



TECH REPORT: **GENERATIVE AI**

Disclaimer: An artificial intelligence program was used to reformat the image illustrating this text.

Copyright © 2025 Inter-American Development Bank (“IDB”). This work is subject to a Creative Commons license CC BY 3.0 IGO (<https://creativecommons.org/licenses/by/3.0/igo/legalcode>). The terms and conditions indicated in the URL link must be met and the respective recognition must be granted to the IDB.

Further to section 8 of the above license, any mediation relating to disputes arising under such license shall be conducted in accordance with the WIPO Mediation Rules. Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the United Nations Commission on International Trade Law (UNCITRAL) rules. The use of the IDB’s name for any purpose other than for attribution, and the use of IDB’s logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this license.

Note that the URL link includes terms and conditions that are an integral part of this license.

The opinions expressed in this work are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



AUTHORS

Lucia Latorre
Eduardo Rego
Ignacio Cerrato
José Daniel Zarate
Lorenzo de Leo

SUPERVISOR

Mariana Gutiérrez

COLLABORATOR

José Daniel Zarate
Eduardo Rego
Rodrigo Villamayor

TechLab

The TechReports are an initiative of the Emerging Technologies Laboratory of the IDB's IT department, known as TechLab, which is in charge of exploring, experimenting, and disseminating information about new technologies to learn about their impact on the IDB Group and the LAC region.



Acknowledgments: The IDB team would like to thank all the individuals who participated in interviews and provided key information for this document.



TABLE OF CONTENT

● EXECUTIVE SUMMARY	6
● DEFINITION	7
The Evolution of Generative AI	7
Current Landscape	8
How Generative AI Works	9
● APPLICATIONS OF GENERATIVE AI	10
Text Summarization and Generation	10
Translations	11
Image and Video Creation	11
SSound, Speech, and Music	11
Software Code Development	11
Design and Art	12
Simulations and Synthetic Data	12
3D modeling generation	12
● GENERATIVE AI AT THE IDB	13
● CHALLENGES AND RISKS OF GENERATIVE AI	15
Accuracy and Hallucinations	15
Bias and Ethical Concerns	15
Data Quality and Licensing Issues	16
Explainability and Trust	16
● A SAFE AND RESPONSIBLE USE OF GENERATIVE AI	17
Collections of Prompts	17
Best Practices	18
Ethics and Regulation	19

Security and Privacy	19
Technical Considerations	20
● REFERENCES	22
● ADDITIONAL REFERENCES	24



EXECUTIVE SUMMARY

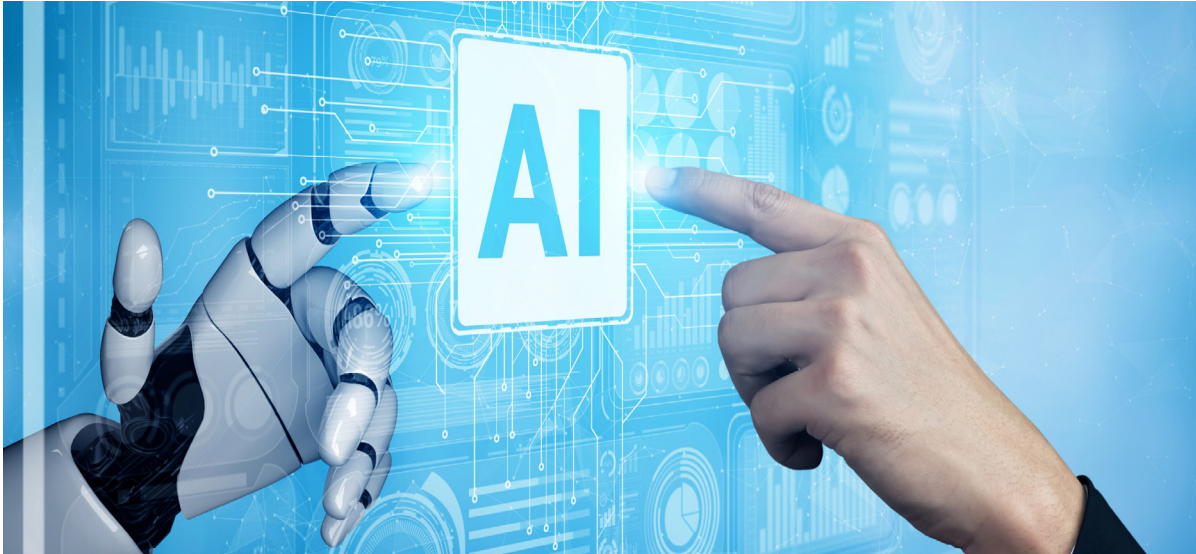
By harnessing advanced algorithms and vast datasets, Generative AI is not just transforming how machines interact with the world but also how they contribute to a wide range of sectors, from health to productivity efficiency or creativity.

The ability of these systems to generate new data points, text, or solutions based on learned patterns underscores their potential to revolutionize industries and spur innovation. With its increasing prevalence, understanding Generative AI, alongside its capabilities and implications, has become crucial for individuals and organizations alike.

This report aims to provide a comprehensive overview of how Generative AI works and will provide an update to the information presented on the September 2023 IDB Report [45]. Further sections will delve into the wide-ranging applications of Generative AI, showcasing examples across different fields and discussing the challenges and risks associated with its deployment, including ethical considerations, its security, and privacy concerns. Lastly, the report will highlight best practices for the safe and responsible use of Generative AI tools to equip readers with essential insights into responsible innovation and the strategic adoption of Generative AI technologies in a rapidly evolving digital ecosystem.



DEFINITION



Generative AI is a branch of Artificial Intelligence (AI) that employs Machine Learning (ML) to create new content based on a large training dataset. Typically, when we interact with search engines like Google or use conventional question-answer chatbots, we are retrieving existing information. In contrast, Generative AI tools utilize existing data to produce original content. The output can take various forms, including text, images, videos, code, 3D renderings, or audio.

THE EVOLUTION OF GENERATIVE AI

Generative AI traces its roots back to the mid-20th century, with initial developments focusing on basic pattern recognition and natural language processing. The concept of intelligent machines was first introduced by Alan Turing in 1947, who explored the idea of machines detecting rational behavior³. The field of AI was formally established in 1956 during The Dartmouth Summer Research Project on Artificial Intelligence, setting the stage for future advancements³. The first notable example of Generative AI, the ELIZA chatbot, was created in 1961 by Joseph Weizenbaum; it simulated a psychotherapist's conversation, marking a significant step in machine-generated human-like text^{1,3}.

The late 20th century witnessed several key breakthroughs that propelled the capabilities of Generative AI forward. In 1979, Kunihiro Fukushima developed the Neocognitron, a hierarchical, multilayered artificial neural network, which laid the groundwork for future deep learning frameworks¹. This period also saw the introduction of Long Short-Term Memory (LSTM) networks in 1997, enhancing the processing of sequential data crucial for tasks like speech recognition and machine translation³. The turn of the millennium brought with it the re-introduction of Restricted Boltzmann Machines and significant

advancements in deep learning, driven by increased data availability and computational power².

The 21st century has been marked by rapid advancements in Generative AI, with the introduction of transformative models like Generative Adversarial Networks (GANs) in 2014 and the subsequent development of transformer models in 2017^{2,3}. These technologies have enabled the generation of increasingly complex and realistic text, images, and audio. In recent years, the release of models like GPT and innovations in neural network architectures have continued to push the boundaries of what Generative AI can achieve, leading to its application across various sectors including art, music, and more⁴.

CURRENT LANDSCAPE

The release of OpenAI's ChatGPT in late 2022 marked a pivotal moment in Generative AI, capturing widespread interest from users, developers, and investors. ChatGPT's ability to generate human-like text responses revolutionized how people perceived and interacted with artificial intelligence, making the technology accessible and practical for everyday use. This launch spurred an immediate surge in public engagement and set the stage for rapid advancements in the Generative AI landscape³⁷.

Since then, the Generative AI sector has witnessed significant growth and innovation. OpenAI continued to lead the industry with the development of its GPT-4 model and subsequent iterations like GPT-4 Turbo and GPT-4.0, which further enhanced the capabilities of AI-driven content generation³⁸. Following OpenAI's lead, other key players have introduced their own models. Anthropic's Claude focuses on safety and interpretability, addressing ethical concerns that have become increasingly important. MetaAI's LLaMA series offers efficient text generation, suitable for applications requiring quick and reliable responses. AI21 Labs' Jurassic-2 excels in long-form content generation, and Cohere's Mistral model is optimized for concise and contextually relevant text.

Perplexity AI has emerged with a strong focus on generating coherent and contextually accurate text, contributing to advancements in natural language understanding. And Alphabet's Gemini, another significant player, is pushing the boundaries of AI creativity and application versatility.

In the image generation field, OpenAI's DALL-E 3 and Stability AI's Stable Diffusion 2 and 3 continue to lead, providing high-resolution and detailed image creation from text prompts; and video generation has seen advancements with Runway Research's Gen-2 and MetaAI's Make-A-Video models, which generate video content from textual descriptions.

Lastly, audio generation has also progressed, with OpenAI's Jukebox generating music and audio from text descriptions, while Whisper produces high-quality speech content. In the multimodal AI space – integrating text, image, and video – models like DeepMind's Gato and Google's Imagen are at the forefront of the industry, enhancing the versatility and applicability of Generative AI.

HOW GENERATIVE AI WORKS

Generative AI models begin their journey in the training phase, where they use neural networks to identify patterns and structures within existing data to generate new and original content^{5,6}. This phase often involves unsupervised learning, where the model finds patterns in unlabeled data, or semi-supervised learning, which combines a small amount of labeled data with a large amount of unlabeled data to improve performance. During this period, models like GPT-3 and Stable Diffusion are trained to understand and manipulate language or visual content based on the inputs they receive⁶.

Once the initial training is complete, models move to the tuning phase. This phase involves fine-tuning the pre-trained models to enhance their performance on specific tasks or domains^{7,8,9}. For instance, generative models can be fine-tuned using prompt engineering, where developers adjust the prompts – or requests – to guide the model's output more effectively^{8,9}. This phase is crucial for aligning the model with specific user requirements and improving its accuracy and relevance in practical applications^{7,8}.

Once the models complete the tuning phase, developers move to the generation phase, where Generative AI models apply their learned capabilities to create new content. This could involve generating text completions, creating images from textual descriptions, or even producing synthetic data for training other AI models^{5,6}. The generative process is often facilitated by advanced neural network architectures like GANs, where a generator and a discriminator work in a dynamic adversarial relationship to refine the outputs⁵. The success of this phase is measured by the model's ability to produce results that are indistinguishable from real-world data⁵.



APPLICATIONS OF **GENERATIVE AI**



TEXT SUMMARIZATION AND GENERATION

Generative AI has significantly impacted both text summarization and text generation, transforming how organizations process and produce content.

Text summarization enables large language models (LLMs) to condense lengthy documents into concise, coherent versions, capturing key points efficiently. This capability is crucial in sectors like law, where legal firms use LLMs to summarize complex case files, saving hours of manual work. In business, these tools summarize market research and customer feedback, offering actionable insights for better decision-making. Media outlets benefit from using LLMs to create concise news digests, enhancing information processing for readers⁴⁷.

On the other hand, text generation leverages LLMs like GPT-3 to automate the creation of high-quality content across various domains, from articles and blogs to social media posts. This capability streamlines content creation processes and enables businesses to personalize content to user preferences, enhancing engagement. In conversational AI, these models improve chatbot interactions, offering more fluid and contextually aware dialogues in platforms like Google's BERT and Facebook's BlenderBot¹⁰.

TRANSLATIONS

Generative AI has greatly enhanced the field of translation by leveraging its ability to process and generate human-like text across multiple languages. AI systems can translate vast amounts of text in real-time, offering high-speed and cost-effective solutions for communication across language barriers. These models also use deep learning techniques, improving accuracy over time as they are trained on diverse datasets. Nevertheless, while AI excels in efficiency and scalability, challenges remain in capturing cultural nuances and idiomatic expressions, which human translators still handle more effectively⁴⁶.

IMAGE AND VIDEO CREATION

In the realm of image and video creation, Generative AI technologies like DALL-E 2 and GANs use neural networks to generate realistic or creative visuals by learning patterns from vast datasets, enabling the creation of new images and videos from textual descriptions or other inputs. These tools are employed in a variety of fields, making headlines recently for their use in advertising and media¹⁰. The film and animation industries also benefit from Generative AI, utilizing it to create detailed and realistic special effects and animations, thereby reducing production costs and enhancing visual storytelling¹¹. In healthcare, Generative AI is revolutionizing diagnostics by enhancing medical imaging, improving patient outcomes and accelerating the development of new treatments³⁹.

SOUND, SPEECH, AND MUSIC

Generative AI's applications in audio are profound, influencing music composition, speech synthesis, and sound design. AI-driven tools can generate realistic speech, music tracks, and sound effects that are indistinguishable from those produced by humans. Innovations in text-to-speech (TTS) technologies allow for voice cloning and customization, providing authentic audio experiences in multiple languages and styles, which are particularly valuable in entertainment and advertising^{12, 41, 42}.

SOFTWARE CODE DEVELOPMENT

The development of software code has been notably enhanced by Generative AI. Tools like GitHub Copilot and Amazon CodeWhisperer assist programmers by suggesting code

snippets and entire functions, improving productivity and reducing the likelihood of errors. These AI models are trained on vast datasets of existing code, enabling them to suggest optimized and context-appropriate coding solutions^{13, 14}.

DESIGN AND ART

Generative AI is making significant inroads in the fields of design and art, enabling artists and designers to explore new creative possibilities. AI algorithms can suggest initial design concepts, assist in the creation of digital art, and even collaborate with humans to produce innovative artworks. This technology not only augments the creative process but also opens up new forms of artistic expression, as seen in AI-generated installations and digital artworks displayed in galleries worldwide^{15, 43, 44}.

SIMULATIONS AND SYNTHETIC DATA

The generation of simulations and synthetic data is a critical application of Generative AI, particularly in scientific research and development. By creating realistic yet artificial datasets, researchers can conduct experiments and train other AI models without the ethical and privacy concerns associated with real data. This capability is crucial in fields like healthcare, where synthetic data can be used to advance medical research while protecting patient privacy^{16, 17}.

These applications illustrate the versatility and transformative potential of Generative AI across various sectors, driving innovation and efficiency while also raising important ethical and practical considerations.

3D MODELING GENERATION

AI models can create 3D versions based on 2D images or textual descriptions. This method allows for the construction of digital twins in the metaverse, facilitating the creation of virtual worlds. Applications of this technology include training for sectors such as construction, manufacturing, and healthcare, as well as in city planning and physical product design.



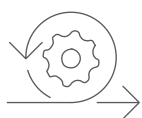
GENERATIVE AI AT THE IDB



Generative AI has the potential to impact and disrupt the Latin America and the Caribbean (LAC) region across different sectors and industries. The IDB Group has encouraged and is supporting the adoption of this technology in the region and within the organization.

To better address the challenges and opportunities of this technology, an internal task force was created to align and coordinate Generative AI-related initiatives. This task force is mandated to generate knowledge, keep the organization and the Region informed and updated, raise awareness about opportunities and risks, define the Generative AI agenda for the IDB Group, and identify safe tools to develop, implement, and use.

The following are projects, prototypes and pilots that reflect on the use and potential effects of Generative AI in the LAC region:

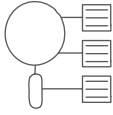


IINA: An in-house solution to support employees in their activities to streamline and optimize the preparation and evaluation of IDB projects. Leveraging generative AI, IINA efficiently searches and synthesizes insights from over 900 public documents, ensuring content is relevant, targeted, and thoroughly sourced.



Aurora: Aurora is the internal Inter-American Development Bank's (IDB) generative AI multi-assistant platform designed to enhance the efficiency of searching, summarizing, and generating content from institutional

documents. The platform hosts multiple assistants, each tailored to access specific sets of documents, allowing users to focus their queries and responses. Aurora helps users find information quickly, summarize key points, and generate new content, all within a secure environment.



Seek: Available in the IDB Group publications website, facilitates and accelerates access to and utilization of knowledge within our publications, with the use of Generative AI¹. Seek generates a response based exclusively on the information contained in the publication. Additionally, the response includes a linked citation that allows you to navigate to the page related to the answer and read more directly in the publication.



ATAL: The IDB is testing a Generative AI chatbot designed to provide teaching materials for the “Aprendamos Todos a Leer” (ATAL) program. This chatbot assists teachers in navigating the methodology and accessing additional resources and techniques to better support their students, who range from pre-scholar to third grade, in learning how to read.

1. [Amplifying Access to Knowledge: Publishing with Generative IA](#)



CHALLENGES AND RISKS OF **GENERATIVE AI**



ACCURACY AND HALLUCINATIONS

Generative AI can sometimes produce “hallucinations,” where the model outputs false or misleading information, presenting it as fact^{18, 19, 20}. This phenomenon is exacerbated by biases or limitations in the training data and algorithms, potentially leading to harmful content generation^{18, 19}. Ensuring the accuracy of Generative AI outputs is crucial, especially when these systems are used in sensitive areas such as news dissemination or legal advice, where misinformation can have serious repercussions^{18, 19, 20}.

BIAS AND ETHICAL CONCERNS

Bias in Generative AI arises from the data it is trained on. If the training data contains biases, the AI model will likely perpetuate these biases in its outputs, leading to ethical concerns and skewed results^{20, 23}. This can be particularly problematic in applications like law enforcement or healthcare, where biased AI-generated outputs could lead to unfair or harmful consequences^{20, 23}.

DATA QUALITY AND LICENSING ISSUES

The effectiveness of Generative AI heavily relies on the quality of its training data. Poor data quality can lead to unreliable and incorrect outputs, which can affect decision-making processes and business operations²¹. Additionally, the use of Generative AI raises complex licensing and copyright issues, particularly when the AI uses or generates content that includes components that are protected by intellectual property rights³⁰.

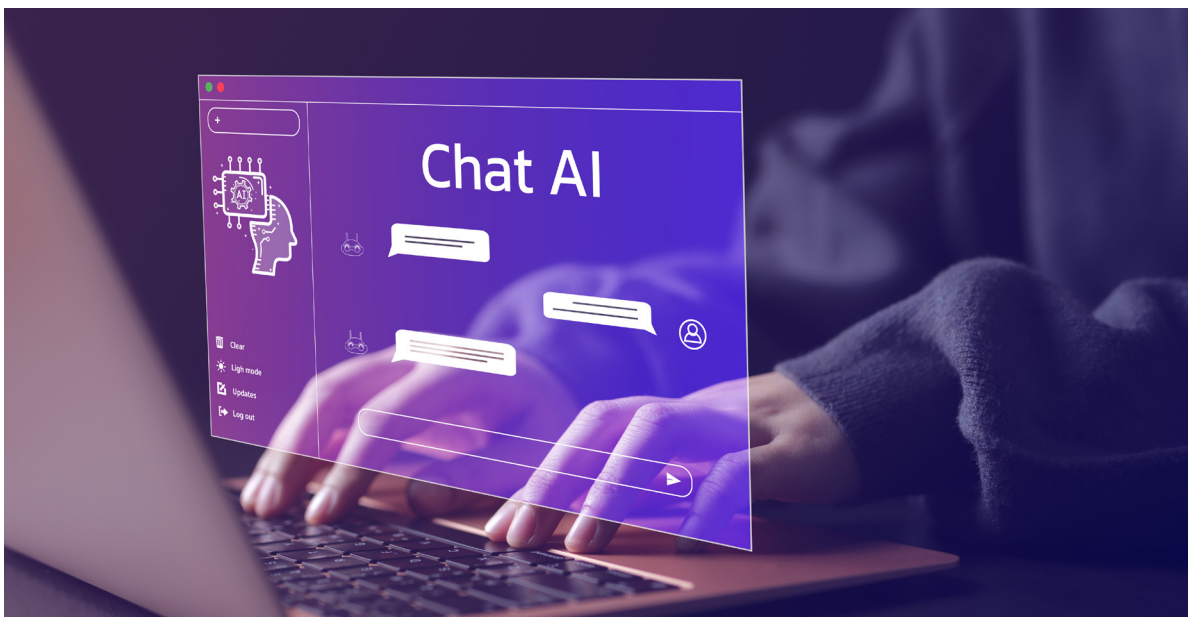
As a reference, we share the case of the Association for the Advancement of Artificial Intelligence (AAAI), which establishes that generative models do not meet the criteria for articles published by AAAI due to the material not being able to be used as a citable reference. Attribution of authorship carries responsibility for the work, which cannot be effectively applied to AI systems³¹.

EXPLAINABILITY AND TRUST

The complexity of Generative AI models often makes it difficult to understand how decisions are made, which is a critical aspect in sectors where transparency and trust are paramount^{22, 23}. Explainable AI (XAI) aims to make the processes within AI models more understandable, which is essential for validating the fairness and accuracy of the outputs and for building trust among users^{22, 23}. Regulatory bodies are increasingly focusing on promoting and enforcing explainability in AI to ensure that these technologies are used responsibly and ethically²².



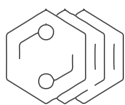
A SAFE AND RESPONSIBLE USE OF **GENERATIVE AI**



COLLECTIONS OF PROMPTS

The popularity of models like ChatGPT and DALL-E have inspired experts in creative industries to create and share collections of prompts for generating industry-relevant content.

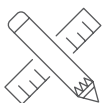
Here are some popular collections of prompts:



Content at Scale Prompt Library²⁶: This library is designed to address a wide range of use cases and needs, catering to AI models like ChatGPT, Bard, Midjourney, DALL-E 2, and many others. It allows users to delve into categories crafted to inspire specific responses or explore broad themes to kickstart various creative projects.



Prompts for Content Creation²⁷: This includes well-engineered content creation prompts by various experts such as Amin Boulouma, Robert Brandl, and Charlotte Evans. It covers areas like sales and marketing, customer service, development, content creation, and copywriting.

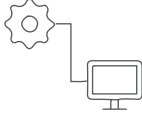


AI Art Prompts²⁷: For those interested in generating AI art, there are prompt collections for DALL-E, Midjourney, and Stable Diffusion. Some

notable collections include stunning AI art prompts and detailed guides on crafting effective prompts for AI art generation.



Coding and Development Prompts²⁷: These prompts help in writing code, conducting code reviews, debugging, predicting errors, CSS development, and software architectures. They are useful for automating tasks in software and data science engineering.



Autonomous AI Agents Prompts²⁷: Collections focusing on autonomous AI agents built on top of models like GPT-4, Auto-GPT, and Baby-AGI. These prompts guide the creation of complex tasks broken down into multiple sub-steps.

BEST PRACTICES

When using AI-generated content, it is important to validate and verify the accuracy of the information. We recommend verifying any sources quoted by Artificial Intelligence. While Generative AI aims to create new and original content, it is possible for this content to be inaccurate or biased. Therefore, it should not be relied upon as the sole source of information, as outputs may be unreliable or based on outdated information.

Before using non-public or confidential information, ensure that your organization has identified and approved compliant tools. Some Generative AI public tools store and utilize the information you share to enhance the model, making it available to other users. To protect personal data and prevent potential privacy breaches through indirect identification of individuals, we recommend refraining from sharing personal data.

To better understand the capabilities and limitations of Generative AI tools, we encourage asking questions about how conclusions were reached. Ongoing learning and training are essential for applying these tools responsibly in the work environment.

It is crucial to be mindful of biased data that can lead to inaccurate outcomes or discrimination. When sharing generated content, ensure that it aligns with your organization's values.

Please, be aware that the content generated by these tools may not be copyright-free. As these tools extract and generate information from multiple sources, it is important to consider intellectual property rights.

It is recommended to disclose the use of content (text/image/video) created using Generative AI tools. For guidance on how to cite ChatGPT and other Generative AI sources, you can refer to the MLA, APA, and Chicago Manual Style citations³⁶.

ETHICS AND REGULATION

To mitigate the risks associated with Generative AI, organizations should adopt a comprehensive approach encompassing legal, ethical, and technical aspects. Understanding AI laws and regulations is crucial as these technologies become increasingly integrated into various industries, raising complex legal and regulatory questions²⁹. Establishing a clear AI data governance framework is essential for responsible development and use, ensuring that data is collected, processed, stored, and shared ethically and transparently²⁹. Additionally, conducting privacy impact assessments can help evaluate potential risks to individuals' privacy and in implementing appropriate safeguards²⁹.

Ethical considerations are paramount when deploying Generative AI. These include addressing potential biases, ensuring transparency, and managing the ethical use of AI-generated content²⁹. The need for explainable AI (XAI) is highlighted by the demand for systems that are not only effective but also understandable and justifiable in their decisions⁷⁶. Regulatory compliance, particularly with data privacy laws like GDPR and the EU AI Act, is critical for maintaining trust and accountability^{35, 24}.

SECURITY AND PRIVACY

Generative AI's integration into various applications has raised significant security and privacy concerns. Organizations face risks such as regulatory compliance issues, sensitive data breaches, and reputational damage^{32, 33, 34}. The sensitivity classification of any data input into Generative AI platforms (e.g., public, confidential internal, restricted, or highly restricted) must be carefully considered. Data exchanged during the use of Generative AI is reviewed by AI experts to improve systems and train models, which could eventually become part of the content provided to other users. Currently, there are no options to establish contractual agreements with OpenAI in the use of ChatGPT to ensure the protection and confidentiality of organizational information.

Moreover, there is a risk of bad-faith actors that, under the pretext of new Generative AI platforms, install malicious software with the aim of stealing confidential information or committing fraud. Therefore, it is crucial to take precautions when acquiring, installing, or using new Generative AI applications.

From a privacy perspective, Generative AI presents several areas of concern. Users must consider their own privacy when using public tools, as the information shared is stored and can be used for other purposes. Personal information shared becomes part of the tool's database and could be potentially disclosed without further notice. Additionally, there is a possibility that the system could be breached, or personal data could become publicly available due to system bugs or leaks.

Privacy concerns extend to the potential for inadvertently providing information that could identify individuals, directly or indirectly, when combined with other information already possessed by the tool. This could result in breaching their privacy without their knowledge or consent. Moreover, the development of Generative AI applications challenges

fundamental privacy principles regarding transparency, access, use, and rights. There is an ongoing debate about how data used to train models is obtained, often not following basic privacy principles or, depending on the jurisdiction, violating privacy legislation. Some countries have issued bans on Generative AI tools and filed lawsuits claiming data was gathered without proper notice, accuracy mechanisms, consent controls for minors, and legal bases for collection.

There is consensus that individuals should be informed about how their data is collected and processed. The term “explainable AI” refers to the need to explain system decisions in an easy-to-understand manner, upholding transparency and fairness principles of privacy. Generative AI also presents challenges in exercising individual data subject rights and enabling paths for individuals to remove their personal data, which may be very difficult, if not almost impossible, without compromising the model’s usefulness.

To mitigate these risks, a layered security strategy that includes policy frameworks, robust processes, and advanced technology is vital. Tools like Liminal provide essential functions for setting security protocols and managing data governance across Generative AI engagements, ensuring data integrity and privacy are maintained²⁸. Adopting a privacy-by-design mindset is an important step towards incorporating privacy protection from the outset.

In conclusion, while Generative AI has the potential to transform industries, it comes with the responsibility to use it safely and ethically. By adhering to best practices, respecting ethical norms, and implementing strong security measures, organizations can harness the benefits of Generative AI while minimizing its risks.

TECHNICAL CONSIDERATIONS

Integrating Generative AI into enterprise applications has an enormous potential from a technical perspective. However, there are several key considerations that must be taken into account, regardless of the AI framework, technology, or programming language used.

Please find below relevant considerations when integrating this technology in your initiatives:

- It is essential to comprehend the specific task at hand and select the appropriate model aligning with data requirements.
- We recommend optimizing model training and considering ethical considerations to avoid biases and harmful content generation.
- Generative AI requires high energy power to run these models. Be aware of energy consumption and carbon footprint impact when using this technology²⁵.

- Implementing role-based authentication gives you control access to sensitive data, ensuring that only authorized users can interact with and manipulate private information. This adds an extra layer of security to your application, reducing the risk of unauthorized access and data breaches.
- Prioritize user experience testing and implement robust security measures, such as encryption and secure communication channels, to protect user data and generated content.
- Comply with data privacy regulations and stay informed about advancements to leverage Generative AI responsibly and effectively across diverse applications.
- Take into account that the quality of the answers generated by the models will depend on the quality of the data and knowledge base that is provided to leverage Generative AI responsibly and effectively across diverse applications.



REFERENCES

- 1 - <https://www.dataversity.net/a-brief-history-of-generative-ai/>
- 2 - <https://matthewdwhite.medium.com/a-brief-history-of-generative-ai-cb1837e67106>
- 3 - <https://www.qualcomm.com/news/onq/2024/02/the-rise-of-generative-ai-timeline-of-breakthrough-innovations>
- 4 - <https://www.solulab.com/top-generative-ai-trends/>
- 5 - <https://www.altexsoft.com/blog/generative-ai/>
- 6 - <https://www.nvidia.com/en-us/glossary/generative-ai/>
- 7 - <https://medium.com/@jackssqcy/an-overview-of-generative-ai-model-fine-tuning-b6d63f5fb1f0>
- 8 - <https://ai.gopubby.com/5-stages-of-generative-ai-project-lifecycle-ed84c27c08b0>
- 9 - <https://www.infoworld.com/article/3715396/understanding-the-generative-ai-development-process.html>
- 10 - <https://hbr.org/2022/11/how-generative-ai-is-changing-creative-work>
- 11 - <https://medium.com/@itirupati/the-future-of-generative-ai-in-image-and-video-a-comprehensive-comparison-602882b52bed>
- 12 - <https://www.assemblyai.com/blog/recent-developments-in-generative-ai-for-audio/>
- 13 - <https://leaddev.com/tech/11-generative-ai-programming-tools-developers>
- 14 - <https://www.ibm.com/blog/ai-code-generation/>
- 15 - <https://www.cnbc.com/2024/04/01/generative-ai-in-art-how-artists-are-using-it-or-not.html>
- 16 - <https://www.xenonstack.com/blog/generative-ai-in-synthetic-data>
- 17 - <https://www.k2view.com/blog/generative-ai-synthetic-data/>
- 18 - <https://builtin.com/artificial-intelligence/ai-hallucination>
- 19 - <https://www.ibm.com/topics/ai-hallucinations>
- 20 - <https://mitsloanedtech.mit.edu/ai/basics/addressing-ai-hallucinations-and-bias/>
- 21 - <https://www.plantemoran.com/explore-our-thinking/insight/2024/03/foundational-data-considerations-for-generative-ai>
- 22 - <https://deeperinsights.com/ai-blog/ai-explainability-unlocking-trust-in-artificial-intelligence>
- 23 - <https://www.linkedin.com/pulse/explainable-ai-key-unlocking-generative-ais-potential-zighra-t2lre>
- 24 - <https://securiti.ai/generative-ai-privacy/> <https://securiti.ai/generative-ai-privacy/>
- 25 - <https://www.technologyreview.com/2023/12/01/1084189/making-an-image-with-generative-ai-uses-as-much-energy-as-charging-your-phone/>
- 26 - <https://contentatscale.ai/ai-prompt-library/>
- 27 - <https://medium.com/@maximilian.vogel/the-chatgpt-list-of-lists-a-collection-of-1500->

useful-mind-blowing-and-strange-use-cases-8b14c35eb

28 - <https://www.liminal.ai/blog/ensuring-security-in-the-era-of-generative-ai-key-insights>

29 - <https://bigid.com/blog/8-generative-ai-best-practices-for-privacy/>

30 - <https://tenovos.com/resources/blog/power-of-generative-ai-addressing-rights-and-licensing-challenges/>

31 - <https://aaai.org/about-aaai/ethics-and-diversity/>

32 - <https://securiti.ai/generative-ai-security/>

33 - <https://www.axios.com/2024/03/14/generative-ai-privacy-problem-chatgpt-openai>

34 - <https://biztechmagazine.com/article/2024/01/what-are-privacy-risks-generative-artificial-intelligence>

35 - <https://calypsoai.com/ethical-considerations-in-generative-ai-deployment/>

36 - <https://guides.nyu.edu/data/ai-citations>

37 - <https://www.eweek.com/artificial-intelligence/generative-ai-landscape/>

38 - <https://iot-analytics.com/leading-generative-ai-companies/>

39 - <https://www.newhorizons.com/resources/blog/what-is-generative-ai>

40 - <https://www.industryemea.com/market-overview/78147-generative-ai-tools,-models,-applications>

41 - <https://www.linkedin.com/advice/1/what-most-innovative-applications-generative-uiu1c>

42 - <https://picovoice.ai/blog/state-of-generative-ai-for-audio/>

43 - <https://www.forbes.com/sites/bernardmarr/2024/05/28/how-generative-ai-will-change-the-jobs-of-artists-and-designers/>

44 - <https://medium.com/@thushanfernando86/the-impact-of-generative-ai-on-creative-work-a-professional-perspective-6713ece42812>

45 - <https://publications.iadb.org/en/tech-report-generative-ai>

46 - <https://medium.com/@mediarunday.ai/how-generative-ai-can-act-as-your-translator-892bd17734cc>

47 - <https://www.otechtalks.tv/generative-ai-use-cases-text-summarization/>



ADDITIONAL REFERENCES

<https://research.ibm.com/blog/what-is-generative-AI>
<https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai>
<https://www.techtarget.com/searchenterpriseai/definition/generative-AI>
<https://courses.nvidia.com/courses/course-v1:DLI+S-FX-07+V1/>
<https://news.mit.edu/2023/explained-generative-ai-1109>
<https://toloka.ai/blog/history-of-generative-ai/>
<https://www.cmswire.com/digital-experience/generative-ai-timeline-9-decades-of-notable-milestones/>
<https://masterofcode.com/blog/generative-ai-trends>
<https://www.tricension.com/domainai/proper-training-for-generative-ai/>
https://medium.com/@social_65128/the-comprehensive-guide-to-understanding-generative-ai-c06bbf259786
<https://www.xenonstack.com/blog/generative-ai-architecture>
<https://www.solulab.com/generative-ai-architecture/>
<https://www.systango.com/blog/generative-ai-architecture>
https://www.larksuite.com/en_us/topics/ai-glossary/variational-autoencoders-vaes
<https://www.analyticsvidhya.com/blog/2023/07/an-overview-of-variational-autoencoders/>
<https://www.techtarget.com/searchenterpriseai/definition/variational-autoencoder-VAE>
<https://aws.amazon.com/what-is/gan/>
<https://towardsdatascience.com/understanding-generative-adversarial-networks-gans-cd6e4651a29>
<https://machinelearningmastery.com/what-are-generative-adversarial-networks-gans/>
<https://www.pluralsight.com/resources/blog/data/what-are-transformers-generative-ai>
<https://aws.amazon.com/what-is/transformers-in-artificial-intelligence/>
<https://blogs.nvidia.com/blog/what-is-a-transformer-model/>
<https://medium.com/@ruslanmv/generative-ai-for-text-generation-from-scratch-25db8d6cd335>
<https://research.aimultiple.com/ai-text-generation/>
<https://aibusiness.com/nlp/ai-text-generation-models-and-apps-everything-you-need-to-know>
<https://techbullion.com/how-generative-ai-is-transforming-video-content-creation/>
<https://www.cprime.com/resources/blog/15-impacts-of-generative-ai-on-software-development/>

<https://garystafford.medium.com/unlocking-the-potential-of-generative-ai-for-synthetic-data-generation-f42907cf0879>

<https://guides.library.ualberta.ca/generative-ai/ethics>

<https://www.forbes.com/sites/forbestechcouncil/2023/10/17/which-ethical-implications-of-generative-ai-should-companies-focus-on/>

<https://www.techtarget.com/searchenterpriseai/tip/Generative-AI-ethics-8-biggest-concerns>

<https://www.mesh-ai.com/blog-posts/generative-ai-boom-data-quality-and-regulators-struggles-enterprise-data-and-ais-trends-of-2023>

<https://www.telusinternational.com/insights/ai-data/article/explainable-ai-framework>

<https://www.coveo.com/blog/generative-ai-best-practices/>

<https://support.wharton.upenn.edu/help/gen-ai>

<https://huit.harvard.edu/ai/guidelines>

<https://www.cmswire.com/digital-experience/generative-ai-exploring-ethics-copyright-and-regulation/>



IDB

Improving lives

