

## COMPREHENSIVE ANALYSIS OF CHATGPT

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### ABSTRACT

Chat GPT an AI generated tool, which is developed by Open AI. A technology which creates new content on the basis of formats & examples collected from a large database. Chat GPT also creates images, texts which makes it more valuable in chatbots & other applications & also in creation of content. It involves step-by-step process, internet learning, context understanding, receiving guided improvement, users' conversion, & continuous learning and growing. Chat GPT has its advantages like generation of natural language, scalability, customizability & effectiveness, & also has limitations such as dialogue options which are limited, challenges faced in natural language processing, lack of contextual understanding, limited domain knowledge, and insensitivity to emotional cues. Its features are automated conversations, enhanced customer service, cost effectiveness, processing of natural language, personalized responses, customizability, scalability, and translation of language. Customer service, healthcare, development of software, employment, IT, consulting, and research are just a few of the areas it has affected. Its effects include enhancing customer experiences, revolutionizing research, and generating new job opportunities.

**Keywords:** Chat GPT, GEN-AI, AI Technology, Language Generation, Theoretical Framework

### Introduction

Natural Language Processing (NLP) has undergone significant advancements in recent years, transforming the way humans interact with machines and revolutionizing various industries. One of the prominent developments in NLP is the emergence of chatbots powered by the Chat GPT (Generative Pre-trained Transformer) model, developed by OpenAI. Chat GPT is a state-of-the-art language model that leverages deep learning techniques to generate human-like text responses, making it an invaluable tool for enhancing NLP applications. In this in-depth examination, we examine Chat GPT's NLP-related capabilities and effects.

We evaluate Chat GPT's strengths and weaknesses, look at its applications and use cases, and talk about its architecture and training procedures. We also examine any difficulties and moral issues that may arise from using Chat GPT in real-world situations. The GPT-3.5 architecture, upon which Chat GPT is based, marks a substantial advancement in conversational AI. It gains the ability to produce replies to user inputs that are coherent and appropriate for the context by receiving training on a vast corpus of varied text sources, such as books, papers, and websites. The model's capacity to interpret and produce text that resembles human speech enables it to participate in lively discussions that closely resemble natural language interaction.

The effects of Chat GPT are felt in many different fields. Chatbots driven by Chat GPT may offer immediate, personalized assistance in customer support, responding client questions and effectively resolving difficulties. It can act as a virtual tutor in the classroom, providing students with lessons that are tailored to their needs and responding to their inquiries in a way that encourages participation and learning. Chat GPT may be used to help writers, journalists, and content creators come up with interesting and well-organized pieces of writing. Although Chat GPT has a lot of promise, it is not without its drawbacks. The model could occasionally respond in a wrong or meaningless way, and it might have trouble comprehending complex or confusing questions. The use of such potent language models in practical applications also raises issues with prejudice, the spread of false information, and lack of explain ability.

Researchers and developers are actively looking towards methods to adjust and manage Chat GPT's output in order to overcome these issues. To increase the model's precision, dependability, and responsiveness, a variety of strategies—from rapid engineering to reinforcement learning—are being used. The creation of policies and procedures to lessen possible hazards and biases is another action being taken to assure the moral and ethical use of Chat GPT.

**Fig. 01 Evolution of Chat Gpt with its significance (Source Mehta, 2023)**

**Literature Review**

What is CHATGPT & GEN-AI?

(Kaynaklar, 2022) GPT (Generative Pre-Trained Transformer), a particular kind of artificial intelligence model, was created by OpenAI. It has features to generate humanized text based on the input it receives. The transformer design used by GPT mode enables them to process and understands the context of given prompt and generate coherent and relevant response.

(Mehta, 2023) Chat. A generative AI chatbot called "generative pre-trained transformer" uses a big language model to have human-like conversations and generate text and picture material. It was created and launched in November 2022 by OpenAI with funding from Microsoft.

Artificial Intelligence

(Mehta, 2023) chatbot Technology that can behave intelligently, varying from clear and simple algorithms to complex systems like human simulation, is termed to it as AI.

Language models (Macneil, Seth , Daniel , & Erin , 2022) Language models are kind of natural network that can

| <b>FROM OVER 100 MILLION TO NEARLY 100 TRILLION PARAMETERS</b>  |  |  |  |   |
|---|--|--|--|---|
| <b>LAUNCH DATE</b>  |  |  |  |   |
| June 11, 2018   | Feb 14, 2019   | June 11, 2020  | Nov 30, 2022   | March 14, 2023  |
| <b>VERSION</b>  |  |  |  |   |
| <b>GPT-1</b>  | <b>GPT-2</b>   | <b>GPT-3</b>   | <b>GPT-3.5</b><br>(aka ChatGPT free version)   | <b>GPT-4</b><br>(aka ChatGPT-4, or plus version, \$20/m)  |
| <b>HOW IT HAS EVOLVED</b>   |  |  |  |   |
| <ul style="list-style-type: none"> <li>Consisted of about 117 million parameters, or factors by which it processes info.</li> <li>It proposed a complex language model trained to classify unlabelled data and recognise the emotional tone of a text.</li> </ul> | <ul style="list-style-type: none"> <li>Consisted of nearly 1.5 billion parameters.</li> <li>It was trained on a larger collection of data and more model parameters to produce an even more effective language model.</li> </ul> | <ul style="list-style-type: none"> <li>Consisted of nearly 175 billion parameters.</li> <li>Its human-like story writing, programming language scripts &amp; interpretation of SQL (a query language for searching databases) took the world by surprise.</li> </ul> | <ul style="list-style-type: none"> <li>Upgrade of GPT-3</li> <li>It is trained on the same datasets of GPT-3 but with an additional fine-tuning process that adds a concept called 'reinforcement learning with human feedback', or RLHF, to the GPT-3 model.</li> </ul> | <ul style="list-style-type: none"> <li>Consists of nearly 100 trillion parameters</li> <li>It accepts the input in the form of text as well as images and can provide outputs in the form of both and is well-trained in close to 26 languages, including Hindi, Telugu, Gujarati, Marathi, Bengali.</li> </ul> |

anticipate the following word in the given string of words. A sort of machine learning mode known as a big language model is capable of performing various natural language processing task including categorizing text for translating it from one language to another.

Machine learning

Neural network is a short of machine learning where computers can learn from many instances without human supervision for example if the network has to be taught what a dog looks like it will need to see many photographs of the dog in order to figure this out.

### Chatbot

(King, 2022) Chatbot is a computer program design to simulate conversation with human user especially over the internet.

### Generative AI

It is a salt of AI that can pick up new information by creating and generating new data whether it be text images or other artificial information.

### Generative Pre-trained Transformer (GPT)

Is a machine learning model developed by Open AI? It is a type of neural network architecture based on the Transformer model, which has been widely used for natural language processing (NLP) tasks.

### GPT and CHATGPT

(Brockman, et al., 2016) Open AI is a research laboratory founded in 2015, OpenAI has developed ChatGPT, an intimately available tool grounded according to (Lund & Wang, Research Gate, 2023) on the language model technology of GPT. This sophisticated chat bot can carry out colorful textbook- grounded tasks, from answering simple questions to generating thank- you letter and furnishing guidance on Productivity problems

(Lund, Wang, 2023) With the help of its extensive data sources and clever architecture, ChatGPT can comprehend and interpret stoner requests and produce replies in language that seems natural and mortal like. Beyond practical operations, Chat GPT's capability to induce sophisticated textbook and negotiate complex tasks represents a significant advance Productivity problem with the help of its extensive data sources and clever architecture, ChatGPT can comprehend and interpret stoner requests and produce replies in language that seems natural and mortal like. Explores how Chat GPT functions and discusses its implicit impacts across diligence. ChatGPT, developed by OpenAI as an intimately available tool grounded on GPT technology, is a sophisticated chatbot.

(Lund, 2023) able to fulfill a wide range of textbook- grounded requests. From answering questions to generating complex content like scholarly essays, Chat GPT leverages GPT's capabilities to understand and induce mortal- suchlike language. Its vacuity has the implicit to impact colorful diligence, similar as client service, legal exploration, document medication, and education. Still, it's important to admit the limitations of GPT models, similar as immortalizing impulses and lacking common sense or logical logic capacities. Also, training GPT models requires significant computational coffers and energy consumption, making perpetration challenging for some associations and individualities. Responsible use of GPT technology is pivotal, considering these limitations.

(Kirmani, 2022) Chat GPT is a public tool developed by open AI that is best on the GPT language model technology

### Objectives of the Study

1. To study theoretical framework of Chat GPT.
2. To study benefits & drawbacks of Chat GPT.
3. To study the effect of Chat GPT on career.

### Research Methodology

Researcher used secondary data which was collected through Research Papers, News Papers and Internet etc.

### Secondary Data Analysis

A step-by-step breakdown of how Chat Gpt, as an AI, works. (Chat GPT, 2023)

### Step 1: Learning from the Internet

Chat Gpt is like a curious learner, it starts by exploring a vast amount of text from the internet, including books, articles, websites, and more.

Just like reading and absorbing knowledge, Chat Gpt tries to learn and understand the patterns and also try to relate between words, sentences, and concepts.

This helps Chat Gpt develop its understanding of grammar, facts, reasoning abilities, and even a bit of general knowledge about the world.

### **Step 2: Understanding Context**

Chat Gpt uses a special brain architecture called a Transformer, which allows it to process and understand sequences of words and generate responses.

Think of Transformers as Chat Gpt's way of organizing information. It has multiple layers, like different levels of thinking that help it understand how words are related to each other and make predictions.

### **Step 3: Guided Improvement**

Chat Gpt's learning journey doesn't stop there. It gets additional training with the help of human reviewers, who follow guidelines provided by Open AI.

These reviewers act as mentors, helping Chat Gpt understand which responses are good or bad for different example inputs.

By learning from human feedback, Chat Gpt gets better over time at generating responses that are more accurate, helpful, and aligned with human values.

### **Step 4: Conversing with Users**

When you interact with Chat Gpt, it tries to have a conversation just like a friendly companion.

Your input is like a message to Chat Gpt, which it reads and tries to understand by breaking it down into chunks it can work with, called tokens.

Based on its training and the context it has learned, Chat Gpt predicts the most likely next tokens and generates a response that it thinks is the best fit.

### **Step 5: Learning and Growing Together**

Open AI values user feedback and actively works on improving Chat Gpt based on your experiences and insights.

Just like humans learn and adapt, Open AI fine-tunes Chat Gpt's behavior to address biases, improve the quality of responses, and align with what users expect.

It's an ongoing process of refining and enhancing the model, so it can continue to be a helpful and reliable AI companion.

While Chat Gpt strives to generate impressive responses, it's important to remember that it's not perfect. Sometimes it may provide incorrect or nonsensical answers. Additionally, its knowledge is limited to what it has learned from the data it was trained on and may not include recent events or developments since its knowledge cutoff date.

Advancements in artificial intelligence have given rise to the remarkable technology known as ChatGPT, and it has excelled at generating responses like human to natural language prompts. While ChatGPT offers various advantages, including natural language generation and scalability, it is important to acknowledge its limitations. We will delve deeper into the pros and cons of Chat Gpt in this section.

### **Advantages of Chat Gpt: (Mehta, 2023)**

#### **Natural Language Generation**

ChatGPT's remarkable capability to generate coherent and human-like responses is a significant advantage. This feature proves its importance in such Customer service, chatbots, and language translation are just a few examples of applications where natural language is essential. By producing responses that closely resemble human conversation, ChatGPT facilitates mostly significant and appealing interactions with people, improving their pleasure and experience to the end user.

#### **Scalability**

ChatGPT's ability to handle a large volume of conversations simultaneously and generate responses swiftly is another advantage. For companies and organizations who refuse to use an automated customer service and language translation system it is the best ideal solution because of its scalability and work efficacy. By reducing the need for human intervention, ChatGPT enables faster response times and improved user satisfaction.

### **Customizability**

Chat Gpt may be configured to do specific jobs or applications, such language the translation process or customer assistance, through changes to its initial learning data and algorithms. Because it assures that replies fit to each user's unique needs, this flexibility makes Chat Gpt a very flexible tool. Customizability helps businesses and organizations to offer more individualized client experiences, boosting customer satisfaction and loyalty.

### **Effectiveness**

Chat Gpt has an ability to quickly generate responses and handle multiple discussions simultaneously which allows it to work on large amounts of information in a short period of time. In jobs like dealing with clients or translating between languages, where human participation can be tedious and costly, this efficiency is especially useful. ChatGPT helps companies and organizations increase productivity and profitability by automating these procedures to save time and resources.

Despite its advantages, it is very important to be aware of the drawback and Possible challenges related with ChatGPT. These disadvantages include potential biases in generated responses, sensitivity to input phrasing, and a lack of genuine understanding or contextual knowledge. Ongoing To try to address these issues and improve ChatGPT's overall performance and dependability, study and improvement are required.

### **Limitations of Chat Gpt: (OpenAI, 2023)**

#### **a. Limited Dialogue Options**

Chat Gpt's conversations can feel constrained due to its reliance on a predetermined set of responses. This limitation can hinder users' ability to engage in meaningful and open-ended conversations, potentially leading to a less satisfying user experience.

#### **b. Challenges in Natural Language Processing**

Despite its sophisticated algorithms and training, there are certain chances that Chat Gpt may face problems during processing of natural language. It may have difficulty comprehending complex queries or interpreting the nuances of human language, resulting in responses that may be inaccurate or confusing.

#### **c. Lack of Contextual Understanding**

Chat Gpt lacks inherent context awareness, which means it may not fully grasp the text of a discussion. This limitation can lead to generate contextually incorrect responses that are irrelevant, requiring additional clarification from users to provide accurate information.

#### **d. Limited Domain Knowledge**

Responses by Chat Gpt are based on the information present in its data Impute, which may have limitations and its ability to address highly specialized or niche topics. Users seeking detailed or specific information outside of Chat Gpt's training domain may not receive satisfactory responses.

#### **e. Lack of Sensitivity to Emotional Cues**

While Chat Gpt is capable of producing replies that seem realistic, it is very difficult to understand emotional cues like sarcasm, comedy, or empathy. Because Chat Gpt lacks true emotional awareness, this may lead to incorrect or insensitive reactions.

It is significant to note that extensive research and development and projects are aimed at reducing these restrictions and enhancing Chat Gpt's functionality

### **Features of Chat Gpt: (Kalla & Smith, 2023)**

#### **a. Automated Conversations**

By enabling automated chats, Chat Gpt enables users to communicate with a chatbot devoid of human interaction. Based on patterns and connections in its taught data, it can produce replies fast and precisely. It is a useful tool for companies and organizations who need automated customer support or language translation services because of its functionality.

#### **b. Enhanced Customer Service**

By giving prompt and correct answers to user questions, Chat Gpt dramatically enhances customer service. Since consumers can get quick support and help, this increases customer happiness and loyalty.



### **c. Cost-Effective Solution**

By doing away with the requirement to hire human operators for customer support discussions, Chat Gpt provides a cost-effective solution. Businesses save a lot of money as a result, especially those managing a lot of client inquiries.

### **d. Natural Language Processing**

Chat Gpt can comprehend and reply to inputs in natural language thanks to natural language processing algorithms. It understands and produces comments that resemble human speech, offering a natural and user-friendly interaction.

### **e. Personalized Responses**

Chat Gpt may provide customized responses by keeping track of user preferences and configuring its replies accordingly. Users believe that the system understands and caters to their specific requirements thanks to this feature, which boosts engagement and satisfaction.

### **f. Customizability**

By modifying its training data and methods, Chat Gpt may be tailored for certain activities or applications. Due to its adaptability, Chat Gpt may be used by corporations and organizations to customize its replies to meet their unique needs, making it a very flexible and adaptive tool.

### **g. Scalability**

Chat Gpt has a great capacity for scaling and can manage several chats at once. This makes it ideal for applications that call for quickly and effectively processing large volumes of information.

### **h. Language Translation**

Chat Gpt has the capacity to translate text across many languages, improving international conversation. It offers consumers a smooth and effective way to communicate across language boundaries since it can effectively translate text in real-time...

It's crucial to understand that GPT boasts these features, ongoing advancements and refinements are necessary to enhance its capabilities further and address its limitations.

## **Impact of Chat Gpt on different careers / jobs (Kalla & Smith, 2023)**

### **A. Educational**

Academics might undergo a transformation thanks to Chat Gpt by providing customized explanations and feedback to students, assisting teachers in grading assignments, and developing creative initiatives and tools. It can produce interactive games as well and intelligent tutors for personalized guidance and support.

### **B. Cyber Security**

Significant progress has been achieved in the realm of cyber security thanks to Chat Gpt by detecting and preventing cyber-attacks. It can identify phishing emails, detect malware, and help create secure passwords, enhancing online security.

### **C. Customer Support**

Chat Gpt improves customer support by offering personalized assistance and creating virtual agents that understand customer requests. It helps automate problem detection and resolution, leading to efficient and effective customer service.

### **D. Healthcare**

Chat Gpt provides personalized assistance to healthcare professionals, offering automated systems that use patient history to deliver medical recommendations. It helps in detecting health problems, creates virtual agents for patient support, and enhances privacy concerns.

### **E. Software Development**

Chat Gpt has transformed software development by integrating natural language processing capabilities, making applications more interactive and user-friendly. It enables developers to create advanced chatbots and apply AI and machine learning to their applications.

### **F. Jobs**

New career prospects have been made possible by Chat Gpt in industries like AI and natural language processing. However, technology has also had an effect on already existent occupations, including those of customer support agents. While technology could eliminate some jobs, it also adds new ones, boosts production, and improves efficiency across a range of sectors.

### **G. IT (Information Technology)**

Chat Gpt has revolutionized how we interact with technology, enabling the use of chatbots and virtual assistants in customer service, healthcare, e-commerce, and more. It has improved search engines, recommendation systems, cybersecurity, and data analysis.

### **H. Consulting**

Chat Gpt has had a significant impact on consulting, allowing consultants to provide personalized services, collect data, automate tasks, and analyze large datasets. It enhances collaboration, knowledge sharing, and the delivery of accurate advice and insights.

### **I. Researchers and Scholars**

Chat Gpt has transformed research in natural language processing and AI, facilitating the development and testing of new models. It assists in analyzing large volumes of text data and enables collaboration, data sharing, and access to diverse datasets.

It's crucial to understand that GPT brings significant advancements, it also raises ethical considerations and challenges, such as bias, privacy, and misuse. Continued research and responsible development are necessary to address these issues and maximize the positive impact of Chat Gpt in various fields.

### **Which jobs will get affected (Mehta, 2023)**

A wide range of vocations and sectors may be impacted by Chat Gpt and comparable language models. Here are few instances:

#### **Client support agents**

Chat Gpt can automate some client interactions, which eliminates the requirement for live customer support agents. It can respond to typical inquiries, give rudimentary details, and help with

#### **Troubleshooting**

Writers of content and advertising copy may use language models like ChatGPT to create text and come up with ideas for a variety of writing assignments, including blog articles, product descriptions, and marketing copy. In some circumstances, this may affect the need for human authors.

#### **Translators**

Chat Gpt offers its services for translating texts from one language to another. While basic translation requests may be handled by language models, sophisticated and nuanced translations will still require human translators.

#### **Virtual Assistants**

Language models like Chat Gpt may function as virtual assistants, setting up appointments, responding to queries, and giving people information. In some positions, this can result in a requirement for fewer human helpers.

#### **Researchers and Knowledge Workers**

Chat Gpt offers researchers access to a wealth of knowledge, which might be helpful. Furthermore, helping with literature reviews. It may have an effect on various facets of research and knowledge work since it may also spark ideas and help with data analysis.

#### **Tutoring and education**

Chat Gpt may offer individualized learning experiences for pupils by engaging with them and responding to their inquiries. It may have an effect on the tutoring sector by giving explanations, giving examples, and helping with assignments.

It's crucial to remember that, despite the fact that language models like Chat Gpt can automate certain portions of these occupations, they cannot fully replace the knowledge, imagination, and empathy that come from people.

Many businesses still rely heavily on human workers, who can also offer the degree of comprehension and critical thinking that AI models now lack.

### **When will it affect the jobs? (Mehta, 2023)**

Converse GPT, or analogous AI language models, has formerly started to impact colorful jobs and careers across different diligence. The goods have been conspicuous in certain areas since the deployment of AI- powered chatbots and virtual sidekicks in client service and support places.

These systems can handle routine inquiries, give introductory information, and help with common tasks, reducing the need for mortal involvement in similar places. Still, it's significant to highlight that the effects of AI on jobs and careers isn't invariant across all fields. Some diligences are passing more significant changes than others. Jobs that involve repetitious tasks, data analysis, or rule- grounded decision- timber are more susceptible to robotization by AI technologies.

The extent of the impact also depends on the specific job or task involved. While AI can automate certain aspects of work, it frequently complements mortal capacities rather than fully replacing them. AI systems exceed at processing vast quantities of data, feting patterns, and performing specific tasks efficiently. Again, mortal workers tend to retain rates like creativity, critical thinking, complex problem- working, and empathy, which are challenging for AI to replicate. It's pivotal for individualities to acclimatize and acquire chops that round AI technologies.

This might involve developing moxie in areas where mortal judgment, emotional intelligence, creativity, or complex decision- timber are essential. Also, gaining knowledge and experience in the development, perpetration, and operation of AI systems can produce new career openings. Overall, the impact of Chat GPT and analogous AI models on jobs and careers is an ongoing process, and it's important for individualities to stay informed, adaptable, and visionary in developing chops that are in demand in the evolving job request.

### **Conclusion**

In conclusion, the GPT-3.5 architecture-based Chat GPT has established itself as a key development in the Natural Language Processing (NLP) discipline. It is a cutting-edge language model that can produce text answers that resemble human speech, allowing for more interesting and dynamic discussions between people and machines. The implications of Chat GPT are being seen in a many of disciplines and sectors.

The capacity of Chat GPT to produce natural language replies is one of its main advantages, making it appropriate for applications like customer service, online tuition, content production, and more. It may give targeted training, quick, individualized support, and aid with producing engaging, well-structured writing.

Chat GPT does, however, have certain restrictions. It may occasionally respond incorrectly or illogically, and it can have trouble comprehending queries that are difficult to grasp. Concerns concerning bias, the dissemination of misleading information, and lack of explain ability are also brought up by the usage of potent language models like Chat GPT.

The accuracy, dependability, and responsiveness of the model are actively being improved by researchers and developers. To improve Chat GPT's performance, techniques like fast engineering and reinforcement learning are being used. To reduce possible hazards and biases related to its usage, regulations and procedures are also being established.

In the NLP field, Chat GPT has enormous promise, but careful research and implementation are needed to assure its ethical and responsible usage. We may use the capabilities of this cutting-edge language model to build conversational systems that are more efficient, interesting, and human-like by addressing the problems and utilizing the breakthroughs linked to it. This will improve user experiences, revolutionize research, and open up new career possibilities across a number of industries.

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