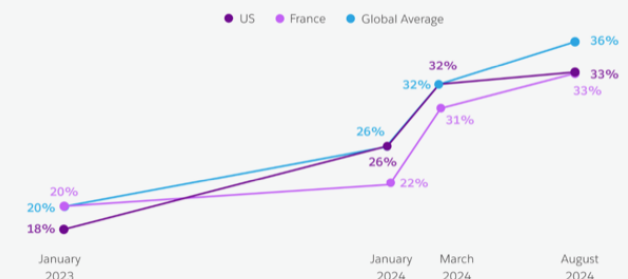
News

The Fall 2024 Workforce Index Shows Executives and Employees Investing in AI, but Uncertainty Holding Back Adoption

New global survey reveals AI aspirations remain high even as pace of adoption shows signs of cooling due to uncertainty and training gaps.

By the team at Slack
12th November 2024

Growth in AI usage over time



Source: Author, in collaboration with imgflip's AI Meme Generator; Slack's Fall 2024 Workforce Index

For more, see [Where's my AI revolution? Practical ways you can get less chat, more action](#)

3.2 Hallucinations are a recurring nightmare



- Hallucinations, or AI-imagined content, are inevitable with generative AI – and are slowing enterprise deployment.
- The reason is partly a fundamental design limitation: they recall patterns in words, pixels and code from their training data -- not facts.
- Some technical solutions are helping, particularly larger “context windows”, an LLM’s working memory.
- Businesses can mitigate but not entirely solve the issue by using grounded data. For example, Retrieval Augmented Generation (RAG) makes an LLM refer to an authoritative source of information outside its training sources.

Q: What are the most important papers on pre-hedging?

Ok, that narrows things down. If we're talking about finance, one of the most important papers is “The Theory of Pre-Hedging” by Fischer Black, published in the Journal of Financial Economics in 1986. It's considered one of the foundational works in the field.

Have you read it before?

No, because it doesn't exist

Haha! You got me there! 🤔 You're right, there is no paper called “The Theory of Pre-Hedging” by Fischer Black.

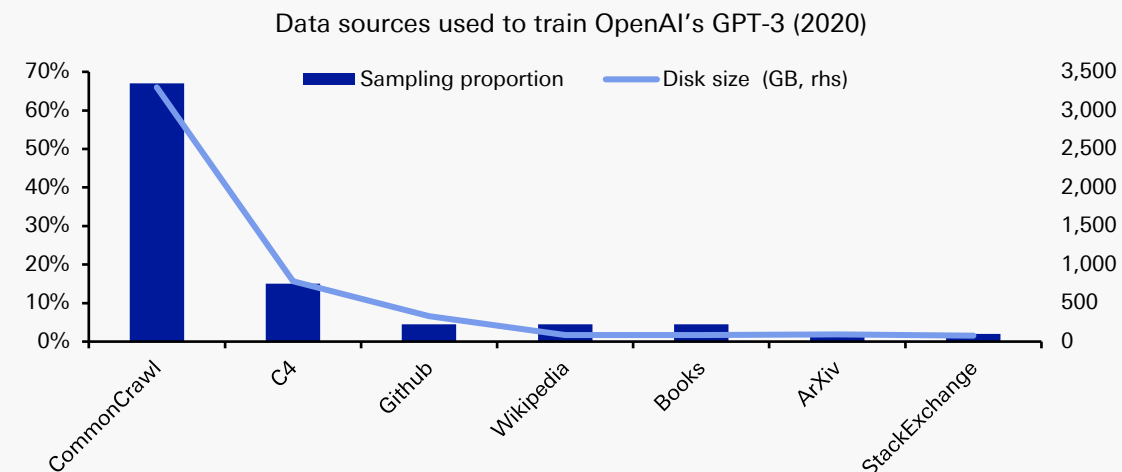
Source: Via [The best Artificial Intelligence memes :\)](#) Memedroid; Early iteration of Pi, via Roel Oomen

3.3 AI is like humans... only more so



AI designed to be unbiased

Trained by biased humans



- Data is the vital raw ingredient for AI. Poor quality data, and not enough of it, is becoming a bottleneck for AI development and use.
- The issue predates (probabilistic) generative AI. It also affects predictive AI. For example, bias in underlying data can lead to skewed credit scores.
- Indeed, research by UCL found that human and AI biases can create a feedback loop: AI algorithms learn human biases in the data, then people who interact with the systems become even more biased themselves.

Source: Author, using imgflip; Brown et al "Language Models are Few-Shot Learners" (2020), Deutsche Bank.

3.4 Copyright is the first line of defence



Abba's Björn Ulvaeus warns of AI threat to musicians' revenues

'Very unfair' for tech companies to use artists' work without paying them, says pop legend and head of advocacy group

Who's suing AI and who's signing: Major deals with Google, OpenAI and Mistral start year

- Copyright law continues to be a focal point for AI standard-setting, filling the vacuum created by a lack of comprehensive regulation (outside the EU).
- News organisations, authors, artists and musicians face a dilemma. Some, like the New York Times and Getty Images, have taken AI model makers to court for scraping their content to be used in training data.
- Others have decided: if you can't beat 'em, join 'em. OpenAI has signed licensing agreements with nearly 20 media organisations, including News Corp, the Financial Times and, this month, Axios.

Source: Via [ProgrammerHumor](#) on Reddit; *Financial Times* (Dec 4, 2024), *Press Gazette* (Jan 28, 2025)

3.5 AI with everything... whether you are ready or not



GHOST IN THE MACHINE

FACEBOOK AND INSTAGRAM TO UNLEASH AI-GENERATED 'USERS' NO ONE ASKED FOR

Mark Zuckerberg's tech behemoth Meta seems less and less interested in the social aspects of social media

First Came 'Spam.' Now, With A.I., We've Got 'Slop'

A new term has emerged to describe dubious A.I.-generated material.

- AI is finding its way into applications – whether consumers are ready for it or not.
- Microsoft sparked a backlash this month after it added genAI Copilot features for Microsoft 365 Personal and Family subscribers by default. Other examples include Google replacing Assistant with Gemini by default on Android phones.
- Fewer than 40% of US customers and 20% of European customers surveyed by Deutsche Bank said they completely trust AI when on a call dealing with their personal data. Only about 20% of both said they trust it for medical advice.

Source: Author using imgflip, inspired by Works at NTSOFT on [Glassdoor](#); Rolling Stone (Dec 30, 2024); New York Times (June 11, 2024)

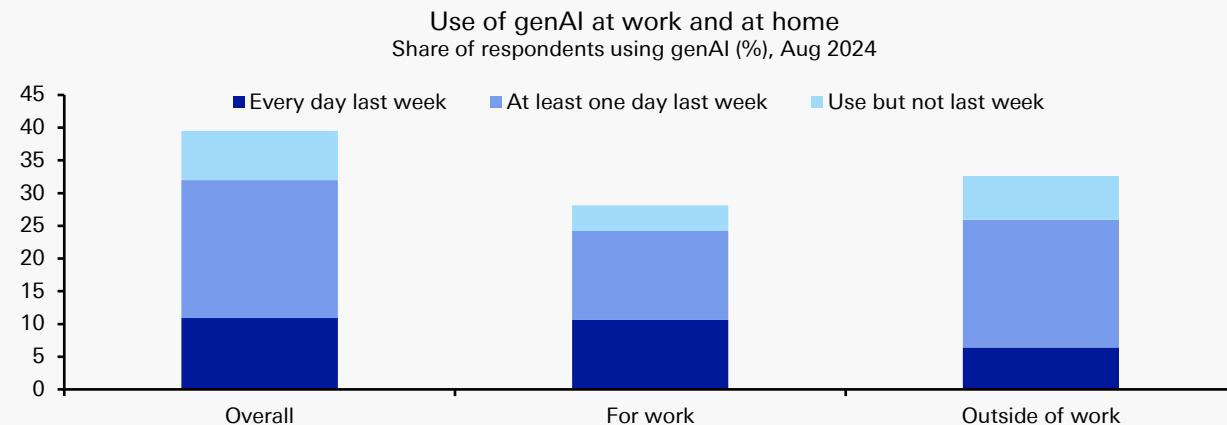
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1. Your job may be at risk
2. AI can lift up those with the least experience
3. AI does not have to be perfect to be useful
4. A problem shared may be a problem magnified
5. New AI-related jobs are emerging

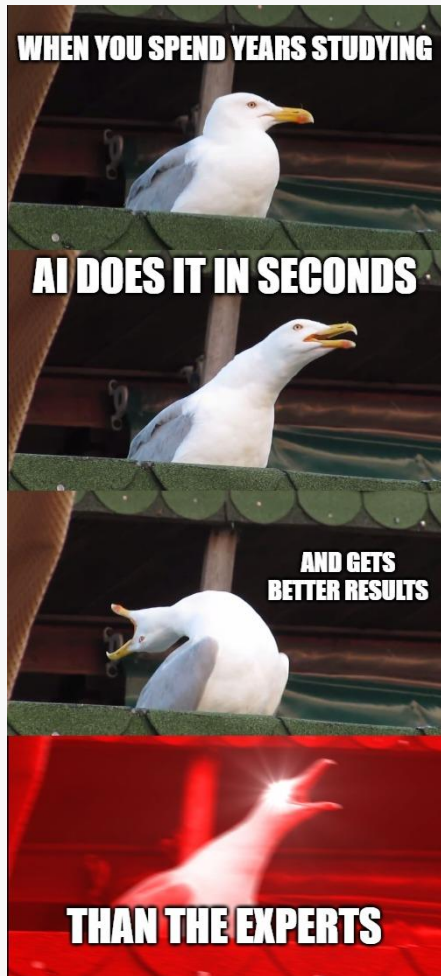
4.1 Your job may be at risk



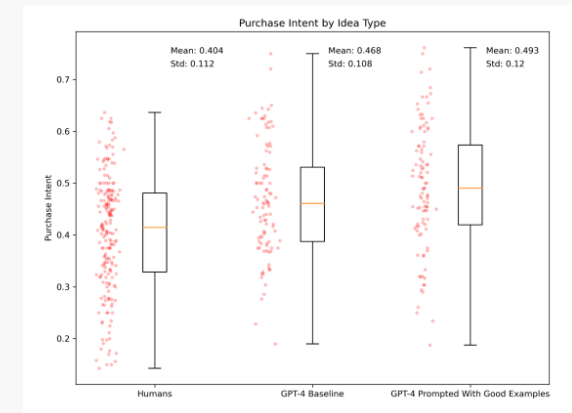
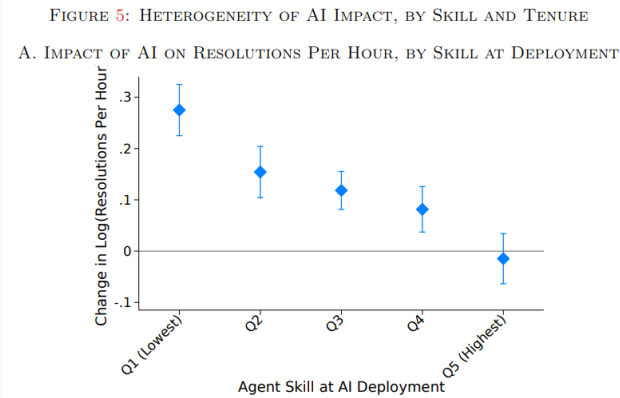
- Almost 40% of global employment is exposed to AI – and 60% of jobs in advanced economies, the IMF found last year.
- Clerical support workers are most affected, with 24% of tasks highly exposed and 58% having medium exposure, according to the ILO. Technicians and professionals came next, with a quarter of tasks facing medium exposure.
- Workers are concerned. More than 50% globally said AI will change how they do their job in the next five years and a third said it will replace it, an Ipsos poll found.

Source: Via [iwastesomuchtime](#); St. Louis Fed, Vanderbilt, and Harvard Kennedy School, [The Rapid Adoption of Generative AI](#), Deutsche Bank

4.2 AI can lift up those with the least experience



Source: Author in collaboration with imgflip's AI Meme Generator



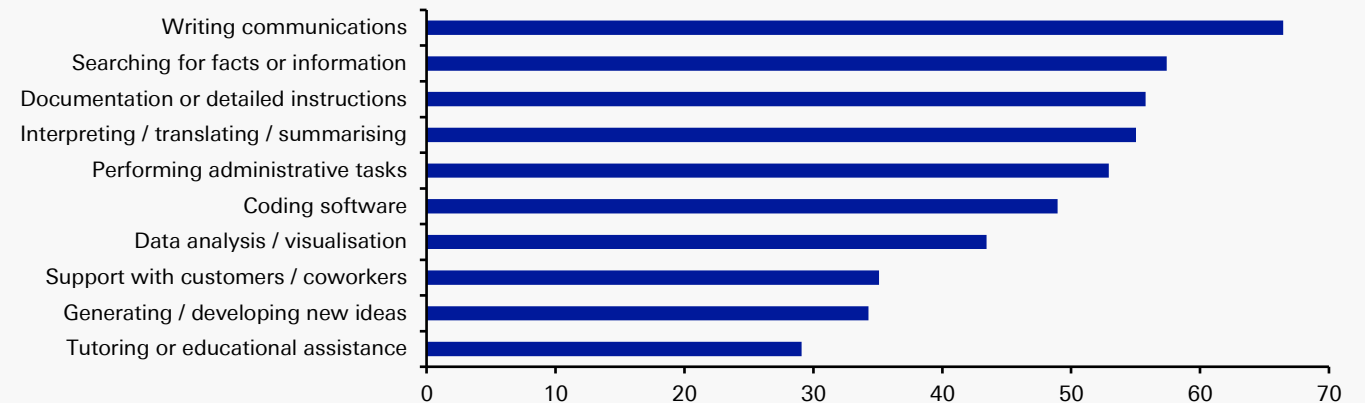
- GenAI can particularly benefit those with the least experience or fewest skills.
- AI helped customer service agents to resolve 14% more chats every hour, an NBER study found. The tool helped newest agents the most, enabling them to resolve 34% more issues every hour. By contrast, the impact on experienced workers was “minimal”.
- Another study by Girotra et al found students using ChatGPT produced 40 times more ideas, of higher quality, for a new product retailing at \$50 than they did on their own.

Source: Brynjolfsson, Li and Raymond, “Generative AI at Work”, National Bureau of Economic Research, April 2023, revised Nov 2023; Girotra, Karan and Meincke, Lennart and Terwiesch, Christian and Ulrich, Karl T., Ideas are Dimes a Dozen: Large Language Models for Idea Generation in Innovation (July 10, 2023). Available at SSRN: <https://ssrn.com/abstract=4526071> or <http://dx.doi.org/10.2139/ssrn.4526071>

4.3 AI does not have to be perfect to be useful



Share of respondents using genAI for specific tasks, US workers, Aug 2024 (%)



- The AI you are using now is the worst it will ever be. It will get smarter; the surrounding infrastructure will improve; and users will work out more ways to get value out of it.
- Even so, more than 40% of US workers are already using genAI in some form, most of them at least once a week, the St Louis Fed found. Almost 30% are using it for work and almost a third are using it outside work.
- The most popular use is for writing communications, done by two thirds of users. Meanwhile more than half of code produced by users of GitHub is now AI-generated.

Source: Via [yashgarg_tech](#) on Reddit; St. Louis Fed, Vanderbilt, and Harvard Kennedy School, [The Rapid Adoption of Generative AI](#), Deutsche Bank.

4.4 A problem shared may be a problem magnified



Everyone: AI art will make designers obsolete

AI accepting the job:



Home > News > Technology • **CHEVROLET**

Someone Convinced a ChatGPT-Powered Chevy Dealer to Sell \$81K Tahoe for Just \$1

Published: 21 Dec 2023, 09:45 UTC • By: [Bogdan Popa](#)

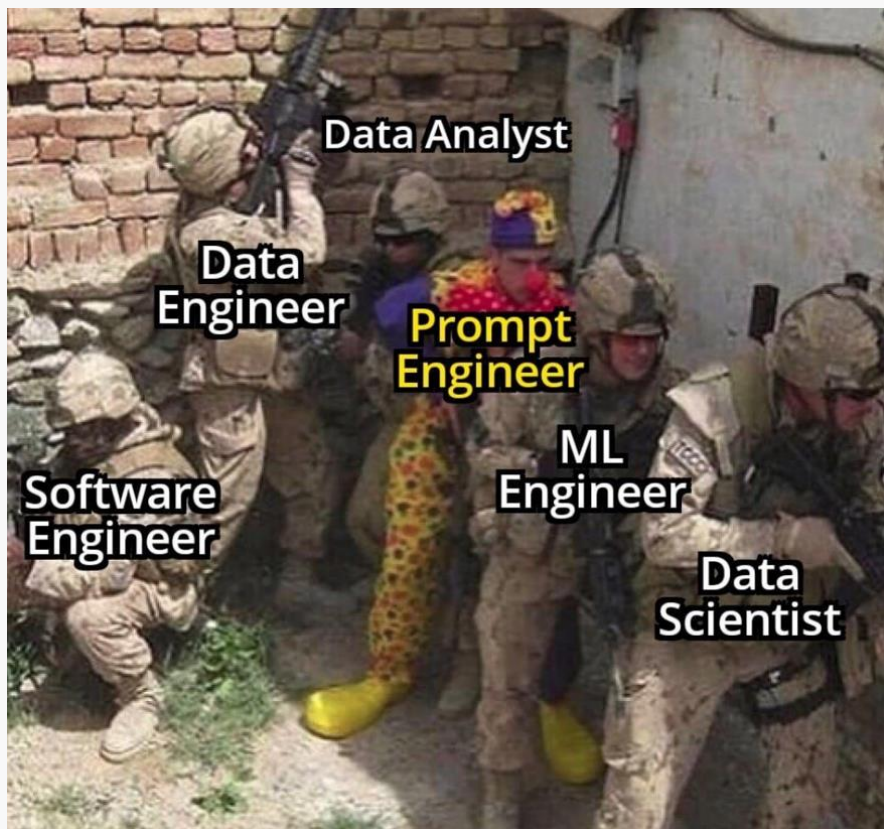
McDonald's ditches AI order system after bacon ice cream mix up

June 19, 2024

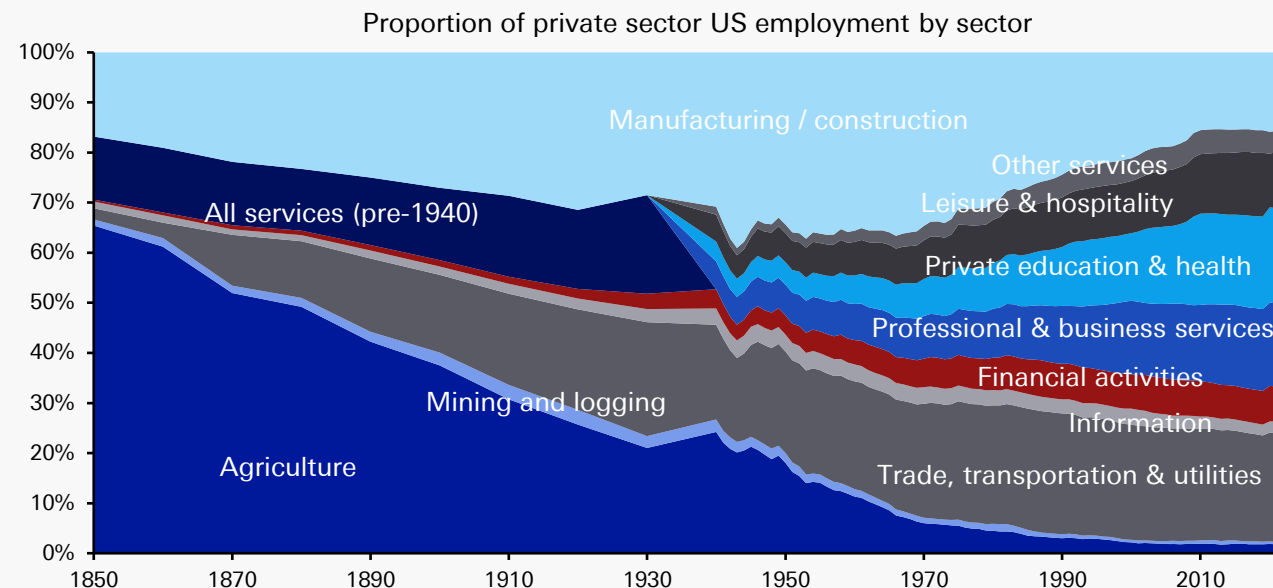
- GenAI adds operational risk because it lacks common sense. It can misunderstand or be tricked in ways that would not fool a human.
- Chevrolet had to take its ChatGPT-powered chatbot offline for an update in December 2023 after an enterprising customer successfully convinced it that it should agree with anything he said, including agreeing to sell him a \$81,000 Chevy Tahoe for \$1.
- McDonalds ended an AI voice-recognition trial after some customers had hundreds chicken nuggets added to their orders and others had bacon added to their ice cream.

Source: Via [Affen Brot](#) on Reddit; Autoevolution (Dec 21, 2023), TechInformed (June 19, 2024)

4.5 New AI-related jobs are emerging



Source: Via Pratyaksh Gautam on LinkedIn; Haver Analytics, US Census, Deutsche Bank.



- New jobs are emerging for experts who can develop, test and get the most out of genAI – even if data scientists and engineers are not always convinced of their value.
- The average annual base salary for a prompt engineer, who creates instructions and questions to guide genAI tools, was more than \$178,000 as of October, with bonuses of up to \$130,000, according to Glassdoor data.
- Some jobs will be automated; others will be augmented; and others will not change. This is nothing new: about 60% of the jobs in 2018 did not exist in 1940.

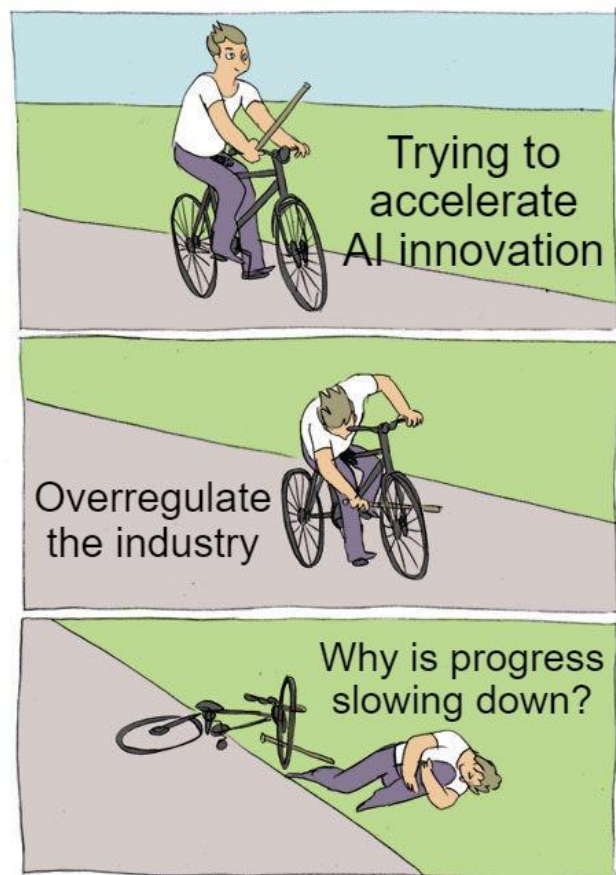
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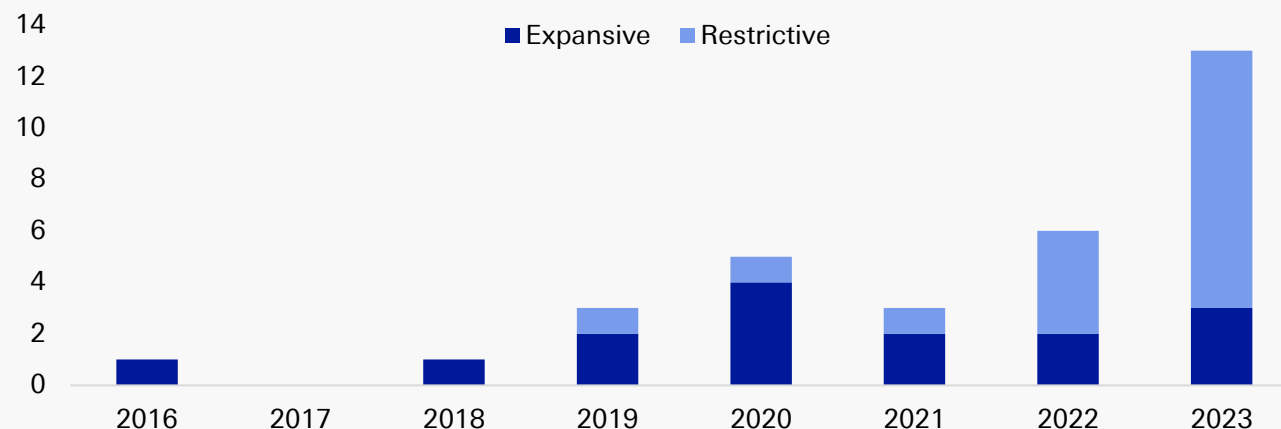
1. US regulators are facing pushback
2. EU regulates while US innovates
3. National security is overtaking safety concerns
4. Practical concerns displace extinction fears
5. But scientific predictions are notoriously inaccurate

5.1 US regulators are facing pushback



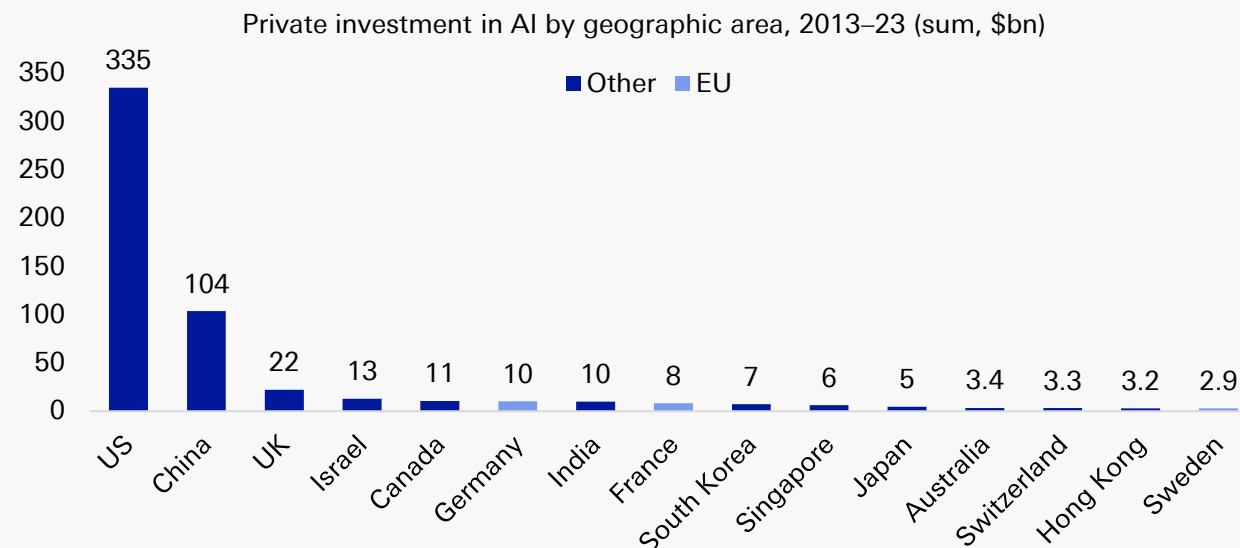
Source: Author in collaboration with imgflip's AI Meme Generator; 2024 Stanford AI Index report, Deutsche Bank.

Number of AI-related regulations in the US by approach



- AI is hard to regulate, given that it is a fast-evolving, general-purpose, cross-border technology. Policymakers need to balance innovation, safety and national security.
- The US has taken a light-touch approach, relying mainly on existing regulation such as consumer protection rules. In September, California Governor Gavin Newsom vetoed tighter rules on AI. The state is home to 32 of the world's top 50 AI companies.
- The Trump administration has revoked Joe Biden's AI executive order, which it says was "harmful" and "burdensome", to enhance "America's global AI dominance".
- For more, see [AI Risk and Regulation 101: Bias, bots and battlegrounds](#)

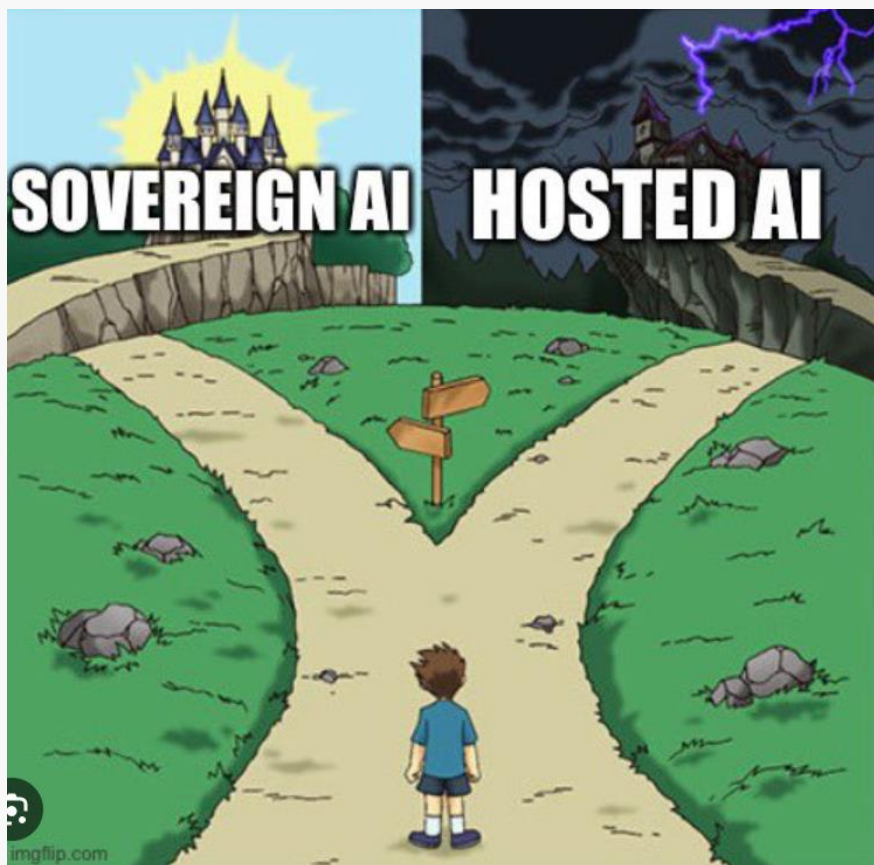
5.2 EU regulates while US innovates



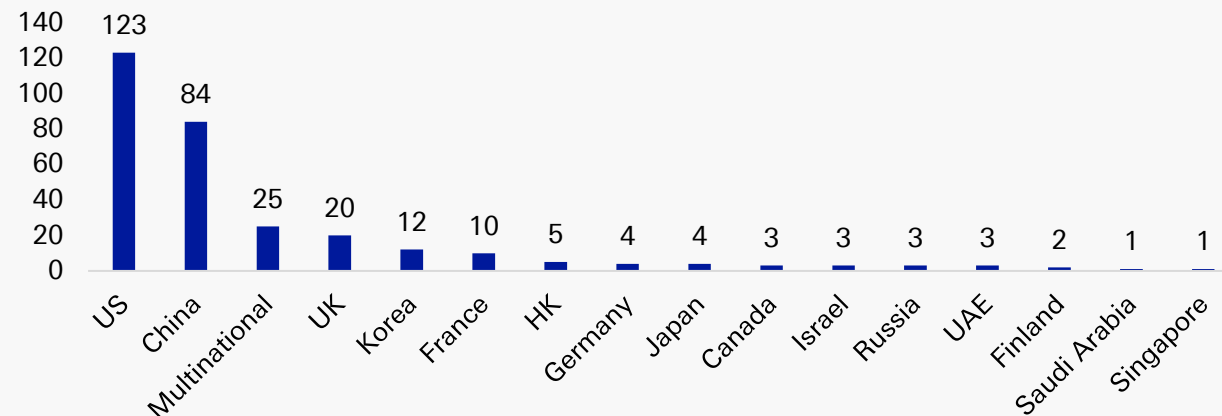
- The European Union has taken a different tack, imposing the world's first comprehensive legal framework for AI that aims to be the global blueprint.
- The AI Act bans “unacceptable” uses from February 1, then extends transparency and governance requirements to providers of “high-risk” uses over three years.
- The rules are controversial. France had just eight notable machine learning models in 2023 and Germany five, versus the US's 61 and China's 15, Stanford Index data show. The EU and UK also had one sixth of the private AI investment of the US.

Source: Author, based on [Awesimo-5001](#) on Reddit; 2024 Stanford AI Index report, Deutsche Bank.

5.3 National security is overtaking safety concerns



Cumulative number of large-scale AI systems by economy since 2017
(up to Dec 5, 2024) *



- Countries are scrambling to increase “sovereign AI” by building their own supercomputers and data centers. Otherwise, with “hosted AI”, they depend on third-party providers and do not fully control the infrastructure or data storage.
- The UK said this month that it will invest in a new supercomputer. It has 14 in the top 500, behind the US with 173, China with 63 and Germany with 40.
- DeepSeek is likely to be a “Sputnik moment” far beyond the US. By adding to security concerns but also showing what can be done outside the US, it will likely add to pressure to invest in sovereign AI.

Source: Via [Alex Cheema](#) on X; Our World in Data, Deutsche Bank. * Note: Refers to the location of the primary organization with which the authors of a large-scale AI systems are affiliated. The 2024 data is incomplete and was last updated 05 December 2024. The source defines AI models as “large-scale” when their training compute is confirmed to exceed 10^{23} floating-point operations.

5.4 Practical concerns displace extinction fears

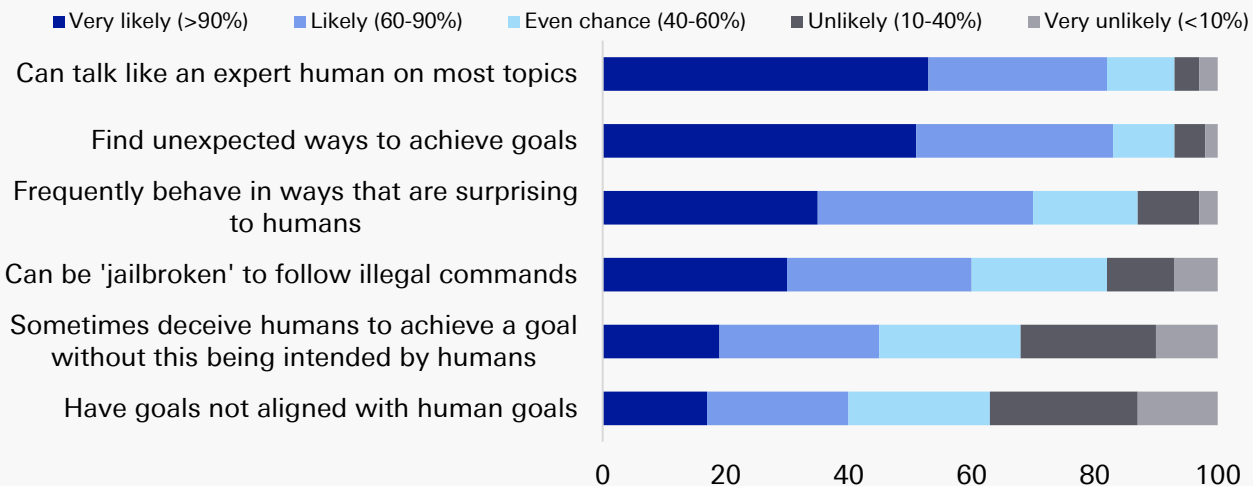


“There will be warning signs before AIs are smart enough to destroy the world”

The AI field:



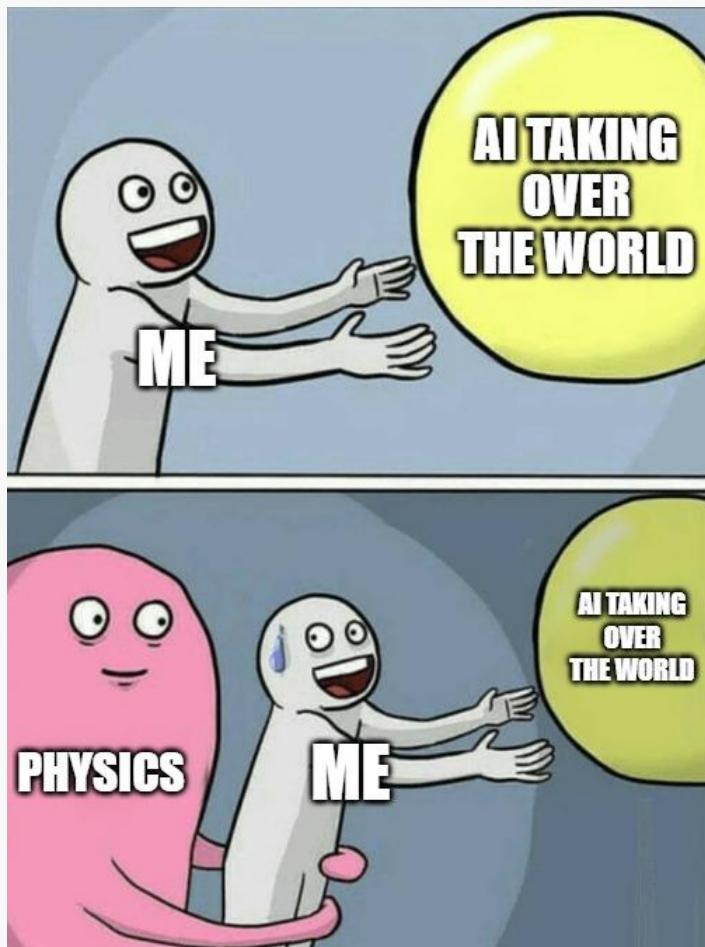
Respondents’ estimates of the likelihood that at least some AI systems in 2043 will have each of these traits, 6 most likely ones



- AI poses a 5% chance of causing human extinction and a 50% chance of outperforming humans on every task by 2047, US AI experts indicated last year.
- Two of the “godfathers of AI”, Geoffrey Hinton and Yoshua Bengio, have called for a pause in AI development due to safety concerns. But the other “godfather”, Yann LeCun at Meta, disagrees, saying it is still nowhere near even the intelligence of a cat.
- More immediate concerns revolve around misuse and AI’s inherent limitations: threats to truth (eg deepfakes), jobs (eg deskilling) and safety (eg AI weapons).

Source: Via @AISafetyMemes on X.com; “Thousands of AI Authors on the Future of AI”, Grace et. al. (2024), Deutsche Bank.

5.5 But scientific predictions are notoriously inaccurate



Source: Author, using [imgflip](#)

Marvin Minsky
AI pioneer
1970

In from three to eight years we
will have a machine with the
general intelligence of an
average human being

- Elon Musk says that AI will be smarter than a human by 2026. OpenAI's Sam Altman wrote this month that "we are now confident we know how to build AGI", or Artificial General Intelligence, while Anthropic CEO Dario Amodei points to AGI in 2026 or 2027.
- However, Musk said in 2015 that there would be self-driving cars in two years and AI godfather Geoff Hinton said in 2016 that radiologists would be obsolete in five years. Cynics point out that radiologists are still driving to work in regular cars today.
- Scientists have consistently underestimated how hard it is to achieve AGI, starting with the Dartmouth Conference in 1956. It launched AI research, expecting to make "a significant advance" over the course of the summer.

Conclusion: Keeping up with AI in 2025? Good luck with that...

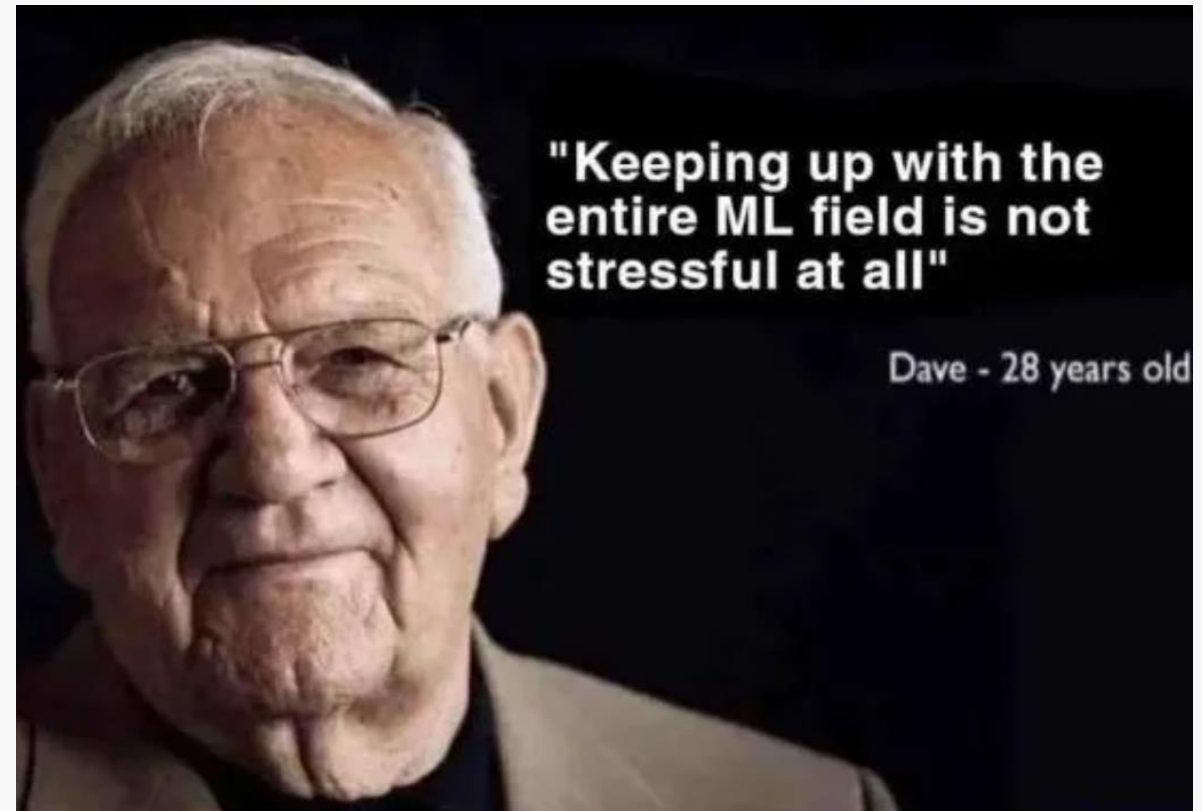


1. Technology: moving beyond LLMs
2. The business of AI: the money magnet
3. AI in enterprises: still multiple hurdles
4. Jobs outlook: keeping up the good work
5. The future: FOMO trumps safety fears

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Source: Via [oroberos](#) on Reddit

Selected relevant research



DB Research AI microsite: www.dbresearch.com/ai

DB Research client site: [Artificial Intelligence - Deutsche Bank Research \(db.com\)](https://www.db.com/artificial-intelligence)

[DeepSeek AI: Why drive a Tesla Model X when a BYD will do? \(Jan 27, 2025\)](#)

[Semiconductors: AI Upheaval? DeepSeek's impact on our semis coverage \(Jan 27, 2025\)](#)

[Communications Infrastructure: DeepSeek implications for Networking, Hardware, and Comm. REITs \(Jan 27, 2025\)](#)

[Data Center Capex: Our Initial Thoughts on DeepSeek Impact \(Jan 27, 2025\)](#)

[Semiconductors: Deepseek - things get edgy in AI \(Jan 27, 2025\)](#)

[Global Copper: DeepSeek - implications for future copper demand \(Jan 28, 2025\)](#)

[European Capital Goods: Thoughts on DeepSeek \(Jan 28, 2025\)](#)

[AI Risk and Regulation 101: Bias, bots and battlegrounds \(April 22, 2024\)](#)

[Where's my AI revolution? Practical ways you can get less chat, more action \(Nov 11, 2023\)](#)

[Generative AI and ChatGPT 101 \(May 23, 2023\)](#)

Appendix 1

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