

Research Article

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ChatGPT vs Chatbots Unleashing the Power of Conversational AI

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ABSTRACT

This article explores the distinctions between ChatGPT and chatbots, two prominent technologies in the field of conversational AI. ChatGPT, powered by OpenAI's GPT-3.5 architecture, represents a state-of-the-art natural language processing model that learns from vast text data, enabling it to generate contextually relevant responses. In contrast, chatbots operate within predefined rules and offer structured interactions. The article discusses the strengths and weaknesses of each approach and their respective applications. While ChatGPT excels in natural language understanding and adaptability, chatbots are well-suited for rule-based tasks. The future of conversational AI may involve hybrid systems that combine these strengths. Ethical considerations surrounding bias and privacy in AI conversations are also addressed. Ultimately, the choice between ChatGPT and chatbots depends on specific needs and goals, but both technologies play a pivotal role in shaping the future of human-computer interactions.

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Received: October 14, 2022; **Accepted:** October 21, 2023; **Published:** October 30, 2023

Keywords: ChatGPT, Chatbots, Conversational AI, Natural Language Processing, GPT-3.5, GPT 4.0, Rule-based AI, Adaptability, Use Cases, Hybrid Systems, Ethical Considerations, Bias, Privacy, Human-Computer Interactions.

Introduction

In the realm of artificial intelligence, the field of conversational agents has seen remarkable progress over the past few years. Among the various technologies in this domain, two terms often emerge in conversations: ChatGPT and chatbots. While both are designed to facilitate human-like interactions, they differ significantly in their capabilities, applications, and underlying technologies. In this article, we will delve into the world of ChatGPT and chatbots, exploring the distinctions that set them apart and the unique strengths they bring to the table.

Businesses may be wondering if ChatGPT is any more advanced than current chatbots and how this would affect customer service given its recent surge in popularity.

It is tempting to declare any new automated technological tool to be completely unique and unheard of. With advancements in the field of artificial intelligence (AI), this is particularly alluring. Text-generating chatbots have been around for a long and have grown to define the customer experience, even though ChatGPT and other forms of generative AI may be grabbing the headlines due to the breadth and depth of use cases.

At the moment, customer service is the main area where chatbots and people engage, and these interactions are mixed. While chatbots occasionally can be useful in bringing up the solution to a bothersome question you have that is hidden deep inside a website's FAQs, most encounters are characterized by a lack of

nuance and context, and they operate as an unpleasant barrier before to the inevitable phone conversation with a human operator. See Figure-1.

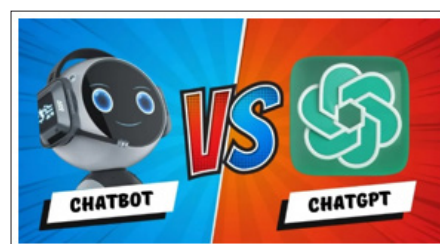


Figure 1: Two Recent Generative AI Systems

In contrast, ChatGPT provides significantly greater depth and opportunities in this area because of the way the system is designed. Though Open AI's ChatGPT is still a chatbot and will undoubtedly have some issues that prevent it from being appropriate for many use cases, it has the potential to completely transform how humans and machines communicate in a variety of contexts.

What is Chatbot and How It Works?

In its most basic form, a chatbot is a computer software that mimics and interprets spoken or written human communication, enabling people to engage with digital devices in the same way they would with a real person. Chatbots can be as basic as one-line programs that respond to a basic question, or they can be as complex as digital assistants that learn and develop over time to provide ever-more-personalized services as they collect and analyze data.

Moreover, a chatbot is a computer program that simulates human conversation, either written or spoken, using artificial intelligence and natural language processing. It can be embedded and used

through any major messaging application and can solve customer queries, automate responses, or provide information [1-4]. See Figure-2.



Figure 2: Ideal Chatbot at Technical Level

Chatbots can vary in complexity and sophistication, from simple programs that answer a single-line query to digital assistants that learn and personalize [2]. Chatbots are also known as Talkbots, bots, IM bots, interactive agents, or artificial conversation entities [3]. The term chatbot was coined by Michael Mauldin in 19945. Chatbots require continuous tuning and testing, and none of them can pass the standard Turing test. [5]

In technical terms, a chatbot is a computer software designed to answer client inquiries by simulating human communication. The chatbot is available to greet and assist customers or leads via any channel when they get in touch. If necessary, they can assist clients with submitting emails, submitting service requests, and establishing connections with live agents. See Figure-2

You would be absolutely correct if this makes you think of a phone customer service number where you can select the options based on your needs. Even though it's a very basic chatbot, that phone tree is also one. The same thing is done by contemporary chatbots, who converse with clients. This exchange of ideas could take the shape of speech, text, or a combination of the two.

A chatbot that functions through machine learning has an artificial neural network inspired by the neural nodes of the human brain. The bot is programmed to self-learn as it is introduced to new dialogues and words. In effect, as a chatbot receives new voice or textual dialogues, the number of inquiries that it can reply to and the accuracy of each response it gives increases.

Furthermore, by instantly replying to queries and requests via text, audio, or both, chatbots can facilitate users' information discovery and eliminate the need for manual investigation or human interaction.

Nowadays, chatbots are everywhere. You can find them in everything from home smart speakers to consumer-facing SMS, WhatsApp, and Facebook Messenger apps to business messaging platforms like Slack. The most recent iteration of AI chatbots, also known as "virtual agents" or "intelligent virtual assistants," are capable of automating pertinent tasks in addition to understanding natural language exchanges through the use of advanced language models. In addition to popular consumer-facing IVTs like Amazon Alexa and Apple's Siri, virtual agents are now being utilized more frequently in business settings to help clients and staff.

Advantages and Disadvantages of Chatbot

Chatbots are a convenient way to offer help and customer care around-the-clock, every day of the week. They are also significantly less expensive in the long run than hiring someone

to provide help, and they free up phone lines. Chatbots are getting more adept at figuring out what clients want and giving them the assistance, they require thanks to artificial intelligence and natural language processing. Businesses also appreciate chatbots because they can gather information about client inquiries, satisfaction levels, response times, and other topics.

Nevertheless, chatbots are still somewhat rare. Even with natural language processing, they might not understand what a consumer is saying completely and might respond in a nonsensical way. Additionally, the range of questions that many chatbots can answer is constrained. This could make you feel frustrated by the absence of feeling, empathy, and individualization in the generally generic feedback. Apart from the unhappiness of customers who are unable to speak with a human, chatbots can be costly to set up and operate, particularly if frequent customization and updating is required.

Chatbots Pros and Cons are listed below

Pros Chatbot

- Lower cost than human workers
- Online 24/7
- Can be used as a sales & marketing tool

Cons Chatbot

- May not understand user queries
- Lacks emotion and is not personalized
- May be expensive/complicated to install and maintain

Today, chatbots are ubiquitous on corporate websites, e-commerce platforms, and other customer-facing sites online (on the web or via app). These can help with customer support such as how to return or replace an item, how to request a refund, and so on. See Figure-3

Chatbots have also been implemented to help with public policy and inform citizens if they have certain questions. For example, in response to the COVID-19 pandemic, several health chatbots were created by governments and healthcare providers. A recent study of such chatbots identified five key applications of the current health chatbots, which were

- disseminating health information and knowledge
- self-triage and personal risk assessment
- monitoring exposure and notifications
- tracking COVID-19 symptoms and health aspects and
- combating misinformation and fake news



Figure 3: Artistic Communitive Chatbot

Furthermore, these technologies can ask and answer questions, create health records and history of use, complete forms and generate reports, and take simple actions. Nonetheless, the use of health chatbots poses many challenges both at the level of the social system (i.e., consumers' acceptability) as well as the technical system (i.e., design and usability) [5].

What is ChatGPT and How It Works?

ChatGPT is a cutting-edge, artificial intelligence-powered conversational agent developed by OpenAI. It represents a significant advancement in natural language processing (NLP) and is built upon the GPT (Generative Pre-trained Transformer) architecture, which is renowned for its language understanding and generation capabilities.

At its core, ChatGPT is a large neural network model that has been pre-trained on vast amounts of text data from the internet. This pre-training process equips ChatGPT with a deep understanding of human language, allowing it to recognize patterns, syntax, semantics, and even context within the text. This understanding extends to a wide range of languages, making ChatGPT versatile and capable of handling diverse linguistic inputs.

The primary function of ChatGPT is to engage in text-based conversations with users in a highly natural and human-like manner. Unlike traditional chatbots, which often rely on rule-based scripts, ChatGPT does not depend on specific rules or predefined decision trees. Instead, it employs generative AI techniques, enabling it to generate responses dynamically based on the input it receives. This means ChatGPT can have open-ended conversations on a wide array of topics, adapt to user queries, and provide contextually relevant responses.

What sets ChatGPT apart is its ability to engage in multi-turn conversations, understanding not just individual queries but also the context of the conversation as a whole. This allows for more meaningful and coherent interactions, making it suitable for a broad spectrum of applications. ChatGPT can assist with tasks such as answering questions, offering recommendations, providing information, generating text content (like articles or reports), and even simulating conversations for various purposes.

Moreover, ChatGPT can be fine-tuned for specific domains or applications, making it adaptable to a wide range of industries and use cases. It can be integrated into websites, applications, or customer support systems, enhancing user experiences and automating various aspects of communication.

In essence, ChatGPT represents a remarkable advancement in the field of conversational AI, offering a versatile and powerful tool for businesses, developers, and individuals looking to engage in natural, text-based interactions with machines. Its ability to understand, generate, and adapt language in real-time opens up a world of possibilities for improving customer support, content generation, personal assistance, and much more.

Advantages and Disadvantages of ChatGPT

A short summary of Advantages and Disadvantage of ChatGPT are listed below as

Advantages of ChatGPT

- **Natural Language Understanding:** ChatGPT excels in understanding and generating human-like text, enabling more natural and engaging interactions with users.
- **Adaptability:** ChatGPT can learn and adapt continuously, providing up-to-date information and improving its responses over time.
- **Versatility:** It can be applied to a wide range of tasks, from content generation and customer support to creative writing and personal assistance.
- **Context Awareness:** ChatGPT understands context in conversations, allowing for more coherent and contextually

relevant responses.

- **Multilingual Support:** It can handle various languages, making it accessible to a global audience.

Disadvantages of ChatGPT

- **Over-Reliance on Data:** ChatGPT's responses are based on the data it was trained on, which may contain biases or inaccuracies present in the training data.
- **Lack of Critical Thinking:** It lacks true understanding and critical thinking abilities, sometimes producing plausible-sounding but incorrect or nonsensical answers.
- **Potentially Inappropriate Content:** Without proper filtering and guidance, ChatGPT can generate inappropriate or harmful content.
- **Resource-Intensive:** Training and running ChatGPT models require significant computational resources, limiting accessibility to smaller organizations and individuals.
- **Ethical Concerns:** The use of ChatGPT raises ethical concerns regarding bias, privacy, and the potential for misuse in areas like disinformation or social engineering.

ChatGPT Pros and Cons are listed below

Pros of ChatGPT

- **Natural Language Understanding:** ChatGPT excels in understanding and generating human-like text, leading to more natural and engaging conversations.
- **Adaptability:** It continuously learns and adapts, providing responses that become more contextually relevant and accurate over time.
- **Versatility:** ChatGPT can be applied to a wide range of tasks, from content generation and customer support to creative writing and personal assistance.
- **Contextual Awareness:** It understands and responds coherently within the context of a conversation, improving the quality of interactions.
- **Multilingual Support:** ChatGPT can communicate in multiple languages, making it accessible and useful for a diverse global audience.

Cons of ChatGPT

- **Data-Driven Biases:** ChatGPT's responses may reflect biases present in the training data, potentially leading to biased or politically incorrect responses.
- **Limited Critical Thinking:** Despite its impressive capabilities, ChatGPT lacks true understanding and critical thinking abilities, occasionally producing incorrect or nonsensical answers.
- **Content Control:** Without proper filtering and guidance, ChatGPT can generate inappropriate or harmful content, raising concerns about content moderation.
- **Resource-Intensive:** Both training and deployment of ChatGPT models require substantial computational resources, limiting accessibility for smaller organizations and individuals.
- **Ethical Concerns:** The use of ChatGPT raises ethical questions related to bias, privacy, and the potential for misuse in areas like disinformation or social engineering, necessitating responsible usage and oversight.

In summary, ChatGPT offers several advantages, including its natural language understanding, adaptability, versatility, contextual awareness, and multilingual support. However, it also has notable drawbacks, such as data-driven biases, limited critical thinking, content control challenges, resource-intensive requirements, and ethical concerns. Understanding both its strengths and limitations

is crucial for responsible and effective usage.

Generative AI: The Engine Behind Chatbots and ChatGPT

In the rapidly evolving world of artificial intelligence, generative AI stands at the forefront, driving the development of conversational agents like chatbots and ChatGPT. These technologies are transforming the way we interact with machines, making our exchanges more natural, intelligent, and intuitive. In this article, we will delve into how generative AI powers chatbots and ChatGPT, enabling them to engage in meaningful conversations and perform diverse tasks.

Understanding Generative AI

Generative AI refers to a subset of artificial intelligence that focuses on creating content or generating responses that mimic human-generated text, audio, or visuals. It relies on machine learning models, particularly deep learning techniques, to understand patterns and structures within data and generate contextually relevant outputs.

The Rise of Chatbots

Chatbots, often the first encounter many have with conversational AI, have become ubiquitous in various domains, from customer service to e-commerce. These rule-based or generative AI-driven programs facilitate text-based conversations with users, providing information, answering queries, or assisting with tasks.

Generative AI in Chatbots

- **Response Generation:** Rule-based chatbots use predefined rules and scripts to generate responses based on specific keywords or patterns in user input. Generative AI-powered chatbots, however, leverage machine learning models to generate responses dynamically. These models, often based on recurrent neural networks (RNNs) or transformers, analyze user input and generate contextually relevant replies, making conversations more human-like.
- **Personalization:** Generative AI-driven chatbots can personalize responses by analyzing user data, preferences, and history. This personalization enhances user engagement and satisfaction, as the chatbot can provide tailored recommendations or solutions.
- **Adaptability:** Unlike rule-based chatbots, generative AI-powered chatbots can adapt to changing contexts and respond effectively to unexpected user inputs. They continuously learn from interactions and improve their responses over time.

The Emergence of ChatGPT

ChatGPT, a flagship product of OpenAI, represents a groundbreaking advancement in generative AI. It is a language model built on the GPT (Generative Pre-trained Transformer) architecture, designed to understand and generate human-like text at an extraordinary level of sophistication.

Generative AI in ChatGPT

- **Natural Language Understanding:** ChatGPT's generative AI engine excels in natural language understanding, allowing it to interpret user inputs contextually. It can recognize nuances, idioms, and even engage in multi-turn conversations with a high degree of coherence.
- **Content Generation:** ChatGPT can generate content across various domains, including articles, reports, and creative writing. Its ability to contextualize information and produce coherent text makes it a powerful tool for content creators.
- **Adaptability and Learning:** Generative AI in ChatGPT enables it to continuously learn and adapt to new information

and contexts. It remains up-to-date and relevant, offering users accurate and timely information.

The Synergy of Generative AI and Conversational Agents

Generative AI serves as the driving force behind the evolution of conversational agents like chatbots and ChatGPT. By harnessing the power of machine learning and deep learning models, these technologies are redefining human-computer interactions. They provide users with more personalized, natural, and context-aware experiences, ultimately enhancing customer satisfaction and engagement across various applications.

As generative AI continues to advance, we can expect even more sophisticated and versatile conversational agents, pushing the boundaries of what is possible in human-machine communication. These innovations will not only benefit businesses and organizations but also enrich the daily lives of individuals by making technology more accessible and user-friendly.

Understanding ChatGPT

ChatGPT, a marvel of modern AI, has its roots deeply embedded in the realm of natural language understanding and generation. With a sophisticated architecture founded on transformers, it possesses an innate aptitude for comprehending and generating text that mirrors human speech. Unlike the conventional rule-based chatbots, ChatGPT operates on a fundamentally different principle.

Natural Language Understanding

One of ChatGPT's defining attributes is its unparalleled prowess in comprehending natural language. It navigates the complexities of conversations with agility, understanding context, and delivering responses that are not just contextually relevant but often deeply insightful. This natural language understanding makes it an ideal candidate for a wide array of tasks, including content generation, customer support, and even creative writing.

Adaptability and Learning

Another remarkable feature of ChatGPT is its capacity to learn and adapt continually. This dynamic learning process ensures that it remains current, providing users with up-to-date information and the ability to tackle ever-evolving contexts. This adaptability is a cornerstone of its versatility, allowing it to transcend the boundaries of predefined rules and operate seamlessly across various domains and applications.

Exploring Chatbots

In contrast to the cognitive marvel of ChatGPT, chatbots represent a more traditional approach to conversational AI. These systems are anchored in a rule-based paradigm, functioning strictly within the parameters established by their designers. They are programmed to respond to specific inputs with pre-determined, often scripted, responses.

Predefined Rules

Chatbots, by design, adhere to predefined rules and scripts. They are exceptionally well-suited for tasks that necessitate structured and straightforward interactions. These include answering frequently asked questions or providing fundamental information to users.

Limited Learning Capabilities

Unlike ChatGPT, chatbots have limited learning capabilities. They lack the capacity to adapt to novel information or navigate conversations that veer beyond their programmed rules. Consequently, they may falter when confronted with nuanced or evolving discussions, rendering them less suitable for tasks of a

complex or dynamic nature.

In summary, as we proceed through this exploration of ChatGPT and chatbots, we will examine their distinct use cases, applications, and the unique strengths they bring to various scenarios. Additionally, we will explore the potential convergence of these technologies in hybrid systems and consider the ethical implications that come to the fore as conversational AI gains prominence in our daily lives. The choice between ChatGPT and chatbots is not merely a matter of preference; it hinges on specific needs, goals, and the intricacies of the tasks at hand. Yet, both technologies are pivotal in shaping the future landscape of human-computer interactions, with each offering a set of remarkable capabilities and addressing unique challenges.

Conclusion

In conclusion, ChatGPT represents a remarkable advancement in the field of conversational AI, offering a powerful tool for engaging in natural and dynamic text-based interactions. Its strengths lie in its natural language understanding, adaptability, versatility, contextual awareness, and multilingual capabilities. These features make it well-suited for various applications, from content generation to customer support.

However, ChatGPT is not without its challenges. It can inherit biases from its training data, lacks true understanding and critical thinking abilities, may generate inappropriate content if not properly controlled, demands substantial computational resources, and raises ethical concerns regarding bias, privacy, and potential misuse.

The overall conclusion is that ChatGPT is a valuable tool but must be used responsibly and with awareness of its limitations. To harness its benefits while mitigating its drawbacks, it is essential to implement effective content moderation, provide guidance to the model, and continuously monitor its interactions.

As technology advances, addressing these challenges will be crucial in unlocking the full potential of conversational AI systems like ChatGPT while ensuring ethical and reliable usage. [6-9].

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