

**DANIEL FLAX**  
Senior Research Analyst

# Gen AI: The Next Wave

As artificial intelligence tools gather steam, what's the potential impact on businesses, investors and the planet?

It's been nearly two years since the "ChatGPT moment," when OpenAI's flagship chatbot brought the world face-to-face with the power of generative artificial intelligence (Gen AI) to gather and interpret information, and communicate its findings to users. The moment represented the culmination of years of AI research and development. Today, technology companies are working to harness the power of AI to capitalize on their vast datasets to solve problems and create new solutions.

## Euphoria and Potential

As even passing observers of the stock market will know, Gen AI has since captured the imagination of investors, who have bid up the shares of companies in the AI ecosystem—starting with key chipmakers and cloud-based tech giants, and extending to software developers, data center providers and many others.

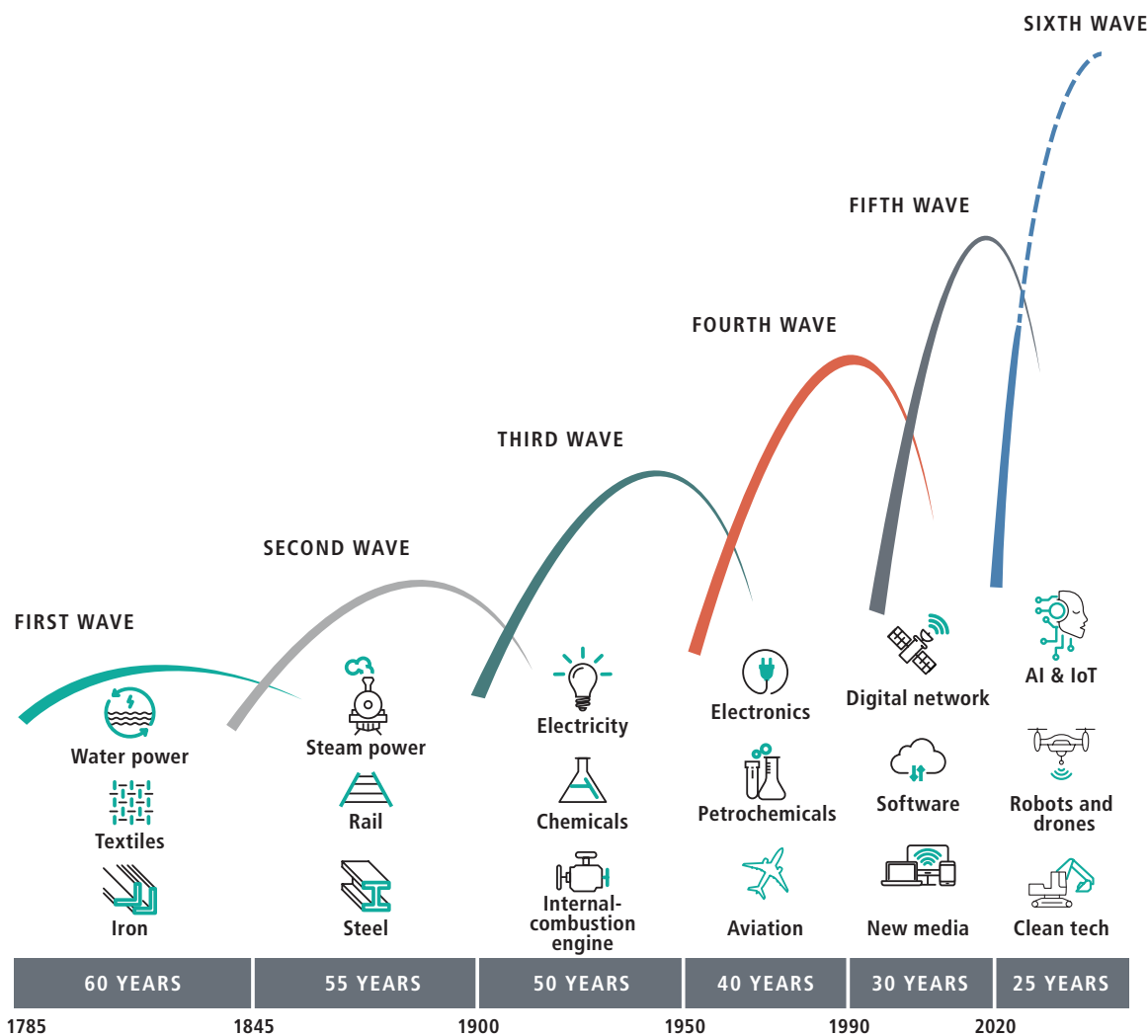
For some well-known names, competition has been fierce: Microsoft was early to the market through its close relationship and investment in OpenAI, and quickly introduced AI Copilot to the Bing search engine and across its Office software suite. Google, in response to ChatGPT, announced the Gemini chatbot in upgrading AI capability within its search engine. Apple recently revealed plans for "Apple Intelligence," AI that is to be integrated into new devices and applications, including the Siri "personal assistant." Myriad other players, from mega-caps to startups, have been racing to build AI capabilities.

More broadly, the corporate world has been embracing AI, whether out of enthusiasm about successfully leveraging more proprietary data or concern that their businesses will need to capitalize on AI to keep up with competitors, generate cost savings and speed up innovation. This, in turn, is spurring demand for chips, models and systems from the cloud providers and strategic platforms such as Nvidia.

How much of this is hype? With any game-changing technology, euphoria is usually baked in. But the excitement today also reflects the potential that many see from early generative AI capabilities.

Think about it. If you ran a telecom company, wouldn't you want to improve the often-painful experience that customers have in interacting with operators and online bots? If you owned a software company and could use AI to debug or even write reams of computer code, cutting development time by about 30%, wouldn't that appeal to you? On the consumer side, if your chatbot could plan your vacation from the travel routes to the hotels and restaurants, wouldn't it be worth a try?

## INNOVATION WAVES ARE SPEEDING UP



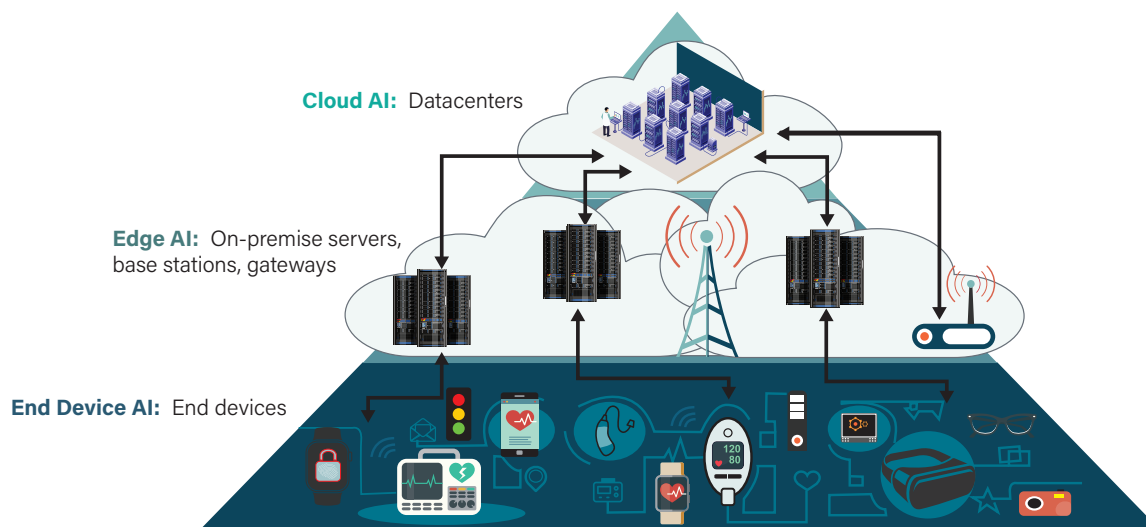
Source: Visual Capitalist, Edelson Institute, as of 2024.

Opportunities to enhance the commercial world and, more broadly, the human experience, appear to be boundless, even to jaded observers. As AI extends into virtually every environment, including factories, machines, cars, farms and homes, use cases are proliferating. Here are a few that, to us, reflect the special power of AI:

- **Drug discovery.** Identifying potentially effective drug molecules has traditionally been a time-consuming, hit-or-miss process. But AI can quickly sort through thousands or even millions of datapoints<sup>1</sup> to find targets for research, while its predictive capabilities can accelerate clinical trials and drug formulation.
- **Digital twins.** Building and running manufacturing plants is complicated and expensive, and many issues crop up during or after construction that need to be rectified on the fly. Increasingly, companies are using AI to build and analyze digital twins of their potential facilities, to find and solve the problems before any concrete has been poured.
- **Smarter smartphones.** The minicomputers that most of us carry around are about to get a major upgrade, turning them into AI digital assistants that can predict our requests, transcribe and summarize our meetings, help us write our emails, improve our photographs and much more.

---

## THE AI ECOSYSTEM



Source: BofA Global Research, Infineon, as of 2024.

## Notes of Caution

All this said, the negatives have been well chronicled. There have been the sometimes amusing (and occasionally alarming) missteps from AI chatbots: Google's Gemini famously mis-portrayed various historical figures when generating images and, more recently, included glue as an ingredient in a pizza recipe; chatbots periodically "hallucinate," making up facts for no discernable reason; and we've seen basic mistakes in calculation, and responses showing social or political bias. Indeed, anyone who has experimented with AI at work will note flaws in its outputs, even as iteration and refinement of queries have improved user results.

More serious is the potential for AI-enabled misdeeds. The news is filled with stories about the threat of AI-powered disinformation in our elections, while realistic "deepfakes" are making fraud easier, and experts fret about the use of AI in the hands of terrorists. Military weapons appear to be a key arena for AI development, and rival countries are rapidly trying to build a technological edge, even as many (including the Pope at the recent G7 summit) caution about abdicating life-and-death decisions to robots.

<sup>1</sup> Drug compound-related data is spread across multiple databases, making it hard to estimate. ChemBLE, a "manually curated database of bioactive molecules with drug-like properties" includes about 2.4 million compounds, according to its website.

## Is There Room for Humans?

Leaving aside more dire scenarios, a key question is the role humans can all play in a business world informed by artificial intelligence. Earlier innovations in computers and software boosted efficiency in paper-heavy fields like accounting and law, while automation helped modernize support centers and the factory floor, with employment often redistributed across industries and geographies. But AI is now moving to ever-higher tiers of the white-collar landscape, not only summarizing and organizing information, but developing creditable (if sometimes flawed) business communications, rapidly analyzing data and offering crucial insights that can affect business decisions.

Even with this in mind, our response is that, yes, we believe there will be room for humans—although the nature of work is likely to change. If you consider the earlier combination of smartphones and faster networks (most recently 5G), it not only facilitated existing tasks, but unleashed thousands of new uses tied to shopping, gaming, weather, entertainment and interaction, among others. Phones became a platform for new (and some would say, hyper) activity.

Gen AI presents another promising advance, and the question becomes, “What kinds of business models and applications can be developed, and what sorts of functions can we humans serve on top of the technology?” It seems to us that using AI as a building block for work projects is a given—organizing, summarizing, analyzing—but that the point will be to facilitate human decisions, which can become more sophisticated and nuanced as a result. In the end, some work functions are likely to dwindle, but others will take their place, although the actual ratio of losses to gains remains an open question.

## Much to Think About

Clearly society has some thinking to do. Privacy was already a concern with constant digital tracking of cellphones, but AI augments the level of intrusion and ability of businesses to capitalize on the data “firehose” from our interactions across the digital and physical landscapes. Companies that can better safeguard personal information may have a competitive advantage, even as they seek to insulate their own proprietary datasets, which, with AI, can help to drive their growth.

Intellectual property is also front-and-center. Tech companies are scraping the internet and their proprietary apps to train generative AI algorithms, enhancing their ability to “borrow” creative and intellectual output to answer new queries. Some publishing organizations are making licensing deals with AI providers while others are fighting back through litigation. Meanwhile, artists are panicking over how easy it is to copy the works they may have posted online to promote their work.

For those worried about the planet, artificial intelligence presents the opportunity to fine-tune operations to limit waste and emissions, but the training of AI requires a level of computing power that could strain the electrical grid and, all else equal, actually produce more emissions. Central to the task of any organization leveraging or supporting AI will be energy efficiency, as well as an openness to varied sources of energy, including nuclear power.

Amazon, for example, recently purchased a 1,200-acre campus in Pennsylvania, located next to a nuclear plant that will serve as its power source. And Bill Gates-founded TerraPower is starting construction on a next-generation nuclear facility in Wyoming, with a liquid sodium-cooled reactor that is said to be more efficient, safer and cheaper to build than traditional water-cooled systems.<sup>2</sup> The prototype may encourage adoption as AI-dedicated datacenters proliferate.

Finally, as noted, in our view it seems likely that various geopolitical rivals will work furiously to build the advantages that AI can add to an already tech-driven arms race. But at what point will certain uses become unacceptable even to combatants, and will there be enough world cohesion to agree to even basic guardrails?

Leaders will need to think about these issues, and how treaties, laws and regulation can offer a degree of protection without stifling innovation.

<sup>2</sup> Pequeno IV, Antonio, “TerraPower: What We Know About Bill Gates’s Nuclear Power Plant in Wyoming,” *Forbes*, March 19, 2024.

## Looking Ahead

More concretely for investors, the goal will likely be to get ahead of the AI wave and avoid getting caught in the undertow. In the tech field, we think chip manufacturers, well-resourced cloud, software, system, device vendors and strategically placed startups could see benefits. More broadly, we believe companies should be proactive in seeking business opportunities and cost efficiencies, while warding off new competitive threats. Relying on past success and reputation could be a mistake as long-held “truths” about industry dynamics change rapidly.

For nearly everyone, in our view, this is a time to experiment with AI—to assess what it does well, and to think about what it should not be asked to do. It is not a time to stand still, which would simply leave us less prepared for what is to come.

### Artificial Intelligence at Neuberger Berman

Development of AI capabilities has been a key focus of research and experimentation at Neuberger Berman in recent years.

We built a Data Science team back in 2017 and acquired a quantitative investment boutique in 2018. Both groups use “big data” to identify alpha signals or provide insights to our investment teams. Any business that started thinking about how to use AI only when ChatGPT was rolled out is several years behind the curve.

That said, we recognize the advance that generative AI like ChatGPT represents. It helps that we have been focused on these revolutionary technologies as investors. We see them being put to work in the economy and, where there is potential, we explore applications in our own business. As a result, last year we partnered with Microsoft to help launch our own NB ChatGPT pilot program. At year-end, we had more than 1,700 users throughout our organization exploring how to get the best out of the tool for various tasks, such as translation, and in various departments, including finance.

Using ChatGPT is not always straightforward, and requires asking the right questions and double-checking the output you receive. This is a learning process for both human and machine. But we are already seeing how AI can help us redirect precious time and energy away from repetitive and labor-intensive tasks and toward more creative and productive uses. We believe the opportunities for Neuberger Berman and the broader economy are significant.

This material is provided for informational and educational purposes only and nothing herein constitutes investment, legal, accounting or tax advice, or a recommendation to buy, sell or hold a security. This material is general in nature and is not directed to any category of investors and should not be regarded as individualized, a recommendation, investment advice or a suggestion to engage in or refrain from any investment-related course of action. Investment decisions and the appropriateness of this material should be made based on an investor's individual objectives and circumstances and in consultation with his or her advisors. This material is not intended as a formal research report and should not be relied upon as a basis for making an investment decision. The firm, its employees and advisory clients may hold positions within sectors discussed, including any companies specifically identified. Specific securities identified and described do not represent all of the securities purchased, sold or recommended for advisory clients. It should not be assumed that any investments in securities, companies, sectors or markets identified and described were or will be profitable. Neuberger Berman, as well as its employees, does not provide tax or legal advice. You should consult your accountant, tax adviser and/or attorney for advice concerning your particular circumstances. Information is obtained from sources deemed reliable, but there is no representation or warranty as to its accuracy, completeness or reliability. All information is current as of the date of this material and is subject to change without notice. Any views or opinions expressed may not reflect those of the firm as a whole. Third-party economic or market estimates discussed herein may or may not be realized and no opinion or representation is being given regarding such estimates. Neuberger Berman products and services may not be available in all jurisdictions or to all client types. The use of tools cannot guarantee performance. Diversification does not guarantee profit or protect against loss in declining markets. As with any investment, there is the possibility of profit as well as the risk of loss. Investing entails risks, including possible loss of principal. **Past performance is no guarantee of future results.**

Neuberger Berman Investment Advisers LLC is a registered investment adviser. The "Neuberger Berman" name and logo are registered service marks of Neuberger Berman Group LLC.

NEUBERGER	BERMAN
-----------	--------

**Neuberger Berman**

1290 Avenue of the Americas  
New York, NY 10104-0001

[www.nb.com](http://www.nb.com)