



## Investment Perspectives

# Generative AI Investing: Opportunities at a Key Tech Inflection Point

We believe the emergence of generative AI—and its deployment in a growing number of industries—marks a powerful new phase of the Technology Revolution.



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### Key Points

- The arrival of ChatGPT in late 2022 signaled an inflection point in the development of generative artificial intelligence (genAI), in our view, pointing the way to widespread adoption of this technology across a range of industries.
- As the buildout phase of genAI continues, the technology, consumer, and healthcare sectors appear ripe for disruption, including functions as varied as call centers, social media advertising, and drug discovery.
- We think investors considering exposure to genAI-related names should be mindful of how the market has consistently undervalued the growth rate of prior disruptive technologies, such as PCs, the internet, mobile devices, and cloud computing.

### I. Innovation Growth Flourishes

The Technology Revolution continues to enable an innovation boom. Over the past 25 years, five large new markets that conquer distance, space, and time (cloud computing, e-commerce, mobility, search, and social networks) have been created. Those developments have set the stage for the next leap in innovation. We believe we have now reached an inflection point whereby computers can be taught to perform human tasks via generative artificial intelligence (genAI). These include inference—human actions arrived at through the process of reasoning.

What does this mean for investors? We think that the potential of genAI is underestimated, like many past technology breakthroughs. Applications from this new capability have already begun to emerge in the technology, consumer, and healthcare sectors.

### II. The GenAI Inflection Point

Artificial intelligence company OpenAI rocked the technology world with its initial demonstration and launch of ChatGPT in November 2022. Since its release, this technology has undergone numerous iterations, and new competitors have emerged. Most recently, DeepSeek stunned the world with its low-cost language learning model. While DeepSeek shook up the competitive dynamic, we view its cost breakthrough as a positive development for this new technology.

Although its arrival seemed to happen suddenly, genAI was a long time coming. In the late 1940s, Alan Turing's imagined machines simulating human intelligence; the term "artificial intelligence" first appeared in the 1950s. Hopes were ignited in 1997 when IBM's Deep Blue supercomputer defeated chess champion Garry Kasparov, and again in 2012, when the success of the AlexNet convolutional neural network in the ImageNet large-scale visual recognition competition was seen as a major advancement in deep learning. Deep learning had used neural networks and statistical learning to evolve beyond previous rules-based models.



Google introduced transformers later in the decade, which enabled computers to see words in context (versus in sequence). As processing power increased, and the Internet continued its buildout, software models became vastly more efficient and capable of training. Large language learning models (LLMs) were born.

That paved the way for the inflection point: the introduction of OpenAI's GPT-3. For the first time, an LLM had been trained to be able to eloquently respond to questions and generate content. This went well beyond traditional search techniques. It could also perform this function with images.

Seeing this success, leading consumer internet and social media companies (hyperscalers) shifted their R&D focus and invested billions of dollars into building the infrastructure for genAI, aiming to integrate these techniques into their businesses, recognizing the tremendous monetization and productivity opportunities.

We believe we are still in the genAI industry buildout phase—the development of necessary infrastructure to support the substantial computational power required for advanced AI applications. This buildout is primarily occurring within data centers, which, from a market perspective, has been a tailwind for semiconductor and industrial stocks that are levered to the electrification, cooling, and engineering services necessary for scaling this new technology.

At this stage, the capital expenditures in accelerated computing have yielded material incremental improvements in computational power, which leads us to believe further investments are likely. This creates an incentive for the established hyperscalers to invest to outcompete each other and to stave off competition from well-funded upstarts. A technology shift like this will likely be very disruptive, and the stakes for success or failure are extremely high.

We believe the next phase of genAI will be the development of applications that enhance revenue and productivity. Companies that develop these applications could represent compelling new investment opportunities. Their rollouts across technology, consumer, and healthcare are discussed below.

### III. New Applications for GenAI

#### A. Technology

Here, we are seeing enhancements of human activities, as well as replacements of humans and the jobs they do. Chatbots such as Perplexity are replacing human search with AI-generated search. The impact on software coding is already apparent. Large tech companies are generating significant source code with AI, reducing staffing needs for software engineers. The same may be said for graphic designers now that AI can generate art works and videos.

AI is being applied across many industries to change all manner of customer interactions, especially those involving call centers. For example, Salesforce's Agentforce deploys AI agents to make customer service interaction more efficient.

The technology has also begun to permeate law and medicine. Legal AI tools can achieve vast efficiency gains in analyzing cases, contracts, and laws. These hold the potential to lower the cost of legal services as AI is improving those services. At medical facilities, interactions with doctors can be recorded, summarized, and analyzed by AI. One other fascinating development: AI has enabled the creation of "companions," with which individuals can have one-to-one interactions in health or social matters.

#### B. Consumer

Consumer spending represents two-thirds of U.S. gross domestic product,<sup>1</sup> so this is where most of the spending on genAI-fueled innovation is likely to flow. Below are some company-specific examples of the early application of genAI.

##### *Meta*

The parent company of Facebook recently revealed that four million advertisers are now using at least one of its GenAI ad creative tools in launching new campaigns. This is up fourfold from just six months earlier. Meta's vast trove of data, alongside its significant investments behind open-source AI infrastructure, allow it to provide the foundation for advertisers to create ads in a fraction of the time, without sacrificing quality.

##### *Reddit*

The company is seeking to bring its content to non-English users. Early in 2024, Reddit began to leverage AI to translate its deep catalog of user-generated (but mostly English-language) content to French. It quickly expanded this to include Spanish, Portuguese, Italian, and German. This boosted its active users by fourfold versus the previous quarter; that growth looks set to continue as more languages are added. GenAI language translation is done at a fraction of the cost and time of human translation.



### *Wix*

AI is enhancing website development, an important fulcrum in most businesses. Wix launched its first AI website generator, dubbed Artificial Design Intelligence (ADI) in 2016. It helped democratize how websites are built. Not only did it allow novices to harness the power of design more easily, but it also assisted advanced web designers and agencies by helping them complete their detailed work in a more timely, efficient manner. Last year it released its Responsive AI feature in Wix Studio. By leveraging thousands of Wix sites and proprietary data, the technology can detect related elements in each site so that it can optimize those elements based on recognized website-design best practices.

### *Duolingo*

Duolingo's Birdbrain uses AI to improve language learning. In traditional education, teachers teach to a "grade level," which is suboptimal because students learn at different levels. The Birdbrain model is an AI system that creates a personalized learning path for each user. The model's algorithm estimates the difficulty of each exercise and adjusts its estimate of the user's ability and the exercise's difficulty based on the learner's performance.

## **C. Healthcare**

AI is transforming healthcare in two ways: helping enhance the diagnosis of major and minor ailments and enable huge leaps in drug discovery and development.

In diagnostics, AI is helping to make disease detection faster and more accurate. AI can extract genetic patterns, which help to detect the early onset of diseases. Greater accuracy aids in distinguishing cancerous tumors from benign growths. Machine learning can identify unknown variants of rare diseases.

AI can integrate genetic signatures of individuals with various diseases. This can clarify the causal relationship and functional mechanisms of complex diseases. The genetic signature provides information to determine how and why a person develops a disease such as Alzheimer's.

AI has the potential to significantly enhance the monitoring of diseases, which is valuable in informing treatment. It can differentiate the risk posed by different patients. AI models can also detect the onset of events such as epileptic seizures and heart attacks.

In biotechnology, AI models are enhancing drug discovery. These enable a more accurate assessment of disease states, which help to select the best targets for drugs. This requires a greater understanding of proteins, the molecular machines which perform a vast array of biological functions. Proteins consist of strings of amino acids that fold into origami-like shapes to perform their functions. There are an astronomical number of possible folding configurations. Google's Deep Mind cracked this folding code in late 2020. In 2024, a Nobel Prize in Chemistry was awarded for using AI to accurately design proteins, and to design them from scratch.

AI is also being used to improve clinical trials. This should improve the selection of drugs for clinical trials, which may lead to faster drug development and a greater probability of trial success. Patient molecular signatures can enable a better matching of patients and trials. The more accurate analysis of trials should enable more to be rescued by reruns.





In drug therapy, AI is being used to expand the reach and efficacy of new and current drug compounds. A big database of existing patients benefits more people seamlessly, as new drugs and treatments are introduced. Side effects can be monitored to detect disease and patient patterns.

Large LLMs hold the potential to revolutionize the mental health field. The depth and complexity of these ailments can make diagnosis and treatment a daunting endeavor; the ability to provide care and support through tools like chatbots and virtual therapy assistants could make life better for millions of people.

## **IV. This Technology Inflection Point Is Likely Underestimated**

Of course, forecasting is difficult, especially when it comes to envisioning future innovations. Therefore, our forecasts will be subject to revision as new data emerge. However, as we pass the two-year anniversary of ChatGPT, we are reminded that in recent history, breakthrough innovation has been systematically underestimated. In the past forty years, the personal computer, the Internet, the smart phone, and cloud computing arrived on the scene with great fanfare, yet still dramatically exceeded consensus expectations about how transformative these modern technologies would be.

**Figure 1. The Market Has Persistently Underestimated Innovation Growth Rates**

Innovation Wave	Initial Forecast	Actual	% Growth Exceeded Forecast
 PC	225M PC users in 2000	354M PC users in 2000	57%
 Internet	152M Internet Users in 2000	361M Internet Users in 2000	138%
 Mobile	657M Smartphones Shipments in 2013	1,019M Smartphones Shipments in 2013	55%
 Cloud	\$90.2B Top 3 Cloud Provider Revenue in 2020	\$115.6B Top 3 Cloud Provider Revenue in 2020	28%
Average:			70%

Source: Morgan Stanley Research AI Guidebook: Fourth Edition, January 23, 2024, and Lord Abbett. Data as of January 23, 2024 (latest available).

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Just as the generative AI era is associated with the launch of ChatGPT, the Internet era started with the founding of Netscape and the introduction of its web browser in 1994. Thirty years later, the Internet has revolutionized how we communicate (think of the transformative power of email and social media), while providing unprecedented access to information.

The financial impact of this disruption has been monumental. Technology and interactive media stocks now represent 45% of the S&P 500® Index's free cash flow, versus 15% in the pre-Internet era. The robust cash flow generation and profitability of technology companies have elevated the overall margin profile of the entire market. Today, technology stocks' net profit margins are near 30%, in stark contrast to the modest gains observed in other sectors. (Data on free cash flow and margins are from FactSet as of February 28, 2025.)

The Internet has helped birth new sectors, industries, and companies that have since become household names. Some have achieved dominance in the tech landscape, while others serve as a cautionary tale of the volatile nature of rapidly evolving innovation.

At this stage, there are questions about AI's business model. How it will be priced and offered is unknown. Competition is likely to be fierce in this dimension, making it unclear how the cost for expensive chips and data centers will be recouped. The pursuit of real productivity gains over time should provide a strong incentive for AI providers and users to innovate.

## V. Summing Up: Reasons for Optimism

We think of the Technology Revolution as "the gift that keeps on giving." It just bequeathed a good deal more with the dawn of generative artificial intelligence. LLMs have proven to be extraordinary adept at training computing devices to perform human tasks, and now smaller models leveraging these advancements are delivering inference applications at a surprisingly low cost. The emerging applications are abundant and cover a large swath of the economy. We expect many to become much larger in coming years.

We think that the potential of genAI is underestimated like many past technology breakthroughs, and that the developments mentioned here will speed the adoption of this groundbreaking technology—and increase its potential.

<sup>1</sup>Source: U.S. Bureau of Economic Analysis, based on GDP data for the fourth quarter of 2024.



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