



Generative AI

"ChatGPT"

Brief Study

08 April 2023

Document Type: Brief Study

Document Classification: Public

Version No.: 1.0

Terms and Concepts

What is Generative AI?

Generative AI refers to artificial intelligence models that can generate novel content rather than simply analyzing existing data or processing such data for generating new visions. Not only do generative AI models produce various types of outputs, including texts, images, artwork, codes, etc., but they also reduce application development time and maximize nontechnical users' capabilities.

What is ChatGPT?

ChatGPT (Chat General Pre-trained Transformers) is an Optimizing Language Model for Dialogue developed by Open AI and released on November 30, 2022. It is based on natural language processing that focuses on specific tasks such as text generation and language translation. It is significantly improved compared to its predecessor, the GPT-3.5 (Generative Pre-trained Transformer 3.5) model, which is one of the largest and most advanced language models currently in use. Moreover, the Tool is remarkably characterized by its ability to interact in conversational settings and provide responses that fit perfectly and accurately in the human context.

This latest class of generative AI systems has emerged from foundation models such as - large-scale, deep learning models trained on massive, broad, unstructured data addressing several topics. Hence, developers can adapt the models for a wide range of use cases, through little fine-tuning required for each task.

How ChatGPT Works?



ChatGPT is trained on using Reinforcement Learning from Human Feedback (RLHF) as an additional training layer to provide it with the ability to follow directions and generate responses that are satisfactory to humans.



To generate responses, ChatGPT uses a multi-layer transformer network, which is a type of proven deep learning architecture in natural language processing. The model takes an input sentence, processes it using its internal knowledge, and then generates a response relevant to the input.

What is the Impact of Generative AI on Government Entities?

Government entities can invest in generative AI, particularly in ChatGPT, to enable a seamless digital transformation journey, given the tool's ability to enhance government services at different scales. For instance, entities can provide prompt and reasonable responses using ChatGPT as a result of the tool's ability to minimize the workload for government sectors allowing them to provide valuable services. In addition, the tool can go beyond this to another level of innovation to create original media content and utilize available data to provide innovative breakthrough opportunities. DGA has released the ET guidelines that support the adoption of this advanced technology.

Digital transformation, enterprise architectures and technology innovation leaders must evaluate the impact of various use cases for application of generative AI in their governmental entities:

Determine generative AI's impact in terms of (benefits/risks) on business competency.

Leaders' work with various stakeholders to evaluate generative AI use cases investigating relevant opportunities and threats, in addition to evaluating the technology and organizational readiness as well as other external factors that shall be either approved or mitigated.

Work with security and risk management leaders to proactively mitigate the risks of intellectual property issues and other malicious uses of generative AI technology at entities' level.

Opportunities and Challenges

Opportunities

The uses of ChatGPT is at nascent stages of scaling and still in need of more research and development. However, this does not preclude the search for possible opportunities to create a perception of the government sector's potential application packages and directions for the use of such technologies. The top most sectors that could gain potential benefits are Education, Health, Technology, Justice, and administrative operation. Some of the opportunities are as follows:



Operations

Generate task lists for efficient execution of a given activity



IT / Engineering

Create, document, and review software codes



Risks and Legal Aspect

Answer complex questions, leverage vast amounts of legal documentation, and draft & review annual reports



Research & Development

Accelerate new drug discovery through a better understanding of diseases and discovery of chemical structures

Challenges

Generative AI may unveil many opportunities, but can also cause plenty of practical and ethical issues, including but not limited to:



Like humans, generative AI can make mistakes



Content filtration processes are not yet effective enough to evaluate the extent to which replies and responses are appropriate.



Systemic biases still need to be addressed



Intellectual-property issues

For further studies and publications, You may visit the Digital Consulting Program Knowledge Center on:

 digitalconsulting.dga.gov.sa



Sources:

Burke, Chandrasekaran, & Sicular. *Innovation Insight for Generative AI*. Gartner | *ChatGPT: Optimizing Language Models for Dialogue*. openal.com | Hirn, García, Montesinos-Navarro, Sánchez-Martín, Sanz, & Verdú. *Methods in Ecology and Evolution*. A deep Generative Artificial Intelligence system to predict species coexistence patterns.