

# Unleashing the Power of Generative AI: The Race for Advancement and the Global Ramifications

By

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Submitted to the MIT Sloan School of Management in Partial Fulfillment of the Requirements of  
the Degree of

Master of Science in Management Studies

at the

Massachusetts Institute of Technology

May 2023

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## **Abstract**

Generative AI, including language models like ChatGPT, has had a significant impact on a wide range of industries and applications. It has created new opportunities in industries like content creation, marketing, and design thanks to its capacity to produce high-quality text, images, and other types of media. The increased use of generative AI has, however, also sparked a global arms race for supremacy in the area.

Concerns have been raised about the potential misuse of generative AI technology, including the production of fake news, propaganda, and deepfakes, as countries and corporations compete for control over it. The creation of highly sophisticated generative AI systems has also sparked discussions about the moral and societal ramifications of making machines that can generate content on their own with little to no human input.

Despite these worries, generative AI will probably continue to have a positive social impact in the years to come. The potential for industries to undergo a revolution and for our interactions with media and information to change as technology becomes more widely available and sophisticated.

As a result, it is critical that we keep a close eye on its development and application while also attempting to address any potential ethical and societal issues that may come up.

Through this research, I will analyze the holistic view of generative AI and raise up concerns about the effect of AI growth & global repercussions to such tension in the race for superior generative AI. Additionally, I will take parallels from past disruptive technologies to forecast the outcome of generative AI's abrupt changes to society.

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# 1. Introduction

“ChatGPT is a generative language model developed by OpenAI, trained on a massive dataset of text from the internet using a deep learning approach called transformer architecture. It has the ability to generate human-like text, making it a powerful tool for natural language processing and conversation applications, such as chatbots and virtual assistants. ChatGPT represents a major breakthrough in AI and has the potential to transform the way we interact with technology and each other. Its impact can be seen across a wide range of fields, including education, healthcare, entertainment, and more. With its ability to generate highly realistic text, ChatGPT has opened up new possibilities for creative expression, automated content creation, and personalized communication, making it a technology that has the potential to change the world in profound ways.”

- ChatGPT, April 2023

As an avid follower of the technology sector, I have always thrived to understand the newest disruptive technologies that have come to light over the decades and how it had shaped both our day-to-day activities as well as society as whole. We now have a chatbox that can accurately respond to your exact requests and conduct a well written response to the user as well as learn from its interaction and dialogue overtime. If we turn back time to remember when the iPhone was first popularized, we can remember that this disruptive technology had greatly changed how we searched, communicated, and interact with one other. The disruptive technology had fundamentally change society on a social, political, and economical level ... and now we are approaching another inflection point with Generative AI.

Artificial intelligence (AI) has been one of the most transformative technologies of the past few decades, revolutionizing industries ranging from healthcare to finance. Generative AI, in particular, has attracted significant attention in recent years for its ability to generate novel and creative outputs, such as images, videos, and even music.

One of the most notable examples of generative AI is ChatGPT, a large language model that was trained using a massive dataset of text from the internet. ChatGPT has been able to generate text that is often indistinguishable from that written by humans, leading to numerous applications in fields such as natural language processing, chatbots, and even creative writing.

The landscape of investments has been significantly impacted by the growth of ChatGPT and other generative AI models. In an effort to take advantage of its potential for disruptive innovation, generative AI is receiving billions of dollars in research and development from venture capital firms, startups, and established businesses alike.

With a focus on the present state of the market, its potential for growth, and the difficulties and opportunities that lie ahead, this thesis seeks to investigate the investment landscape of generative AI after ChatGPT. We aim to gain a deeper understanding of the forces guiding the investment landscape of generative AI and its potential impact on the future of technology and society by examining the most recent trends and developments in the field.

As businesses and academic institutions make significant investments in this cutting-edge technology, the competitive environment of generative artificial intelligence (AI) is quickly changing and become more congested. Generative AI seeks to create fresh, creative material for a variety of uses, including the creation of images and videos, natural language processing, and musical composition.

The generative AI market is dominated by a number of major firms, each of whom provides a variety of strategies and answers. The most well-known businesses include OpenAI, IBM, Microsoft, Google, Meta Platforms, and Microsoft. These businesses have made some of the most sophisticated generative AI models to date by making significant investments in research and development in this field. We will examine the competitive environment of generative AI in this thesis.

I intend to use this thesis to first investigate the background, motivation and objections of Generative AI, and dive into the existing and potential repercussions for the advancement of such technology and how it will affect different countries individually as well as globally.

## 2. Background

### 2.1 Rise of Generative AI

According to the World Economic Forum, generative AI “refers to a category of artificial intelligence algorithms that generate new outputs based on the data they have been trained on.”

The next big thing in a variety of industries, including tech, banking, and media, is generative AI, a class of artificial intelligence algorithms that can create new content based on existing data. In fact, we can already see how the technology is being used in a variety of ways.

A deep learning model known as DALL-E 2 gained notoriety in 2022 for its capacity to produce digital images from text prompts. More recently, ChatGPT has become wildly popular around the globe because of its sophisticated conversational features. The AI-powered chatbot was created by OpenAI and is supported by investors such as Microsoft. In the future, according to CEO Satya Nadella, the company plans to incorporate the technology into "every layer of the stack," starting with its Edge browser and Bing search engine.

The most recent version of OpenAI's ChatGPT software, GPT-4, was unveiled in March 2023 and is now accessible to subscribers and developers. Competing businesses want to introduce comparable tools: One such project being developed by Alphabet is the conversational AI service Bard.

In addition to improving consumer search results, generative AI has a wide range of business implications, both advantageous and disadvantageous. The way people work in the field of data analysis has changed because of generative AI. Generative AI can recognize patterns and make predictions because it can process enormous amounts of data in real time, which would otherwise be challenging or impossible for humans to do. In industries like finance, marketing, and healthcare, efficiency and accuracy have significantly increased because of this.

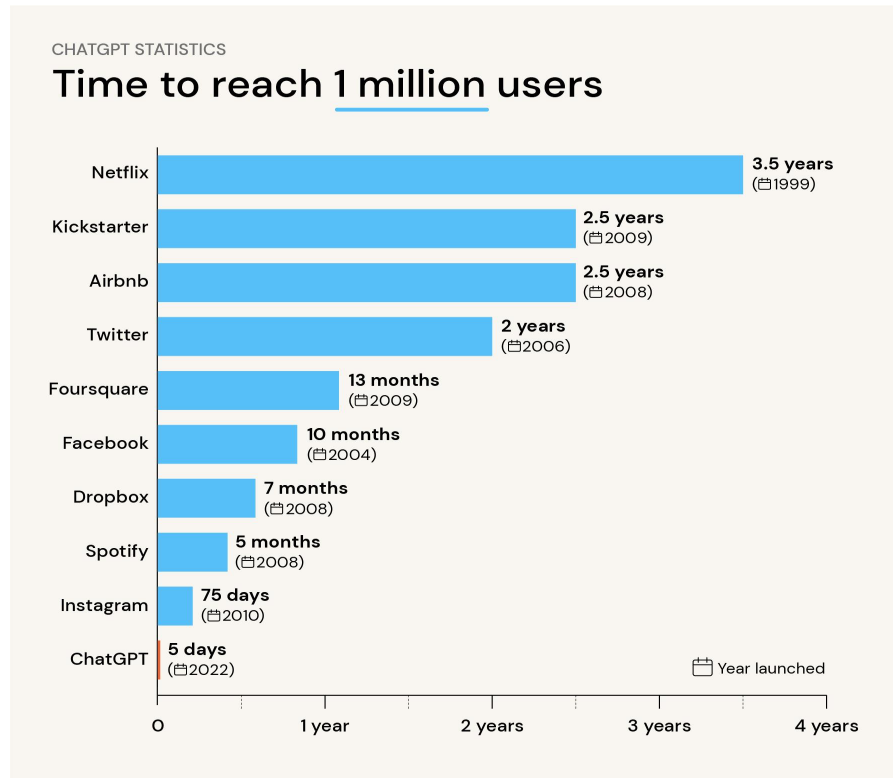


Generative AI are looking to create a much bigger impact and ChatGPT had become a catalyst to countries and companies fighting to become a leader in the field.

## 2.2 History of ChatGPT

The development of GPT (Generative Pre-training Transformer), an AI language model made by OpenAI in 2018, is where ChatGPT's roots can be found. GPT was created to anticipate each subsequent word in a given string of words by studying the grammar and style of a sizable dataset of human-generated text. This approach turned out to be very effective and was immediately incorporated into many different applications, such as music creation, language development, and machine translation.

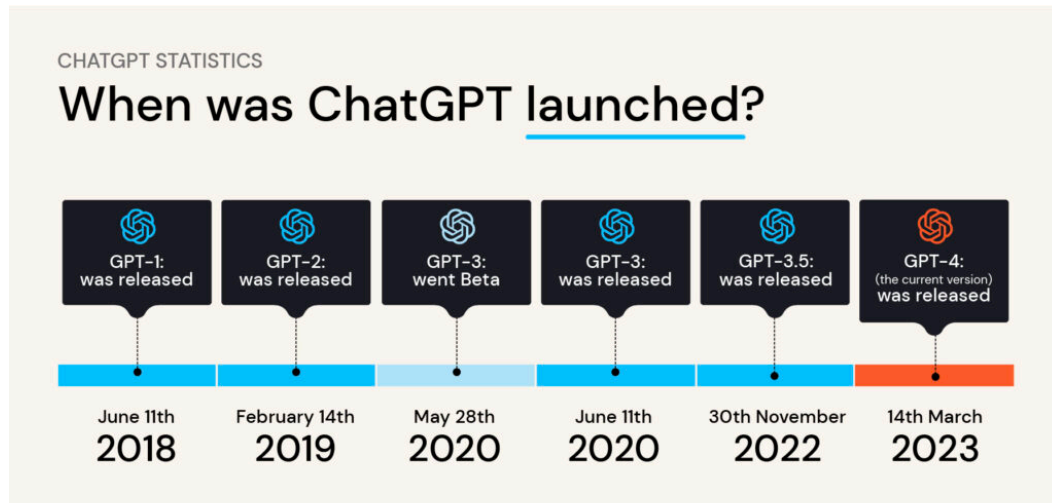
In late November 2022, San Francisco-based artificial intelligence company OpenAI quietly introduced ChatGPT to the world with little fanfare. Undoubtedly, nobody at OpenAI was ready for a massively popular viral sensation. Since then, the company has been battling to catch up and profit from its achievements. ChatGPT was so popular and disruptive of a new technology that it surged to 1 million users in a short 5 days as illustrated in the exhibit below:



(Sources: OpenAI, Venture Beat)

The OpenAI team set out to develop a chatbot that could have natural discussions with people, building on the success of GPT. As a result, ChatGPT was created and made available... ChatGPT is now among the most sophisticated chatbots on the market.

It was seen internally at OpenAI as a "research preview," according to Sandhini Agarwal, who works on policy: a sneak peek at a more refined version of a two-year-old technology and, more importantly, an effort to fix some of its problems by soliciting public comment. "We didn't want to oversell it as a big fundamental advance," says Liam Fedus, an OpenAI scientist who worked on ChatGPT.



(Sources: OpenAI, Venture Beat)

The AI research and application company OpenAI is the owner and developer of Chat GPT. Several well-known individuals, including Elon Musk, Sam Altman, Peter Thiel, OpenAI's chief scientist Ilya Sutskever, Jessica Livingston, and LinkedIn cofounder Reid Hoffman, founded the company, but has since seen some big names leave. Elon Musk left the OpenAI board in the years since it was founded in 2015.

### 2.3 The Rise of Generative AI among companies

Since the announcement of ChatGPT and its quick rise in popularity, many companies have now either largely increased their budget and timeline on building their generative AI capabilities or starting to deploy their existing technologies to match with ChatGPT. According to 15 current and former employees as well as internal documents from the companies, the unexpected success of ChatGPT has made Microsoft and Google more willing to stray from the moral standards they have established over the years to make sure their technology doesn't cause social issues.

The first business to launch a product "is the long-term winner just because they got started first," he wrote, when the tech industry is abruptly shifting toward a new type of technology. Therefore,

the world of generative AI is quickly turning into a war of arm race, a continuation of reckless releases of products, and a level of impatience that could endanger the future of generative AI.

Microsoft, a significant OpenAI investor and the effective stakeholder of the company, used ChatGPT's technology to create an AI tool it calls "even more powerful." The outcomes thus far have fluctuated between being truly off the rails and being impressive. Hence they created BingAI, combining its search engine software with ChatGPT like capabilities to try compete with Google.

Google, on the other hand, are faced with a threat. For a long time, Over 90% of the market for search engines is controlled by Google. It has remained the unchallenged leader, safeguarded by its sizable user and advertiser base, revenue, and purchasing power, as well as the fact that it is the default search engine for the two most widely used browsers (Chrome and Safari), as well as Android and iOS.

Google has been able to enjoy its market share thanks to its hegemonic position without feeling the need to innovate. There have undoubtedly been a few modifications to Google Search throughout the years, including improvements to deep learning and question-answering. But the fundamentals of the search experience have remained the same, and many users are now saying that it has gotten worse over time as more adverts are seen above the fold.

Google responded to Microsoft's Bing AI Chat project with a hurried demo of its own LLM, Bard, which contained factual errors and caused a \$100 billion reduction in the company's market price. Google must now reinvent itself and innovate, or else its search engine business will be threatened by rival digital firms. But the conflict has not yet been won. Google still has a ton of cash to invest in the issue. And the competition's flaws are beginning to surface.

Amazon also declared its entry into the generative AI competition. Instead of releasing its own chatbot, Amazon Web Services will make two new AI language models accessible for clients to utilize in the creation of their own chatbots. The potential of generative AI has the tech sector

frothing at the mouth in recent months. Amazon continues to dominate the global cloud computing business, followed by Google, Microsoft, and then. Through a collaboration with OpenAI, Microsoft is making the ChatGPT technology accessible through its cloud computing service Azure. The underlying language model technology has been developed by Google for many years, and it just released its own model PaLM, which is accessible through Google Cloud.

This is just a glimpse of how generative have been creating friction among competitors and causing disruption in once well-defined industries... The frenzy is being driven to extremes by Microsoft, Google, and Meta. Although they have all emphasized the significance of AI for many years, they all seemed taken aback by the astounding increase in interest and usage—and now appear to be prioritizing speed over safety. This raises an issue both on a domestic level and on an international level.

### 3. How ChatGPT Kicked Off an A.I. Arms Race

In the past, the development of the global web gave rise to the possibility of a worldwide digital ecosystem that was interconnected. Digital sovereignty, which refers to a nation's power to control its digital destiny and may entail control over the full AI supply chain, from data to hardware and software, has grown as a result of growing mistrust between states. The worry of losing access to essential digital components like computer chips and having no control over the global flow of citizen data is a result of the trend toward greater digital sovereignty, which in turn fuels the tendency. Due to the threat posed by these advances, high technology markets have begun to disintegrate and, in varied degrees, have begun to retrench back into the nation state.

According to many analysts, China will develop better artificial intelligence and take over the world. In fact, over the past year, American security analysts, policymakers, and journalists have increasingly used a Cold War-era analogy to describe issues surrounding the development of artificial intelligence (AI). They have specifically described the current state of U.S.-China technological competition as an "AI arms race," in which the two countries are presumably locked in competition for artificial intelligence hegemony. President Trump's Deputy Assistant for Technology Policy Michael Kratsios in 2023 stated that "in the end, we will win the race for AI." A 2018 U.S. National Security Council paper even mentioned "algorithm battles" between the United States and China. This situation plainly frames itself as winner-takes-all: One country will profit from artificial intelligence in ways as diverse as increased economic growth and improved military might, while the other falls short and is doomed to failure. The method in which American officials manage China's technical advancement and the advancement of artificial intelligence in our nation is significantly hampered by this framing of artificial intelligence, which is not only incorrect but also hazardous. The United States needs to quickly address China's growing AI development because artificial intelligence will have a significant impact on the balance of international power and the future world order.

AI development in the US and China needs to stop being called an "AI arms race," but that doesn't mean that AI development doesn't matter. In actuality, the reverse is true. We live in a time of great power competition, and for two main reasons, U.S. officials need to be more aware of Chinese and domestic AI research. The first is that artificial intelligence will have a significant impact on state power, primarily through increased economic growth and military prowess. Second, global leaders in AI will establish standards for its usage and for the general use of technology, which will have a significant impact on other "undecided" governments and the future global order. Because of this, American politicians ought to concentrate on cooperating with China on AI initiatives without renegeing on crucial know-how or technological advancements that can strengthen potentially dangerous applications of artificial intelligence, whether in law enforcement, business, or the military.

Additionally, the idea of an arms race sometimes leads to discussions of artificial intelligence as a single technology, although this is untrue and may result in poor governance. Even among professionals, there is no actual agreement definition of artificial intelligence, yet it is obvious that AI encompasses a variety of technologies. Artificial intelligence. However, viewing AI as a single entity runs the danger of leading policymakers to address AI concerns incorrectly and lose out on benefits.

### **3.1 US vs China**

The United States currently has an advantage over other nations in terms of computing hardware and human talent, making it evident that it is the leader in AI. China, however, is catching up quickly. Beijing has a better government policy for pushing AI than Washington does, and the ecosystem for AI is very open and technological advancements happen frequently. China has a sizable and expanding population of top-notch AI experts, and it has surpassed the United States in the use of AI. The U.S. immigration ban may unintentionally assist Beijing by allowing China to retain more

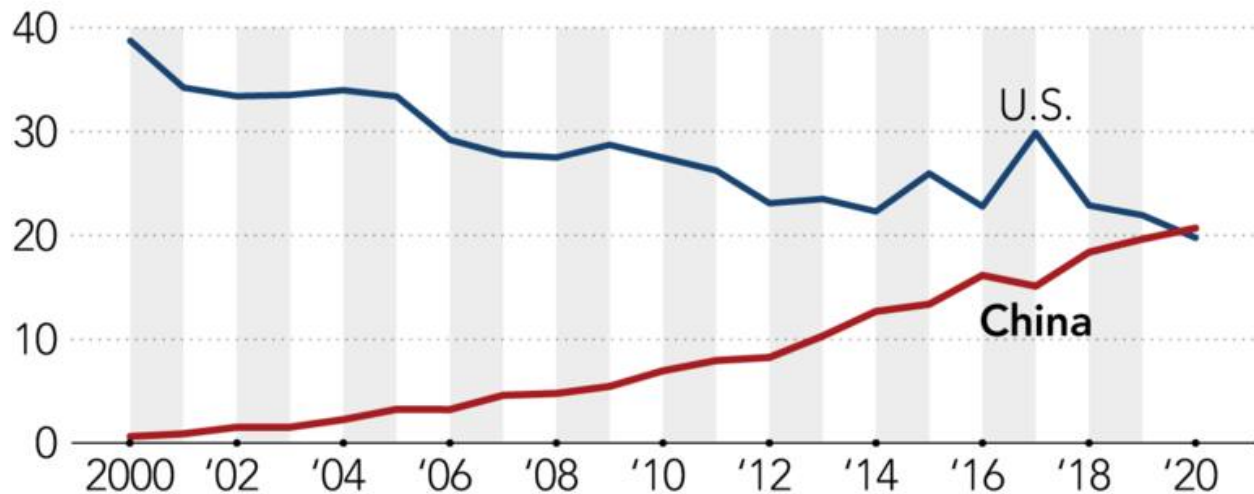
talent. Meanwhile, Washington's attempt to block off China from American technology may speed the time when Beijing will no longer require American computer equipment.

The United States must be cautious when dealing with Beijing and carefully plan its own initiatives if it wants to win the AI competition. It requires a plan to keep China reliant on imported chips, and it must maintain luring in and retaining the best AI talent in the world. It must ensure that all of its institutions, particularly the military, fully embraced recent developments. Additionally, it must make the most of its current advantages by making a concerted effort to deploy academic, business, and governmental resources to advance its understanding of the technologies that will rule the future.

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## China challenging U.S. dominance in terms of AI quality

Share of AI paper citations (*In percent*)



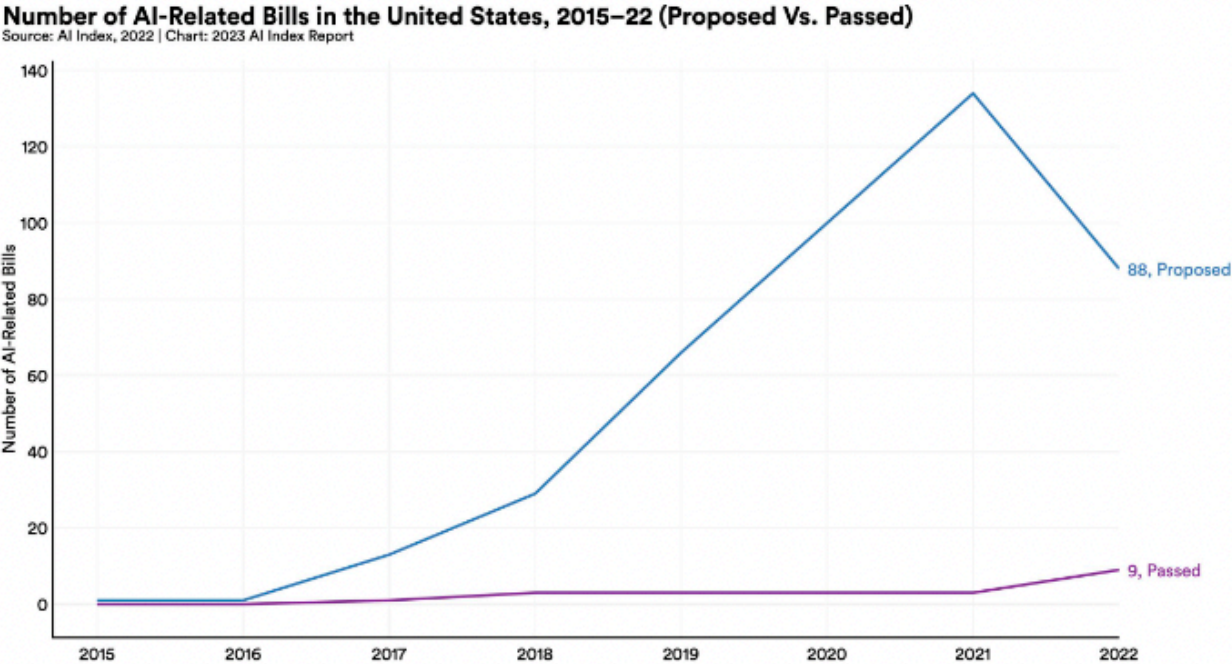
Source: Stanford University's AI Index Report

(Sources: Stanford University's AI Index Report)

We learned how concerned the US government was about it in 2021: The National Security Commission on Artificial Intelligence was established, with Eric Schmidt, the former CEO of Google, serving as its chairman. The commission forewarned that China might soon overtake the US as the



world's "AI superpower," that AI systems would be employed in the "pursuit of power," and that "AI will not stay in the domain of superpowers or the realm of science fiction" in its report, which was released in March of that year. Additionally, it advised President Biden to oppose proposals for a global ban on highly contentious autonomous weapons powered by AI, arguing that China and Russia would be unlikely to adhere to any pact they signed. Looking at the graph below, we see that more than ever the US government is taking AI governance more strictly and have increased its attention and legislation for it.

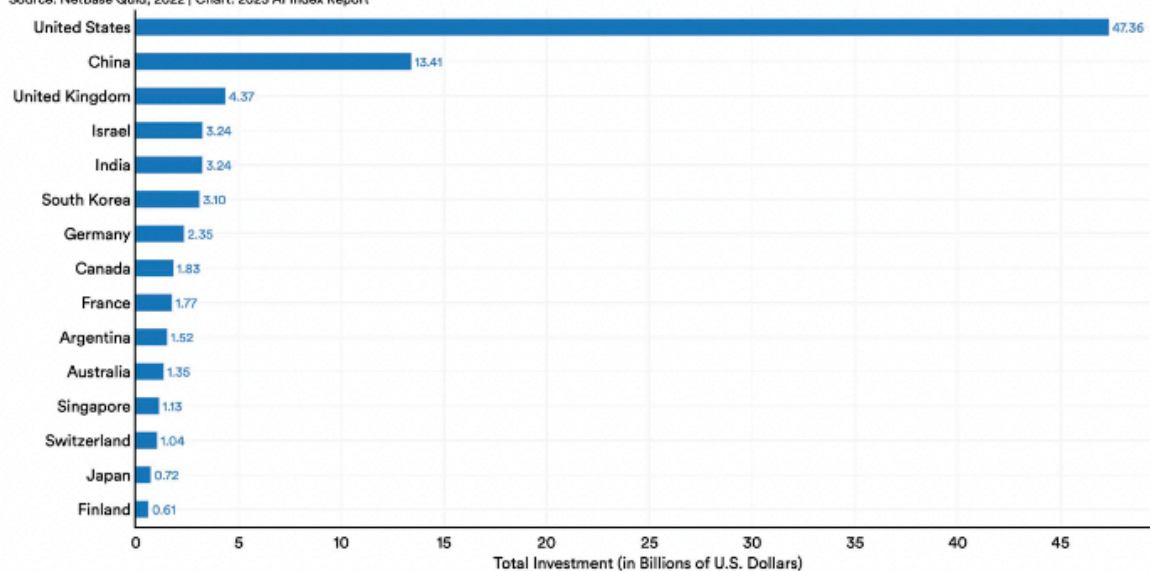


(Sources: Stanford University’s AI Index Report)

Though there have been speculations that China will surpass US in its AI capabilities, the US currently still has the finger on its AI capabilities. With tech giants like Microsoft, Google, AWS, and Meta all spending billions into the advancement of AI, the private invest in AI domestically far surpasses the amount overseas in China. In fact, the US lead’s in 2020 private investment into generative AI, more than triple of China’s current spending and more money than the top 15 countries combined spent, as illustrated below.

### Private Investment in AI by Geographic Area, 2022

Source: NetBase Quid, 2022 | Chart: 2023 AI Index Report



(Sources: Nikkei Asia)

Now diving deeper into China, virtually every major tech company in China is eager to create its own artificial intelligence chatbot in response to the buzz that ChatGPT has created. The release of Baidu's own variety is scheduled for next month. This recent focus is consistent with Xi Jinping, the supreme leader of China, who has strategically prioritized AI development since at least 2017, as part of China's quest to overtake the globe as a leader in AI and ultimately establish itself as a "science and technology superpower." Moreover, even though ChatGPT and other large language model (LLM) bots are just one aspect of the development of AI, LLMs will, in the words of a prominent AI scientist recently, "define artificial intelligence." In fact, ChatGPT's quick rise to popularity at Google "upended the work of numerous groups inside the company to respond to the threat that ChatGPT poses"—a blatant sign of the LLMs' perhaps excessive prominence.

However, China's ambitions to surpass all other superpowers in the field of artificial intelligence are quickly coming into conflict with its own censoring system. Controlling the information environment is more important to the Chinese Communist Party (CCP) than any kind of human or non-human innovation or creativity. The creation and adoption of LLMs may be severely hampered as a result, lagging China behind the West in the race for AI.

A shocking article from Nikkei Asia claims that Chinese regulators have ordered major internet firms not to provide ChatGPT services "amid growing alarm in Beijing over the AI-powered chatbot's uncensored replies to user queries. The main issue is that there are many speech restrictions in China, and transgressors face severe political repercussions. The CCP's wrath can be directed at the parent firm of a chatbot that implies Taiwan is an independent nation or says Tiananmen Square was a bloodbath. A chatbot that produces racist content or threatens to stalk a user makes for an embarrassing narrative in the United States.

On April 11, draft Measures to control the provision of generative AI services in China were released by Chinese regulators at the Cyberspace Administration of China (CAC). The Measures for the Management of Generative Artificial Intelligence Services (see full translation) as written would hold companies that offer generative AI services to the general public accountable for the results of their systems and would set strict criteria for the quality of the data used to train their algorithms. DigiChina consulted several experts to weigh the implications of this draft for the development of the Chinese AI market, the likelihood that businesses could continue to offer customers compelling services while complying, and the value this law will bring to the already crowded Chinese AI regulatory landscape. The restrictions on "deep synthesis" services, which have been in place since January, as well as the reporting requirements and other guidelines for recommendation algorithms, are already in place.

### **3.2 Russia, EU, and the rest**

Vladimir Putin, the president of Russia, has gotten involved in the international debate over the development of artificial intelligence. Putin stated in a speech in 2017 that the nation that advances AI research will eventually come to rule international affairs. Putin stated that "artificial intelligence is the future, not only for Russia but for all of humanity." "It comes with colossal

opportunities, but also threats that are difficult to predict. Whoever assumes control of this field will also assume control of the entire planet.

Though Russia is heavily regarded as a respected field within Artificial Intelligence research, Russia is not considered a front-runner compared China and the US are. Similarly, over in Europe, a sudden increase in the attention of generative AI had led to increased investments into Oxford & Cambridge University on the research of generative AI and data machine learning. Additionally, many prominent generative AI startups have caught the eyes of investors for their progress in AI development. For example, The open-source text-to-image generator Stable Diffusion's creator, Stability AI, a London-based company, raised over \$100 million in a seed round that valued the company at \$1 billion. The money will be used to triple the company's current employee count and build out the infrastructure for DreamStudio, a commercial version of its text-to-image model. Many of their AI capabilities are on par with the developments of the US and China.

With such progression across multiple continents, it begs to wonder what is needed to correctly regulate a soon-to-be globally disruptive technology. China is one of many nations that are taking action to control generative AI. The U.S. Commerce Department announced on Tuesday that it would spend the following 60 days gathering public input on AI audits, dangers, and strategies for increasing consumer comfort with AI systems.

Additionally, Italy last month outlawed ChatGPT, and the Italian Data Protection Authority (IDPA) directed OpenAI to cease processing user data while it looks into a possible violation of European privacy laws. Regulators in France, Ireland, and Germany are also looking into possible GDPR violations using ChatGPT. The IDPA gave OpenAI until April 30 to adhere to specific data guidelines before allowing the AI provider to resume operations in the nation on April 12.

Regulation is not simple and struggles to keep up with technology. Regulators must deal with issues including training data, data protection and privacy, intellectual property rights, and improper usage of AI systems.

Businesses deploying such chatbots must assess data security breaches. The if, what, and how of regulating AI in general and generative AI still raises a host of unanswered issues. It will take some time to address the potential effects of regulation on how technology is developed and applied. Instead of outright prohibiting generative AI or chatbot systems, nations seeking to understand generative AI can start a discussion about the proper use of these models, according to Sarah Kreps, head of Cornell's Tech Policy Institute.

## 4. Disruptive Technologies and their Repercussions

At its core, generative AI refers to the ability of algorithms to create new and original content, such as images, music, or even entire pieces of writing, without direct human input. This technology has the potential to revolutionize industries as diverse as art, design, and advertising. It has already been used to produce everything from lifelike portraits to realistic text conversations. However, as with any disruptive technology, generative AI is likely to have significant impacts on society, both positive and negative. It is crucial to look at the history of other disruptive technologies, such as smartphones, social media, and electric vehicles, in order to fully comprehend these effects. Each of these technological advancements has profoundly impacted our society and altered how we relate to one another and the outside world.

For instance, smartphones have completely changed how we access information, communicate, and even do business. These gadgets have proliferated in recent years, with billions of people relying on them for everything from social networking to GPS navigation. However, smartphones have also sparked worries about addiction, privacy, and the possibility that technology will take the place of interpersonal communication.

Similar to how social media has changed how we connect and share information, it allows us to have real-time conversations with people anywhere in the world. However, social media has also been criticized for contributing to political polarization, spreading misinformation, and creating a culture of online harassment and bullying.

Electric vehicles, meanwhile, have the potential to drastically reduce our reliance on fossil fuels and combat climate change. However, because of infrastructure issues, range anxiety, and expensive batteries, their adoption has been slow.

Disruptive technologies have the potential to significantly alter our lives in each of these situations, but they also present risks and difficulties that need to be carefully considered. In order to ensure

that generative AI is developed and implemented in a responsible and advantageous manner, it is crucial that we consider its potential effects on society.

## 4.1 The Smartphone disruption

The invention of smartphones caused a significant social upheaval that altered how we relate to one another and with technology. Smartphones were originally primarily used for communication, but they have since evolved into an all-pervasive technology that allows users to access information, conduct business, and consume media from any location at any time. This has changed how we work, interact with others, and pass our free time. However, the proliferation of smartphones has also given rise to fresh problems and worries. The privacy of users, who are worried about how their data is being gathered and used by technology companies, is a significant issue. As users depend more and more on their devices for social interaction and entertainment, there is also the risk of addiction and social isolation.

Governments and society have implemented several measures to control and manage smartphone use in response to these challenges. For instance, many nations have passed laws to safeguard users' privacy, and some businesses and workplaces have put in place rules to restrict the use of smartphones during specific times of day or in specific locations.

Various regulations have been put in place by governments all over the world to safeguard smartphone users' privacy. Here are a few illustrations:

1. The European Union's General Data Protection Regulation (GDPR): A comprehensive data protection law known as the GDPR was unveiled in 2018. Users now have more control over their personal data, and companies are now required to obtain explicit consent before collecting and using that data. The GDPR also imposes heavy fines on businesses that break the rules and grants users the right to access, modify, and delete their data.

2. The United States' California Consumer Privacy Act (CCPA): A state-level law called the California Consumer Privacy Act (CCPA), which took effect in 2020, gives Californians the right to know what personal information is being collected about them, the right to refuse to have their data sold, and the right to ask for the deletion of their data. Companies must make specific disclosures about their data collection and sharing practices under the CCPA.
  
3. PIPEDA is Canada's law governing the protection of personal information in electronic documents. A federal law known as PIPEDA governs how private sector organizations must collect, use, and disclose individuals' personal information. Companies are required by law to obtain user consent before collecting any data from them and to give users access to that data. Additionally, the PIPEDA imposes fines for non-compliance.

Governments have also introduced a number of guidelines and recommendations for businesses to abide by in order to protect user privacy in addition to these laws. For instance, the UK's Information Commissioner's Office (ICO) has published guidelines on the use of location data, and the National Institute of Standards and Technology (NIST) in the US has developed a set of standards for developing secure mobile apps.

Overall, these actions show that governments are becoming more aware of the importance of preserving user privacy in the context of mobile technology. These laws and guidelines are a significant step toward ensuring that users have more control over their personal data and that their privacy is respected in the digital age, even though there is still much work to be done in this area. We can draw lessons from the smartphone industry's experiences when it comes to generative AI. First, we can foresee possible repercussions from the widespread application of generative AI, such as worries about privacy, security, and job displacement. Second, we can create laws and rules that encourage the ethical and responsible use of this technology, like data



protection regulations and rules for algorithmic judgment. Additionally, we can gain insight from the smartphone industry's experiences regarding the significance of user engagement and education. We can ensure that the positive effects of generative AI are maximized while minimizing its negative effects by encouraging digital literacy and empowering users to make knowledgeable decisions about their use of technology.

Connecting it back to generative AI, strong data protection rules and regulations that control the gathering, use, and sharing of personal data are an important tactic. For instance, the GDPR mandates that businesses seek the explicit agreement of users prior to collecting and processing their data, as well as granting users the ability to view, change, and delete their personal information. Governments and enterprises can also utilize technical safeguards like encryption and anonymization to protect user privacy. For instance, we may make sure that user data is secure and shielded from illegal access by encrypting it. Similarly, we may reduce the possibility that personal information will be connected to particular people by anonymizing user data.

Promoting user knowledge and education regarding privacy issues is another tactic. Users will be better equipped to choose how to use this technology if they are taught about the advantages and risks of generative AI. This might entail presenting transparent and succinct privacy policies, user-friendly privacy settings, and broader promotion of digital literacy. Overall, it is crucial to take into account the privacy of personal data when discussing generative AI. We can create efficient solutions to deal with this issue and make sure that users' personal data is safeguarded and respected by drawing on lessons learnt from the smartphone era.

## **4.2 Warning Signs of Generative AI**

Beyond issues of privacy, there are many other unknowns about this new technology. There are legal dangers associated with generative AI such as intellectual property violation, and it frequently raises legal issues that are still being resolved. Does AI-created content fall under copyright, patent, or trademark infringement laws, for instance? Is it clear whether you, your customers, or

generative AI platforms own the material they produce? Businesses must grasp the hazards and how to take precautions before embracing the advantages of generative AI. We now have generative AI products that could literally write, illustrate, analyze, decipher better than the average human being, it begins to wonder where the line is drawn?

Companies that deploy generative AI face a number of difficulties as a result of all this unpredictability. In contracts that doesn't speak towards the use of generative AI by its vendors and consumers, there are risks of infringement, whether deliberate or inadvertent. By feeding data into generative AI technologies, there is a chance of unintentionally disclosing private trade secrets or corporate information.

Additionally, we face a new level of threat when it comes to accepting our reality. We hear about scam calls asking for money and using witty gimmicks to trick money out of innocent people. Generative AI is making it simpler and cheaper for scammers to deceive others through visual or audio imitation and trick others into believing their loved ones are in danger. According to data from the Federal Trade Commission, impostor scams were the second most common scam in America in 2022, with over 36,000 instances of victims being duped by con artists posing as friends and relatives. According to FTC officials, more than 5,100 of these occurrences involved phone calls and resulted in losses of more than \$11 million.

Artificial intelligence advancements have introduced a disturbing new element, making it possible for scammers to mimic a voice with just a little audio sample, such as a few phrases. With the aid of artificial intelligence (AI), a plethora of low-cost web programs can convert an audio clip into a voice clone, enabling a con artist to make anything they type "speak". Imagine scammers can now attain your voice and call you parents or grandparents asking for money to pay tuition or requesting your social security number to apply for a job, generative AI makes it essentially indistinguishable.

In fact, on the popular social media app, TikTok, a new filter allows you to essentially glamour up and look completely different from oneself but looks natural and indistinguishable as if it was

themselves. The photo comparison below illustrates the same girl with and without the filter. Its generative AI capabilities is incredibly strong and implicates a whole new level of security threat... This raises security risk that could create unfathomable problems that we cannot even imagine right now.



(Sources: BBC, TikTok)

### 4.3 Civilisation Destruction, Tech Leader's stance on Generation AI

Elon Musk, Steve Wozniak, and other well-known high-tech figures and industry executives have signed an open letter requesting that the artificial intelligence sector take a six-month break from the development of safety protocols for the technology. The Future of Life Institute, a nonprofit organization dedicated to guiding transformational technology away from extreme, large-scale hazards and towards benefitting life, produced the letter, which as of April 2023 has been signed by approximately 1,400 people. The group mentions in the letter how AI technology is quickly advancing and how it has overtaken human performance in several domains. The organization

cites the ease with which AI may be used to produce lethal infections in addition to new medicinal treatments.

In a report released in 2020, the World Economic Forum (WEF) stated that "a new generation of smart machines, fueled by rapid advances in AI and robotics, could potentially replace a large proportion of existing human jobs." Robotics and AI will result in a significant "double-disruption," as the pandemic forced businesses to accelerate the adoption of new technology in order to reduce costs, boost productivity, and become less dependent on actual people. PriceWaterhouseCoopers, a leading management consulting firm, stated that "AI, robotics, and other forms of smart automation have the potential to bring great economic benefits, contributing up to \$15 trillion to global GDP by 2030." But a heavy human cost will accompany it. There are worries that this additional wealth could eliminate a large number of current jobs, but it will also increase demand for numerous jobs.

## 5. Conclusion

This thesis has examined the development of generative AI and the role that ChatGPT had in the start of a global arms race in artificial intelligence. To better comprehend the ramifications of this new technology, we have looked at the historical background of ChatGPT, the emergence of generative AI, as well as earlier disruptive innovations. We have also talked about the possible risks and red flags of AI, including the AI conundrum and the necessity for ethical concerns.

The rise of generative AI poses a variety of benefits and difficulties for society, ranging from considerable employment displacement and ethical concerns to improved efficiency in a number of industries. AI development has already altered how we work, communicate, and engage with technology, and it's expected to do so in the future as well. Therefore, it is vital to comprehend the potential effects of this technology and deal with the problems it poses.

Despite the advantages of generative AI, its development has sparked a global arms race in artificial intelligence, with China and the United States presently leading the way. As nations compete for dominance in this area, this has led to substantial geopolitical issues. To ensure that the development of AI benefits all of mankind, it is crucial to understand the potential effects of this arms race and work toward global cooperation.

Addressing the ethical ramifications of AI development is also crucial. There is a pressing need for ethical considerations in the creation and use of AI, as the AI conundrum and the unfiltered AI chatbot have shown. It is crucial to make sure that ethical values that put the welfare of people and other sentient beings first serve as a guide for AI development.

In order to fully understand the societal and economic effects of generative AI, more research is required. This entails coming up with solutions for AI's problems, including the loss of jobs, and looking at the technology's potential advantages for society, like higher productivity across a range of industries. It is essential to make sure that AI is created and used in ways that are secure, moral,

and advantageous for all as we progress towards a future that is increasingly dominated by technology.

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