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## A comprehensive analysis of Generative Artificial Intelligence's (GenAI) underlying perks and drawbacks in commercial and academic settings

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<p>Submission: 08 Dec 2025</p> <p>Revision: 25 Dec 2025</p> <p>Acceptance: 10 Jan 2026</p> <p><b>Keywords</b></p> <p>Artificial Intelligence, Generative AI, Education, chatbot.</p>	<p>With the potential to revolutionize a variety of industries across the globe, generative artificial intelligence (AI) has emerged as a game-changing technology. This study examines both the advantages and disadvantages of generative AI, focusing especially on India's defences against these charges. This paper investigates how generative AI affects creativity, robotization, invention, and ethical considerations in the Indian context through a thorough assessment of existing research and case study analysis. The results highlight both opportunities and difficulties related to India's abandonment of generative AI, providing insight for experimenters, legislators, and diligence leaders. The possibility of using generative AI to improve literacy and tutoring is also examined in this research, along with the challenges that must be addressed for successful implementation.</p>

### Preface

Generative AI, sometimes referred to as word gen AI, is artificial intelligence (AI) that, upon request or recommendation from a stoner, can create original content that resembles textbooks, photographs, videotapes, audio, or software law. Deep literacy model algorithms, which mimic the literacy and decision-making processes of the human brain, are the foundation of generative artificial intelligence. In order to interpret drug users' natural language requests or questions and provide relevant new content in response, these models relate and jumble the patterns and connections in vast amounts of data. Although artificial intelligence (AI) has been a popular technology for the past ten years, generative AI—more especially, ChatGPT's 2022 debut—has forced AI into global captions and sparked an unknowable wave of AI innovation and

abandonment. A third of companies are currently routinely utilizing generative AI in at least one business function, per study conducted by the management consulting firm **McKinsey**. By 2026, over 80% of businesses would have implemented generative AI applications or utilized generative AI application programming interfaces (APIs), according to industry analyst **Gartner**.

### Literature Review

The groundwork for the development of GenAI was laid by Goodfellow et al. (2014), who presented Generative Adversarial Networks (GANs). After this, text creation was transformed by transformer-based models such as GPT (Radford et al., 2018; Brown et al., 2020), which allowed machines to generate replies that resembled those of humans. There was a lot of

business interest in these models since they showed promise in summarizing, translating, answering questions, and even creating code.

Numerous studies have emphasized the effectiveness and financial advantages of GenAI in the corporate world. GenAI increases productivity in fields like software development, marketing content creation, and customer support, claims Deloitte (2023). According to Microsoft (2023), developer productivity has reportedly increased by 26% thanks to tools like GitHub Copilot and ChatGPT.

Scholars like Bender et al. (2021) warn that GenAI systems could have information hallucinations, which would undermine confidence in applications that are crucial to commercial operations. Similar issues with data provenance are highlighted by Marcus & Davis (2023), where created content may unintentionally imitate or plagiarize protected work.

Teaching and learning in the educational field are being transformed by GenAI. According to research by Kasneci et al. (2023), GenAI can help students with disabilities, automate grading, and improve individualized learning. High adoption rates among professors and students are shown by extensive surveys, such as the one carried out by IIT Delhi in 2024, but they also bring up moral questions about academic dishonesty and over-reliance.

Zhai (2022) asserts that because GenAI can be abused for plagiarism, citation falsification, and ghostwriting, there is an increasing need to update academic integrity regulations. Additionally, in order to preserve confidence in educational systems, Floridi & Chiriatti (2020) stress the necessity of clear AI use policies.

Concerns regarding bias and fairness in GenAI systems have been voiced by academics from a variety of fields. According to Birhane et al. (2022), GenAI models have the potential to magnify societal biases that are frequently reflected in training datasets. Minority students may be disadvantaged in academic contexts if the content is not inclusive, and in commercial settings, this could lead to discriminatory judgments (e.g., in employment).

According to Ebert and Louridas (2023) and Guan et al. (2023), general artificial intelligence (GAI) is a broad order of artificial intelligence that focuses on synthesizing and/or generating data or material that is often indistinguishable from mortal-generated stuff.

Research on conversational chatbots dates back to the 1970s, when they used rule-based pattern matching and basic scripted responses (Weizenbaum, 1966). Examples of these include MYCIN (an expert system that helps Croaker

diagnose and treat bacterial infections using rule-based clinical knowledge), ELIZA (a computer program for studying human-machine natural language communication) by MIT professor Joseph Weizenbaum (Weizenbaum, 1966s), and the Student's Advisor on Heuristic Algorithms (SCHOLAR) (Carbonell, 1970). In 1975, Shortliffe et al.

These early studies are not distributed as GAI in the ultramodern meaning since they are not suitable to create new textbooks or maintain a thorough awareness of the trading environment. The use of large language models (LLMs) is a key component of GAI's state-of-the-art models (Fan et al., 2023). These models are typically trained on large datasets that include web crawls, books, social media, and encyclopaedias, though the training procedure and dataset size can differ based on the particular chatbot being used (Shannahan, 2022).

These disciplines gave rise to the field of GAI, which has now developed into a distinct subject with a wide range of vibrant themes and paradigms. Based on the digital knowledge maturity (DLM) framework (Sharma et al., 2016, 2018), we propose that innovation, education and human capital, structure and methods, and governance are the key elements required for emerging technologies to promote development and socio-profitable substance.

The potential of generative AI to boost creativity, automate tasks, and encourage discovery across various disciplines is highlighted in the literature. For instance, an OpenAI project showed how generative AI can produce realistic graphics and textbooks, encouraging creativity and ingenuity. However, businesses have expressed concerns about the ethical rebuttals to the allegations of generative AI, namely with relation to biased algorithms and the spread of deepfakes. Understanding how generative AI affects frugality, society, and culture is becoming increasingly important in the Indian context.

### **Methodology**

The benefits and drawbacks of generative artificial intelligence (GenAI) in business and academia are examined in this study using a qualitative exploratory methodology. To create a comprehensive grasp of the subject, the study integrates a systematic literature review, case study analysis, and expert opinion synthesis. A significant portion of the primary sources came from industry specialists, such as GenAI providers, consulting organizations, third-party service providers, end users, and other pertinent commercial enterprises. These participants offered practical perspectives on the application and difficulties of GenAI.

Furthermore, conclusions were validated and supported in large part by secondary research. Press announcements, government and institutional reports, peer-reviewed journals, and works by well-known writers were all consulted in the process. To guarantee data accuracy and relevance, information was also obtained from official portals, industry blogs, vendor websites, and approved academic papers. Patterns in the data were found using thematic analysis, and the results were arranged using a SWOT framework to compare the impact of GenAI in academic and commercial contexts. All sources were appropriately cited, and ethical standards were upheld throughout the investigation. IRB approval was not necessary because the research is only based on secondary data and expert insights.

### A brief history of generative AI

Although the term "generative AI" gained widespread recognition in the 2020s, artificial intelligence (AI) has been a part of our lives for decades, and current generative AI technology builds on advancements in machine literacy dating back to the early 20th century. The following dates could be included in a non-exhaustive representative history of generative artificial intelligence:

1964 saw the creation of ELIZA, a textbook-based natural language processing system by MIT computer scientist Joseph Weizenbaum. In essence, ELIZA, the first chatbot (referred to as a "chatterbot" at the time), responded to compartmented natural language inputs with sympathetic textbook responses by using pattern-matching scripts.

1999 The first graphical processing unit, GeForce, is a product of Nvidia. First created as a smooth stir plate for VHS games, GPUs are now the standard platform for mining bitcoins and creating AI models.

2004 As drug users type in their search keywords, Google autocomplete first appears, producing inferred coming words or sentences. The Markov Chain, a sophisticated model created in 1906, serves as the foundation for the rather current example of generative AI.

2013 saw the introduction of variational autoencoders, or VAEs.

2014 saw the release of the first model of generative adversarial networks, or GANs.

2017 "Attention is All You Need," a study by Ashish Vaswani of Google Brain Battalion and a team from the University of Toronto, outlines the principles of motor models that are generally accepted to be crucial for the creation of the most important foundation models and generative AI tools available today.

2019–2020 Large language models called GPT (Generative Pretrained Transformer) are released by OpenAI. Due to their wide range of applications, which almost anyone can use for communication and production, as well as their extraordinary ability to converse with a stoner, generative AI systems like ChatGPT, GitHub Copilot, Stable Prolixity, and others have captivated people's attention in a way that AlphaGo (developed by DeepMind, the first AI master and professional Go player) did not. A variety of standard tasks, such as data bracketing and restructuring, can be carried out using the backmost generative AI procedures. However, their ability to write textbooks, compose music, and create digital art has inspired captions and encouraged people to try it out for themselves. This problem isn't getting any easier given how quickly generative AI technology is evolving.

- The release of ChatGPT took place in November 2022.
- Four months later, OpenAI unveiled GPT-4, a new large language model (LLM) with much enhanced capabilities.
- Similarly, when Anthropic's generative AI, Claude, was first released in March 2023, it could process about 9,000 tokens of text; by May 2023, it could process 100,000 tokens, or roughly 75,000 words per minute, the length of an average novel.
- In May 2023, Google revealed a number of generative AI-powered new features, such as Search Generative Experience and PaLM 2, a new LLM that would power its Bard chatbot and other Google products.

### Generative AI Global Market Share

Generative AI has been fleetly expanding across various diligence and witnessing significant growth in recent times. While precise request share numbers can differ based on the source also methodology, the thing apparent that generative AI is getting decreasingly current in sectors similar as art, entertainment, healthcare, finance, and more. From USD 13.5 billion in 2023 to USD 255.8 billion by 2033, the global generative AI request size is expected to expand at a compound annual growth rate (CAGR) of 34.2 between 2024 and 2033.

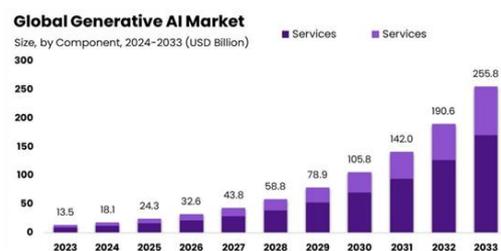


Fig 1: How market will grow

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According to a new study conducted by eminent academics from MIT Sloan, The Wharton School, The Warwick Business School, and Harvard Business School, generative AI could boost worker productivity by up to 40%. This finding suggests that applying generative AI technology to other industries could result in notable efficiency gains.

Furthermore, a survey conducted on the subject highlights that in a midpoint adoption scenario, generative AI has the capability to increase US labor productivity by 0.5 to 0.9 % points annually through 2030. This projection underscores the long-term potential of generative AI in driving productivity growth within the economy.

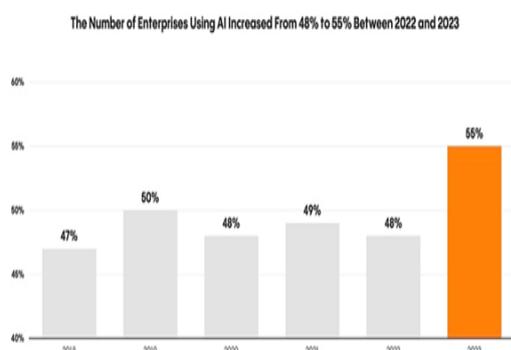


Fig 2: Number of users used AI

- The percentage of businesses utilizing AI increased by 7% from 48% in 2022 to 55% in 2023.
- AI spending in businesses increased by an average of 8% over that time. This reduced the overall 5% growth in enterprise tech spending.

### India's take on GenAI:

India's Generative AI Startup Landscape, 2023, Inc42's most recent analysis, predicts that the nation's GenAI market would expand rapidly over the coming years. It is expected to expand at

a CAGR of 48% from \$1.1 billion in 2023 to over \$17 billion by 2030.

The adaptability of India's GenAI products is another noteworthy feature. Approximately 81% of these are sector-agnostic, meaning that different industrial segments can use them. Bengaluru, also referred to as India's Silicon Valley, is the city with the greatest concentration of GenAI start-ups.

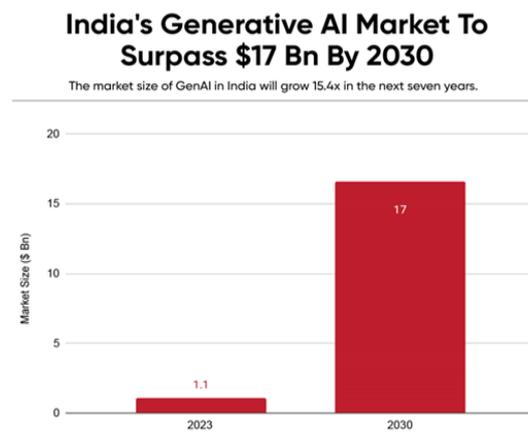


Fig 3: India's Generative AI Market

Fig 2. Shows different industries applying GenAI to increase their market share in this rapidly growing world:

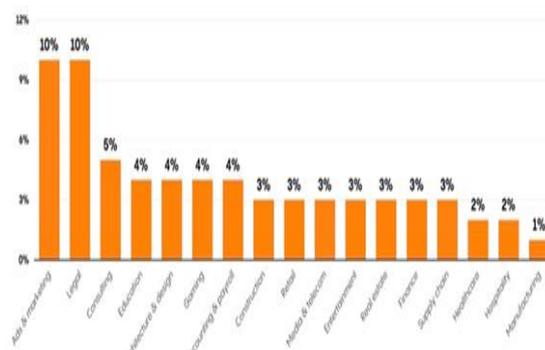


Fig 4: Generative AI Adoption by Industry

Industry	Key Players	What They Do
IT	Infosys, TCS, HCL Tech, Wipro, Tech Mahindra, LTIMindtree	Indian IT majors assert that they have developed their workforce, acquired a number of GenAI projects, and built skills. These include industry-specific models to encourage enterprise adoption of GenAI; flexible LLMs; content and code production; copywriting; marketing; and other proprietary solutions like Topaz (created by Infosys to improve the off-store consumer experience) and Canvas.ai (introduced by LTIMindtree).
Ecommerce, Quick Commerce, Retail Commerce	Flipkart, Myntra, Blinkit,	For increased productivity and efficiency, Walmart-owned Flipkart has implemented chatbots for both buyers and sellers, improved search using LLMs, and created internal GenAI capabilities.

		<p>For tailored suggestions from its inventory, <b>Myntra</b> is currently concentrating on MyFashion GPT, a combination of proprietary and open-source tools. Better demand prediction, trend tracking, and search accuracy are the outcomes of its GenAI prowess. Q-commerce expert.</p> <p>Recipe Rover is a GenAI-powered recipe engine provided by <b>Blinkit</b>. Since all of the ingredients are available in the online grocery and may be delivered right away, one can start cooking these recipes right away. Blinkit combines Midjourney, ChatGPT, and Stable Diffusion 1.5 to create captivating text and eye-catching images.</p>
<b>On-Demand Food Delivery</b>	<b>Zomato, Swiggy</b>	<p><b>Zomato</b> has created a multiple-agent framework to perform a range of activities and an AI chatbot to assist with order placement. The chatbot "aligns with your momentarily unique food &amp; beverage preferences, dietary needs, and even your moods," according to a Zomato blog post. An LLM-based neural search engine has been developed by <b>Swiggy</b> to comprehend all food-related phrases, inquiries, culinary preferences, and requirements.</p>
<b>Travel &amp; Hospitality</b>	<b>ixigo, OYO</b>	<p>Travel marketplace <b>ixigo</b> provides a personalized trip planner called PLAN, which is based on Open AI's ChatGPT. Users enter their desired destinations to obtain a comprehensive itinerary. For a completely customized trip itinerary, this can be further adjusted.</p> <p>Recently, <b>OYO</b>, which is planning an IPO, launched a virtual front desk for self-check-ins in the UK that is powered by ChatGPT.</p>
<b>Edtech</b>	<b>Unacademy</b>	<p>Cohesive AI, a product of edtech giant <b>Unacademy</b>, is designed to create AI-generated content for producers, customer service, and sales and marketing. Along with other real-time collaboration tools, it comes with more than 100 pre-made content templates.</p>
<b>Medtech</b>	<b>Suki AI</b>	<p><b>Suki</b> has created a voice assistant and a unique voice platform that uses GenAI to create healthcare records by listening in on patient-clinician talks.</p>

*Source: Company websites, secondary sources*

### Positive Impacts of Generative AI

In India Generative AI offers several positive impacts in various sectors for India

1. Art and Design: Generative AI tools and platforms are increasingly espoused by artists, contrivers, and creative professionals in India. Companies like RunwayML and Artbreeder offer generative AI- grounded tools for creating digital art, generating music, and designing plates. Generative AI is used for creating digital artworks, generating design variations, and exploring new creative possibilities. Artists in India influence generative AI for producing unique illustrations, robustness, and interactive installations.
2. Entertainment and Media: In India's entertainment assiduity, generative AI is gaining

traction, particularly in content creation and personalization platforms. still, specific request share data may not be intimately available. Generative AI technologies like deepfake tools, virtual characters, and happy recommendation systems are employed by media companies, advertising agencies, and content generators. Indian filmmakers and product houses explore generative AI for visual goods, vitality, and liar inventions.

3. Healthcare: Generative AI operations in healthcare are still arising in India, with limited data on request share available. still, the relinquishment of AI- driven medical imaging results and medicine discovery platforms are on the rise. In healthcare, generative AI is used for medical image conflation, complaint opinion,

medicine discovery, and substantiated treatment planning. Indian hospitals, exploration institutions, and pharmaceutical companies explore generative AI for perfecting patient care and advancing medical exploration.

4. Finance: The use of generative AI in the fiscal sector is fairly incipient in India, with operations primarily concentrated on algorithmic trading, threat assessment, and fraud discovery. Fiscal institutions in India influence generative AI algorithms for assaying request data, optimizing trading strategies, and detecting anomalies in transactional data. Indian fintech startups and banks explore generative AI for enhancing client experience and perfecting fiscal services.

5. Gaming: Generative AI's request share in the gaming assiduity in India is challenging to quantify, but the relinquishment of procedural content generation and AI-driven game development tools is growing. Indian game inventors use generative AI for creating dynamic game surroundings, generating situations, characters, and narratives. AI-powered gaming gestures offer players substantiated gameplay, adaptive challenges, and immersive liar.

### Negative Impacts of Generative AI

Despite its benefits, generative AI presents certain negative impacts

Job relegation robotization driven by generative AI technologies may lead to job relegation in India, particularly in sectors reliant on routine tasks. A World Economic Forum report claims that, around 10- 15 of jobs in India could be at threat of robotization in the coming decade.

Bias and Fairness Poisoned algorithms eternalized by generative AI systems can complicate social inequalities and undermine fairness in decision-making processes, similar as hiring and advancing. A study by the Centre for Democracy & Technology set up that AI algorithms used in India displayed impulses against marginalized communities. Ethical enterprises the abuse of generative AI, similar as creating deepfakes for vicious purposes, poses ethical challenges for Indian society, challenging robust nonsupervisory fabrics and ethical guidelines. Cases of deepfake vids targeting Indian politicians and celebrities have raised enterprises about misinformation and sequestration.

### Conclusion

In conclusion, generative AI holds immense eventuality to drive positive change in India, from fostering creativity and invention to perfecting effectiveness and competitiveness. still, it also poses challenges in terms of job relegation, bias, and ethical considerations. To

capitalize on generative AI's advantages while appeasing its negative impacts, policymakers, assiduity stakeholders, and experimenters must unite to develop ethical guidelines, invest in skill development enterprise, and promote inclusive invention.

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