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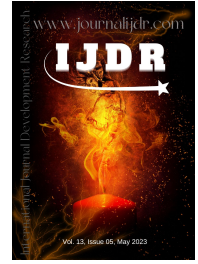
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AN INVESTIGATION ON THE CHARACTERISTICS, ABILITIES, CONSTRAINTS, AND FUNCTIONS OF ARTIFICIAL INTELLIGENCE (AI): THE AGE OF CHATGPT AS AN ESSENTIAL ULTRAMODERN SUPPORT TOOL

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ABSTRACT

In November 2022, Open Artificial Intelligence (AI) released a chatbot tool known as ChatGPT that utilizes the procreativepre-trained transformer (GPT) design. Since its launch, ChatGPT has gained significant popularity on the internet as it allows users to engage in conversations with an AI using prompts, leveraging OpenAI's language model. ChatGPT is an impressive tool that creates captivating content such as stories, poetry, tracks, compositions, and more. However, it has its limitations. While users can ask questions to the bot, its responses are restricted to relevant and plausible topics. The popularity of ChatGPT has grown to the extent that it has become a focal point for many academic institutions. Task teams have been established, and institution-wide seminars are being held to discuss the adoption of this technology, with the majority of feedback being positive. The purpose of this paper is to provide an overview of ChatGPT, its importance, and the several advanced workflow processes of the tool, which are presented in diagrammatic form. The paper explores the specific characteristics and abilities of the ChatGPT Support System. Furthermore, the paper identifies and discusses the essential functions that ChatGPT plays in the contemporaryera. Additionally, the building blocks of character AI are neural language models, which have been specifically designed with conversations in mind. This technology employs deep learning techniques to analyze and generate text. The model has the capability to comprehend the nuances of natural language generated by humans, through the huge volumes of data gathered from the internet. The paper further contributes to artificial intelligence (AI) and information technology body of knowledge.

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INTRODUCTION

ChatGPT, an artificial intelligence (AI) developed by OpenAI, was presented as a modelaround November 2022 and has generated awareness among scientists, social media users, corporate owners, scholars, and students. Although many people have expressed concerns regarding ChatGPT, machine learning (ML) indisputably has agood prospect.Since its widespread adoption, machine learning (ML) has influenced various areas and enabled tasks such as high-resolution climate forecasting and medical imaging assessment (Rudolph *et al.*, 2023; Gilson *et al.*, 2023). Moreso, creating a free OpenAI account and using ChatGPT has the potency to transform the way severalcareers are done. To improve its training algorithms, this technology has the potential toleverage user-generated data (Kung *et al.*, 2023; Dowling & Lucey, 2023).

The shift in information accessibility brought about by Chat-GPT's pattern changes could prove advantageous for industries that rely on tags, such as education, study, broadcasting, Information Technology (IT), and merchandising. Accordingly, generative AI technologies can swiftly generate persuasive writing that can be further refined based on feedback, making it further suitable for the intended purpose. This development has implications for anextensivevariety of industries, comprising industries that require advertisingprint, IT and computer softwarebusinesses that can benefit from the swift and largely precise code generated via AI models (van Dis *et al.*, 2023). Furthermore, companies can leverage generative AI to improve the quality of technical assets, such as high-resolution replicas of medical images. Moreover, such organizations can explore new business opportunities and enhance their capability to deliver greater value while optimizing their time and resource utilization (Liebrenz *et al.*, 2023;Shen *et al.*, 2023). In OpenAI, the organization responsible for the development of ChatGPT, has been involved in this field for several years.

The organization is dedicated to advancing the capabilities of AI and studying its societal impacts. Despite the numerous benefits of AI, there are also various challenges that need to be addressed. Since ChatGPT can provide a single correct solution to different problems and showcase its functioning, a student could potentially use it effectively without the teacher's knowledge (Chen, 2023; Alshurafat, 2023). Even if AI is used correctly, like for verifying syntax or sentence structure, its impact can be noticed on an aesthetic level. For instance, if a bot insists that a specific method is the correct way to accomplish a task, students may become discouraged or hesitant to take creative risks in their work. Likewise, if ChatGPT is employed to create the outline for a given composition or written assignment, the student may not have the opportunity to test with structure or advance their own vocal sound (Ante & Demir, 2023; Alkaissi & McFarlane, 2023). Moreso, deep learning is a widely recognized form of AI that employs algorithms trained on extensive datasets to make estimates grounded on the information. Applications of this technology comprise language translation, vocal sound and speech recognition, as well as image and object recognition. Artificial intelligence that comprehends and generates human language is referred to as the natural language processing (NLP) (Mhlanga, 2023). Some of its applications include translation of languages, textsynthesis, and sentiment investigation. Similarly, ChatGPT utilizes a diverse and innovative range of AI models that are primarily founded on unofficial and semi-supervised ML techniques. These models can analyze and create content from several sources like images, lengthy textual documents, electronic mail, internet data, soundtracks, and organized data, and many others. In addition to examining and generating content from various sources, AI models utilized by ChatGPT can also create new materials, translate languages, generate enquiries and responses, perform sentiment investigation, produce synopses, and even generate films. As a result, ChatGPT has the possibility to revolutionize several domains of our lives, such as healthcare, transport, and instruction (Donato *et al.*, 2023; De Angelis *et al.*, 2023).

In addition, ChatGPT has rapidly gained global recognition and it is important for readers to understand the capabilities of this program. With its remarkable ability to quickly search through vast amounts of online data and powerful language and writing skills, ChatGPT can generate unique articles on any topic (Huh, 2023). Consequently, ChatGPT is a chatbot that has been trained to offer responses to user submissions in a manner that resembles human-like conversation. Through the use of ML, ChatGPT has acquired a surprisingly diverse range of skills and capabilities (Kutela *et al.*, 2023). At a moment's notice, ChatGPT can generate a wide range of outputs, including rudimentary financial assessment, entertaining rhymes and melodies, impeccable imitations, thoughtful essays on a vast array of topics, natural language synopses of technical articles or scientific concepts, customer service interactions via chat, precise predictions, personalized guidance, and responses (Biswas, 2023). In light of the above discussions, the present paper aims to provide answers to the following interrogations: *Q1*. What is ChatGPT and its necessity? *Q2*. How does the advanced workflow procedure of the ChatGPT support system work? *Q3*. What are the specific characteristics and abilities of the ChatGPT support system? *Q4*. Find and analyze the essential functions of ChatGPT in the contemporary era?

Furthermore, this paper makes some contributions to the existing body of knowledge. (1) This paper contributes to artificial intelligence (AI) and information technology body of knowledge by assessing the uniqueness of ChatGPT as the newest AI platform. (2) The researchers of this paper believe that this investigation is the first of its kind to analyze the roles of ChatGPT in this contemporary era. (3) This paper will further serve as a reference material for researchers, students, educationists, and stakeholders on ChatGPT, its corresponding characteristics and significant functions in this contemporary era.

Based on the above synopsis, the rest of the investigation is organized as follows: Part 2 introduces the literature review, Part 3 presents the

discussion, Part 4 presents the constraints in ChatGPT and future scope, Part 5 concentrates on the conclusion.

LITERATURE REVIEW

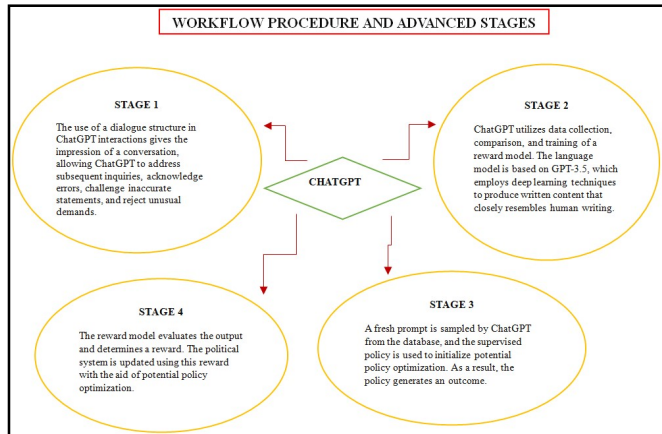
This section provides an understanding of the details of some literary works regarding this research area; brief description of ChatGPT and its necessity, the advanced workflow procedure of the ChatGPT support system, the specific characteristics and abilities of the ChatGPT support system, and the essential functions of ChatGPT in this contemporary era.

Brief description of ChatGPT and its necessity: There is a growing fascination and interest surrounding ChatGPT, a pre-trained transformer that utilizes generative techniques. The term "Generative" or the letter "G" in the abbreviation GPT refers to the device's ability to generate text. Accordingly, "pre-training" or "P" in the abbreviation GPT refers to the process of training a model on a big corpus of information before fine-tuning it on a precise task. This is similar to how humans use prior knowledge to learn new things, but it specifically refers to the training process of the model. ChatGPT provides a significant amount of text data that can be used for pre-training purposes. The neural network represented by the letter "T" in the GPT acronym stands for "Transformer", which analyzes the relationships between all components of the input data sequence (Pal, 2022; Street & Wilck, 2023; Kumar, 2023). Furthermore, OpenAI has developed and publicly released a chatbot named ChatGPT that can answer a wide range of questions for free, making it accessible for public testing. Some consider ChatGPT to be the best AI chatbot currently available (Zielinski *et al.*, 2023).

ChatGPT has demonstrated its ability to generate computer encryption, university-level compositions, poems, and even somewhat humorous funs (George & George, 2023). The initial ChatGPT archetype was trained via a process called controlled fine-tuning, by which both human AI instructors and an AI assistant conversed with users to improve the model's performance. During the supervised fine-tuning process, the instructors had a link to the sample of the written responses to assist them in composing answers. ChatGPT is one of the latest innovations developed to understand and respond to natural language as a language model. This means that ChatGPT is capable of engaging in natural and intellectual discussions with people. One of the main benefits of ChatGPT is that it is openly accessible via OpenAI, allowing developers to integrate the model to their own softwares (Sakirin & Said, 2023; Hargreaves, 2023; Deng & Lin, 2022).

The advanced workflow procedure of the ChatGPT support system: For ChatGPT to function properly, a smooth flow of facts, data, and insight is essential in its working structure. Thus, the figure 1 below shows the various stages and processes involved in the ChatGPT system to support the day-to-day requirements of society (Mann, 2023). Four stages are emphasized and analyzed in the figure, beginning with communications and dialogue, followed via data response as well as assessment creation. These stages enable ChatGPT to involve in natural and intuitive chats with users while fulfilling their routine needs. Additionally, the data is tested, and the procedure is deduced by deciding the reward technique and updating it in the cloud information set (M. Alshater, 2022; Anderson *et al.*, 2023). Moreso, this technology holds significant potential for various individuals, including business executives, researchers, students, and educationalists. Teachers can use this technology to showcase, elucidate, and encourage learners to apply various ideas. A teacher can prompt a pupil to articulate their reasoning and thought process for a composition and then liken it to the composition itself (Bishop, 2023; M. Alshater, 2022). In case there are notable discrepancies among the composition and the pupil's elucidation, it might suggest that the learner used a text-generation program such as ChatGPT (Florida, 2023). In addition, an instructor can pursue for visible markers of text generation in the composition. ChatGPT is widely used for various tasks, ranging from writing higher institutions

documents to generating authorized papers and even drafting regulation. Such programs can generate multifaceted written materials almost instantly (Floridi, 2023). Additionally, there are several ways an instructor can decide whether a learner produced a composition by himself or herself or used a text-generation tool such as ChatGPT. Applying plagiarism detection tools can be an effective way to determine whether a composition was generated with the help of a text-generating program like ChatGPT (Gao *et al.*, 2022). These tools can compare the content of the composition with other available materials and identify any similarities or matches, which could show that the learner utilized a text-generation software. ChatGPT interacts with users through conversation, addressing their follow-up queries, recognizing and rectifying mistakes, declining inappropriate requests, and challenging erroneous assumptions. Its purpose is to offer prompt and comprehensive responses to instructions (Aljanabi *et al.*, 2023).

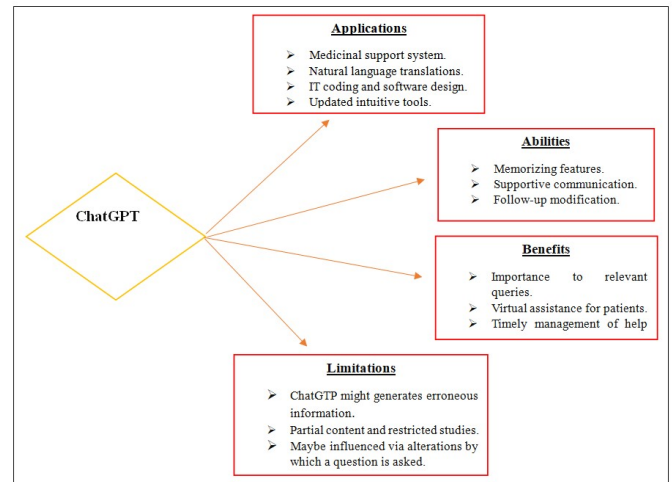


Source: author's own construction (2023)

Figure 1. Workflow procedure and advanced stages in ChatGPT framework

The specific characteristics and abilities of the ChatGPT support system: Regarding the specific characteristics and abilities of the ChatGPT support system, Figure 2 delves into the different link functionalities, advantages, use cases, and constraints of ChatGPT assistance. It encompasses attributes such as memory recall, helpful communication, post-interaction rectifications, and more. Besides the various features and capabilities, ChatGPT has also been found to have certain limitations, such as the potential to generate erroneous information and biased content (Baidoo-Anu & Owusu Ansah, 2023; Bishop, 2023). Figure 2 further illustrates and explains several other advantages and use cases of ChatGPT. Additionally, ChatGPT's capacity to comprehend context and furnish relevant information renders it a valuable instrument for gathering, assessing, and comprehending market trends. This technology has the potential to improve existing processes, collect qualitative information through unofficial questionnaires, evaluate data, excerpt features from large sizes of unorganized data, provide valuable marketplace insights, and save scholars time and energy (Taecharunroj, 2023). AI is ushering in a fresh phase of natural language processing, as demonstrated by early users of ChatGPT who have shown that the technology can sustain a conversation across multiple questions and even generate computer code. The advancement of AI is enabling more complex interactions between humans and machines (Macdonald *et al.*, 2023; Aljanabi, 2023). Accordingly, compared to prior AI models, ChatGPT stands out in its ability to perform a variety of tasks such as writing software in multiple programming languages, identifying and fixing errors in code, simplifying complex topics into more manageable parts, aiding in interview preparation, and even generating essay drafts (Alkaiissi & McFarlane, 2023). Through its ability to streamline complex procedures and offer outcomes in a similar manner to online research, ChatGPT serves as a simplification tool (Mhlanga, 2023). Its language production capabilities mimic natural, casual conversation and basic task performance. ChatGPT's objective is to develop a collaborative AI system that produces language that is not only contextually pertinent, but also informative and stimulating for users (Gao *et al.*, 2022).

The essential functions of ChatGPT in this contemporary era: The main purpose of ChatGPT is to showcase and evaluate the abilities of a highly advanced AI structure. ChatGPT is a creative AI program that employs NLP to create a wide range of outputs including typescript, artwork, song, and video. ChatGPT relies on a large language model to operate, but it requires a constant input of data in order to improve and evolve. Similar to human learning, the model becomes more skilled as it receives more training data (Lund & Wang, 2023).



Source: author's own construction (2023)

Figure 2. Characteristics and abilities of the ChatGPT support system

Through this process, the algorithm can better identify patterns, make predictions, and produce text that is more accurate and credible (Zarifhonarvar, 2023). ChatGPT is equipped with a sequence model that is specifically designed for generating text-based outputs such as question-and-answer pairs, text summaries, and machine translations. By investigating customer information, ChatGPT could also make endorsements for goods or information that are tailored to a user's specific interests and needs. ChatGPT can be a valuable asset for businesses seeking to create exceptional skills for new listeners, enhance participation, and establish belief (Zarifhonarvar, 2023). It can aid companies in expanding their client base, penetrating new marketplaces, running effective marketing drives, and fostering stronger connections with both current and potential clients. Thus, ChatGPT presents itself as a potentially beneficial tool for businesses seeking to achieve these goals (Avila-Chauvet *et al.*, 2023).

The essential functions of ChatGPT in this contemporary era are presented in Table 1. By analyzing a company's advertising approaches, buyer base, product characteristics, and many other reasons, ChatGPT can find the key elements that contribute to its success. It can then provide suggestions on how the company can adopt or enhance these characteristics to achieve even greater success (Dowling & Lucey, 2023). By evaluating market patterns, buyer wants, and several other relevant variables, ChatGPT could propose ways to exploit on prospects and expand a company's reach. It can also evaluate competitors' product offerings, marketing strategies, and client engagement strategies to identify areas for improvement or differentiation (Taecharunroj, 2023). Additionally, based on a company's target audience, marketing goals, and budget, ChatGPT can provide recommendations on the most effective networks to utilize for a particular campaign (Zarifhonarvar, 2023). Digital marketing channels such as social media platforms, electronic mail advertising, and internet advertising can be utilized to promote a company's products or services. Performance analytics can then be used to track and evaluate the efficiency of these digital marketing activities, providing insights into what works and what doesn't. With this information, organizations can modify their campaign plans and tactics in real-time to improve outcomes and optimize their digital marketing efforts (Dowling & Lucey, 2023; George & George, 2023).

Table 1. The essential functions of ChatGPT in this contemporary era

Functions	Explanation
Education	<ul style="list-style-type: none"> ➤ ChatGPT can be utilized in the education industry as a tool for instructors to deliver fundamental knowledge of a subject and offer students a platform to inquire and resolve any uncertainties. ➤ As the chatbot's abilities progress and become more refined in the upcoming years, it has the potential to transform the way students interact with the external world. ➤ For individuals who prefer a conversational search encounter rather than receiving website links as search outcomes, it could be the optimal choice.
Creating new things	<ul style="list-style-type: none"> ➤ By analyzing customer reviews, ChatGPT can be employed to assess the overall feelings of a trademark, commodity, or service, delivering valuable perceptions for market study and fostering positive relationships with customers. ➤ As an example, ChatGPT has been trained on a huge corpus of information sourced from the social media and conversational scripts, allowing it to imitate authentic discussions. ➤ As AI becomes more widespread, ChatGPT will have a significant impact on knowledge workers and the type of work they engage in, potentially reshaping the nature of employment in the future.
offering a dynamic and fascinating way	<ul style="list-style-type: none"> ➤ AI-powered essay writing tools, for example, could offer real-time reminders and guide students throughout the writing process, providing a dynamic and engaging way to enhance their writing skills. ➤ It is also a potent resource that can assist children in developing their writing skills in a more dynamic and captivating manner. ➤ As an example, AI could offer writing prompts tailored to individual students' preferences and writing styles, drawing on their past writing samples or favored themes.
Translate ideas	<ul style="list-style-type: none"> ➤ It can translate English concepts into programming languages and detect any potential flaws in human programmers' language. ➤ It has the capability to execute a variety of tasks associated with natural language processing, like conversation systems, language summarization, and paraphrase. ➤ Its training involves the utilization of an extensive dataset of text sourced from the internet.
Enhancing writing skills	<ul style="list-style-type: none"> ➤ By utilizing AI, ChatGPT can generate useful text, streamlining the workload of digital marketers. ➤ AI systems can offer comprehensive feedback on students' essays, enabling them to enhance and refine their writing skills further. ➤ Additionally, it can aid in the evaluation and grading of written work, shifting the focus from error correction to fostering more critical writing skills.
Authentic dialogues	<ul style="list-style-type: none"> ➤ Unlike most other chatbots, ChatGPT can recall all previous interactions. ➤ ChatGPT is crafted to resemble and appear like natural chats, with its replies appearing highly human-like. ➤ The ChatGPT technology is based on a combination of controlled and uncontrolled AI learning approaches, resulting in some of the utmost advanced language models across the globe.
Beneficial to digital marketing professionals	<ul style="list-style-type: none"> ➤ ChatGPT can be trained to handle frequently asked questions, deliver customer service, and offer product recommendations. ➤ Conducting audience research can enable digital marketers to gain a deeper understanding of their target audience. ➤ It can assist in generating content for social media posts, blog articles, and various other forms of content.
Encompass a broad spectrum of subjects	<ul style="list-style-type: none"> ➤ Like other chatbots, ChatGPT is capable of evaluating its own performance. Users can input a query or prompt on the OpenAI internet site, like "Provide suggestions for testing out a chatbot," and ChatGPT will respond accordingly. ➤ OpenAI's ChatGPT text-generating software, which uses artificial intelligence, is capable of producing content on a wide range of subjects in various styles of prose and poetry. ➤ Within a short period of time, ChatGPT's AI generates a response to the input provided. The software utilizes text prediction to generate its responses.
Corporate applications	<ul style="list-style-type: none"> ➤ ChatGPT is capable of performing multiple tasks, such as processing search requests, gathering information from various sources, summarizing articles, creating travel strategies, responding to questions, and engaging in conversation via OpenAI technology. ➤ As with most technological developments, it is crucial to exercise caution to safeguard private, delicate, and confidential business and private information from falling into the wrong hands. ➤ It is crucial for policymakers to recognize that AI systems developed or implemented via different corporations may pose substantial risks, particularly considering the possibly high dangers for those affected by decisions made by these systems.
Different language inputs	<ul style="list-style-type: none"> ➤ The ability of ChatGPT to speedily put up on and adapt to fresh data is one of its core characteristics. ➤ ChatGPT has received training on a diverse range of internet typescript, allowing it to learn about a wide range of topics and be able to adapt to new information and tasks without requiring significant retraining. ➤ The training information for ChatGPT emanates from the database of WebText, which is a large and diverse collection of text information from the websites.
Improved interpretability	<ul style="list-style-type: none"> ➤ It makes getting extra precise and electrifying information possible than traditional questionnaires. ➤ GPT can be used to design chat and smart questionnaires that can provide more precise and engaging information than traditional surveys. ➤ Using GPT to design chat and intellectual questionnaires can lead to an enhanced user experience, as it can provide more natural and engaging interactions compared to traditional surveys.
Organize routine obligation at the office stage	<ul style="list-style-type: none"> ➤ ChatGPT could be used to generate virtual assistants for organizations that are capable of performing routine duties like scheduling activities, sending electronic mail, and supervising social media accounts. ➤ OpenAI leads the way in generative AI, which is a technology that is trained on massive amounts of typescript and images and can create content based on easy linguistic input. ➤ Organizations can utilize ChatGPT to develop virtual assistants that are capable of performing mundane tasks like preparation of appointments, sending electronic message, and handling internet accounts.

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Gaining extensive attention	<ul style="list-style-type: none"> ➤ An AI classifier, which is a language archetype developed on a database of typescript sets on the similar topic created by humans-AI, aims to recognize writings generated via AI. ➤ With its ability to assist in replying queries, inspiring imaginative writing, and aiding with everyday tasks, ChatGPT is a powerful device that can greatly enhance human output and inventiveness. ➤ The most advanced AI language model, ChatGPT, has garnered significant attention and interest.
Reply to questions	<ul style="list-style-type: none"> ➤ ChatGPT is proficient in responding to questions, providing commendations, and making forecasts. ➤ Analyzing the text and images that users post can help identify and filter out spam and inappropriate content. ➤ By utilizing ChatGPT's abilities, marketers can create more effective marketing operations, link to their target listeners, and achieve their advertising objectives.
Picking up of up-to-date data	<ul style="list-style-type: none"> ➤ Generative AI has the potency to replace several jobs that comprise generating distinct writing, auditory, and pictorial content in reply to human upload. ➤ Through interactions with humans, it can adjust and expand its replies, gradually becoming extraprecise and refined. ➤ According to experts, the achievement of ChatGPT shall provide OpenAI with a competitive advantage over many other AI companies.
Helpful for a diversity of responsibilities	<ul style="list-style-type: none"> ➤ The objective of the conversational GPT is to comprehend a basic statement. ➤ In the age of phones and computers, it offers direction and support on what is appropriate and inappropriate. ➤ It functions like a human-like assistant and conducts research to provide answers when we need information from another module.
Learning and enlightening	<ul style="list-style-type: none"> ➤ ChatGPT can respond to a wide range of prompts, and there are very few tasks beyond its abilities. ➤ ChatGPT is able to comprehend the framework of a discussion and provide appropriate replies. ➤ The possibility of using ChatGPT to complete tasks is feasible, as every document produced by the bot is original.

DISCUSSION

Open AI provides free access to an uncomplicated idea - AI that we can interact with via a chatbot to assist with various tasks. The availability of ChatGPT has sparked excitement among numerous companies, who are eager to employ its capabilities to streamline their operations (Pavlik, 2023). ChatGPT is trained to simulate human-like text employing a creative pre-trained transformer language archetype, which employs machine learning algorithms to analyze extensive amounts of information and comprehend language forms and structures (Mijwil & Aljanabi, 2023). Interacting with OpenAI's ChatGPT has gained popularity as of late. This online chatbot, equipped with artificial intelligence, can respond to our questions with a subsection's worth of data and even craft melodies or stories based on the prompts we give it. Moreso, ChatGPT utilizes a conversational structure that allows for challenging untrue assumptions, admitting errors, and declining inappropriate requests. This archetype can assist with numerous NLP glitches, and its superior versatility makes it ideal for deployment in broad-based applications (Baidoo-Anu & Owusu Ansah, 2023). Despite the fact that this chatbot has attained traction in recent times, it still remains limited in its ability to provide only basic responses to queries on support desk websites or try to address the concerns of displeased customers (Deng & Lin, 2022). However, the area of natural language processing is entering a new era with the help of ChatGPT's capacity to sustain conversations across multiple interrogations and generate programme encryption. Open AI plans to offer ChatGPT as an application programming interface (API), allowing other groups to integrate it into their internet site or apps with minimal knowledge of the basic technology (Deng & Lin, 2022).

This means that companies may shortly leverage ChatGPT to create advertising devices, client service chatbots, or cyberaides. They may also mechanize tedious tasks such as document reviews or utilize it to generate novel ideas and rationalize decision-making processes (George & George, 2023). Additionally, ChatGPT's ability to generate content quickly based on a prompt makes it a useful tool for content creation. It can aid handlers in refining their job and accomplishing their intellectual goals (Sakirin & Said, 2023). Also, ChatGPT can program, transcribe, and even support in correcting encryption. Similarly, unstructured data can be difficult to manage, categorize, and arrange, leading to redundancy (Anderson *et al.*, 2023). However, ChatGPT has the ability to convert unstructured data into structured data, which makes it a valuable tool. Although many people primarily associate ChatGPT with its text-creation proficiencies, its ability to understand the texts has the potential to

make a significant impact on both the business and public fronts (Shen *et al.*, 2023). AI leverages data probability to construct an archetype of the phrases and expressions that frequently succeed the preceding text. This process is akin to the predictive text function on a mobile phone, albeit on a much grander scale as it generates entire responses instead of just individual words (Alshurafat, 2023).

The constraints in ChatGPT and future scope

The constraints in ChatGPT: OpenAI has acknowledged that ChatGPT is susceptible to generating harmful instructions or demonstrating biased behavior at times, and it can also produce responses that sound plausible but are incorrect or nonsensical. Additionally, it may exhibit slow response times, a problem attributed to its inventors (Deng & Lin, 2022). While there is reason for enthusiasm regarding such technologies, particularly if they can aid address disparities in reading proficiency, such as those related to race, there are ways to mitigate these risks. Selecting appropriate initial data for training these algorithms is crucial to avoid incorporating detrimental material (Alshurafat, 2023). Companies can also opt for smaller, specialized models instead of a general generative AI model. Establishments with greater resources can modify a general model using their own information to align with their objectives and minimize partiality (George & George, 2023). In addition, establishments must refrain from relying solely on generative AI models for critical decisions that impact significant resources or human welfare. They should also ensure that a human reviewer examines the production of a creative AI archetype before it is printed or used (Anderson *et al.*, 2023; George & George, 2023). When it comes to sustainability, AI can only offer a partial solution to some of humanity's challenges. The quality of the data and techniques used to train AI is a significant problem on its effectiveness (M Alshater, 2022). AI platforms are restricted to making estimates founded on the information they have been given, which can limit their accuracy and reliability. Furthermore, AI lacks certain human-specific capabilities, such as originality and compassion, which can be crucial for solving complex problems (Pavlik, 2023). AI systems are not capable of creative thinking or understanding complex human feelings as they are designed to perform specific tasks. Therefore, it is important for users to validate information from consistent sources before depending on replies generated by ChatGPT (Floridi, 2023). Unlike Google, ChatGPT only utilizes raw text without any links or citations, making it challenging to confirm the accuracy of its responses. Additionally, as ChatGPT continues to advance, Google is likewise developing its own large language models and utilizing AI in its searching tools (Aljanabi *et al.*, 2023).

ChatGPT, as a large language archetype, is consistently being equipped to advance the precision of its answers. The AI chatbot may not provide accurate information as the model is still in need of further instructions due to its novelty. Similar to other AI models, ChatGPT's training data is also constrained, which may result in bias and limitations that could adversely affect the model's productivity (Deng & Lin, 2022; Liebrez et al., 2023). It should be noted that the latest AI technologies are not capable of reading human thoughts. In order to generate desired results, a unique form of human creativity is necessary, which involves providing text prompts that are less intricate (Russell, 2019). The AI system generates a sequence of outputs by employing iterative prompting, a form of human-AI collaboration, until the individual creating the reminders is satisfied with the results. Determining the appropriate level of regulation for ChatGPT will depend on the explicit dangers and potential repercussions associated with its use (Liebrez et al., 2023). Like any other advanced technology, it is imperative to thoroughly evaluate its potential impacts and implement safeguards to ensure it is applied ethically and responsibly. Although several individuals have lauded ChatGPT for its ability to enhance their output, yet there are those who have valid concerns regarding its use (Deng & Lin, 2022). Educational institutions, including schools, universities, and teaching panels, have reservations concerning implementing this ChatGPT for assessments and exams (Baidoo-Anu & Owusu Ansah, 2023). Additionally, after the release of ChatGPT, Stack Overflow, a podium for creators, banned the use of artificial intelligence owing to the heightened risk of imprecisions in the outcomes.

The future scope: As an increasing number of users provide new prompts, ChatGPT's database continues to expand. Students who opt to rely on ChatGPT's shortcuts instead of traditional education are contributing to the advancement of AI, which will ultimately enhance its usefulness for future users. The impact of ChatGPT is also likely to be substantial in the educational technology sector. Numerous educational technology companies may now utilize ChatGPT to provide students with a foundation in a subject while also offering a platform to seek answers to their queries and alleviate their concerns. Notwithstanding its limitations, ChatGPT could undoubtedly confirm beneficial in practical usage scenarios. As a result, businesses are enthusiastic to employ ChatGPT for profit-generating purposes. Going forward, AI may aid in identifying which learners would benefit greatly from specific instructors, who can not solely assist in closing studying gaps but likewise act as appropriate bases of guidance, guidance, and motivation. Developing fresh AI applications requires thoughtful deliberation, especially given our communities' varied responses to the speedily growing AI landscape, which is a multifaceted amalgamation of worry, hopefulness, worry, amazement, and phenomenon.

CONCLUSION

In deduction, ChatGPT has achieved noteworthy achievement since its launch around 2022, with the ability to produce compositions, fictional stories, haikus, as well as cover letters for work applications. Hence, ChatGPT has the capability to offer answers to a wide range of problems, from life's utmost substantial to the most trivial. Accordingly, ChatGPT is able to engage in human-like conversations on diverse topics using natural language, thanks to the meticulous oversight of human experts and the vast amount of information gathered from the internet. Similarly, ChatGPT's users are using the platform for a range of purposes, such as drafting emails, programming code, and responding to questions on various topics, including investment. The platform has received exceptionally positive response, with several users commending its advanced capabilities and user-friendly interface. With its conversational, albeit slightly formal, responses powered by OpenAI's platform, ChatGPT has the possibility of becoming a major player in the field of NLP. Furthermore, ChatGPT's ability to comprehend and reply to an extensive variety of issues has been predominantly notable, with some proposing that it could revolutionize human interactions with technology. In the future, the platform's capabilities could prove

invaluable to businesses operating in industries such as buyer service, internet education, and advertising operations study. OpenAI and its major stakeholders have poured over millions of dollars into the expansion, training, and implementation of these models. This investment is likely to pay off in the end, positioning OpenAI as a leader in the field of AI-powered creative tools.

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REFERENCES

- Aljanabi, M. 2023. ChatGPT: Future directions and open possibilities. *Mesopotamian Journal of Cyber Security*, 2023, 16–17.
- Aljanabi, M., Ghazi, M., Ali, A. H. & Abed, S. A. 2023. ChatGpt: Open Possibilities. *Iraqi Journal For Computer Science and Mathematics*, 4(1), 62–64.
- Alkaissi, H. & McFarlane, S. I. 2023. Artificial hallucinations in ChatGPT: implications in scientific writing. *Cureus*, 15(2).
- Alshurafat, H. 2023. The usefulness and challenges of chatbots for accounting professionals: application on chatgpt. *Available at SSRN 4345921*.
- Anderson, N., Belavy, D. L., Perle, S. M., Hendricks, S., Hespanhol, L., Verhagen, E. & Memon, A. R. 2023. AI did not write this manuscript, or did it? Can we trick the AI text detector into generated texts? The potential future of ChatGPT and AI in Sports & Exercise Medicine manuscript generation. In *BMJ Open Sport & Exercise Medicine* (Vol. 9, Issue 1, p. e001568). BMJ Specialist Journals.
- Ante, L. & Demir, E. 2023. The ChatGPT Effect on AI-themed cryptocurrencies. *Available at SSRN 4350557*.
- Avila-Chauvet, L., Mejía, D., & Acosta Quiroz, C. O. 2023. Chatgpt as a Support Tool for Online Behavioral Task Programming. *Available at SSRN 4329020*.
- Baidoo-Anu, D. & Owusu Ansah, L. 2023. Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Available at SSRN 4337484*.
- Bishop, L. 2023. A computer wrote this paper: What chatgpt means for education, research, and writing. *Research, and Writing (January 26, 2023)*.
- Biswas, S. 2023. ChatGPT and the future of medical writing. In *Radiology* (p. 223312). Radiological Society of North America.
- Chen, T.-J. 2023. ChatGPT and other artificial intelligence applications speed up scientific writing. *Journal of the Chinese Medical Association*, 10.
- De Angelis, L., Baglivo, F., Arzilli, G., Privitera, G. P., Ferragina, P., Tozzi, A. E. & Rizzo, C. 2023. ChatGPT and the rise of large language models: The new AI-driven infodemic threat in public health. *Available at SSRN 4352931*.
- Deng, J. & Lin, Y. 2022. The Benefits and Challenges of ChatGPT: An Overview. *Frontiers in Computing and Intelligent Systems*, 2(2), 81–83.
- Donato, H., Escada, P. & Villanueva, T. 2023. The Transparency of Science with ChatGPT and the Emerging Artificial Intelligence Language Models: Where Should Medical Journals Stand? *Acta Médica Portuguesa*, 36(3), 147–148.
- Dowling, M. & Lucey, B. 2023. ChatGPT for (finance) research: The Bananarama conjecture. *Finance Research Letters*, 53, 103662.
- Floridi, L. 2023. AI as Agency without Intelligence: On ChatGPT, large language models, and other generative models. *Philosophy & Technology*, 36(1), 15.
- Gao, C. A., Howard, F. M., Markov, N. S., Dyer, E. C., Ramesh, S.,

- Luo, Y. & Pearson, A. T. 2022. Comparing scientific abstracts generated by ChatGPT to original abstracts using an artificial intelligence output detector, plagiarism detector, and blinded human reviewers. *BioRxiv*, 2012–2022.
- George, A. S. & George, A. S. H. 2023. A review of ChatGPT AI's impact on several business sectors. *Partners Universal International Innovation Journal*, 1(1), 9–23.
- Gilson, A., Safranek, C. W., Huang, T., Socrates, V., Chi, L., Taylor, R. A. & Chartash, D. 2023. How does CHATGPT perform on the United States Medical Licensing Examination? the implications of large language models for medical education and knowledge assessment. *JMIR Medical Education*, 9(1), e45312.
- Hargreaves, S. 2023. 'Words Are Flowing Out Like Endless Rain Into a Paper Cup': ChatGPT & Law School Assessments. *The Chinese University of Hong Kong Faculty of Law Research Paper*, 2023–03.
- Huh, S. 2023. Are ChatGPT's knowledge and interpretation ability comparable to those of medical students in Korea for taking a parasitology examination?: a descriptive study. *Journal of Educational Evaluation for Health Professions*, 20, 1.
- Kumar, A. H. S. 2023. Analysis of ChatGPT tool to assess the potential of its utility for academic writing in biomedical domain. *Biology, Engineering, Medicine and Science Reports*, 9(1), 24–30.
- Kung, T. H., Cheatham, M., Medenilla, A., Sillos, C., De Leon, L., Elepaño, C., Madriaga, M., Aggabao, R., Diaz-Candido, G. & Maningo, J. 2023. *Performance of ChatGPT on USMLE: Potential for AI-assisted medical education using large language models. PLOS Digit Health* 2 (2): e0000198.
- Kutela, B., Msechu, K., Das, S. & Kidando, E. 2023. Chatgpt's Scientific Writings: A Case Study on Traffic Safety. Available at SSRN 4329120.
- Liebreznz, M., Schleifer, R., Buadze, A., Bhugra, D. & Smith, A. 2023. Generating scholarly content with ChatGPT: ethical challenges for medical publishing. *The Lancet Digital Health*, 5(3), e105–e106.
- Lund, B. D. & Wang, T. 2023. Chatting about ChatGPT: how may AI and GPT impact academia and libraries? *Library Hi Tech News*.
- M Alshater, M. 2022. Exploring the role of artificial intelligence in enhancing academic performance: A case study of ChatGPT. Available at SSRN.
- Macdonald, C., Adeloje, D., Sheikh, A. & Rudan, I. 2023. Can ChatGPT draft a research article? An example of population-level vaccine effectiveness analysis. *Journal of Global Health*, 13, 1003.
- Mann, D. L. 2023. Artificial Intelligence Discusses the Role of Artificial Intelligence in Translational Medicine: A JACC: Basic to Translational Science Interview With ChatGPT. *Basic to Translational Science*.
- Mhlanga, D. 2023. Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. *Education, the Responsible and Ethical Use of ChatGPT Towards Lifelong Learning (February 11, 2023)*.
- Mijwil, M. & Aljanabi, M. 2023. Towards Artificial Intelligence-Based Cybersecurity: The Practices and ChatGPT Generated Ways to Combat Cybercrime. *Iraqi Journal For Computer Science and Mathematics*, 4(1), 65–70.
- Pal, S. 2022. Performing effective research using ChatGPT. *Indian Journal of Computer Science*, 7(6), 8–15.
- Pavlik, J. V. 2023. Collaborating With ChatGPT: Considering the Implications of Generative Artificial Intelligence for Journalism and Media Education. *Journalism & Mass Communication Educator*, 10776958221149576.
- Rudolph, J., Tan, S. & Tan, S. 2023. ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning and Teaching*, 6(1).
- Russell, S. 2019. *Human compatible: Artificial intelligence and the problem of control*. Penguin.
- Sakirin, T. & Said, R. Ben. 2023. User preferences for ChatGPT-powered conversational interfaces versus traditional methods. *Mesopotamian Journal of Computer Science*, 2023, 24–31.
- Shen, Y., Heacock, L., Elias, J., Hentel, K. D., Reig, B., Shih, G. & Moy, L. 2023. ChatGPT and other large language models are double-edged swords. In *Radiology* (p. 230163). Radiological Society of North America.
- Street, D. & Wilck, J. 2023. "Let's Have a Chat": Principles for the Effective Application of ChatGPT and Large Language Models in the Practice of Forensic Accounting. Available at SSRN 4351817.
- Taecharunroj, V. 2023. "What Can ChatGPT Do?" Analyzing Early Reactions to the Innovative AI Chatbot on Twitter. *Big Data and Cognitive Computing*, 7(1), 35.
- van Dis, E. A. M., Bollen, J., Zuidema, W., van Rooij, R. & Bockting, C. L. 2023. ChatGPT: five priorities for research. *Nature*, 614(7947), 224–226.
- Zarifhonarvar, A. 2023. Economics of chatgpt: A labor market view on the occupational impact of artificial intelligence. Available at SSRN 4350925.
- Zielinski, C., Winker, M., Aggarwal, R., Ferris, L., Heinemann, M., Lapeña, J. F., Pai, S. & Citrome, L. 2023. Chatbots, ChatGPT, and Scholarly Manuscripts-WAME Recommendations on ChatGPT and Chatbots in Relation to Scholarly Publications. *Afro-Egyptian Journal of Infectious and Endemic Diseases*, 13(1), 75–79.
