

# Generative AI

## Concepts and trends

# What is generative AI

The premise of generative artificial intelligence (AI) is to **create content**, as opposed to other forms of AI, which might be used for other purposes, such as analyzing data or helping to control a self-driving car.

All it refers to, is to AI **learning algorithms** that generate or create an output, such as text, photo, video, code, data, and 3D renderings, based on patterns and relationships identified in existing data they are trained on.

It relies on techniques such as deep learning and neural networks to analyze **large amounts of data** and **generate new content** that is similar in style or structure.

One popular example of generative AI is the use of **generative adversarial networks (GANs)**, which involve two networks working together, one to generate new data and the other to evaluate its authenticity. GANs have been used to create realistic images and videos, as well as to generate natural language text.

Because machine learning and deep learning are inherently focused on generative processes, they can be considered types of generative AI, too.

## Why is generative AI a hot topic right now?

Three main reasons make Generative AI a hot topic.

1. The exponential popularity of recently launched generative AI programs, such as OpenAI's ChatGPT and DALL-E. The conversational chatbot and AI image generator both use generative AI to produce new content, within seconds, including computer code, essays, emails, social media captions, images, poems, etc.

2. The increasing perception that generative AI is still at the beginning (several new “apps” will be launched soon) and can have a profound and disruptive effect in all spheres of life, with impacts in business, health, education, government.
3. The ethical issues that its growing use will pose are bringing concerns about responsibility and safety and growing attention.

## ChatGPT 3.5 was the fastest growing “app” ever

ChatGPT, now in its version 4.0, is an AI application (a sophisticated chatbot) that answers questions (short prompts) in clear, concise and well-structured prose, and allows for continued customized interaction. It pushes your imagination into limits, allowing everyone to freely (so far) create everything from business plans to data analysis, code, poetry, songs, love letters, and to mimic established content producers.

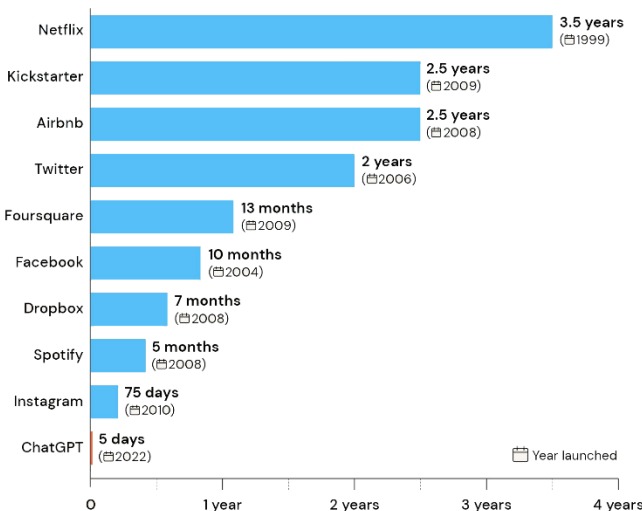


By OpenAI  
Artificial intelligence lab  
San Francisco

Its earlier version, ChatGPT 3.5, launched in November 2022, was the fastest growing app ever, reaching 1 million users in five days and hitting 100 million users in only two months.

CHATGPT STATISTICS

### Time to reach 1 million users



### Time to hit 100 million users (by UBS)

**ChatGPT** – 2 mos  
**TiKTok** - 9 mos  
**Instagram** – 2,5 yrs

Read the full report at  
[tooltester.com/en/blog/chatgpt-statistics](https://tooltester.com/en/blog/chatgpt-statistics)

## Popular free generative AI “apps”

The most popular and free **art** AI generators are:



[DeepDream Generator](#) - An open-source platform that uses deep learning algorithms to create surrealistic, dream-like images.



[DALL·E 2](#) - This AI model from OpenAI generates new images from text descriptions.



[Pikazo](#) - This mobile app uses AI filter to turn digital photos into paintings of various styles.



[Artbreeder](#) This platform uses [genetic algorithms](#) and deep learning to create images of imaginary offspring.

The following platforms provide end users with a good place to experiment with using AI for **creative writing and research** purposes:



[GPT-3 Playground](#) - Allows end users to interact with OpenAI's GPT-3 language model and generate text based on prompts the end user provides.



[Write With Transformer](#) - Allows end users to use Hugging Face's transformer ML models to generate text, answer questions and complete sentences.



[AI Dungeon](#) - This online adventure game uses a generative language model to create unique storylines based on player choices.



[Writesonic](#) - This writing and image generation platform is a popular choice for ecommerce product description.

Here are some of the best generative AI **music** “apps” that can be used with free trial licenses:



**Amper Music** - Creates musical tracks from pre-recorded samples.



**AIVA** - Uses AI algorithms to compose original music in various genres and styles.



**Ecrette Music** - Uses AI to create royalty free music for both personal and commercial projects.



**Musenet** - Can produce songs using up to ten different instruments and music in up to 15 different styles.

## The potential benefits of AI

Mostly, Generative AI is being seen as a potentially transformative platform shift, like the smartphone or the early days of the web. These kinds of shifts greatly expand the total addressable market of people who might be able to use the technology, moving from a few dedicated nerds to business professionals and eventually everyone else.

The benefits of AI are widespread. The main benefits can be grouped into five categories:

### i. **Efficiency and cost savings**

Advancements in AI, automation and edge computing can help businesses to streamline operations and reduce costs. For example, RPA and VR can improve efficiency in all activities, while edge computing can reduce the need for expensive data storage and processing in the cloud.

**ii. Improved decision-making**

AI can assist businesses in making more informed decisions by analyzing large amounts of data and providing insights that may be difficult for humans to discern.

**iii. Better and smarter products and services**

Generative AI, AI-powered robotics and quantum computing can enable businesses to develop more advanced and versatile products and services that can work alongside humans in various industries. Businesses that embrace these technology trends will have a competitive advantage in the market by differentiating themselves from their competition and delivering new products and services to their customers. Therefore, businesses need to stay informed and adapt to new technologies as they emerge to ensure they remain competitive.

**iv. Advanced customer experience**

In particular, Generative AI can significantly contribute to customer experience by enabling personalization, faster response times, improved content quality, and enhanced product design, providing more engaging, relevant, and customer-centric experiences, ultimately leading to higher customer satisfaction and loyalty. The major applications are personalized recommendations, sophisticated chatbots and virtual assistants, virtual try-on in retail and fashion, enhanced product design, natural language processing and sentiment analysis for customer feedback, reviews and social media.

**v. Increased security**

AI-powered cybersecurity can help businesses to detect and respond to threats in real-time, reducing the risk of data breaches.

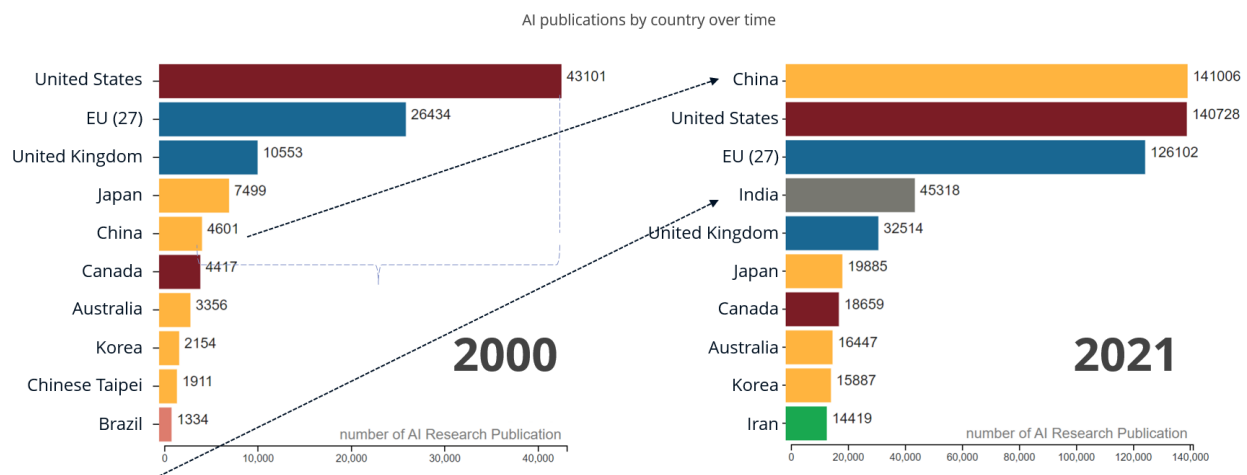
# Major trends in generative AI

## Investment in AI will continue strong

There are several predictions on the future growth of AI. What the source, all point to a steady increase. For example, Brainy Insights (January 2023) estimates that the global Generative AI market will grow by 36% a year until 2032.

On the other hand, PitchBook (December 2022) registered a 425% increase in venture capital investment in generative AI from 2020 to 2022.

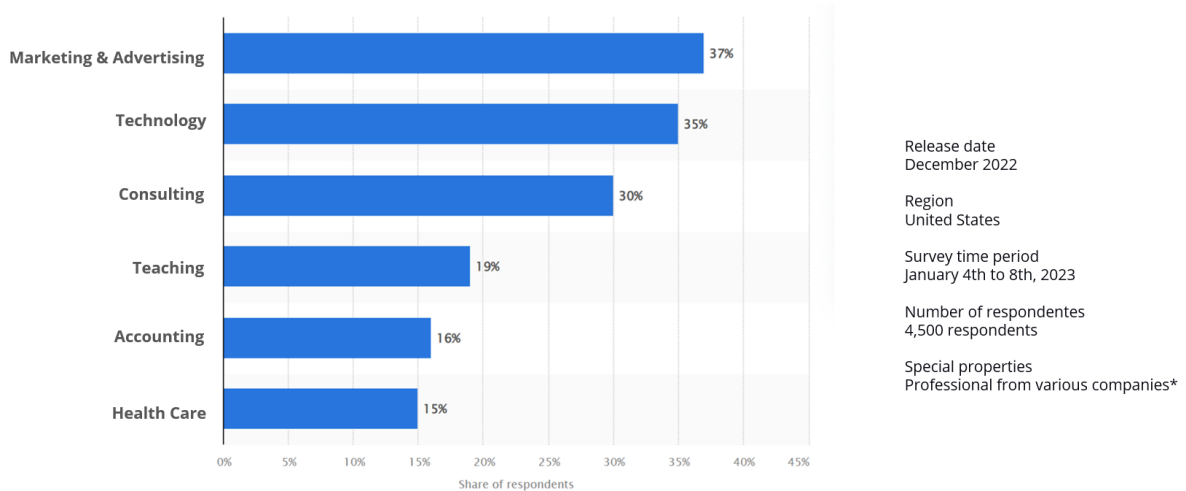
Of particular relevance is the surge of China and India as major investors in research in AI.



Source: OECD.AI(2023), visualisations powered by JSI using data from MAG, version of 31/12/2021, accessed on 5/3/2023, [www.oecd.ai](http://www.oecd.ai)

## Adoption rate will vary by industry

The adoption rate of Generative AI will vary from industry to industry. The statistics from the US market, shown below, are very indicative of this.



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## AI will become mainstream

Four trends will make Generative AI mainstream by the end of 2023.

Very fast advancements in **natural language processing** and **machine learning**  
(due to increased investments in AI and continuous learning by AI apps)

**Democratization** will accelerate  
(due to low-code/no code features, cloud vendors, AI will be more widely commercialized)

**Faster adoption of AI** and task automation by business  
(due to increased business disruption and market competition)

**AI ethics** will become a top priority  
(due to negative and dangerous applications, complex legal & ethical issues,  
more regulation by governments)



# Major trends in generative AI

## 1. AI for text, speech and vision will continue its journey into mainstream.

- As a result, AI can learn more about us and perform more complex tasks with this technology.
- Improving upon existing applications in text summarization and generation, chatbots, increasing translation accuracy and enhancing sentiment mining, search, code generation, etc.
- In the field of computer vision, newer and more powerful models for object detection, segmentation, tracking and counting are being built that deliver previously unimagined levels of accuracy.

## 2. Generative AI in the art and creative space will iron-out current limitations and become more powerful.

- Apart from obvious use cases in marketing, it can potentially revolutionize the media industry.
- We need to be vigilant of the creation of deepfakes (artificially generated fake images and videos) which will lead to emerging threats like the proliferation of fake news and furthering harmful propaganda.

## 3. Explainable AI will make ethical and responsible AI a reality. Improving trust & adoption.

- There will be a greater focus on developing systems that can explain their decision-making processes thus improving transparency, establishing accountability and exposing biases in automated decision-making systems.
- Litigation cases will grow and will help to regulate the generative AI space.
- Proper model validation and audit mechanisms with inbuilt explainability and checks for reproducibility will grow and become

the norm, for safeguarding against ethical lapses.

#### **4. Greater AI-Human collaboration.**

- AI support for various human functions.
- Implement repeated and physically strenuous tasks. Doing so will allow human staff to perform more specialized duties.

## **Some technical trends in generative AI**

### **Adaptive AI**

Will evolve rapidly, mainly in customer and brand experiences. Adaptive AI systems support a decision-making framework centered around making faster decisions while remaining flexible to adjust as issues arise.

### **Federated learning**

Federated learning allows multiple devices to collaborate and share their data to train a single AI model. This approach allows for more efficient and privacy-preserving training of AI models.

### **AI-driven automation**

AI-driven automation is set to revolutionize the manufacturing and supply chain sectors by helping companies to improve efficiency and reduce costs.

### **Advancements in natural language processing (NLP)**

With the integration of NLP in various industries, we can expect to see more sophisticated and human-like interactions with computers.

## **Adversarial machine learning**

Adversarial machine learning involves training machine learning models to defend against malicious attacks and improve their robustness. This approach will be increasingly important as AI is used in more critical applications such as self-driving cars and medical diagnosis.

## **AI-powered cybersecurity**

AI-powered cybersecurity is gaining popularity, as it can detect and respond to threats in real-time, reducing the risk of data breaches.

## **AI-powered robotics**

With the integration of AI in robotics, we can expect to see more advanced and versatile robots that can work alongside humans in various industries.

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