The Economics of the AI Boom

Canada’s AI Adoption Imperative

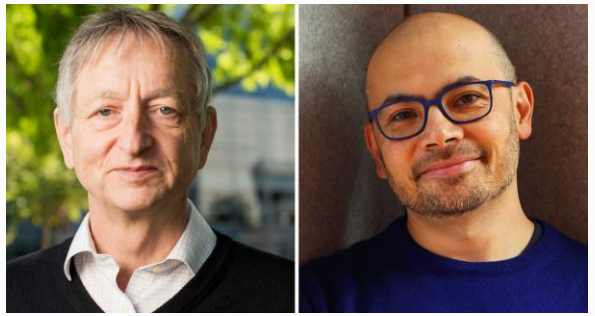
Canada2020

Sean Mullin | September 2025

AI is Everywhere

AI is dominating today's headlines

- ChatGPT is fastest growing consumer app in history
- Gemini (Google) won a gold medal in the International Math Olympiad
- Meta offering $100M+ pay packages for top researchers
- Nobel Prize for Geoff Hinton …. and Demis Hassabis (for Chemistry!)
- NVDIA market cap hits $4 trillion (most valuable company in the world)
- Cohere raises $500MUSD in latest venture round



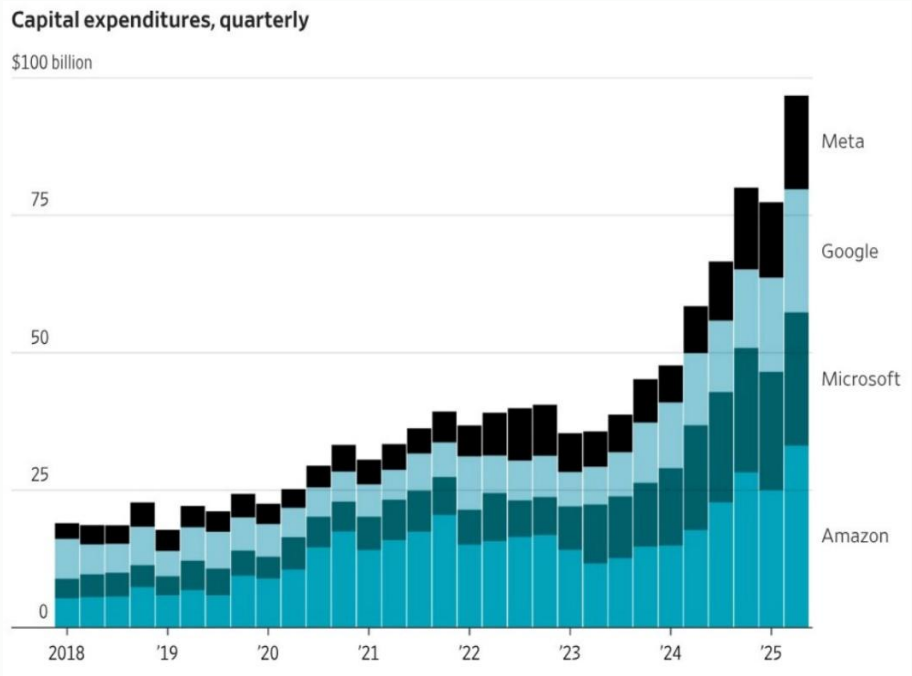
Cohere secures $500 million USD at $6.8-billion valuation, hires former Uber and Meta execs

Macroeconomic Impact

The boom is impacting GDP and driving stock returns

- First half of 2025, the Big Four are estimated to have spent $100B-$200B on AI cap ex in the US
- Estimated to have added 0.5% to US GDP growth (more than consumer spending!)

- Meanwhile, stock market gains are increasingly driven by large AI firms:
  - 60% of the S&P 500's gains over the last two years have been driven by AI-related firms
  - One-third has come from NVDIA alone!

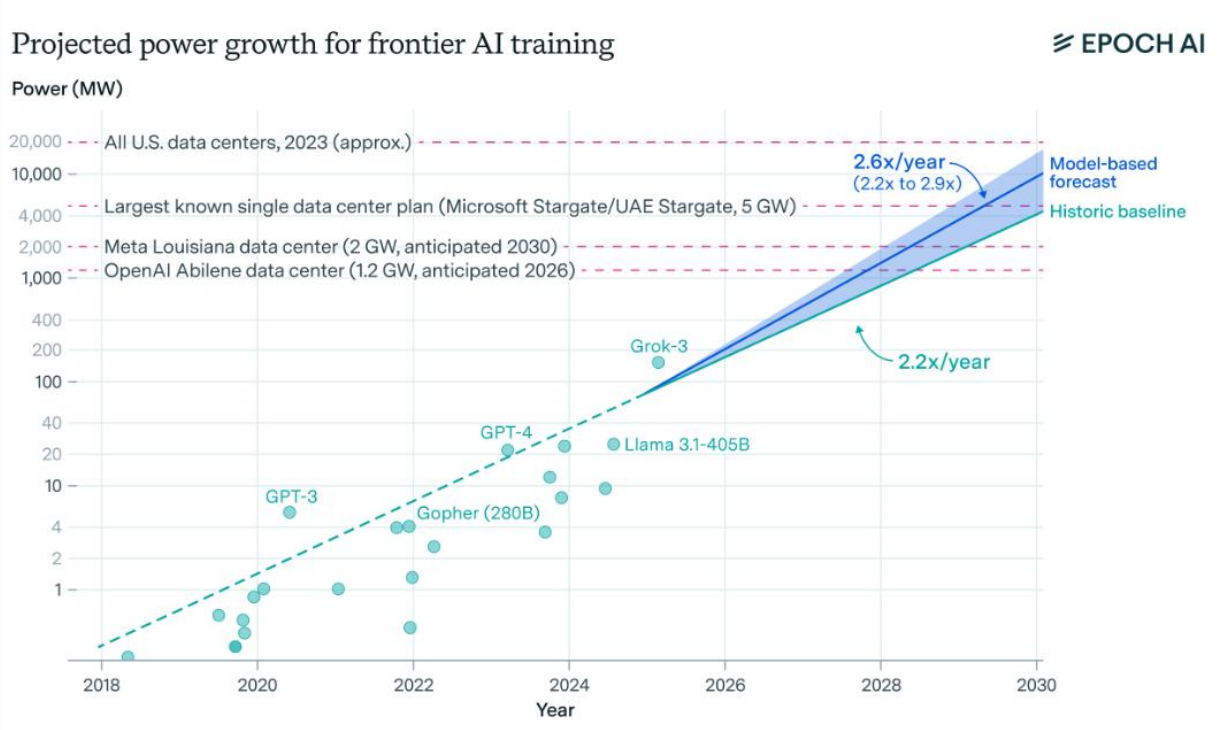


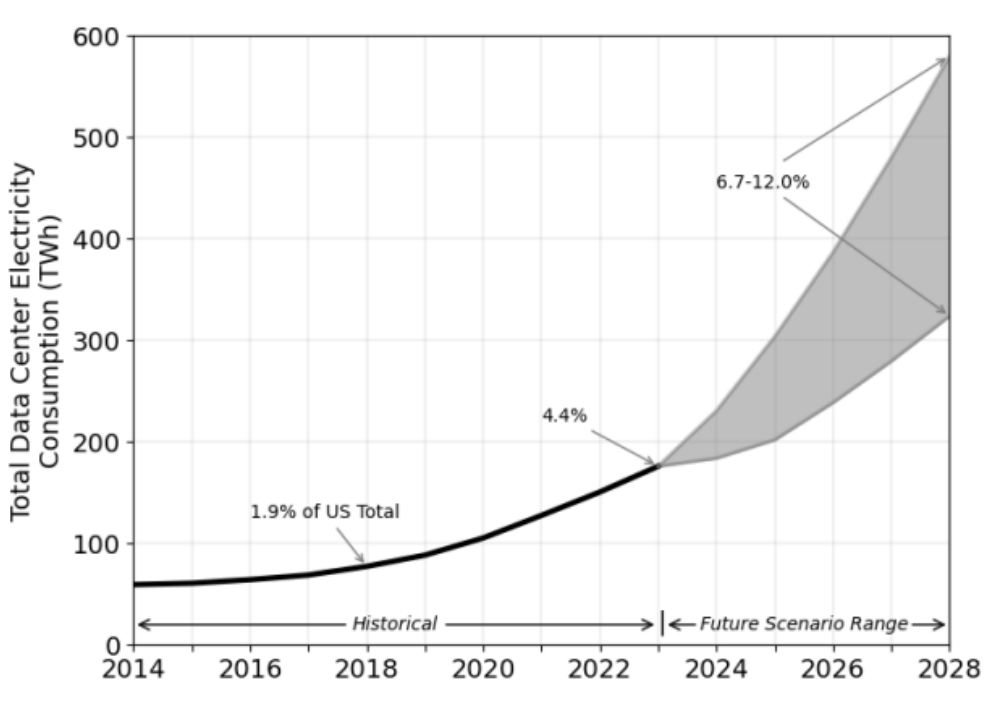
Sources: WSJ, JP Morgan, RBC

Energy and Compute

Demand for compute and energy is skyrocketing

- Model training costs continue to scale exponentially



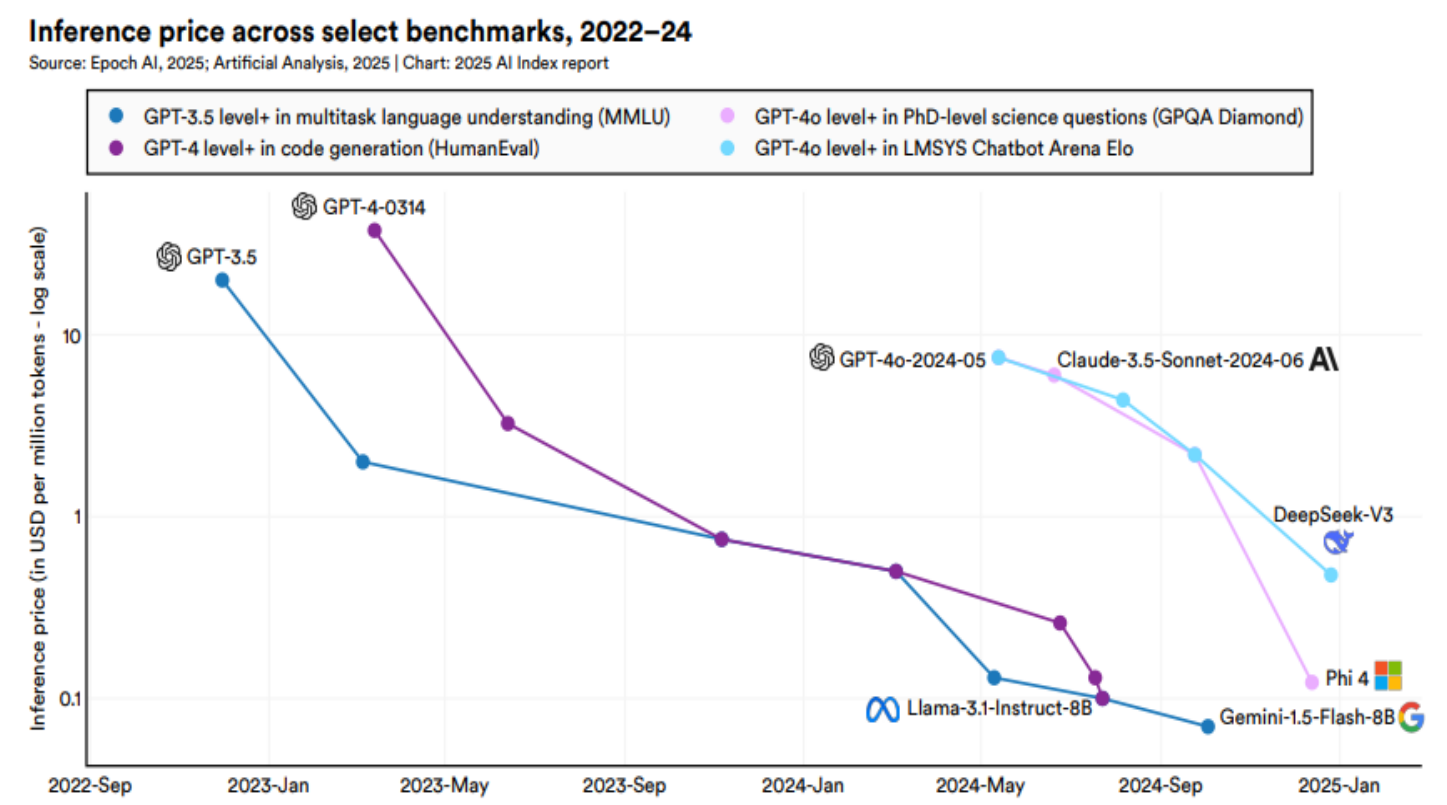


- Leading to an explosion in electricity demand for data centres

Sources: Epoch AI, US Department of Energy

Models are getting cheaper

Cost of intelligence is dropping significantly each year

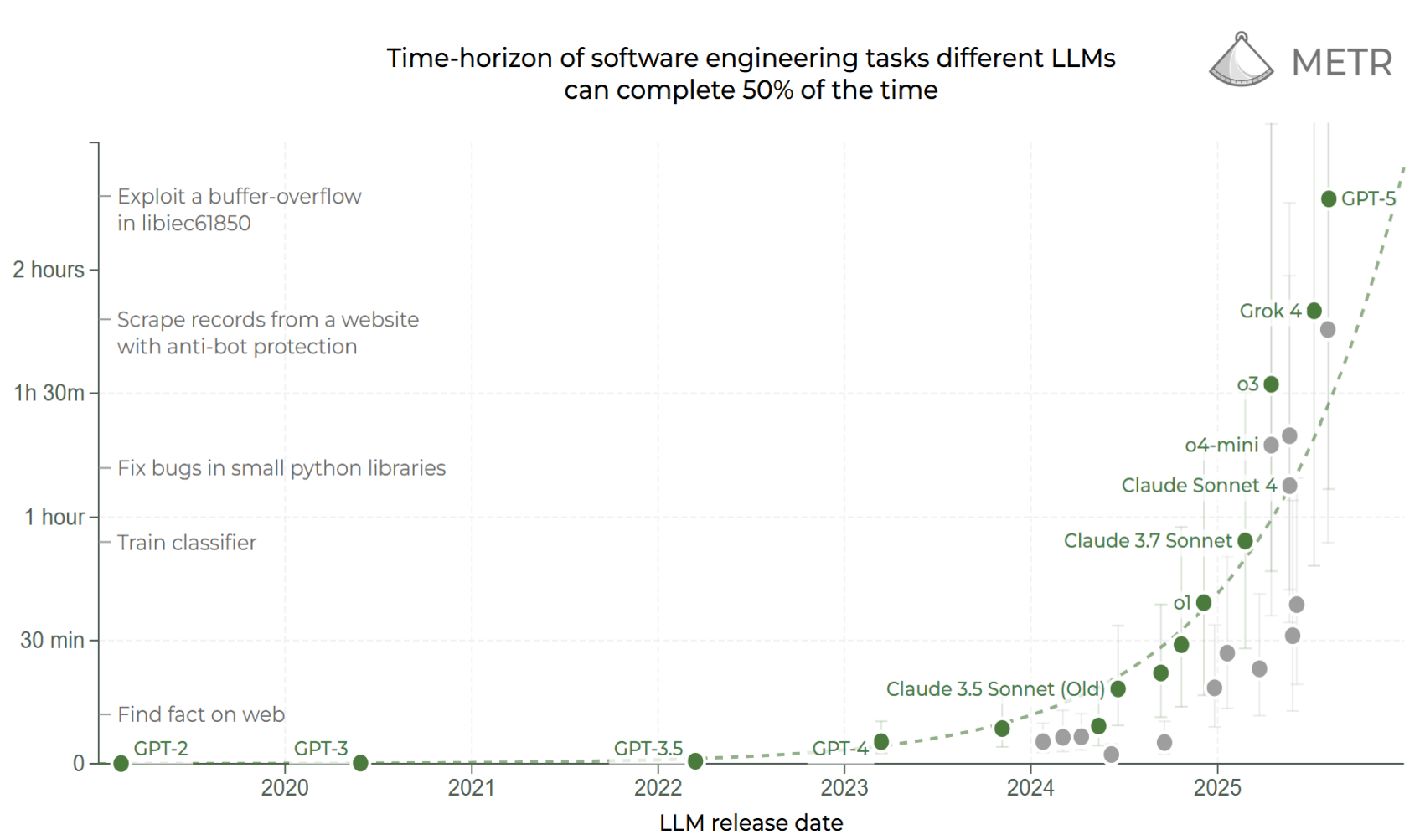


- Cost per token of frontier models has been dropping exponentially
  - **280x price drop** since ChatGPT launched in 2022
- As **price goes down, consumption increases**
- Allowed the emergence of “thinking models” and agentic tools that use much more tokens to produce answers

Sources: Stanford AI Index

Frontier Models Keep Improving

New models capable of increasingly complex tasks



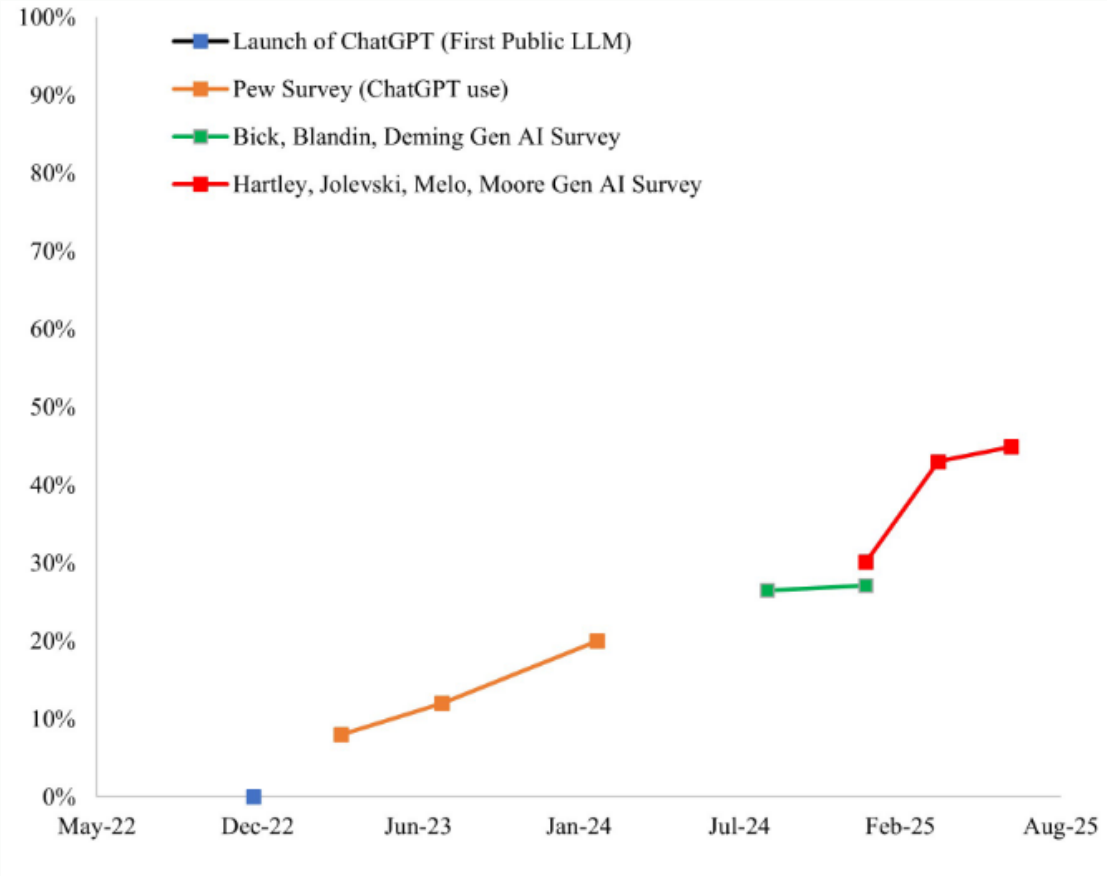
- Length (time) of software tasks LLMs are capable of completing is **doubling every seven months**.
- Current models exceed **human-level** performance on numerous tasks, including: reading comprehension, image recognition, language understanding, handwriting recognition, speech recognition

Sources: METR

AI Adoption

AI increasingly being use by employees and business

- Employees are increasingly using Gen AI tools at work:
  - Usage has increased from 30.1% in Dec 2024 to 45.9% in July 2025 (US)
  - But Canadian usage is lagging the United States (21% versus 45.9%)
- Business adoption measures vary significantly:
  - 78% of US business use AI in “at least one function”
  - 12.2% of Canadian businesses used AI to “produce goods or services” in last 12 months
- Adoption is occurring **faster** than introduction of PC or the internet

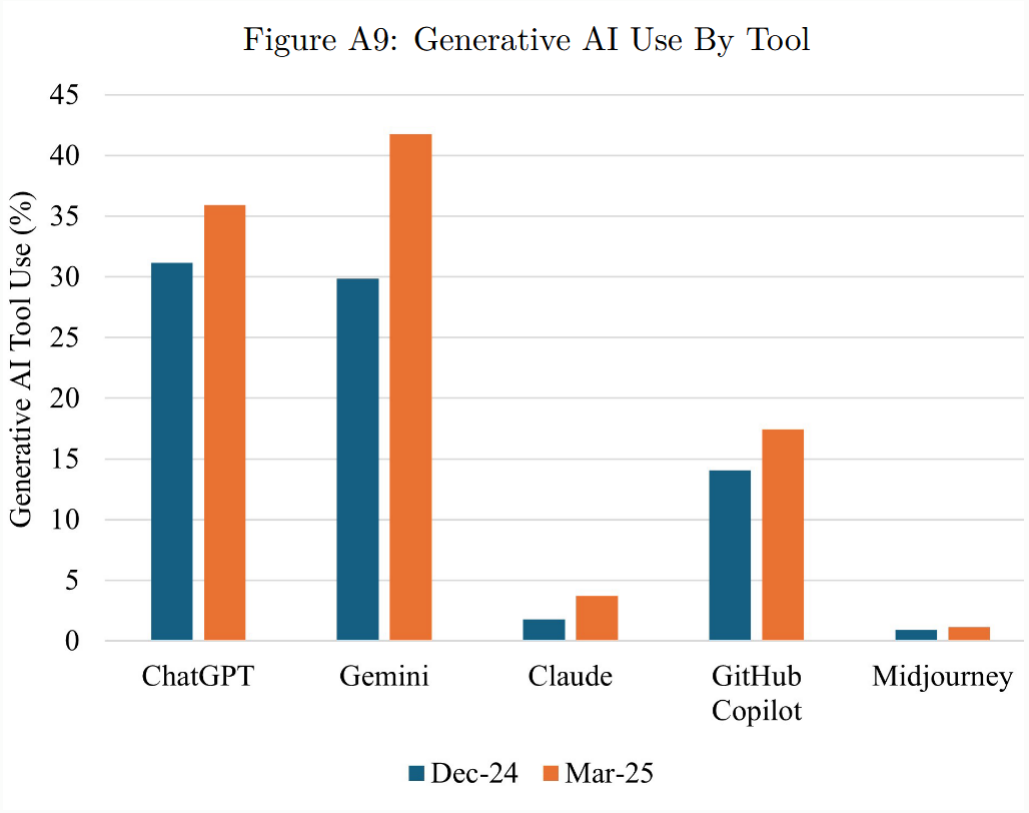


Sources: Hartley et al. (2025), Stanford, Statistics Canada

How is AI Being Used?

Generative AI is being used for wide range of work tasks

- Top work-related uses of ChatGPT include **practical guidance (29%), seeking information (25%) and writing (24%)**
- Claude skews towards technical users, with **computer and mathematical** usage 37.2%
- Software industry (coding) is undergoing rapid change due to LLMs:
  - More than 25% of code written at Google in 2024 was generated by an LLM!
- Usage higher among **knowledge intensive industries**, **"white collar"** workers



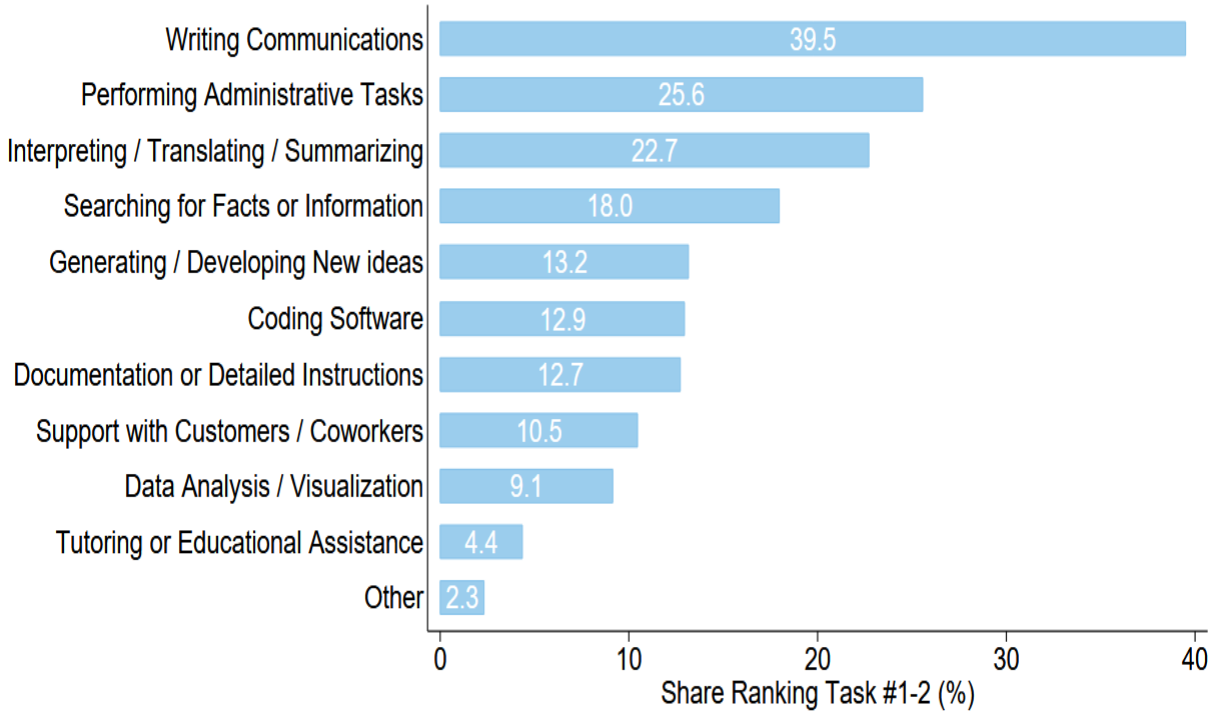
Sources: OpenAI, Anthropic, Hartley et al. (2025)

Is AI Helping Workers?

Early evidence showing productivity boosts for workers

- AI is saving employees, on average, **5.4% of hours worked** (U.S.)
- Surveyed workers estimate tasks completed with AI take 30 minutes on average, compared to about 90 minutes without AI. Implies a potential **tripling of productivity** in those specific tasks.
- Usage is higher among **younger**, more **highly educated**, and **higher-income individuals**. Nearly 50% of those with a graduate degree use generative AI at work, compared to roughly 20% of high school graduates.

Figure 9: In Which Specific Work Tasks Is Generative AI Most Useful?

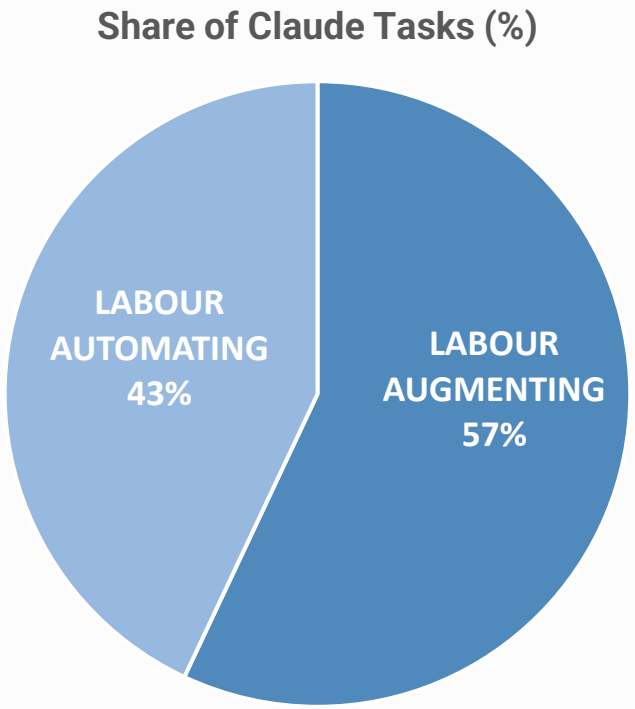


Sources: Bick et. al (2025), Hartley et al. (2025), Anthropic

AI and Employment

Is AI showing up in the jobs numbers?

- Some evidence of impact on **early-career jobs**:
  - 13% decline in **high AI-exposed jobs** among 22-25 year olds
  - But in same occupations, employment for 35+ workers is **stable or rising**;
- Another study found **no significant effect on job openings**, but found wage **gains** in occupations with higher exposure to Gen AI.
- Automation versus Augmentation: job declines are concentrated in occupations where AI tends to automate, instead of augment work
  - According to Anthropic, 57% of usage is **labour augmenting**, while 43% is **labour automating**

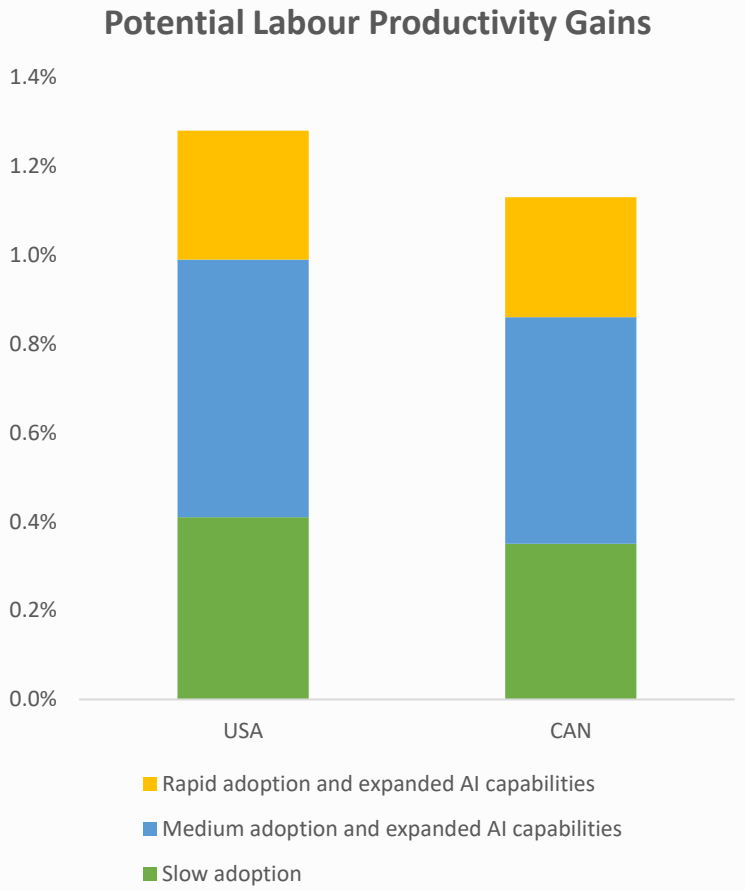


Sources: Brynjolfsson et al. (2025), Hartley et al. (2025), Anthropic

Implications for Canada

Productivity gains could have a transformative impact

- According to the OECD, **AI productivity gains for Canada** are estimated to be between 0.35% (low) and 1.13% (high) per year over the next 10 years
  - OECD estimates Canada be in the top three in G7 (after US and UK)
- Key difference between high and low scenarios is **speed of adoption across the economy.**
- Implications are profound:
  - A sustained 1% higher rate of productivity growth for 10 years translates into $200B-$300B in higher GDP
  - Or $5,000-$7,000 in GDP per capita



Sources: OECD

Final Thoughts

Canada’s Adoption Imperative

- Adoption is critical
  - Potential economic gains from diffusion are enormous
- Regulation is important to get right, but we are in a race
- Government has to also adopt:
  - Not just about cost savings
  - Invest in capacity to understand, learn and use this tech

Thank You!

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