Deconstructing DeepSeek's AI disruption

Lessons for the EU

→ DeepSeek's launch of its open-source AI-powered chatbot app will lead to a future in which AI is more accessible and less monopolistic while reducing negative environmental impact.

→ Its impressive results reveal that advanced research can lead to the discovery of new, more efficient, and sustainable AI models and underscore that EU plans to create large European AI champions with public money were misguided.

Introduction

DeepSeek's launch of V3, an open-source AI-powered chatbot app, on 10 January rocked the global technology industry. The Chinese start-up produced a more cost-effective and more sustainable model using less advanced chips that matched the performance of others on the market. It also open-sourced its system, allowing public study and use.

The unveiling of DeepSeek's V3 model shattered the notion that only well-resourced tech companies like Microsoft, Google, and Meta could afford to build advanced AI. DeepSeek V3 reportedly costs $5.6 million to train, while ChatGPT-4 exceeded $100 million.[1] Unlike competitors, who used 16,000 chips to train their chatbots with supercomputers,[2] DeepSeek used 2,000 Nvidia H800, a less advanced chip,[3] stockpiled before U.S. government export controls to China tightened in October 2023.[4]

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OpenAI has accused DeepSeek of distilling its GPT-4 knowledge and violating its Terms of Service and property rights. DeepSeek contends that distillation is common, and OpenAI has not provided evidence of intellectual property theft. The case represents the growing challenge of balancing AI innovation, intellectual property rights, and ethics as these accusations will likely be difficult to prove in court.

DeepSeek's nearly $6 million in training costs refers only to what it spent to train the final AI version and does not include the complete cycle costs. While there is no evidence to dispute the company's cost claims, DeepSeek likely reported its costs narrowly to boost its claims as the "most economical."[5] DeepSeek claims it utilized several strategies to reduce computation time and

memory storage. It relied on generalists to coordinate expert interactions, used data aggregates instead of raw data, and optimized decimal calculations.[6]

The start-up also demonstrated that high-quality AI can be created with a reduced carbon footprint. Many tech companies do not disclose their carbon footprints due to their high levels, yet DeepSeek reduced its environmental impact by decreasing the computational costs of training and running models.

DeepSeek publicized enough information to enable others to run and adapt its model but not enough to recreate it. The new paradigm allows competitors to build cutting-edge AI models with less money and computing power. It could lead to a day when AI technology is considered a commodity, with companies selling essentially the same product. Proprietary software technology has faced challenges from Chinese technology. This implies it will be more difficult to monetize AI, but it will be easier to develop applications.

Markets react, but no AI crash

Tech stocks fell 5.8 percent on 27 January following DeepSeek's announcement,[7] with Nvidia losing 17 percent and ASML dropping 6 percent.[8] However, the market quickly rebounded the next day, leading to a partial recovery and indicating investor caution about AI-related stock valuations but sustained demand for more advanced chips.

DeepSeek's breakthrough poses a more significant challenge for AI service providers like OpenAI, which, albeit not publicly traded, likely suffered more substantial losses. The announcement also triggered a sell-off of electricity companies near data center hubs, signaling expectations of a shift to more decentralized AI infrastructure.[9]

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Fears of an AI-driven stock bubble persist, and the late-1990s dot-com crash is often compared to it. However, some sources say that current valuations are based on solid earnings, not speculation.[10] Rather than bursting an AI bubble, DeepSeek's entry led to a market correction that may help stabilize future growth. Nevertheless, more time is needed to see what will ultimately happen.

DeepSeek's breakthrough may not yet immediately threaten advanced chipmakers like Nvidia. As AI development becomes faster and cheaper, adoption will expand, boosting demand for high-performance chips. Nvidia's proprietary coding language, Cuda, remains the industry standard, and even leaner AI models still rely on its most powerful chips.[11] Some Chinese tech giants have significantly increased their orders of Nvidia's H20 chip, which is designed for China under U.S. export controls, since DeepSeek's launch.[12] Indeed, Nvidia's profits and revenues soared last quarter due to strong AI chip demand, with sales up 78% to $39.3 billion and net income rising 80% to $22.1 billion, despite concerns over competition from DeepSeek and initial production issues with its new Blackwell chips.[13]

However, DeepSeek's ability to produce a comparable model at one-tenth the cost seriously threatens OpenAI and Anthropic. OpenAI CEO Sam Altman acknowledged the challenge and pledged to accelerate product releases.

The launch of DeepSeek's V3 also casts doubts on the U.S. tech giants' planned $310 billion AI capital expenditures in 2025. Whether these companies will adjust their strategies remains to be seen, but DeepSeek's breakthrough has already forced a rethink.

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EU impact

In some ways, the DeepSeek disruption came at a fortunate time – Europe was planning to invest large sums of public money and DeepSeek has shown this would not have been an optimal strategy.[14] The EU lags behind in AI technology, with the United States and China currently leading the field. At the same time, the EU is taking a more heavy-handed approach to AI regulation, exemplified by the landmark AI Act, which may hinder its ability to close the technology gap. The EU Act disadvantages European companies compared to their global rivals. The recent EU pledge of €200 billion for AI acknowledges the need to boost investment. The EU has pledged €50 billion in public funds for AI development through existing programs, but the remaining €150 billion relies on attracting private investment, which is not yet fully secured. Still, the EU's real opportunity lies in concentrating research and development efforts on AI applications with high social and economic benefits, both at the macro and micro level, using compact systems with moderate computing requirements.[15]

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Conclusion

If history is a guide, the ability to study and design AI models will accelerate technological innovation in large LLMs because they benefit from large training datasets and generalization, or an AI model's ability to apply what it has learned from its training data to new, unseen situations. Specialized AI, like protein design and drug discovery, advances through incremental, domain-specific breakthroughs, thus, the DeepSeek disruption will not have as large of an impact in this space.[16] These other subsets of AI operate in a more constrained, data-limited environment, require scientific accuracy, and face stricter validation procedures. Finally, at the broader level, AI will accelerate change in employment and productivity, opening the potential to unlock immense economic gains.

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Notes

[1] https://www.ft.com/content/ea803121-196f-4c61-ab70-93b38043836e

[2] *Ibid*.

[3] https://www.nytimes.com/2025/01/27/technology/what-is-deepseek-china-ai.html

[4] https://www.bbc.com/future/article/20250131-what-does-deepseeks-new-app-mean-for-the-future-of-ai

[5] https://cyber.fsi.stanford.edu/publication/taking-stock-deepseek-shock

[6] https://www.nytimes.com/2025/02/12/technology/deepseek-ai-chip-costs.html

[7] https://www.reuters.com/technology/tech-stock-selloff-deepens-deepseek-triggers-ai-rethink-2025-01-28/

[8] *Ibid*.

[9] https://www.ft.com/content/5b82cd02-983c-4bce-b1b4-3137d7897c3b

[10] *Ibid*.

[11] https://www.economist.com/leaders/2025/01/29/the-real-meaning-of-the-deepseek-drama

[12] https://www.reuters.com/technology/artificial-intelligence/nvidias-h20-chip-orders-jump-chinese-firms-adopt-deepseeks-ai-models-sources-say-2025-02-25/

[13] https://www.ft.com/content/d634d069-e945-49d8-823c-953ed6c6d278

[14] https://blog.funcas.es/lecciones-de-deepseek-para-la-implementacion-de-la-brujula-de-la-competitividad-europea/

[15] *Ibid*.

[16] https://www.fisclouds.com/the-benefits-of-domain-specific-ai-to-unlock-industry-potential-10744/