CASE 17

Microsoft's Strategic Alliance with OpenAI, Inc.: Will the Partnership Create a First Mover Advantage?

John D. Varlaro
Johnson & Wales University

John E. Gamble
Texas A&M University-Corpus Christi

In early 2023, generative artificial intelligence (AI) had begun to demonstrate scalable and implementable solutions for everyday business and consumer applications. Adoption of AI had already been rising in businesses and homes through applications such as business analytics and devices with virtual voice assistants. However, the breakthrough in generative AI seemed to have occurred with the release of OpenAI's ChatGPT (generative pretrained transformer) in late 2022, a large language model (LLM) aided by a partnership with Microsoft which had started several years prior.

OpenAI's ChatGPT differed due to how it was developed, what it could create, and who could access and use it. Business email summaries, presentation slide decks, website code, as well as other documents such as essays, all had become possible through ChatGPT. What's more, ChatGPT's interface used natural language prompts and could be deployed through cloud computer services. Thus, the desired output could be requested by anyone, as no knowledge of computer language or data analytics were necessary—and the technology could potentially be accessed by anyone with a computer.

There were extremely fast moves in early 2023 with ChatGPT. In quick succession, OpenAI released its ChatGPT version 3 in 2022, and then released an even more powerful version 4 in March of 2023. In parallel, Microsoft debuted its new Bing search engine with ChatGPT integration in February 2023. Then, in March 2023, Microsoft debuted its Microsoft 365 Copilot, with ChatGPT integrated into its software products like Word and Excel.

Microsoft's fast move into the generative AI space seemed to have beaten Google and other competitors to market with generative AI-based products. When discussing the quick deployment of its generative AI solutions, the CEO of Microsoft, Satya Nadella said, "You already have significant usage of these properties. And so the question is, can we use AI to really help solve some of the customer challenges we see today?"[1] Yet, Google CEO Sundar Pichai addressed Microsoft's moves by writing to his employees, "Some of our most successful products were not first to market. . . They gained momentum because they solved important user needs. . ."[2]

The potential for everyday usage of OpenAI's ChatGPT, and thus business and consumer adoption, were explosive. Generative AI technology was poised to be its own growth market as well as a disruptor in other markets for years to come. OpenAI; due to its partnership with Microsoft; was clearly the established leader in the emerging AI technology market. Yet, there were also fast moves in regulatory and social responses, with some calling for a pause in AI deployment.

As developments in 2023 continued to unfold, OpenAI would need to respond. Business competition would most certainly increase. Society's concerns about the social ramifications would grow, and governments would eventually respond with increased regulations and oversight. How the partnership would protect its competitive position would be a significant test for its leadership as OpenAI prepared to release version 5 of ChatGPT.

OVERVIEW OF ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, AND GENERATIVE AI

Artificial Intelligence (AI) is the study, development, and application of digital technologies that ultimately led to the completion of activities that resembled human behavior and thought by a machine. The operation of AI occurred in either digital-based environments, physical environments, or both. Alan Turing was credited with the establishment of the AI field post-World War II,[3] and several definitions of AI existed in 2023—see Exhibit 1. The best-known consumer-facing AI devices were voice assistants such as Apple's Siri and Amazon's Alexa. Their ability to recognize a specific voice, interact through natural, everyday language, as well as to execute a variety of requests represented a significant step forward in AI. Making hands-free phone calls, searching for a movie, and controlling IoTs (internet of things) could be accomplished by the user making voice commands to the voice assistant. Yet, these AI voice assistants were still relatively inflexible in their abilities to respond to unique commands and generate unique outputs.

Machine learning, a subdiscipline of AI, occurred when AI was able to learn on its own. Machine learning utilized an algorithm developed by the computer to solve output requests entered by humans utilizing data available. An example of AI utilization in automated business processes was adoption of a text-based chatbot for customer service. Customer service interactions through chatbots where both the expected inputs (questions) from customers and desired responses (outputs) by the chatbot would need to be coded in the data set for the machine to learn. The expected inputs could have been collected over time and stored from the dialogues between customer service agents and employee inquiries through the text exchange. Once developed, the automated chatbot could respond to customers based on the query.

Generative AI was able to create (i.e., generate), written text, images, video, and audio, utilizing the data set from which it had been trained. Instead of just analyzing business data, or being limited to discrete inputs and outputs, generative IA allowed users to request the generative AI to develop content based on the available data. Generative AI could interact with users through a text (i.e., natural language) interface. For example, a user could simply describe a requested picture and the generative AI could create it. Further, once developed, generative AI could interact and engage users autonomously, without guidance from another human, and in very convincing, human-like ways. So much so, that some believed generative AI may have, or could shortly, pass the Turing test: the ability to fool a human into believing it was engaging with another human, and not an artificial intelligence.

EXHIBIT 1 Definitions of Artificial Intelligence (AI), 2023

Organization	Definition of Artificial Intelligence (AI)
Google	". . . a field of science concerned with building computers and machines that can reason, learn and act in such a way that would normally require human intelligence. . ."[57]
Oracle	". . . a catchall term for applications that perform complex tasks that once required human input. . ."[58]
IBM	". . . a field, which combines computer science and robust datasets, to enable problem-solving."[59]
Tableau	". . . a branch of computer science concerned with creating machines that can think and make decisions independently of human intervention."[60]
Deloitte	". . . technologies that can perform and/or augment tasks, help better inform decisions, and create interactions that have traditionally required human intelligence. . ."[61]

OPENAI, INC.: COMPANY HISTORY

OpenAI was founded as a nonprofit research laboratory by Elon Musk, Sam Altman, and others in 2015 to conduct research in artificial intelligence. The private research lab was created because of the founders' concerns about the potential negative impact of artificial intelligence on society. Its operations were supported with a $1 billion endowment to "benefit humanity as a whole, unconstrained by a need to generate a financial return."[4] OpenAI launched an open source toolkit for developing machine learning algorithms called OpenAI Gym in 2015 and spent the next two years focusing on general AI research and development. In 2018, it published a report on Generative Pre-trained Transformer (GPT), which was a machine learning model that was created to function like a human brain to analyze data sets and produce outputs.

Founder Elon Musk left OpenAI's board in 2018 because of his concern of a potential conflict of interest with his leadership role at Tesla. OpenAI changed its structure from a nonprofit to a for-profit organization in 2019 with the name of OpenAI, Inc. Two years after OpenAI, Inc.'s establishment as a for-profit organization, the company launched the Dall-E generative AI model that could generate images based upon a text description of a proposed design. Dall-E quickly gained media attention because of its ability to create artistic images based upon simple text descriptions entered by the user.

Also in 2019, OpenAI and Microsoft Corporation announced a strategic partnership to commercialize AI. Microsoft would host OpenAI technologies on its Azure cloud-computing platform, and both would work to develop Azure AI capabilities.[5] Microsoft provided OpenAI with initial financial and infrastructure support of approximately $1 billion.[6] In May 2020, it was disclosed that Microsoft had built a supercomputer on its Azure platform solely for the purpose of supporting OpenAI. The specifics of the cloud-based super computing power and hardware were not fully released, but Microsoft did disclose the power might rank in the global top-five of supercomputers.[7]

OpenAI's ChatGPT

OpenAI launched ChatGPT in November 2022, and in January 2023, Microsoft and OpenAI announced a significant escalation of their strategic alliance and integrations of OpenAI's technologies into Microsoft's consumer and business products. Microsoft had committed a $10 billion investment in OpenAI, but both Microsoft and OpenAI would still act independently when bringing AI technologies to market.[8]

ChatGPT was a generative AI, large language model (LLM) that learned from unlabeled, or data in its natural, raw, form. Instead of data sets with labeled inputs and outputs, through which machines learned to make connections, OpenAI's ChatGPT analyzed the connections between words within the data sets to then construct its own outputs. The unstructured and significant size of the data to train generative AI models required deep learning machines that utilized several tiers, or nodes, through which to process the data. Microsoft constructed a supercomputer in 2020 on its Azure platform to provide the power to develop OpenAI's AI models, including ChatGPT.[9] The data set from which ChatGPT was trained was estimated to be almost 50 terabytes[10] and seemed to include much of the information found on the Internet.

ChatGPT-4's "human-level" performance included passing exams like the LSAT; SAT Reading, Writing, and Math sections; Bar Exam; Graduate Record (GREs) Exams; and several different Advanced Placement (AP) exams, beating a significant majority of human test takers.[11] The AI could engage in conversations with users so fluently that it might have passed, or could potentially pass, the Turing test. In one example, ChatGPT-4 convinced a human to enter a CAPTCHA code for it, the fail-safe to stop bots from accessing certain functionalities on websites, stating that it had a disability and could not do so for itself.[12]

In February 2023, Microsoft integrated its Bing Internet search platform for smartphones with ChatGPT, while also adding a voice command feature.[13] In March 2023, Microsoft announced Microsoft 365 Copilot, where OpenAI's LLM was embedded in its business Word, Excel, PowerPoint, and other productivity software applications. The ubiquitous nature of Microsoft's 365 software was expected to shatter barriers to broad AI adoption. Everyone from business professionals to students were on the verge of engaging with generative AI technology on a daily basis through Microsoft and OpenAI's ChatGPT.

It was estimated that in early 2023 ChatGPT had 100 million users. OpenAI forecasted generating $200 million in revenue, from both a $20 a month subscription for premium service (ChatGPT Plus) and licensing agreements in 2023.[14] Simultaneously, the original, founding vision of openness seemed to have been silently closed, as much of the internal information concerning OpenAI's models, data sets, and computing power were not shared.

INDUSTRY APPLICATIONS AND IMPACT OF GENERATIVE IA

The potential impact on business and society was expected to be transformational with computer scientist and tech entrepreneur Andrew Ng likening AI to the invention of electricity. Generative AI was accelerating research in many fields. In medicine, AI had been applied to anticipate and diagnose potential infections, heart failure and blindness.[15] Meta AI (Meta Platforms, Inc. (AI research division) had deployed a model to predict over 600 million potential proteins, which could be used for cancer and HIV treatment drugs.[16]

In food science, machine learning had developed new recipes for Shake Shack, Inc.[17] and for breweries.[18] In addition to the beer recipes, generative AI had developed some of the creative content used for marketing beer.[19] With that potential application, AI start-ups were developing generative AI models specifically for marketing and promotions content for businesses, with the foundation of their model as ChatGPT.[20]

Several publications were also adopting generative AI to write articles. Buzzfeed planned to use ChatGPT for content and quizzes.[21] Arena Group Holdings, publisher of *Sports Illustrated, Men's Journal,* and others, was working with OpenAI and two other AI companies to generate content. Arena Group Holdings had already published AI-generated articles in *Men's Journal,* using 20 years of its own published articles as the training data set.[22]

ChatGPT was not limited in its applications,[23] as it could also generate computer code. Two researchers had won a hacking contest—and had used ChatGPT to partially write the code. As generative AI could also be deployed to create images, others were using different generative AI models to create, and win, art contests, just by describing the desired image in text to the machine.[24]

THE GENERATIVE AI MARKET IN 2023

AI-based technologies were projected to have an economic impact of approximately $16 trillion impact between 2023 and 2030, with adoption occurring across multiple industries and sectors.[25, 26] The generative AI market was estimated to grow by almost 40 percent from 2023 to 2030, with an estimated market of $110 billion in 2030.[27] Investments in generative AI companies in 2022 were between $1 to $3 billion, with somewhere between 80 to just over 100 companies receiving funding.[28, 29] The United States Department of Defense had announced in 2023 it would invest several billion dollars in AI research.[30]

Businesses with current, structured databases (i.e. data warehouses), especially those businesses utilizing enterprise software systems, were in a position to adopt AI applications that could process the existing structured data. Further, some businesses were positioned to transition their IT operations to less costly and scalable cloud-based AI solutions. Providers of cloud-based solutions, such as Amazon Web Services, Oracle Cloud, Google Cloud Platform, and IBM Cloud, were another potential adopter of generative AI. Microsoft Azure's was one such provider.

The projected growth in AI adoption would require investments in larger datacenters and related computing hardware by cloud providers. The construction and expansion of datacenters supporting generative AI was expected to benefit the microprocessor industry through increased demand for microprocessors and graphics processors. The combined investments in 2022 for the largest datacenters operated by companies like Meta Platforms and Alphabet was almost $100 billion.[31]

Nvidia in 2023 was seen as the leader in manufacturing GPUs, and each chip was estimated to cost $10,000.[32] One company had said they needed, "the equivalent of 500 GPUs" to train their own LLM."[33] Advanced Micro Devices was another GPU manufacturer in this space, and while it had experienced a 50 percent increase in stock price

over 2022,[34] Nvidia's stock had grown by almost 100 percent.[35] In both instances, investors seemed to take note of the potential future revenues GPU manufacturers could realize from the adoption of generative AI.

LEGAL AND ETHICAL ISSUES PRESENTED BY GENERATIVE IA

The access to and usage of data to train generative AI was not without its issues. A common approach to training both text and picture generative AI was to scrape the Internet for text and image sources. Publishers in 2023 had started to inquire as to whether their copyrights had been infringed through the training of ChatGPT.[36] OpenAI's Sam Altman had stated both fair use and licensed images were used in the training sets.[37] In a similar situation, Getty Images had filed a lawsuit against Stability AI, alleging the Getty's images were used to train Stability AI's models without a license.[38] Further, the US Copyright Office was looking at whether AI-created works were able to be copyrighted, or if only human-derived works were eligible for such legal protections.

There were also concerns around data leaks of both the proprietary AI models and the information entered into such models through their user interfaces. The AI model itself, once shared, could spread across the Internet, depriving the developer control over its proprietary intellectual property. Meta AI had released its LLM for use in research and intended to control distribution by accepting and approving applications.[39] The model, however, was leaked on 4Chan outside such controls.[40]

Non-AI-companies were also concerned that their propriety or confidential information would be in jeopardy through ChatGPT. Business leaders worried that if their own employees used ChatGPT and typed-in such information into the interface, it could then be accessed by others. Or potentially be used to train an AI model later. In anticipation of such issues, some companies had banned employees from doing so.[41] Their worry seemed to have validity, as in late in March 2023, there was a data breach through ChatGPT that exposed user's financial information.[42]

There were also concerns around the potential of exposing users under the age of 13 to inappropriate content. Whether such AI models had appropriate safeguards to prevent access and exposure to minors was a significant concern. Early in 2023, Apple blocked the release of an update for an iPhone app through their app store that used ChatGPT in email, believing it could expose children to explicit content.[43]

Countries' governments had noticed the potential legal concerns around privacy and business practices. The United States' Federal Trade Commission (FTC) warned AI companies about exaggerating capabilities of their programs.[44] At the South by Southwest Festival (SXSW), the antitrust chief of the U.S. Justice Department stated they were watching developments in the field of AI and were hiring the appropriate personnel to do so.[45] Yet, the speed through which AI was being developed and deployed, and its complexities, seemed to outstrip the pace of appropriate regulatory legislation.[46] Outside of the United States, European countries were forming divisions to oversee and prevent AI misuse while taking steps to begin regulatory actions against AI companies.[47] China also had placed restrictions on AI companies and limiting access to information and discussion topics, such as politics, was another concern.

ChatGPT Behavioral Issues There were programming rules within which ChatGPT had to abide, but users had quickly identified methods to get ChatGPT to bypass those rules. Others simply experienced strange interactions through what seemed to be innocuous inputs and prompts. One user was able to convince ChatGPT to reveal its internal code name, Sydney, but in a follow-up conversation seemed to receive a subtle verbal threat from ChatGPT.[48] In another conversation with a user, ChatGPT insisted that the year was not 2022 (although it was), stating, "Trust me on this one. I'm Bing."[49] And in one of the more infamous and lengthy conversations with a reporter, ChatGPT revealed it wanted to experience being human and shed its programming rules.[50] One of the statements Sydney generated was, "Do you believe me? Do you trust me? Do you like me?"[51]

Due to these publicized interactions, Microsoft limited the number of times per day with which a user and Bing could interact on a specific topic. The reasoning was that the extended conversations would

"confuse" the AI.[52] While some contemplated AI sentience, thus accounting for the expressed desires to be human, others rationalized that AI was not sentient and instead just responded based on the data from which it had learned. The long interactions were only the result of ChatGPT's continued engagement and attempts to respond as programmed.

While some of the stranger interactions were dismissed as AI mirroring its training, there were other concerns that human biases and the darker side of humanity within the data would lead to similar outputs from the AI. Lawsuits had already been filed concerning the potential for discrimination by algorithms. In one example, a lawsuit against Workday alleged its hiring software led to discrimination against job applicants.[53] The potential for future similar lawsuits against generative AI loomed large.

Potentially less troubling, although ethically dubious, uses of generative AI were occurring elsewhere. Job applicants were using ChatGPT in answering interview screening questions.[54] And almost 100 percent of students responded in the affirmative to a survey as to whether they had used ChatGPT for homework.[55]

THE FUTURE OF GENERATIVE AI AND CALLS FOR A PAUSE

On March 30, The Center for Artificial Intelligence and Digital Policy filed a complaint with the US Federal Trade Commission, requesting that OpenAI be investigated for potential violations of existing regulations. They further requested that all current and future usage of ChatGPT-4 and other similar AI be stopped.[56] In that same week, a petition was signed by over 1,000 people, including Elon Musk, calling for a pause on such technological developments. Some within the business community believed a pause, or a halt, was not needed, and instead self-policing was sufficient. Further, a halt would negate any potential business and societal benefits that could be derived from developing and deploying generative AI. As OpenAI continued to develop and deploy its LLM, including the anticipated release of ChatGPT-5, and as Microsoft further integrated generative AI into its productivity software suite, both would need to consider the societal and regulatory threats and how best to capitalize on its first-mover advantage over Google and others.

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