


# Chapter 21

## Unlocking New Potentials in Generative AI

**P. Ashok**

 <https://orcid.org/0000-0002-5859-6041>

*Symbiosis Institute of Digital and Telecom Management, India*

**Tanisha Mangal**

*Symbiosis Institute of Digital and Telecom Management, India*

**Lakshmi Sridevi**

*Chennai Institute of Technology, India*

**Krishna K. Murali**

*Rajalakshmi Engineering College, India*

### **ABSTRACT**

*Generative AI, a subset of artificial intelligence, is dedicated to the development of models that are capable of producing new content, including text, imagery, audio, and entire virtual worlds. Generative AI is capable of replicating human creativity and generating outputs that were previously considered to be exclusively the domain of human intelligence by utilizing sophisticated machine learning techniques, including deep learning and neural networks. AI models in the music industry are capable of composing music in a variety of genres, providing musicians and producers with new tools. Generative AI has the potential to stimulate innovation and creativity in a variety of disciplines as technology continues to develop. This research article delves deep into the various aspects of Generative AI namely history and core concepts, privacy and security, types of Generative AI models and their applications, NLP models and finally on Responsible AI.*

DOI: 10.4018/979-8-3693-8332-2.ch021

## 1. INTRODUCTION

### A. History & Core Concepts of Generative AI

Artificial intelligence (AI) is one of the most widely discussed technology trends globally, potentially contributing US\$ 15.7 trillion to the global Gross Domestic Product (GDP) by 2030. As technology has begun making significant strides with Artificial Intelligence (AI), enterprises have been ushered into a new paradigm of Generative AI. Generative AI is a technology that leverages deep learning models to create human-like content, such as words and images, when instructed with specific prompts. With the advancements in cloud storage, Generative AI can leverage its usage to manage data more efficiently and economically. In Q1 CY2023, the reported investments in Global Private Generative AI amounted to \$11 billion, leveraging its use cases across various areas. The history behind the Generative models in Artificial Intelligence traces back to the 1950s when Markov Models and Gaussian Mixture Models were first developed. These models focused on generating sequential data but struggled with longer sentences. Generative AI analyses customer data and creates precise ads, increasing their effectiveness and resonance with consumers. It was the rise of deep learning that brought about substantial advancements in the performance of generative models, but the most critical advancement cutting across numerous domains was “The Transformer Architecture” which has become the backbone for many generative models. There are two types of Generative models:

- Generative language models (GLMs) - GLMs are designed to produce comprehensible human language by learning from the patterns and structures present in the input data. One of the most significant breakthroughs is Generative Pre-Trained Transformer (GPT), a transformer-based model that is capable of interpreting a wide range of text-based requests and providing answers to simple questions.
- Generative Adversarial Networks (GANs) have become popular in the field of image generation research. GANs have two parts, a generator which aims to grasp the distribution of authentic examples to create new data and a discriminator, which regulates whether the entered data is authentic or not.

Generative AI has the potential to leverage its use cases across various areas: R&D, Marketing, Sales, Software engineering, and Customer operations. The banking industry is likely to generate a value of 2.8 to 4.7 per cent of the industry’s annual revenues. With the applications of Generative AI in areas such as regulations and programming language, the industry is likely to see potential growth. The rise of 14 global Generative AI unicorns and the 1.5x growth in Generative AI startups in India shows that the industry is likely to witness prominent growth as in Fig. 1.

## 2. LITERATURE REVIEW

Generative artificial intelligence (AI) in design and art has disrupted creative paradigms, prompting debates about AI-generated art and NFT markets. In February 2023, the US Copyright Office made a landmark ruling that shows AI work is problematic and need human involvement to commercialize. This study (Tiwary, H, 2024) discusses how neural network AI has changed visual arts. We use genera-

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/unlocking-new-potentials-in-generative-ai/382782](http://www.igi-global.com/chapter/unlocking-new-potentials-in-generative-ai/382782)

## Related Content

---

### **Incorporation of Brain-Computer Interface-Controlled Smartphone Data in Electronic Systems AI**

P. Vijayalakshmi, B. Ashwini, D. Ramya, G. Babu, K. Gowdhami, Amarja Satish Nargundeand Mukundan Appadurai Paramashivan (2025). *Brain-Computer Interfaces and Applications in Business* (pp. 45-64).

[www.irma-international.org/chapter/incorporation-of-brain-computer-interface-controlled-smartphone-data-in-electronic-systems-ai/383309](http://www.irma-international.org/chapter/incorporation-of-brain-computer-interface-controlled-smartphone-data-in-electronic-systems-ai/383309)

### **Revolutionizing Emergency Medical Services With AI and Telegram Integration**

M. Janakirani, S. Anandhi, Tamilselvi Durairajan, J. Ann Roseela, B. Swapnaand R. Kasthuri (2025). *Humans and Generative AI Tools for Collaborative Intelligence* (pp. 191-204).

[www.irma-international.org/chapter/revolutionizing-emergency-medical-services-with-ai-and-telegram-integration/382769](http://www.irma-international.org/chapter/revolutionizing-emergency-medical-services-with-ai-and-telegram-integration/382769)

### **Business English Vocabulary Learning With Mobile Phone: A Chinese Students' Perspective**

Haisen Zhang, Wei Songand Ronghuai Huang (2016). *Human-Computer Interaction: Concepts, Methodologies, Tools, and Applications* (pp. 1736-1755).

[www.irma-international.org/chapter/business-english-vocabulary-learning-with-mobile-phone/139117](http://www.irma-international.org/chapter/business-english-vocabulary-learning-with-mobile-phone/139117)

### **Implementing Linguistic Landscape Investigations with M-Learning for Intercultural Competence Development**

Jacek Tadeusz Waliski (2016). *Human-Computer Interaction: Concepts, Methodologies, Tools, and Applications* (pp. 1283-1294).

[www.irma-international.org/chapter/implementing-linguistic-landscape-investigations-with-m-learning-for-intercultural-competence-development/139092](http://www.irma-international.org/chapter/implementing-linguistic-landscape-investigations-with-m-learning-for-intercultural-competence-development/139092)

### **Visualising Ethics Through Hypertext**

Dominic Garcia (2021). *Human-Computer Interaction and Technology Integration in Modern Society* (pp. 131-156).

[www.irma-international.org/chapter/visualising-ethics-through-hypertext/269652](http://www.irma-international.org/chapter/visualising-ethics-through-hypertext/269652)