



17 January 2025

AI Update (Part 1)

Dear Investors

In today's brief note, we provide an update on our AI thesis, covering recent industry developments that have impacted our views on the direction of AI advancements, as well as examining potential roadblocks to further technological progress. In a subsequent note we will highlight our evolving views on the infrastructure requirements to facilitate the rapid AI demand growth and opportunities that exist here. Overall, we remain optimistic about the implications of AI for energy infrastructure companies, fibre optic producers, and select equipment manufacturers that remain reasonably valued.

AI Adoption: Expanding Use Cases

In a previous note, we posed the question: how many GPUs will be required to meet the growing demand for AI inference and training? The answer hinges largely on how broadly this technology will be adopted. As the industry continues to evolve, we are seeing a sufficient number of use cases to anticipate a relatively high ratio of chips to humans.

While our recent [monthly update](#) touched on several examples, this section offers a more detailed (though not exhaustive) list of AI applications and their potential infrastructure demands:

- The rise of competitors such as Perplexity AI is forcing Google to release AI summary answers to search questions. As we discussed in our previous note, this alone will require a significant number of GPUs.
- Apple's Siri and Google's Gemini are racing to become your future AI assistant. If either company makes overall breakthroughs in becoming the interface or operating system that you interact with to power your need for technology, then it could reshape the industry's economics. Similar to search, these inference requests will require a significant number of GPUs if widely adopted.
- Co-pilots for Google and Microsoft's operating systems continue to roll out more features. Google hopes to ingest enough information about a user to provide them with a customised AI model. This model would better be able to write a user's emails, reports or presentations and better help with planning.
- SAP is using AI to help its customers make their supply chains more efficient. Their AI software helps firms better manage their inventory.
- Serve Robotics is using AI to build autonomous delivery robots to help Uber with food delivery.
- University of Sydney researchers have built Swagbot, a "smart cow" that makes cattle farming more efficient and environmentally friendly. The robot can determine the health, type and density of pasture and monitor the health of livestock.
- NVIDIA can't create or design new chips without AI anymore.
- Innovative Solutions and Support Inc. are integrating AI into plane cockpits to enhance automation.
- Dysolve is using AI in their software to help teach kids with dyslexia.
- TikTok and Instagram are providing content creators and advertisers with AI tools to sell to audiences.
- Amazon Prime is using AI during its live broadcasts of Thursday Night Football to provide more detailed statistics and predict future plays.
- LinkedIn is using AI to create assistants that achieve higher message response rates. Many HR software businesses are using AI to filter down applicants for jobs.
- DoorDash uses a mix of Gen AI to test a mix of images and videos to achieve a 15x higher conversion rate from advertising at half the normal cost.



- GE Aerospace built an AI assistant for all of its employees. Within 3 months, the assistant had responded to 500,000 internal queries and processed more than 200,000 documents.
- Vodafone trialled Microsoft Copilot, finding that it saved 3 hours per employee per week. The company has decided to roll out the technology company-wide.
- UnitedHealth's physicians use AI to summarise patient histories, freeing up hundreds of hours. Nurses use AI to review documentation more efficiently.
- Cognizant Technology uses AI to write 150,000 lines of accepted code a month.
- Salesforce has released Agentforce to allow companies to build their own agents.

This list of applications is not intended to be exhaustive but rather to illustrate how AI technology is being deployed across a variety of use cases. As adoption continues to grow, so too does the demand for AI infrastructure to support these advancements.

AI Progression Pathway

Looking ahead, the development of AI technology is progressing along two primary paths:

1. **Evolution of AI agents** – An AI agent is an automated system designed to act on the user's instructions and on the user's behalf. Ideally, these agents will possess the capabilities to replicate human tasks, such as planning and booking holidays, managing shopping lists, and organizing weekly schedules. Instead of manually researching and planning online, users could delegate these tasks entirely to AI agents.
2. **Development of reasoning models** – Many organisations are complementing generative large language models (LLM's) with reasoning models. These reasoning models incorporate predefined schemas or belief systems to deliver logically structured outputs. For instance, OpenAI's recently released o3 reasoning model can solve 25% of the most challenging mathematical problems devised by humans – a remarkable feat considering that math PhDs typically solve only 5% of these problems.

Challenges and Risks

Despite our optimism, there are two key risks to our thesis that warrant consideration:

- The first risk concerns the exponential relationship between compute power and the volume of tokens processed during inference. Generating a 1,000-token response does not simply require 10 times the compute power of a 100-token response – it demands disproportionately more resources. For AI to realize its full potential, it must efficiently handle tasks that involve processing and comprehending extensive data, such as reading and analysing entire documents or datasets spanning tens or hundreds of pages.
- The second risk is whether we will encounter a shortage of high-quality data to further improve AI models. These models rely on vast datasets to optimise their internal weights, but as existing data sources are exhausted, finding new, diverse, and reliable data may become increasingly challenging. Addressing this constraint will be critical for sustaining AI advancements.

Summing Up

While these challenges exist, we believe we are still a long way from hitting any asymptotes in AI adoption and utility. On the compute front, NVIDIA has already reduced the cost of compute by approximately 20x over the past year. Its upcoming B300 chips promise even more dramatic improvements in efficiency and performance. Meanwhile, synthetic data generation techniques are being leveraged to overcome potential data shortages. Regardless of the adoption pace, these trends point to sustained growth in demand for data centre infrastructure.

Kind Regards,
Fawkes Capital Management



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