Migration Letters

Volume: 20, No: S9(2023), pp. 927-945

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)

www.migrationletters.com

Examining the Potential Usages, Features, and Challenges of Using ChatGPT Technology: A PRISMA-Based Systematic Review

Chanchal Molla[1], Lisa Mani[2], Mohammad Rakibul Islam Bhuiyan[3*], Rashed Hossain[4]

Abstract

OpenAI developed ChatGPT, an AI-powered conversational agent platform that has the potential to revolutionize how people interact with technology. The study intends to determine the crucial features of ChatGPT in different sectors. Moreover, it identifies the prospective sectors of ChatGPT usage along with the challenges of using it in diverse areas. This study employs qualitative approaches, with a primary focus on utilizing secondary sources as the main data sources. Using PRISMA-based guidelines, this research applied specific keywords relevant to the primary objective of the inquiry, such as ChatGPT, characteristics, potential domains, and obstacles. Program developers, call centers, tourism education, digital marketing, mental health education, etc. have mainly benefited from utilizing ChatGPT from Bangladeshi perspectives. This study presents a set of standard features and challenges to gain a comprehensive understanding of the fundamental mechanism of utilizing ChatGPT.

Keywords: *ChatGPT, PRISMA, Artificial Intelligence, Potential Usages, Challenges.*

Introduction

The public can access ChatGPT, an AI chatbot that is an extensively developed language model (LLM) by OpenAI, without restriction (Dwivedi et al., 2023). Considering the Generative Pre-trained Transformer (GPT) framework, the system is built using GPT-3.5 and GPT-4 as its core building blocks (Hadi et al., 2023). The models can participate in lively conversations across multiple languages since they have received substantial training using a huge dataset. While the majority of ChatGPT's training data is from September 2021, plugins can be used to add real-time or knowledge-based data (Rasul et al., 2023). Moreover, GPT-4 has been improved to support text and image input. ChatGPT has the capacity to impact a substantial segment of the world's populace (Haleem et l., 2022). The field of Natural Language Processing (NLP) (Peng et al., 2023; Adewumi et al., 2021), a subfield of Artificial Intelligence (AI), is where ChatGPT first emerged (Remountakis et al., 2023). NLP is devoted to helping machines understand and

[1] Lecturer, Department of Management, Faculty of Business Studies, Jashore University of Science and Technology (JUST), Jashore-7408, Bangladesh. Email: ch.molla@just.edu.bd, ORCID: https://orcid.org/0009-0005-7749-4648

[2] Research Assistant, Department of Accounting & Information Systems, Begum Rokeya University, Rangpur. Rangpur-5404, Bangladesh. Email: lisamoni00@gmail.com, ORCID: https://orcid.org/0009-0008-2957-5656

[3] Lecturer, Department of Management Information Systems, Faculty of Business Studies, Begum Rokeya University, Rangpur, Rangpur-5404, Rangpur, Bangladesh. Email: rakib@mis.brur.ac.bd, ORCID: https://orcid.org/0000-0003-4284-6461

[4] CEO (Founder), Banglay IELTS and Immigration Center: Dhaka-1230, Dhaka, Bangladesh. Email: rashedhbs@gmail.com, ORCID: https://orcid.org/0009-0000-5000-3996

produce human language (Remountakis et al., 2023). The goal of developing an AI language model with advanced capabilities and flexibility to help with a variety of tasks like text generation (Lancaster, 2023), translation, and data analysis was the driving force behind the development of ChatGPT (Hadi et al., 2023). The development of the transformer architecture is the foundation of ChatGPT.

The chatGPT has garnered significant attention on numerous online platforms, establishing itself as a noteworthy advancement in the field of AI-generated content (Aydın & Karaarslan, 2023). The A.I. Research Laboratory of OpenAI developed the chatbot known as ChatGPT (Dwivedi et al., 2023). It is based on the GPdT-4 model and has undergone rigorous training with billions of parameters.

(Floridi & Chiriatti, 2020; Zhang et al., 2023) claim that the advanced artificial intelligence (AI) system can answer questions, solve mathematical puzzles, produce written material, recognize and fix coding flaws, summarize text, and assist with language translation (Li & Xing, 2021). Since its launch, researchers have explored the potential applications of ChatGPT in various sectors.

Because researchers are realizing that artificial intelligence (AI) can be a useful tool for data analysis and literature reviews, AI is becoming more common in academic research (Zhang et al., (2023). Recent research serves as an example of this, such as Burger et al.'s systematic literature reviews (SLR) from 2023. Artificial intelligence (AI) can methodically and successfully aid academic research (Land & Aronson, 2020). Artificial intelligence (AI) is still in its early stages, but it has a lot of promise and might change research significantly, especially when it comes to no-code research applications (Land & Aronson, 2020). With the advancement of AI research, there is an increasing realization that the technology may be used to improve and advance research without requiring specialized knowledge (Dwivedi et al., 2023).

As a matter of fact, ChatGPT was not created from scratch; rather, it was the result of several iterative attempts made in the domain of AI. ChatGPT, an AI-powered tool, has benefits and drawbacks that need ongoing analysis, the creation of research frameworks, and ethical issues (Dwivedi et al., 2023). Over the past few decades, artificial intelligence (AI) has unquestionably played a major influence in shaping various aspects of modern civilization (Zhang et al., (2023). According to Guerra et al. (2023), this transformative technology has proven to have amazing benefits and has brought about revolutionary advances in many other fields. At the same time, the disadvantages are also noticeable (Makhdum et al., 2022). With the advancement of technology in recent times, there has been a persistent question over whether artificial interventions can enhance human characteristics. Previous studies have demonstrated that despite the diverse ways in which technology is employed in language learning, the importance of a teacher remains a crucial factor (Dudeney and Hockly, 2012; Ito, 2023). It is apparent that numerous technology applications and tools received international recognition before ChatGPT came into being. Some are no longer as well-known as they once were, but there are still others that are well-known throughout the world (Yazdani et al., 2020). These programs and tools have different features and are used for different purposes in various academic fields. Those involved in language learning (Li & Xing, 2021), teaching, and research have access to a multitude of resources and information in situations where English is the primary language (Dudeney and Hockly, 2012; Ito, 2023).

ChatGPT is an AI-powered conversational agent platform created by OpenAI with the ability to completely change the way individuals use technology (Dwivedi et al., 2023). This cutting-edge platform makes use of natural language processing (NLP) and machine learning (ML) (Peng et al., 2023) technology to enable conversational user-machine interaction (Remountakis et al., 2023). Despite being recently made available to the general public, this technology has already attracted significant attention and is expected to fundamentally change how people interact with technology (Oridi et al., 2022). For

people of all ages and backgrounds, ChatGPT allows for natural multilingual communication even in the absence of programming or computer science knowledge (Gouvi et al., 2023). Users are empowered to interact with ease because of its ability to comprehend context, intent, sentiment, and other linguistic nuances (Rahman and Husain, 2022). Numerous industries, including but not limited to customer service, entertainment, education, banking, and health care, can benefit from the technology in issue (George & George, 2023).

All things considered, this study provides professionals and scholars with a substantial comprehension of an extremely promising advancement in the field of artificial intelligence research like ChatGPT (Makhdum et al., 2022). Researchers can gain crucial insights into maximizing the usage of these tools for the creation of next-generation artificial intelligences that can react similarly to humans by understanding the internal workings and potential uses of these technologies.

RO 1: To determine the influential features of ChatGPT

RO 2: To identify the potential areas for using AI-based tools, especially ChatGPT.

RO 3: To determine the challenges of using ChatGPT in diverse areas.

Literature Review

Background of ChatGPT

ChatGPT is an artificial intelligence (AI) language model that has been developed by OpenAI (Zhang et al., (2023). OpenAI has utilized the GPT (Generative Pre-trained Transformer) architecture, specifically GPT-3.5, in this context. OpenAI developed the GPT models specifically to produce text (Lund & Wang, 2023) that closely resembles human-generated content by utilizing the input data provided to them (Dwivedi et al., 2023).

For ChatGPT, we apply extensive deep learning methodologies during the training procedure (Ray, 2023). The model undergoes training using a comprehensive selection of online text data, encompassing various sources such as books, journals, websites, and publicly accessible materials. Through the analysis of patterns and correlations inherent in the provided training data (Lv et al., 2014), the model develops its predictive capabilities. By using this procedure, it acquires comprehension pertaining to grammar, syntax, context, and a certain degree of factual knowledge (Bates & MacWhinney, 1989; Awal et al., 2023).

Open AI

The main goal of the research team at OpenAI is to advance the field of artificial general intelligence (AGI) for the benefit of humankind (Obaid, 2023). Founded in 2015 by well-known figures such as Elon Musk and Sam Altman, OpenAI has become a preeminent organization in the artificial intelligence (AI) research domain (Dwivedi et al., 2023). OpenAI has contributed greatly by creating ground-breaking models like GPT-2, GPT-3, and later ChatGPT. With the advancement of GPT-3, OpenAI's R&D endeavors were carried out to a greater extent, resulting in the development of ChatGPT, which is according to the GPT-4 architectural framework. Specifically, ChatGPT was developed to perform very well in activities that require discussion (Rasul et al., 2023). It is more capable than its predecessor, GPT-3, in terms of understanding context, producing replies, and upholding consistency. With the advancement of GPT-3, OpenAI's R&D attempts progressed even further, resulting in the development of ChatGPT, which is according to the GPT-4 architectural framework. Specifically, ChatGPT was developed to perform very well in activities that require discussion (Ray, 2023). Compared to its predecessor,

GPT-3, it exhibits improvements in terms of context comprehension, generating responses, and general coherence (Huallpa, 2023).

GPT

GPT models are specifically designed to generate natural language content (Black et al., 2022; Adewumi et al., 2021), including sentences, paragraphs, and even entire papers, while upholding grammatical consistency and human language rules (Liu et al., 2023). GPT models' main feature is their capacity to be pre-trained on substantial volumes of textual data (Markel et al., 2023) and then adjusted for certain tasks that come after, including text categorization or question answering (Floridi & Chiriatti, 2020). Pre-training is the process of training a model in an unsupervised way using a large volume of textual input, like web pages or books (Markel et al., 2023). This suggests that the training data's explicit labels or annotations are not used by the model. In the pre-training stage, the GPT model picks up the ability to anticipate words in textual sequences by taking into account the words that came before it (Markel et al., 2023). This approach is important regarding a range of NLP application problems (Li & Xing, 2021) and is sometimes called language modeling (Black et al., 2022). The model gains the capacity to identify and infer norms in language, including syntax, grammar, and semantics (Black et al., 2022), by means of instruction on a huge corpus of textual data (Floridi & Chiriatti, 2020). After pre-training, the GPT scheme can be adjusted for a certain downstream objective (Floridi & Chiriatti, 2020). In order to do this, a smaller dataset containing labeled samples is fed into the model. This procedure aims to update the model's weights and biases, improving its capacity to handle the particular activity. For instance, the model may be learned to correctly forecast the proper label for an input text in the context of a downstream job like text categorization (Markel et al., 2023).

ChatGPT

The generative pre-trained transformer known as ChatGPT has recently garnered significant attention (Wu et al., 2023). The term "generative" or "G" inside the acronym GPT denotes the device's inherent ability to generate textual content (Wu et al., 2023). The concept of pre-training, sometimes known as "P", involves utilizing a model from a previous machine learning task to train another model (Wu et al., 2023). This process can be likened to the way individuals leverage their existing knowledge to acquire new information (Roumeliotis & Tselikas, 2023). ChatGPT provides a significant corpus of text (Lund & Wang, 2023) for pre-training purposes. The neural network denoted as *T* is commonly referred to as the "Transformer" model, which analyzes the interrelationships among all components within a given data series (Wu et al., 2023). The chatbot is freely available and capable of providing responses to a wide range of inquiries (Ray, 2023). The creation of the aforementioned technology was attributed to OpenAI, an organization that subsequently released it to the public for the purpose of conducting tests and evaluations (Roumeliotis & Tselikas, 2023). The AI chatbot in question has already garnered recognition as the most exceptional in its field (Dwivedi et al., 2023). The chatbot has demonstrated its ability to generate computer code, essays at the level expected in college, poetry, and even jokes of moderate quality. The initial ChatGPT model underwent a process of overlookedfine-tuning, when human AI trainers engaged in conversations with the user and an AI assistant together (Limna et al., 2023). ChatGPT, an advanced language model developed specifically for the purpose of understanding and responding to natural language, represents one of their latest advancements. This suggests that it possesses the ability to engage in discussions with others in a manner that is both organic and instinctive (Ray, 2023). One notable advantage of ChatGPT is its accessibility through OpenAI, allowing developers to seamlessly integrate the model into their software applications (Firaina & Sulisworo, 2023).

Features of ChatGPT

ChatGPT exhibits several attributes that render it much superior to conventional chatbots and other AI models (Dwivedi et al., 2023). Figure 1 examines some of the crucial features of ChatGPT.

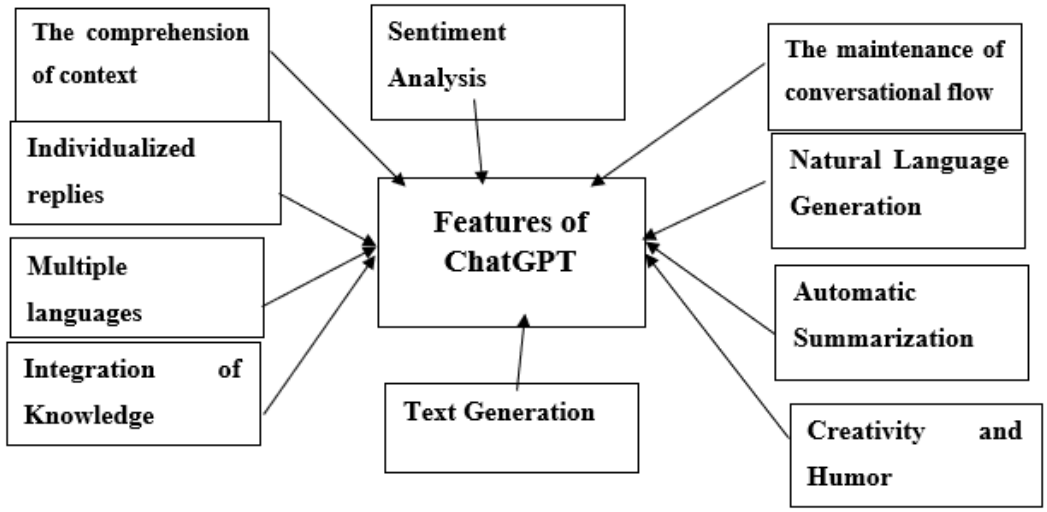

Figure 1: Proposed Potential Areas of ChatGPT

Source: Author's Work

The comprehension of context

ChatGPT has the capacity to interpret the subtleties of a conversation's context and provide more accurate responses (De Winter, 2023). ChatGPT can identify the topic of a conversation by looking at previous messages in the conversation and then providing relevant information (De Winter, 2023). This feature is especially helpful when it comes to chatbots and virtual assistants because it addresses the common need of consumers to ask follow-up questions (Limna et al., 2023).

Individualized replies

Taking into account the user's preferences and previous interactions, ChatGPT can customize its responses (Huallpa, 2023). Based on the user's individual interests and preferences, ChatGPT can tailor its responses by looking through the user's chat history (Huallpa, 2023). This feature is particularly beneficial for the fields of e-commerce and customer care because it can increase consumer satisfaction by offering customized solutions.

Multiple languages

ChatGPT's versatility as a language model is demonstrated by its capacity to understand and produce responses in multiple languages (Huallpa, 2023). ChatGPT can translate across languages (Surameery & Shakor, 2023) and understand contextual information, which makes it possible to overcome language barriers (Li & Xing, 2021) and promote productive conversation between people from different linguistic backgrounds (Surameery & Shakor, 2023).

Integration of Knowledge

Knowledge bases may be easily integrated into ChatGPT, which improves its capacity to provide accurate and timely information (Rasul et al., 2023). ChatGPT can respond to complex questions and provide more thorough explanations by utilizing a knowledge base (Rasul et al., 2023). This specific feature is extremely useful in industries like healthcare and finance, where information accuracy is critical (Rumi et al., 2021).

Sentiment Analysis

When conducting sentiment analysis on a given debate, ChatGPT can produce contextually appropriate responses (Sudirjo et al., 2023). By analyzing the tone of voice and language used in the chat (Li & Xing, 2021), ChatGPT can identify the user's emotional state—it can differentiate between happy, sadness, and anger—and then provide relevant responses (Sudirjo et al., 2023). This specific quality works very well in the field of customer service since it can improve customer satisfaction by providing a deeper understanding of the client's emotional condition (George & George, 2023).

The maintenance of conversational flow

ChatGPT exhibits the capacity to maintain coherence in a conversation (Zhang, 2019), even when the user switches topics or momentarily leaves the chat (Abdullah, 2022). By evaluating contextual clues in the chat, ChatGPT can remember information about previously discussed topics (Zhang, 2019), which makes it easier to carry on with the discussion (Ray, 2023). This feature is quite helpful when it comes to chatbots and virtual assistants since it meets the needs of users who ask different questions all the time (Abdullah, 2022).

Text Generation

ChatGPT is a powerful tool for content creation since it can produce text based on user input (Lancaster, 2023). ChatGPT can create engaging and inventive content by analyzing user input and contextual data (Lee et al., 2022). This particular quality is quite valuable in fields like marketing and advertising, where the production of engaging content is crucial (Lund & Wang, 2023).

Natural Language Generation

Language produced using ChatGPT can be described as having a natural feel to it, much like the patterns found in human speech (Li & Xing, 2021). By analyzing the structure and patterns seen in natural language (Peng et al., 2023), ChatGPT can generate responses that roughly resemble those written by a human (Huallpa, 2023). This particular feature is extremely useful in fields such as journalism and creative writing (Adewumi et al., 2021), where it is crucial to use language that sounds natural and genuine (Li & Xing, 2021).

Automatic Summarization

ChatGPT can automatically create summaries of long texts, which makes it easier to understand large amounts of information (Liu & Healey, 2023). By using content analysis and the identification of significant parts, ChatGPT may provide a summary (Gliwa et al., 2019) that succinctly captures the essential features of the provided text. This feature is very beneficial for industries like research and education since it allows large amounts of data to be condensed, which saves time and increases productivity (AlAfnan et al., 2023).

Creativity and humor

ChatGPT is a compelling and delightful language model for interactive interaction (Chopra, 2023) because it can respond with creative and amusing responses (Huallpa, 2023; Clark, 2022). By analyzing language patterns and applying machine learning algorithms, ChatGPT can deliver response times that are both accurate and interesting (Huallpa, 2023). This characteristic is very useful in the fields of entertainment and social media since it can draw in and keep a devoted following (Clark, 2022).

Methodology

The primary focus of this study lies in the utilization of qualitative methodologies. The data sources utilized in this study consist primarily of secondary sources, including a

range of scholarly journals, articles, televised news broadcasts, and online platforms (Akter et al., 2023). The present study focuses on identifying the essential factors necessary for the development of ChatGPT applications that are both proficient and impactful in the context of Bangladesh (Matenga & Mpofu, 2023). Furthermore, the nascent nature of ChatGPT technology and its limited adoption across various sectors of Bangladesh's economy raise concerns regarding the implementation of tactics derived from technologically advanced countries (Akter et al., 2023). The current investigation employed the PRISMA guidelines, which are especially formulated for the purpose of performing systematic reviews and meta-analyses of observational data (Hodzic et al., 2023). A thorough investigation was carried out to identify primary research articles published from October 2020 to October 2023. This search encompassed global databases including Scopus, Science Direct, and Web of Sciences (López-Sorribes et al., 2023). The methodology utilized in this research entailed the application of specific keywords that are pertinent to the primary objective of the inquiry, such as ChatGPT, characteristics, potential domains, and obstacles (Whaiduzzaman et al., 2022). Any records that do not correspond to the selected keywords or study subjects are excluded (Rumi et al., 2020). There are other variables that could be taken into account when deciding to reject publications and reports, including limited data availability, articles written in different languages, heterogeneous outcomes, and disconnected impacts and findings (Anik et al., 2023; Whaiduzzaman et al., 2022). A total of 29 more publications and five reports were uncovered by the researchers in the investigation.

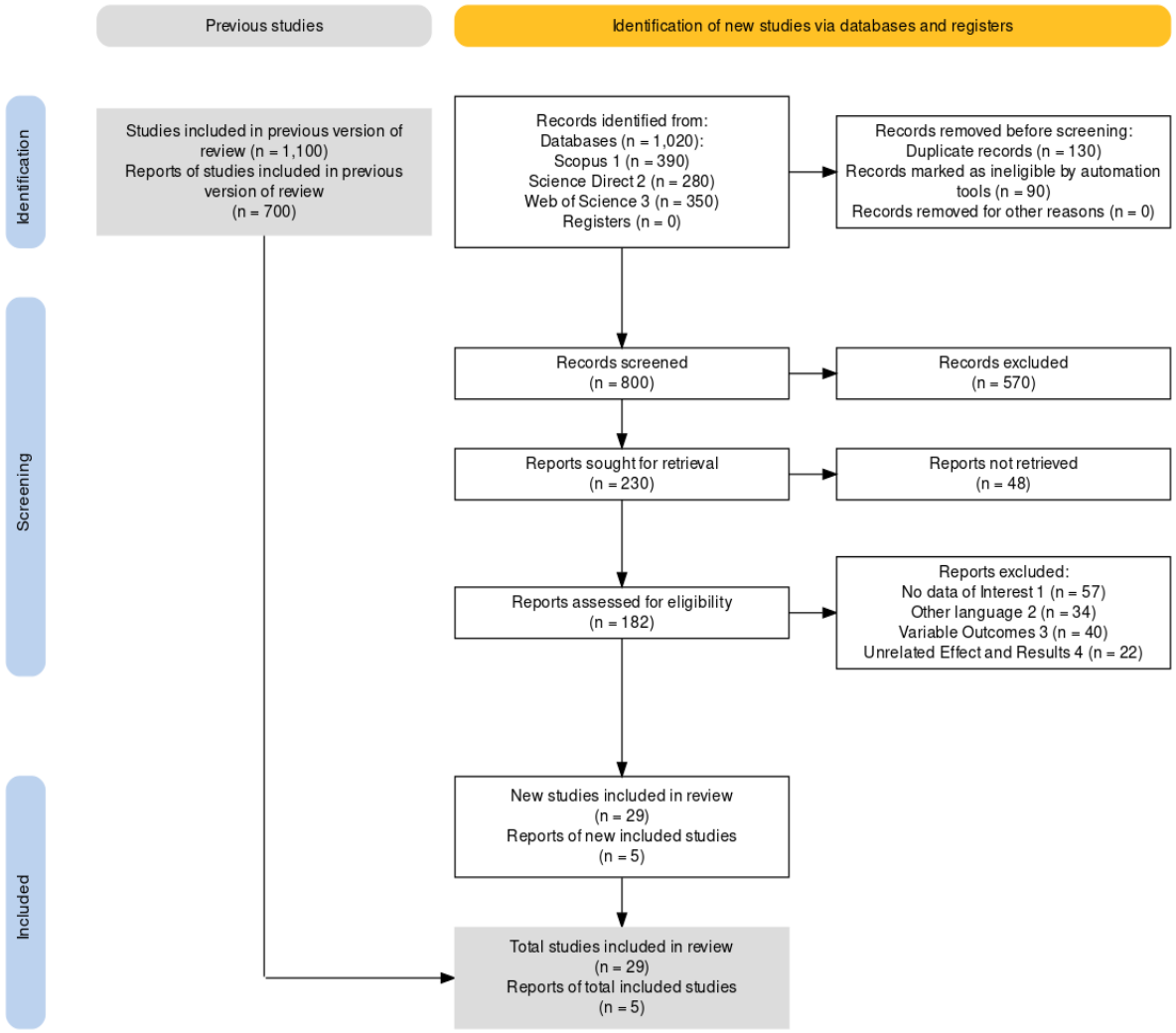

Figure 2: Displays the PRISMA 2020 flow diagram for novel systematic reviews, encompassing solely searches conducted on databases and registers. For further details,

please refer to the following website: http://www.prisma-statement.org/ (Haddaway et al., 2022) [Accessed on November 5, 2023]

Discussion

Applications of ChatGPT

ChatGPT exhibits the capacity to produce text (Lund & Wang, 2023) that closely resembles human-generated content, rendering it a valuable tool for a wide range of applications, such as composing and revising written material (Ray, 2023). If the concept of ChatGPT is unfamiliar to you, I strongly advise accessing a channel where numerous movies on ChatGPT and its applications are available for your perusal (Firaina & Sulisworo, 2023). This can assist individuals in pursuing more advantageous prospects that have the potential to provide substantial financial gains (Meah & Hossain, 2023).

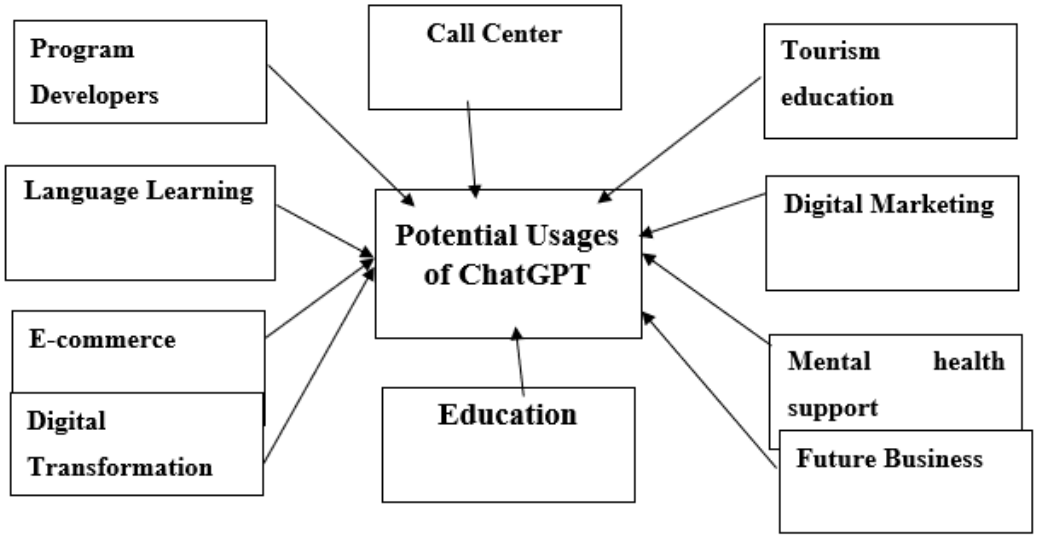

Figure 3: Proposed Potential Areas of ChatGPT

Source: Author's Work

Program Developers

When it comes to code proofreading, problem identification, and solution, GPT can be a very helpful tool. First, GPT can be used as an essential instrument for resolving software errors. There is nothing in the user's text that has to be rewritten in an academic way (Bhuiyan et al., 2023). The programming language that is being used determines whether or not example code structures are displayed. This allows researchers and developers to allocate additional effort towards enhancing fundamental functionalities rather than investing substantial hours in the identification and resolution of vexing syntax errors or other issues stemming from faults in manually written code. Furthermore, it has been demonstrated by Peng et al. (2023) and Adewumi et al. (2021) that GPT possesses advanced capabilities in natural language processing. These capabilities enable GPT to do more precise analyses of current source codes compared to the abilities of the majority of human readers. This functionality facilitates the identification of potential issues by automatically detecting inconsistencies among various components of your program's architecture, hence eliminating the need for manual verification. And lastly, and maybe most importantly, it can create new source code segments from preexisting examples (Bhuiyan, 2017). This suggests that a person can effectively produce several versions of their software, allowing them to find the best version without investing a lot of time and energy in the manual production of each iteration (Bhuiyan et al., 2023). To sum up, the application of GPT can greatly accelerate the process of finding any software defects

(Ray, 2023). It also has the potential to offer examples of how to create efficient solutions in a variety of programming languages. GPT is regarded as an essential tool for developers who run into difficult debugging issues.

Language learning

Like a number of other technologies, ChatGPT integration requires a more thorough analysis when used in L2 situations. To effectively traverse language learning environments in the field of second language acquisition, educators must have the relevant training (Kohnke et al., 2023). Furthermore, students must receive guidance when utilizing chat-GPT-based assignments in addition to being deeply taught about ethical issues and usage conventions (Bhuiyan et al., 2023). It's also important to recognize the prevalence of malicious activity that frequently coincides with the creation of inventions (Ali et al., 2023). Kohnke et al. (2023) carried out a thorough analysis of ChatGPT's possible uses in the field of language learning and teaching in their study. The benefits are numerous and varied, including the supply of rich and varied input, the facilitation of interactive feedback, the personalization of learning experiences, and the augmentation of motivation for language learners. In order to investigate the impact of ChatGPT on the drive to learn among educators and learners of English as a foreign language (EFL) in Saudi Arabia, Ali et al. (2023) carried out a quantitative research study. The study's findings showed that while ChatGPT had a neutral effect on students' speaking and listening skills, it had a favorable effect on their reading and writing abilities. Similarly, Bhuiyan et al. (2023) investigated ChatGPT's ethical, pedagogical, and social effects in the context of education using a qualitative case study (Javaid et al., 2023). The study's findings demonstrated that ChatGPT displayed a range of capabilities and limitations in many academic fields, hence offering opportunities as well as challenges for teachers and students (Dudeney and Hockly, 2012; Ito, 2023).

Call Center

ChatGPT is a cloud-based platform that provides call center employees with a workable substitute, increasing their productivity and efficiency (Bhuiyan, 2019). Customer service representatives may now easily and quickly respond to customer inquiries in real time thanks to this technology (Rasul et al., 2023). ChatGPT makes use of artificial intelligence (AI) technology to understand user inquiries, identify relevant details, suggest possible answers, and provide the best possible answer (Zhang et al., 2023). In addition, it may retrieve information from multiple sources to provide customers with a more thorough answer to their questions. This method helps to reduce the need for costly human intervention and shortens the time needed to resolve problems.

E-commerce

Customer care is a critical component of any successful e-commerce business, but providing excellent help via traditional channels like phone calls or emails can be costly and time-consuming (Shihab et al., 2023). The automated chatbot features provided by ChatGPT allow e-commerce businesses to immediately handle consumer problems without the need to allocate additional human resources (Hadi et al., 2023). This lowers expenses while also improving their customers' overall experience using the product. All things considered, it is apparent that a multitude of industries, both corporate and consumer, stand to gain a great deal from integrating technologies like ChatGPT into their operations (Abir et al., 2020). These advantages include lower expenses for customer service representatives (Sudirjo et al., 2023), streamlined procedures in medical settings, and more engaging brand-consumer interactions (George & George, 2023).

Tourism education

The effectiveness of ChatGPT as a teaching and learning tool is determined by its ability to reject inappropriate requests, challenge incorrect responses, and save a history of the user's previous comments in the chat for future queries (AlAfnan et al., 2023). The system

communicates with users in natural language; thus, no prior knowledge of coding is required. Its interface is also extremely user-friendly in design (Haque et al., 2022). As such, there are no significant barriers to the implementation of this concept in tourism and hospitality programs. In addition, ChatGPT offers clarifications, answers, and responses to complicated topics, including code development strategies, ways to meet optimization requirements, and ways to address layout issues (Haque et al., 2022). The study carried out by Gilson et al. (2023) showed ChatGPT's capacity to provide context and explanation for a sizable majority of responses, making it a strong argument and justification for ChatGPT's potential use in the field of medical education (AlAfnan et al., 2023). Therefore, when integrating ChatGPT into the field of tourism education, it is necessary to take into account a few practical principles and implications (Sharma & Yadav, 2022). Additionally, this application can help people create different kinds of tests and quizzes, evaluate student learning, create curricula, create rubrics, and perform other relevant duties (Ray, 2023). Moreover, the application can function as a grader for homework assignments and other online tasks. ChatGPT can be a useful tool for students to ask questions about specific course material or to get different interpretations in order to improve their comprehension (Bhuiyan, 2019; Firaina & Sulisworo, 2023).

Education

The education sector has a huge opportunity with ChatGPT's ability to personalize learning (Shihab et al., 2023). This AI-powered system lets teachers construct lesson plans for each student based on their interests and skill levels, and students receive real-time feedback on content and projects (Dudeney and Hockly, 2012; Ito, 2023). It also lets teachers and lecturers grade students faster via a chatbot interface, saving them time on a busy day without having to go over every assignment by hand (Limna et al., 2023). ChatGPT can also be utilized in schools as a virtual assistant to answer questions about campus resources and courses without human support (Shihab et al., 2023). Employees should focus on other important tasks, like making sure students have access to resources outside the classroom when they need them, instead of repetitious activities (Islam & Bhuiyan, 2022). Based on its many benefits to teacher-student relationships and classroom productivity, every school should use it immediately (Dudeney and Hockly, 2012; Ito, 2023).

Digital Marketing

Employing ChatGPT in the context of digital marketing has several advantages for businesses in this sector (Shihab et al., 2023). These benefits include increased productivity brought about by automation, better customer interaction, more accuracy in data gathering, which facilitates better decision-making, financial savings from lower labor costs related to manual tasks like answering questions (Islam and Rahman, 2022) or carrying out transactions, and greater scalability because fewer personnel are required when branching out into new markets or initiating international campaigns. Furthermore, companies in this field are able to obtain important insights that would otherwise necessitate large investments in research and development thanks to the integration of natural language processing (NLP) techniques (Remountakis et al., 2023) with artificial intelligence (AI) models that are trained on extensive datasets across various industries (Zhang et al., 2023). These kinds of expenditures are usually required to create customized solutions that meet the unique needs of any organization. To sum up, there are numerous benefits that businesses involved in digital marketing can reap from leveraging ChatGPT's advanced features (Shihab et al., 2023). This gives them a competitive advantage and also saves them a large amount of money spent on labor-intensive tasks related to ensuring successful campaign outcomes. This ultimately results in increased rates of return on investment (ROI).

Mental health support

More and more people are realizing that ChatGPT and similar apps are workable options for reducing the gap in mental health care. Because ChatGPT can produce human-like reactions, it can be a source of friendship, support, and therapeutic assistance for individuals experiencing psychological challenges (Ray, 2023). Notably, ChatGPT exhibits a thorough comprehension of psychiatric conditions and indicates a certain level of "empathy" in the way it formulates its answers (De Winter, 2023). Prior research has demonstrated that ChatGPT is highly skilled at responding to patient questions in an online forum with precise and insightful information. When compared to the answers from doctors, ChatGPT's responses were determined to have a noticeably higher level of empathy (Huallpa, 2023). In particular, ChatGPT showed a 9.8-fold increase in the frequency of empathic or highly empathetic answers compared to medical professionals.

The utilization of simulated case reports by ChatGPT has the potential to drastically alter medical education by offering a case-oriented and dynamic learning approach (AlAfnan et al., 2023). This is especially helpful in circumstances where access to actual patient data is restricted because of consent or confidentiality concerns. The ability of ChatGPT to generate fictitious but genuine patient interactions ensures a broad spectrum of clinical exposure while upholding ethical standards. Students can actively engage in real-time simulated scenarios by integrating this tool into the medical curriculum, which fosters interactive learning and the growth of critical thinking abilities. The application of ChatGPT as a teaching tool has the capacity to bring about a new way of thinking about blended learning (Firaina & Sulisworo, 2023). In summary, it is critical to remember that medical education and training are lifelong pursuits for anyone working in the field of medicine (AlAfnan et al., 2023).

Financial Industry

By using automated conversational systems to conduct routine tasks like answering simple questions or confirming account details, banks may maximize efficiency. This makes it possible for people to focus their efforts on answering more complex questions that require human interaction or support from other bank divisions. Furthermore, ChatGPT uses gathered data and past interactions from specific users to provide individualized responses through its natural language processing (NLP) capabilities (Remountakis et al., 2023; Adewumi et al., 2021). When compared to traditional methods, the use of this technology greatly improves the speed and efficiency of banking procedures. Lastly, frequent training sessions with new datasets derived from user interactions continuously improve the machine learning techniques used by ChatGPT. This suggests that even when presented with new question formats that are unfamiliar to it, the system retains a high degree of accuracy. As a result, clients of your financial institution can always count on timely and trustworthy responses, regardless of the type of inquiry (Islam & Bhuiyan, 2022). Taking into account all of the benefits that come with this technology, you should think about making an investment in it, especially considering how competitive the modern financial services industry is becoming. ChatGPT's application in the banking and financial industries makes it possible to create chatbots that can quickly respond to customer inquiries (Firaina & Sulisworo, 2023). Adding a chatbot to a company's website or app can improve customer access to information. ChatGPT makes it easier for users to keep track of their spending, plan out their finances, and make educated decisions about their financial resources (Limna et al., 2023). Based on each client's unique risk tolerance, targeted goals, and investment history, ChatGPT provides individualized investment advice to help them make wise and well-informed decisions.

Digital Transformation

A digital platform called ChatGPT was created to help businesses with their digital transformation (Shihab et al., 2023). It strives to improve a range of enterprise

characteristics, such as their organizational and cultural frameworks, specialized domains of knowledge, conceptual frameworks, and operational procedures. This technological advancement offers an automated method for improving internal organizational procedures and efficiently managing customer interactions. This technology can be used to automate two manual processes: customer care process automation and sales pipeline management. Furthermore, it offers an extensive range of tools that aid in the creation of innovative goods and services to successfully meet the changing needs of the market. The ChatGPT platform enables businesses to quickly and easily replace their current business processes with more efficient and productive methods that take advantage of machine learning algorithms for predictive analytics (Shihab et al., 2023). Furthermore, this approach helps businesses improve their products by offering insightful data on current user behavior trends and thorough analyses of consumer interactions on mobile and internet platforms (Raj et al., 2023). This can make it easier to fully understand the necessary qualities for a variety of groups in different industries. As a result, they may create tailored solutions that effectively meet the particular needs of these markets faster than they could have with earlier approaches while still upholding high standards of performance and quality. Moreover, ChatGPT's AI-powered powers empower businesses to create innovative strategies through the use of real-time data gathered from several sources, including social media networks (Shihab et al., 2023). This makes it easier for businesses to improve their decision-making procedures in relation to strategic planning (Raj et al., 2023). Last but not least, ChatGPT's advanced analytics engine offers users actionable insights into potential opportunities resulting from changes in consumer behavior and industry breakthroughs in numerous domains. This gives them more power to oversee employee training programs, reorganization projects, and marketing activities. By employing this technology, businesses get access to traditional data as well as a deeper understanding of customer thought processes, feelings, actions, and reactions (Shihab et al., 2023). This gives people better knowledge than they had previously had about prospective future growth prospects and methods for improving operational effectiveness. As a result, the whole organizational ecosystem experiences an increase in return on investment.

Future Business

The application of ChatGPT has the capacity to transform the ways in which businesses communicate with their clients (Dwivedi et al., 2023). By providing a more user-friendly and efficient conversational platform, ChatGPT AI offers businesses the chance to save operating costs, enhance customer service (George & George, 2023), and get a deeper understanding of customer behavior (Dwivedi et al., 2023). This technology is a valuable tool for businesses looking to improve their processes because it can process language instantly (Raj et al., 2023). Additionally, the system's machine learning capabilities enable frequent upgrades when fresh data is acquired from various sources and client interactions. Compared to traditional chatbots, ChatGPT AI can provide more accurate responses because of its capacity, which also enables it to stay current with industry changes (Dwivedi et al., 2023). One cannot exaggerate the influence that this technology has had on numerous businesses (Raj et al., 2023). Businesses may save money and time by utilizing ChatGPT AI, and they can also significantly increase customer satisfaction (Shihab et al., 2023). With more customization options than traditional chatbots, the technology enables users to get exact information quickly and without having to wait for professional responses from someone who might not be familiar with their particular query (Khanom et al., 2022; Limna et al., 2023).

Challenges of ChatGPT

ChatGPT possesses multiple attributes that render it a formidable natural language processing (NLP) solution (Remountakis et al., 2023; Adewumi et al., 2021). The system possesses the capability to comprehend the contextual nuances of a dialogue and produce suitable replies. Additionally, the system has the capability to produce responses in

several languages, such as English, Spanish, French, and German. Moreover, ChatGPT possesses the capability to provide responses in several stylistic forms, including formal, casual, and hilarious (Huallpa, 2023). There are some significant problems associated with the utilization of ChatGPT in our daily lives (Table 1).

Table 1: A list of Challenges of Using ChatGPT

Name of Challenge	Description	Source
1. Security Concerns	ChatGPT poses security issues like any advanced machine-learning system. Adversarial attacks, when an attacker introduces malicious inputs to influence the model and produce incorrect or undesirable outputs, are a major challenge. ChatGPT's ability to spread misinformation or propaganda, especially on social media, poses a significant threat. ChatGPT's ability to mimic human conversation could lead to impersonation and identity theft. Companies using ChatGPT or similar technology must assess these risks and take steps to mitigate them.	(Guo et al., 2023)
2. Ethical Concerns	ChatGPT has the potential to generate comments that are inappropriate, offensive, or biased. The information it was trained on may contain inherent biases depending on the nature of the training data. Despite ongoing efforts to combat them, these prejudices remain a significant problem.	(Ray, 2023)
3. Difficulty to adopt new models	It is possible to incorporate ChatGPT into the development of a new system. However, the application of this model and the integration of it with other models that already exist might be challenging and complicated. There is always a risk to one's data privacy and security when using this model because all queries to it are saved and used to train it further. This risk may encourage students to utilize ChatGPT as an alternative.	(Limna et al., 2023)
4. Lack of Real-Time Knowledge	ChatGPT derives its information from the data it was trained on, with access limited to September 2021. As a consequence of this, it is possible that it does not have access to the most recent information or is not aware of recent occurrences.	(Bhuiyan et al., 2023; Chaudhry et al., 2023)
5. Limited Capabilities	Despite its considerable capabilities, ChatGPT does possess several constraints and restrictions. A significant constraint of the system is its limited capacity to generate text, only relying on the input it receives without access to external sources of information or the capability to explore the internet. This implies that the system lacks the capability to furnish precise or current information pertaining to a diverse array of subjects, and it may encounter difficulties in generating solutions to intricate or non-traditional inquiries. Another constraint of ChatGPT is its reliance on a substantial corpus of human language during training. Consequently, there is a possibility that	(Koubaa et al., 2023)

	the system may generate responses that exhibit biased or offensive language. It is imperative for users of ChatGPT to possess an understanding of these constraints and to employ the model in a suitable manner.	
6. Absence of Emotional Consideration	ChatGPT may struggle to understand and respond accurately to the range of emotions discussed in the chat. When dealing with emotionally or sensitively charged subjects, it is possible that it will not always deliver responses that are compassionate or sensitive.	(Raj et al., 2023)

Conclusions

ChatGPT demonstrates and evaluates a powerful AI system. Artificial intelligence application ChatGPT uses natural language processing to generate text, artwork, music, and video (Zhang et al., 2023). ChatGPT uses data for operational and evolutionary processes but is driven by a large language model. Models learn via training. The system becomes better at recognizing patterns, allowing it to forecast future events and generate credible content. A sequence model for text generation tasks like question-and-answer, text summarization, and machine translation (Lee et al., 2022) was employed. ChatGPT can analyse customer data to provide products and information that meet their needs and interests (Meah & Hossain, 2023). ChatGPT helps businesses create unique experiences for new target audiences, increase interaction, and build credibility (Shihab et al., 2023). ChatGPT can help companies grow their customer base, reach new markets, run successful marketing initiatives, and strengthen relationships with present and potential customers (Islam & Bhuiyan, 2022). ChatGPT may analyze a company's marketing strategy, client base, product attributes, and other aspects to determine its performance. The document suggests ways our company might adopt or develop these traits. ChatGPT can offer company expansion strategies by analyzing market trends, client preferences, and other relevant factors particular to our enterprise (Raj et al., 2023). Our competitors' products, marketing, and customer service would be analysed (Khanom et al., 2022). ChatGPT considers target demographics, marketing goals, and budget to identify channels for a campaign. Digital marketing communication channels include social media, email, search engine, and others (Chaudhry et al., 2023). Performance analytics help companies track and evaluate their digital marketing efforts, revealing effective methods and areas for development.

References

1. Abdullah, M., Madain, A., & Jararweh, Y. (2022, November). ChatGPT: Fundamentals, applications and social impacts. In 2022 Ninth International Conference on Social Networks Analysis, Management and Security (SNAMS) (pp. 1-8). IEEE. DOI: 10.1109/SNAMS58071.2022.10062688

2. Abir, T., Husain, T., Waliullah, S. S. A., Yazdani, D. M. N., Salahin, K. F., & Rahman, M. A. (2020). Consumer buying behavior towards e-commerce: A survey study of consumers at a selected online shopping site in Dhaka, Bangladesh. Open Journal of Business and Management, 8(6), 2716-2728.

3. Adewumi, T., Brännvall, R., Abid, N., Pahlavan, M., Sabry, S. S., Liwicki, F., & Liwicki, M. (2021). Sm {\aa} prat: Dialogpt for natural language generation of swedish dialogue by transfer learning. arXiv preprint arXiv:2110.06273.

https://doi.org/10.48550/arXiv.2110.0627

4. Akter, M. S., Bhuiyan, M. R. I., Poli, T. A., & Hossain, R. (2023). Web-based Banking Services on E-Customer Satisfaction in Private Banking Sectors: A Cross-Sectional Study in Developing Economy. Migration Letters, 20(S3), 894-911.

5. Akter, M. S., Bhuiyan, M. R. I., Tabassum, S., S M, A. A., Milon, M. N. U., & Hoque, M. R. (2023). Factors Affecting Continuance Intention to Use E-wallet among University Students in Bangladesh. International Journal of Engineering Trends and Technology, 71(6), 274–288. https://doi.org/10.14445/22315381/IJETT-V71I6P228

6. AlAfnan, M. A., Dishari, S., Jovic, M., & Lomidze, K. (2023). Chatgpt as an educational tool: Opportunities, challenges, and recommendations for communication, business writing, and composition courses. Journal of Artificial Intelligence and Technology, 3(2), 60-68. DOI: https://doi.org/10.37965/jait.2023.0184

7. Ali, J. K. M., Shamsan, M. A. A., Hezam, T. A., & Mohammed, A. A. (2023). Impact of ChatGPT on learning motivation: teachers and students' voices. Journal of English Studies in Arabia Felix, 2(1), 41-49. https://doi.org/10.56540/jesaf.v2i1.51

8. Anik, F. I., Sakib, N., Shahriar, H., Xie, Y., Nahiyan, H. A., & Ahamed, S. I. (2023). Unraveling a blockchain-based framework towards patient empowerment: A scoping review envisioning future smart health technologies. Smart health (Amsterdam, Netherlands), 29, 100401. https://doi.org/10.1016/j.smhl.2023.100401

9. Awal, M. R., Faisal-E-Alam, M., & Husain, T. (2023). An integration of SOBA paradigm to explore university students' entrepreneurial attitude, intention and action: do university and family support matter?. Arab Gulf Journal of Scientific Research, 41(3), 427-444.

10. AYDIN, Ö., & KARAARSLAN, E. (2023). Is chatgpt leading generative ai? what is beyond expectations?. Academic Platform Journal of Engineering and Smart Systems, 11(3), 118-134. https://doi.org/10.21541/apjess.1293702

11. Bates, E., & MacWhinney, B. (1989). Functionalism and the competition model. The crosslinguistic study of sentence processing, 3, 73-112.

12. Bhuiyan, M. R. I. (2017). UNDP-a2i: Citizens' Awareness Survey on E-Service and Service Simplification through the Digital Innovation Fair. Available at SSRN 4341799.

13. Bhuiyan, M. R. I. (2019). An Analysis of Non-Performing Loan of Janata Bank from the Perspective of Bangladesh. Available at SSRN 4341827.

14. Bhuiyan, M. R. I. (2023). The Challenges and Opportunities of Post-COVID Situation for Small and Medium Enterprises (SMEs) in Bangladesh. PMIS Review, 2(1), 141-159.

15. Bhuiyan, M. R. I., Islam, M. T., Alam, S. A., & Sumon, N. S. (2023). Identifying Passengers Satisfaction in Transportation Quality: An Empirical Study in Bangladesh. PMIS Review, 2(1), 27-46.

16. Bhuiyan, M. R. I., Uddin, K. S., & Milon, M. N. U. (2023). Prospective Areas of Digital Economy: An Empirical Study in Bangladesh.

17. Bhuiyan, M. R. I., Uddin, K. S., & Milon, M. N. U. (2023). Prospective Areas of Digital Economy in the Context of ICT Usages: An Empirical Study in Bangladesh. FinTech, 2(3), 641-656.

18. Black, S., Biderman, S., Hallahan, E., Anthony, Q., Gao, L., Golding, L., ... & Weinbach, S. (2022). Gpt-neox-20b: An open-source autoregressive language model. arXiv preprint arXiv:2204.06745.

https://doi.org/10.48550/arXiv.2204.06745

19. Chaudhry, I. S., Sarwary, S. A. M., El Refae, G. A., & Chabchoub, H. (2023). Time to Revisit Existing Student's Performance Evaluation Approach in Higher Education Sector in a New Era of ChatGPT—A Case Study. Cogent Education, 10(1), 2210461. https://doi.org/10.1080/2331186X.2023.2210461

20. Chopra, A. (2023). How does the collaboration between a Human Comic and Generative Artificial Intelligence Enhance Audience Engagement, Satisfaction, and Perception of Humor

in Live Performance Comedy? (Doctoral dissertation, New York University Tandon School of Engineering).

21. Clark, L. (2022). Towards “creativity amplification”: Or, AI for writers, or beating the system. Writing in Practice, (7).
22. de Winter, J. C. (2023). Can ChatGPT pass high school exams on English language comprehension. Researchgate. Preprint.
23. Dwivedi, A. (2023). USE OF AI IN THE FIELD OF COMPUTER SCIENCE TEACHING AND RESEARC. International Journal of Scientific Research in Modern Science and Technology, 2(1), 08-16.
24. Dwivedi, A. (2023). USE OF AI IN THE FIELD OF COMPUTER SCIENCE TEACHING AND RESEARC. International Journal of Scientific Research in Modern Science and Technology, 2(1), 08-16.
25. Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., ... & Wright, R. (2023). “So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. International Journal of Information Management, 71, 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642
26. Firaina, R., & Sulisworo, D. (2023). Exploring the usage of ChatGPT in higher education: Frequency and impact on productivity. Buletin Edukasi Indonesia, 2(01), 39-46. https://doi.org/10.56741/bei.v2i01.310
27. Floridi, L., Chiriatti, M. GPT-3: Its Nature, Scope, Limits, and Consequences. Minds & Machines 30, 681–694 (2020). https://doi.org/10.1007/s11023-020-09548-1
28. George, A. S., & George, A. H. (2023). A review of ChatGPT AI's impact on several business sectors. Partners Universal International Innovation Journal, 1(1), 9-23. https://doi.org/10.5281/zenodo.7644359
29. 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. https://doi.org/10.2196/45312
30. Gliwa, B., Mochol, I., Biesek, M., & Wawer, A. (2019). SAMSum corpus: A human-annotated dialogue dataset for abstractive summarization. arXiv preprint arXiv:1911.12237.

https://doi.org/10.18653/v1/D19-5409

31. Gouvi, S. A. P. M. M., Lavidas, K., & Komis, V. (2023). The use of ChatGPT as a learning tool to improve foreign language writing in a multilingual and multicultural classroom. DOI: 10.25082/AMLER.2023.02.009
32. Guerra, J. M. M., Danvila-del-Valle, I., & Méndez-Suárez, M. (2023). The impact of digital transformation on talent management. Technological Forecasting and Social Change, 188, 122291. https://doi.org/10.1016/j.techfore.2022.122291
33. Guo, D., Chen, H., Wu, R., & Wang, Y. (2023). AIGC challenges and opportunities related to public safety: a case study of ChatGPT. Journal of Safety Science and Resilience, 4(4), 329-339. https://doi.org/10.1016/j.jnlssr.2023.08.001
34. Haddaway, N. R., Page, M. J., Pritchard, C. C., & McGuinness, L. A. (2022). PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis Campbell Systematic Reviews, 18, e1230. https://doi.org/10.1002/cl2.1230
35. Hadi, M. U., Qureshi, R., Shah, A., Irfan, M., Zafar, A., Shaikh, M. B., ... & Mirjalili, S. (2023). Large language models: a comprehensive survey of its applications, challenges, limitations, and future prospects. https://doi.org/10.36227/techrxiv.23589741.v42.
36. Haleem, A., Javaid, M., & Singh, R. P. (2022). An era of ChatGPT as a significant futuristic support tool: A study on features, abilities, and challenges. BenchCouncil transactions on

benchmarks, standards and evaluations, 2(4), 100089. https://doi.org/10.1016/j.tbench.2023.100089

37. Haque, M. U., Dharmadasa, I., Sworna, Z. T., Rajapakse, R. N., & Ahmad, H. (2022). " I think this is the most disruptive technology": Exploring Sentiments of ChatGPT Early Adopters using Twitter Data. arXiv preprint arXiv:2212.05856. https://doi.org/10.48550/arXiv.2212.05856

38. Hockly, N., & Dudeney, G. (2018). Current and future digital trends in ELT. Relc Journal, 49(2), 164-178. https://doi.org/10.1177/0033688218777318

39. Hodzic, E., Hasbun, R., Granillo, A., Tröscher, A. R., Wagner, H., von Oertzen, T. J., & Wagner, J. N. (2023). Steroids for the treatment of viral encephalitis: a systematic literature review and meta-analysis. Journal of Neurology, 1-13. https://doi.org/10.1007/s00415-023-11715-0

40. Huallpa, J. J. (2023). Exploring the ethical considerations of using Chat GPT in university education. Periodicals of Engineering and Natural Sciences, 11(4), 105-115.

DOI: http://dx.doi.org/10.21533/pen.v11i4.3770

41. Islam, M. N., & Rahman, M. H. (2022). Questioning the Crisis of “Rohingya Muslim” Ethnic Minority Beyond the Foreign Policy of Bangladesh and Myanmar. Rohingya Refugee Crisis in Myanmar: Ethnic Conflict and Resolution, 135-171.

42. Islam, M.A., Bhuiyan, M. R. I. (2022). Digital Transformation and Society, Chapter 5, In book: Management Information Systems and Digitalization: Current Status and Future Trends Edition: 1, Publisher: Dhaka University Press. DOI: http://dx.doi.org/10.2139/ssrn.4604376

43. Javaid, M., Haleem, A., Singh, R. P., Khan, S., & Khan, I. H. (2023). Unlocking the opportunities through ChatGPT Tool towards ameliorating the education system. BenchCouncil Transactions on Benchmarks, Standards and Evaluations, 3(2), 100115. https://doi.org/10.1016/j.tbench.2023.100115

44. Khanom, K., Islam, M. T., Hasan, A. A. T., Sumon, S. M., & Bhuiyan, M. R. I. (2022). Worker Satisfaction in Health, Hygiene and Safety Measures Undertaken by the Readymade Garments Industry of Bangladesh: A Case Study on Gazipur. Journal of Business Studies 3(1):93-105. DOI: http://dx.doi.org/10.58753/jbspust.3.1.2022.6

45. Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). Exploring generative artificial intelligence preparedness among university language instructors: A case study. Computers and Education: Artificial Intelligence, 5, 100156. https://doi.org/10.1016/j.caeai.2023.100156

46. Koubaa, A., Boulila, W., Ghouti, L., Alzahem, A., & Latif, S. (2023). Exploring ChatGPT Capabilities and Limitations: A Survey. IEEE Access. https://doi.org/10.1109/ACCESS.2023.3326474

47. Lancaster, T. (2023). Artificial intelligence, text generation tools and ChatGPT–does digital watermarking offer a solution?. International Journal for Educational Integrity, 19(1), 10. DOI: https://doi.org/10.1007/s40979-023-00131-6

48. Land, M. K., & Aronson, J. D. (2020). Human rights and technology: new challenges for justice and accountability. Annual Review of Law and Social Science, 16, 223-240. https://doi.org/10.1146/annurev-lawsocsci-060220- 081955.

49. Lee, Y. J., Lim, C. G., Choi, Y., Lm, J. H., & Choi, H. J. (2022, October). PERSONACHATGEN: Generating personalized dialogues using GPT-3. In Proceedings of the 1st Workshop on Customized Chat Grounding Persona and Knowledge (pp. 29-48). https://aclanthology.org/2022.ccgpk-1.4

50. Li, C., & Xing, W. (2021). Natural language generation using deep learning to support MOOC learners. International Journal of Artificial Intelligence in Education, 31, 186-214. DOI: https://doi.org/10.1007/s40593-020-00235-x

51. Limna, P., Kraiwanit, T., Jangjarat, K., Klayklung, P., & Chocksathaporn, P. (2023). The use of ChatGPT in the digital era: Perspectives on chatbot implementation. Journal of Applied Learning and Teaching, 6(1). DOI: https://doi.org/10.37074/jalt.2023.6.1.32

52. Liu, S., & Healey, C. G. (2023). Abstractive Summarization of Large Document Collections Using GPT. arXiv preprint arXiv:2310.05690. https://doi.org/10.48550/arXiv.2310.05690

53. Liu, X., Zheng, Y., Du, Z., Ding, M., Qian, Y., Yang, Z., & Tang, J. (2023). GPT understands, too. AI Open. https://doi.org/10.1016/j.aiopen.2023.08.012

54. López-Sorribes, S., Rius-Torrentó, J., & Solsona-Tehàs, F. (2023). A Bibliometric Review of the Evolution of Blockchain Technologies. Sensors, 23(6), 3167. https://doi.org/10.3390/s23063167

55. Lund, B. D., & Wang, T. (2023). Chatting about ChatGPT: how may AI and GPT impact academia and libraries?. Library Hi Tech News, 40(3), 26-29. https://doi.org/10.1108/LHTN-01-2023-0009

56. Lv, Y., Duan, Y., Kang, W., Li, Z., & Wang, F. Y. (2014). Traffic flow prediction with big data: A deep learning approach. IEEE Transactions on Intelligent Transportation Systems, 16(2), 865-873. DOI: 10.1109/TITS.2014.2345663

57. M Alshater, M. (2022). Exploring the role of artificial intelligence in enhancing academic performance: A case study of ChatGPT. Available at SSRN. https://dx.doi.org/10.2139/ssrn.4312358

58. Makhdum, N., Islam, N., Rumi, M. H., & Rashid, M. H. (2022). Knowledge, attitude and practice of rural people on antibiotic usage: Bangladesh perspective. Journal of Health Management, 24(2), 213-221.

59. Makhdum, N., Rumi, M. H., & Islam, N. (2022). Measuring Quality of Public Participation in the Local Government of Bangladesh. Journal of Public Administration and Governance, 12(1), 114-114.

60. Markel, J. M., Opferman, S. G., Landay, J. A., & Piech, C. (2023). GPTeach: Interactive TA Training with GPT Based Students. https: //doi.org/10.1145/3573051.3593393

61. Matenga, A. E., & Mpofu, K. (2023). Blockchain-based Product Lifecycle Management using Supply Chain Management for Railcar Remanufacturing. Procedia CIRP, 116, 486-491. https://doi.org/10.1016/j.procir.2023.02.082

62. Meah, M. R., & Hossain, R. (2023). Ownership Structure and Auditor Choice in Emerging Economy: An Empirical Study. Indonesian Journal of Business, Technology and Sustainability, 1(1), 12-22.

63. Obaid, O. I. (2023). From Machine Learning to Artificial General Intelligence: A Roadmap and Implications. Mesopotamian Journal of Big Data, 2023, 81-91. https://doi.org/10.58496/MJBD/2023/012

64. Oridi, F. I., Uddin, M. S., Faisal-E-Alam, M., & Husain, T. (2022). Prevailing factors of rural women entrepreneurship in Bangladesh: evidence from handicraft business. Journal of Global Entrepreneurship Research, 12(1), 305-318.

65. Peng, B., Zhu, C., Li, C., Li, X., Li, J., Zeng, M., & Gao, J. (2020). Few-shot natural language generation for task-oriented dialog. arXiv preprint arXiv:2002.12328. https://doi.org/10.48550/arXiv.2002.12328

66. Rahman, M. M., & Husain, T. (2022). Structural barriers to providing basic education to Rohingya children in the Kutupalong refugee camp, Cox's Bazar, Bangladesh. International Journal of Educational Research Open, 3, 100159.

67. Raj, R., Singh, A., Kumar, V., & Verma, P. (2023). Analyzing the potential benefits and use cases of ChatGPT as a tool for improving the efficiency and effectiveness of business operations. BenchCouncil Transactions on Benchmarks, Standards and Evaluations, 3(3), 100140. https://doi.org/10.1016/j.tbench.2023.100140

68. Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, F., Ladeira, W. J., ... & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. Journal of Applied Learning and Teaching, 6(1). DOI: http://journals.sfu.ca/jalt/index.php/jalt/index.

69. Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. Internet of Things and Cyber-Physical Systems. https://doi.org/10.1016/j.iotcps.2023.04.003

70. Remountakis, M., Kotis, K., Kourtzis, B., & Tsekouras, G. E. (2023). ChatGPT and Persuasive Technologies for the Management and Delivery of Personalized Recommendations in Hotel Hospitality. arXiv preprint arXiv:2307.14298. https://doi.org/10.48550/arXiv.2307.14298

71. Ren, C., Lee, S. J., & Hu, C. (2023). Assessing the efficacy of ChatGPT in addressing Chinese financial conundrums: An in-depth comparative analysis of human and AI-generated responses. Computers in Human Behavior: Artificial Humans, 1(2), 100007. https://doi.org/10.1016/j.chbah.2023.100007

72. Roumeliotis, K. I., & Tselikas, N. D. (2023). ChatGPT and Open-AI Models: A Preliminary Review. Future Internet, 15(6), 192. https://doi.org/10.3390/fi15060192

73. Rumi, M. H., Makhdum, N., Rashid, M. H., & Muyeed, A. (2021). Patients' satisfaction on the service quality of upazila health complex in Bangladesh. Journal of Patient Experience, 8, 23743735211034054.

74. Rumi, M. H., Rashid, M. H., Makhdum, N., & Nahid, N. U. (2020). Fourth industrial revolution in Bangladesh: prospects and challenges. Asian Journal of Social Sciences and Legal Studies, 2(5), 104-114.

75. Sharma, S., & Yadav, R. (2022). Chat GPT–A Technological Remedy or Challenge for Education System. Global Journal of Enterprise Information System, 14(4), 46-51. https://www.gjeis.com/index.php/GJEIS/article/view/698

76. Shihab, S. R., Sultana, N., & Samad, A. (2023). Revisiting the use of ChatGPT in Business and Educational Fields: Possibilities and Challenges. BULLET: Jurnal Multidisiplin Ilmu, 2(3), 534-545. https://journal.mediapublikasi.id/index.php/bullet/article/view/2761

77. Sudirjo, F., Diantoro, K., Al-Gasawneh, J. A., Azzaakiyyah, H. K., & Ausat, A. M. A. (2023). Application of ChatGPT in Improving Customer Sentiment Analysis for Businesses. Jurnal Teknologi Dan Sistem Informasi Bisnis, 5(3), 283-288. DOI: https://doi.org/10.47233/jteksis.v5i3.871

78. Surameery, N. M. S., & Shakor, M. Y. (2023). Use chat gpt to solve programming bugs. International Journal of Information Technology & Computer Engineering (IJITC) ISSN: 2455-5290, 3(01), 17-22. https://doi.org/10.55529/ijitc.31.17.22

79. Tasnim, Z., Shareef, M. A., Baabdullah, A. M., Hamid, A. B. A., & Dwivedi, Y. K. (2023). An Empirical Study on Factors Impacting the Adoption of Digital Technologies in Supply Chain Management and What Blockchain Technology Could Do for the Manufacturing Sector of Bangladesh. Information Systems Management, 1-23. https://doi.org/10.1080/10580530.2023.2172487

80. Whaiduzzaman, M., Barros, A., Chanda, M., Barman, S., Sultana, T., Rahman, M. S., Roy, S., & Fidge, C. (2022). A Review of Emerging Technologies for IoT-Based Smart Cities. Sensors (Basel, Switzerland), 22(23), 9271. https://doi.org/10.3390/s22239271

81. Wu, T., He, S., Liu, J., Sun, S., Liu, K., Han, Q. L., & Tang, Y. (2023). A brief overview of ChatGPT: The history, status quo and potential future development. IEEE/CAA Journal of Automatica Sinica, 10(5), 1122-1136. DOI: 10.1109/JAS.2023.123618

82. Yazdani, D. M. N. A., Rahman, M. A., Ahmed, S. S., Waliullah, T. H., Salahin, K., Mahfuz, S. A., & Abir, T. (2020). An Empirical Analysis on Consumer's Perception, Attitude and Adoptability of SMS Advertising: Bangladesh Perspective.

83. Zhang, C., Zhang, C., Li, C., Qiao, Y., Zheng, S., Dam, S. K., ... & Hong, C. S. (2023). One small step for generative ai, one giant leap for agi: A complete survey on chatgpt in aigc era. arXiv preprint arXiv:2304.06488. https://doi.org/10.48550/arXiv.2304.06488

84. Zhang, H., Liu, Z., Xiong, C., & Liu, Z. (2019). Grounded conversation generation as guided traverses in commonsense knowledge graphs. arXiv preprint arXiv:1911.02707. https://doi.org/10.48550/arXiv.1911.02707