

Generative AI: The Societal Risks and Rewards

In around 700 BC the world witnessed the first ever implication of artificial life with the story of Talos — a bronze man created by the Greek God of invention. Then came Roger Bacon's Brazen Head — an intelligent automation that could understand matters just like humans. Such stories continued to arise — be it Frankenstein or 2001: A Space Odyssey — but they remained confined to one's imagination. These inventions were, in fact, just another tale from the genre of science fiction. So when did they escape ink and paper and become reality?

In 1956 the invention of 'Logic Theorist'¹ came about. It was a program written by Allen Newell, Cliff Shaw, and Herbert Simon to mimic the thought process and reasoning skills of humans. It has been almost universally acclaimed as 'the first artificial intelligence program'. From then on, the progress has been constant; with generative Artificial Intelligence (AI) coming into the picture just less than a hundred years later. So, what exactly is AI? Essentially, AI is a machine's ability to perform cognitive tasks in a way that humans would. It is a simulation of human intelligence in machines.² These tasks, however, are based on predefined rules. Generative AI, by contrast, focuses on creating new and original content including text, image, and audio connected data. It does so by analyzing, processing, and learning patterns from existing data, and using this information to create new outputs.

This cutting-edge technology can be extremely beneficial and is so advanced that it makes a wonderful tool for everyday tasks. It is used across industries and businesses, from customer service to education, healthcare, and much more. Progressing with our timeline, ChatGPT, launched by Open AI, emerged less than a year ago as one of the finest examples of generative AI that has completely revolutionized technology as we have traditionally seen it.

¹ SITNFlash, "The History of Artificial Intelligence - Science in the News," Science in the News, April 2020, <https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/>

² "Generative AI," Generative AI, n.d., <https://generativeai.net/>

Both small-scale and large-scale firms, schools and industries have employed it. It is, however, only a specific implementation of generative AI — designed only to perform tasks related to conversation. Generative AI can do so much more including image, audio, and video generation, marketing, data analysis, and deepfakes — to name a few.

AI can be thought of almost like a newborn child. It continuously learns from its users, and even improves upon its own performance. There are primarily three techniques that are used to accomplish this: Generative Adversarial Networks (GANs), Transformers, and Variational Autoencoders.³ GANs consist of two parts: a generator which is tasked with creating examples, and a discriminator which classifies them as real or fake. If the discriminator is fooled, then one can conclude that the generator is creating convincing examples. Transformers are mainly used in language models to convert input sequences to output sequences. They do this by checking the relevance of a word in context to other words in the sequence. And finally, Variational Autoencoders consist of encoders and decoders. The encoder takes in sample data and converts it to a distribution of possible encodings (putting a sequence of characters into a particular format) while the decoder takes a sample from this and reconverts the input data.

In today's world, there has been a significant surge in the popularity of generative AI. With ChatGPT 4, Google's Bard, and the upcoming Google Gemini, the market is constantly expanding with the latest estimate being around 10.79 billion US\$ in 2022,⁴ and expected to reach approximately \$1.3 trillion in the next ten years.⁵ The cause of this recognition and growth is mainly due to the efficiency of generative AI, its almost human-like interactions, creative

³ D. Shah, "Generative AI 101: Explanation, Use Cases, Impact," V7, August 2023, <https://www.v7labs.com/blog/generative-ai-guide>

⁴ "Generative AI Market Growth Is Booming with 27.02%," n.d., <https://www.precedenceresearch.com/insights/generative-ai-market>

⁵ "Generative AI to Become a \$1.3 Trillion Market by 2032, Research Finds | Press | Bloomberg LP," Bloomberg L.P., June 2023, <https://www.bloomberg.com/company/press/generative-ai-to-become-a-1-3-trillion-market-by-2032-research-finds/>

capabilities, and wide application in nearly all fields in the world today. It has permeated myriad fields, from school reports to highly acclaimed research papers. The GANs can create jawbreaking images, videos, and even music, which find applications in the performing arts and content creation sector. Dall-E, Stable Diffusion and Midjourney are the most popular tools in this field. Something that would take artists days to make is now produced in mere seconds, with more than 20 million images being created per day.

One of the most commonly used tasks that AI is used for is primary writing. GPT-3 and GPT-4 are repeatedly used for writing reports, emails, articles and much more. Their predominance in this field is mostly attributed to their human-like responses, making their works of literature easily blend in with the rest. In fact, schools have even embraced this, and started introducing AI based assignments! Individuals now no longer have to worry about sometimes tedious drafting tasks, and can focus on other duties, thereby increasing efficiency and saving time. In fact, ChatGPT can be used for almost every task — whether for writing jokes, seeking relationship advice, creating tests, understanding complex topics, writing resumes, or even as a friend to seek solace in!⁶

Generative AI is also increasingly being used in software engineering, healthcare, and gaming. GPT-3 can write effective codes based on language input and requirements, and is also being used by many major companies like GitHub to suggest precise code excerpts to programmers. In healthcare, deep learning is helping in the recognition of cancerous tissues and other abnormalities.⁷ Besides this, AI is also being used to give precise medication dosage to

⁶ M. Timothy, “16 Things You Can Do With ChatGPT,” MUO, August 2023, <https://www.makeuseof.com/things-you-can-do-with-chatgpt/>

⁷ T. Davenport and R. Kalakota, “The Potential for Artificial Intelligence in Healthcare,” *Future Healthcare Journal* 6, no. 2 (June 2019): 94–98, doi:10.7861/futurehosp.6-2-94.

patients, and is even being used by companies to predict the 3D structure of proteins, which proves extremely beneficial for anticipating diseases as well as developing drugs.

Unfortunately, the universe is like a zero sum game and has a way of balancing out the positives and the negatives. With the advent of AI comes fear and panic. Just like with all science fiction, generative AI too brings with it the question — benefactor or malefactor? According to reports, approximately 27% of jobs are at high risk with the AI revolution.⁸ Writers, software developers, graphic designers, proofreaders, and many others are at high risk of being replaced. Apart from job instability, there are other risks associated with AI as well.

AI models are extremely prompt dependent. This gives rise to many output quality issues.⁹ Some outputs may align with user needs, but outputs are not always precise, often lack quality, and can sometimes even produce inappropriate and potentially offensive content. The influx of AI even brings with it many privacy concerns. As discussed, AI systems require huge amounts of data to function. If any of this personal data falls into the wrong hands, then it could be used for nefarious purposes such as identity theft and cyberbullying. Many companies that use AI may also become subjects to intellectual property infringement which puts their users at high risk.¹⁰ As AI learns from user inputs and builds only on existing data, it also becomes susceptible to the biases and prejudices existing in the world. There have been instances of ChatGPT producing racist and even discriminatory outputs. Apart from this, AI is still not perfect, and can even produce inaccurate results and facts that are not actually true, making it unreliable. There are many copyright issues as well, with AI tools producing copyrighted content without the creator's permission.

⁸ L. Thomas, "27% of Jobs at High Risk from AI Revolution, Says OECD," Reuters, July 2023, <https://www.reuters.com/technology/27-jobs-high-risk-ai-revolution-says-oecd-2023-07-11/>.

⁹ M. Vartak, "Six Risks Of Generative AI," Forbes, June 2023, <https://www.forbes.com/sites/forbestechcouncil/2023/06/29/six-risks-of-generative-ai/?sh=71df0b863206>.

¹⁰ "The Risks & Rewards of Generative AI - Spiceworks," Spiceworks, April 2023, <https://www.spiceworks.com/tech/artificial-intelligence/guest-article/the-risks-rewards-of-generative-ai/>.

These risks, however, can be minimized if managed efficiently.¹¹ For example, accuracy risks can easily be managed if organizations train AI based on their own validated data. AI models should also be trained to cite their sources so that authenticity can be cross checked. Issues like biased outputs can be effectively managed by implementing regular testing and assessments. In order to protect data privacy, companies should not release their user data to AI until proper encryptions can be incorporated. Regular checks should also be conducted to make sure that new, as well as existing, regulations are properly implemented into the models. Apart from this, users should also be cautious and not enter any of their private and personal data into these models. If all these precautions are taken, then these complications can be managed and AI can be used effectively for human progress and development.

The future of AI is extremely uncertain, but it is definite that it holds a lot of promise, especially if managed well. AI can accomplish things that could only be imagined before and the combined efforts of the human mind and AI efficiency can lead the world to wonders. It is certain that if the risks are regulated effectively, then AI can help us in leading the world to development and progress. One major concern that remains is that of unemployment and job loss due to AI, but given the propensity of AI to deal with the burden of mankind, one can certainly hope that AI shall also find a solution to the problems that it is likely to bring with itself.

¹¹ K. Baxter, "Managing the Risks of Generative AI," Harvard Business Review, October 2023, <https://hbr.org/2023/06/managing-the-risks-of-generative-ai>.

Bibliography

Baxter, Kathy. “Managing the Risks of Generative AI.” Harvard Business Review, October 2023.

<https://hbr.org/2023/06/managing-the-risks-of-generative-ai>

Davenport, Thomas, and Ravi Kalakota. “The Potential for Artificial Intelligence in Healthcare.”

Future Healthcare Journal 6, no. 2 (June 2019): 94–98.

<https://doi.org/10.7861/futurehosp.6-2-94>

“Generative AI.” Generative AI, n.d. <https://generativeai.net/>

“Generative AI Market Growth Is Booming with 27.02%,” n.d.

<https://www.precedenceresearch.com/insights/generative-ai-market>

“Generative AI to Become a \$1.3 Trillion Market by 2032, Research Finds | Press | Bloomberg LP.” Bloomberg L.P., June 2023.

<https://www.bloomberg.com/company/press/generative-ai-to-become-a-1-3-trillion-market-by-2032-research-finds/>

Shah, Deval. “Generative AI 101: Explanation, Use Cases, Impact.” V7, August 2023.

<https://www.v7labs.com/blog/generative-ai-guide>

SITNFlash. “The History of Artificial Intelligence - Science in the News.” Science in the News,

April 2020. <https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/>

“The Risks & Rewards of Generative AI - Spiceworks.” Spiceworks, April 2023.

<https://www.spiceworks.com/tech/artificial-intelligence/guest-article/the-risks-rewards-of-generative-ai/>

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Thomas, Leigh. "27% of Jobs at High Risk from AI Revolution, Says OECD." Reuters, July 2023.

<https://www.reuters.com/technology/27-jobs-high-risk-ai-revolution-says-oecd-2023-07-11/>

Timothy, Maxwell. "16 Things You Can Do With ChatGPT." MUO, August 2023.

<https://www.makeuseof.com/things-you-can-do-with-chatgpt/>

Vartak, Manasi. "Six Risks Of Generative AI." Forbes, June 2023.

<https://www.forbes.com/sites/forbestechcouncil/2023/06/29/six-risks-of-generative-ai/?sh=71df0b863206>