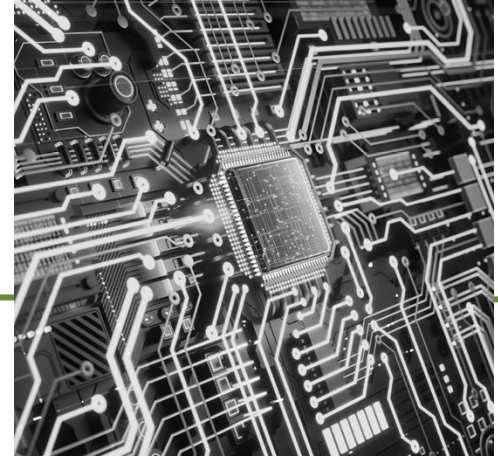


MARKET SIGHT LINES



The future of artificial intelligence is now What does that say about the future?

By Michael O'Keeffe, *Chief Investment Officer*



In 1947, Alan Turing, the mathematician who broke Germany's Enigma Code, said, "What we want is a machine that can learn from experience." A few years later he conceptualized the "imitation game," now known as the Turing test, which gauges if a machine's intelligent behavior is equivalent to, or can be distinguished from, that of a human. For many years, we've seen relatively simple illustrations of this, like in 1997 when an IBM computer called "Big Blue" beat the reigning world chess champion. More recently, of course, we know of self-driving cars and computer-driven websites of mobile app chat support, like airlines and other services. But with the 2022 release of ChatGPT, people now can see and experience firsthand the power of artificial intelligence, or AI. All of a sudden, the future that Turing envisioned is here. And yet, as we sense the power of such applications, we are asking: What does this mean about the future?

In this Sight|Lines, we briefly explain ChatGPT and other competing services, relate these to our long-term investment theme framework, and offer some perspectives on the future, with both optimism and caution.

THE TAKEAWAY: ARTIFICIAL INTELLIGENCE LIKE CHATGPT HAS BEEN, AND WILL BE, A MAJOR INFLUENCE ON OUR WORLD AND OUR INVESTMENT PORTFOLIOS.

AI is part of our *Fourth Industrial Revolution* (4IR) theme, which captures the idea that technological innovation has broken down the boundaries between the physical, digital, and biological worlds. Of course, AI is a key element of 4IR and is influencing many other themes. With ChatGPT, we can all try out AI directly. The capability is immediately influencing today's business world. And yet by using it, we get a sense that these are the early days, and our future will have AI woven more fully into our world. In summary:

- ChatGPT is a chatbot launched by OpenAI that allows the user to ask for help like one would a human.
- Other similar new services include Google Bard and ChatSonic.
- With our 4IR theme in focus, we've invested in companies that do big data analytics, robotic surgery, and precision agriculture.
- We are generally quite optimistic about AI, taking the view that AI will be used *by humans* to be more productive, much more than being deployed *instead of humans* to get work done.
- But some caution: In the near-term, workers will be displaced, as is often the case when new technology emerges. In a more extreme sense, some have cautioned that AI could drive an extinction level event.

ChatGPT illustrates the power and immediate potential of AI. But as OpenAI and its competitors deliver enhanced capabilities and we wrap our heads around potential applications, there is much greater potential in the future.

IN-DEPTH: WE USE AN INVESTMENT THEME FRAMEWORK, AND ARTIFICIAL INTELLIGENCE (AI) PLAYS A KEY ROLE. CHATGPT AND OTHER NEW SERVICES SHOW THAT INCREASINGLY AI WILL INFLUENCE OUR WORLD MEANFULLY, AND SO TOO WILL IT INFLUENCE OUR INVESTMENT DECISIONS.

Our long-term investment theme framework identifies five major themes: *Securing Strategic Resources*, *Shifting Demographics*, *The New Consumer*, *Productive Competition*, and the *Fourth Industrial Revolution (4IR)*. AI is an important component of 4IR, but it's influencing all of our other investing themes as well. While we've seen progress over the last decade or so with AI's application to things like digital assistants (e.g., Siri and Alexa) or self-driving cars and factory robots, with ChatGPT we can all now more fully try out AI ourselves. Business leaders are focused on how to utilize such capabilities. As individuals and businesses apply AI, it is clear that we're just scratching the surface, and the potential is great, but with some risks. Going deeper:

- ChatGPT, a chatbot launched by OpenAI, allows a user to ask for help. Examples:
 - One can ask ChatGPT to briefly explain regulations, draft an e-mail or social media post, write a paper, briefly summarize a long article in a few words, build code, or write a novel.
 - For fun, I've had ChatGPT write a poem, summarize an article, draft an e-mail, and write a song.
- Other new services:
 - Bard, which is Google's AI chatbot, is similar to ChatGPT and is trained for more natural conversational queries and responses.
 - ChatSonic is also an alternative to ChatGPT and allows organizations to personalize client interactions.
 - GitHub Copilot is an AI tool that helps developers write and complete code.
- With our investing themes in focus, we've invested in companies using AI:
 - Big data analytics: AI is used to process large amounts of data to provide insights into consumer behavior, market trends, and operational efficiencies.
 - Robotic surgery: AI is used to enhance precision, improve decision-making, and enable real-time analysis of patient data.
 - Precision agriculture: AI is used to optimize crop yield, reduce resource usage, monitor plant health, and automate farming processes.
- We are generally quite optimistic about AI, but some cautions exist:
 - ChatGPT illustrates that AI can be used *by humans* to be more productive.
 - A less, but still important, influence: AI can be used *instead of humans* to get work done.
 - With this, in the near term some jobs will be displaced, and as the capability is developed, higher skilled works can be replaced as well.
 - While some have cautioned that AI could drive an extinction level event, we don't think so.

CONCLUSION

As early as 1947, Alan Turing envisioned the concept of AI and set a standard now known as the Turing test. We've seen glimpses of this concept over the last 30 years, but in the last 10 years or so, the use of AI has accelerated. Notably, the launch of ChatGPT has put those capabilities in the hands of ordinary people, allowing

all of us to try out AI on our own projects or tasks. We immediately get a sense of AI's power, and its risks, both now and in the future. We will continue to evaluate this and other related topics as we use and evolve our investment theme framework.

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