

A look at the AI phenomenon

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Artificial intelligence, or AI, has been around for decades. The Logic Theorist, a computer program designed to mimic human problem-solving skills introduced in 1956, is considered by many to be the first AI machine.¹ Since then, scientists and computer programmers have been using versions of AI, data analytics and neural networks to perform automated computations and simulated reasoning.

However, it was 2022's release of ChatGPT, a language processing chatbot designed to create humanlike dialogue developed by OpenAI, that sparked the considerable excitement for AI we're seeing in industry, popular culture and the markets right now. ChatGPT, which stands for "Chat Generative-Pre-Trained Transformer," uses an iteration of AI known as generative artificial intelligence. Generative AI learns the patterns and structure of its input training to then "generate" content in a variety of types, including text, imagery and audio. Just two months after its launch, ChatGPT, reached 100 million active users, making it the fastest-growing consumer app ever.

Currently, the most exciting uses of AI center around improving productivity. Software developers are developing AI programs to assist with writing code. With training, these tools could do some of the grunt work associated with software programming, which allows developers to focus on work at a more abstract level.² Biotechnology and pharmaceutical companies are using AI tools to sift through vast amounts of data to shorten and improve the drug discovery process. Analysts believe AI-assisted improvements in early-stage drug discovery could lead to the development of 50 novel therapies over the span of 10 years, creating a potential \$50 billion opportunity for these companies.³

Current limitations and drawbacks to AI

As with most technology dubbed a game changer, Generative AI has its downsides. Models like ChatGPT learn from the training data they receive. These models are likely to experience hallucinations, meaning it thinks the answer it's giving is correct when the response is wrong.

Further, if the training data is biased or includes distortions, these models may incorporate falsehoods into its responses. This opens the door for bad actors to create

disinformation or propaganda campaigns. AI also lowers the barrier for all sorts of cyber threats since no programming ability is needed. It is likely corporations and individuals could see more sophisticated identify thefts, malware and ransomware incidents, as well as social engineering schemes like phishing attacks.

AI's role in drug discovery could bring 50 new therapies to market over the next 10 years

The advent of this technology also poses legal and ethical concerns. If ChatGPT generates content that mimics original copyrighted work, is it an infringement of copyright or intellectual property? Then there's the fear of job displacement or elimination due to AI's inherent automation applications.

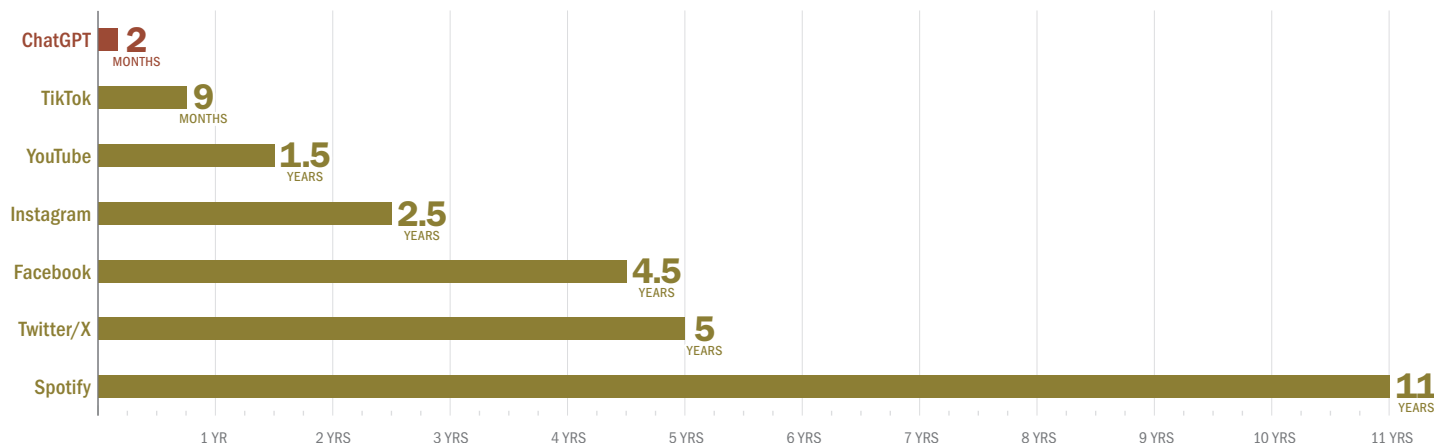
AI Investment opportunities

With all the recent buzz on AI, investors naturally want to know where the opportunities are. We are looking at it from a few areas leveraged to various parts of the technology used in AI. The infrastructure needed to produce the massive amount of computing power to run these large language models that use trillions of inputs exists. Leading semiconductor, networking and data center companies are at the center of the increase in infrastructure spending. While many AI companies are unprofitable private companies, there are a few large technology and software companies that currently have revenue streams from AI applications. In addition, large cloud service providers are developing foundation AI models, which can apply learned information from one application to another through transfer learning.



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CHATGPT'S SHORT PATH TO 100 MILLION USERS *Growth comparison of popular app platforms*



Source: Demand Sage, Commerce Trust

There are a number of exciting start-up companies working in AI, but few pure-play AI companies listed on the major U.S. equity indexes. Nvidia, manufacturer of the semiconductors that power many AI models, is arguably the largest company with the greatest AI exposure on the S&P 500 Index. Its revenue and earnings expectations have risen this year due to the strong demand for chips.

No company listed on the S&P 500 gets more than 20% of its revenue from AI-related products

Microsoft, an early investor in OpenAI, has incorporated AI capabilities into its Office suite of products and Azure cloud computing business. Google-parent Alphabet has released its own generative AI chatbot known as Bard. Within the software space, ServiceNow uses AI in its workflow systems as it digitizes company operations.

Although 2023's year-to-date S&P 500 returns can be attributed in part to AI euphoria, Commerce Trust estimates no company listed on the index derives more than 20% of its revenue from AI-focused products. Still, AI is expected to play a significant role in the product development of numerous companies for years to come.

Even though AI holds the promise of a technological revolution, there are current gating factors relating to design and development to make models scalable, dependable and reliable. Semiconductors are currently undersupplied, leading to a supply/demand imbalance in the market. AI also has a "last mile" problem, meaning the models need to work on a large scale to become available for widespread use.

It is exciting to see such an innovative technology being developed and implemented in real time. Commerce Trust will continue to look for opportunities for investments in AI, as well as potential opportunities for companies to incorporate AI models into their operations.

¹ "The History of Artificial Intelligence," Rockwell Anyoha, Harvard University Graduate School of the Arts and Sciences, Aug. 28, 2017.

² "AI learns to write computer code in 'stunning' advance," Matthew Hudson, American Association of the Advancement of Science, Dec. 8, 2022.

³ "Why Artificial Intelligence could speed drug discovery," Morgan Stanley Research, Sept. 9, 2022.

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