ChatGPT
A Review on Evolution, Fields of Applications and Potential Effects

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Abstract: Automation in every sector is increasing with the emergence of various artificial intelligence (AI) based tools. Amongst, ChatGPT have been innovated as new open ended webtool to serve such needs. As a large language model, ChatGPT have the potential to understand and generate text in a wide range of subjects and languages. It can be used to answer questions, provide explanations, write essays, translate languages, and even generate creative writing, among other tasks. Its scope depends on the quality and quantity of the data it have been trained on and the algorithms that power its operation. As an AI language model, ChatGPT have the potential to bring significant benefits to society. ChatGPT can provide fast and accurate responses to queries, offer personalized recommendations, and help people access information and services more easily. It can also help bridge language barriers, enabling communication across borders and cultures.

Additionally, it can assist in research and development in various fields such as medicine, finance, and engineering. While ChatGPT have a lot of potential, there are also some limitations to its abilities. For example, ChatGPT is not capable of understanding the nuances of human emotion or cultural context the way humans can. This means that its responses may sometimes lack empathy or sensitivity, furthermore, it may not always be able to provide accurate or appropriate responses. Additionally, ChatGPT can only generate responses based on the data it has been trained on, which may include biases or inaccuracies. Finally, ChatGPT cannot create original ideas or thoughts that go beyond the data it have been trained on. The text provided here reviews the introduction of ChatGPT and history, its social roles and limitations.

INTRODUCTION

AI is a branch of computer wisdom that focuses on creating intelligent machines that can suppose and act like humans. AI systems are designed to learn from their terrain and make opinions grounded on the data they admit. AI can be used to break complex problems, similar as medical opinion, independent vehicles, and natural language processing. also, it can also help to reduce the original and functional costs of information systems, electrical systems (Wang et al., 2018), and client service (Daqar and Smoundy, 2019).

OpenAI is an artificial intelligence research laboratory consisting of a team of researchers and engineers working on developing cutting-edge AI technologies. The organization was founded in 2015 by a group of entrepreneurs and scientists, including Elon Musk, Sam Altman, and Greg Brockman. OpenAI conducts research in a variety of fields such as machine learning, natural language processing, robotics, and computer vision. The organization is dedicated to advancing artificial intelligence in a safe and beneficial manner, and its research has been published in top-tier academic conferences and journals. OpenAI has also developed several AI-based tools and products, including the GPT language models, which are widely used in natural language processing applications.

OpenAI is an artificial intelligence research organization that was founded in 2015. The organization is focused on developing cutting-edge AI technologies that can help to solve some of the world's most pressing problems. One of their most well-known achievements is the development of the GPT (Generative Pre-trained Transformer) language model series, including the latest iteration GPT-3.5. ChatGPT is a large language model developed by OpenAI that is based on the GPT-3.5 architecture. It has been trained on a vast amount of text data and is capable of generating human-like responses to a wide variety of natural language prompts. ChatGPT has been used in a variety of applications, including chatbots, virtual assistants, and customer service tools. Its sophisticated language processing capabilities make it well-suited for a range of natural language processing tasks.

ChatGPT, the large language model developed by OpenAI, is at the forefront of the artificial intelligence (AI) revolution. With its ability to understand natural language and generate human-like responses, ChatGPT is changing the way we interact with machines. ChatGPT can understand and generate text in multiple languages, making it a versatile tool for communication and information retrieval. However, it's important to note that ChatGPT is not a substitute for professional advice or expertise in any particular field. Its responses should be considered as general information only, and users should always seek out professional advice for specific concerns.

As the field of AI continues to develop, ChatGPT is likely to become even more advanced. It may be able to understand and respond to more complex language, and even develop a sense of empathy and emotional intelligence. This could have significant implications for human society.

HISTORY AND EVOLUTION OF ChatGPT

As an AI language model, ChatGPT is part of the larger trend towards the development of artificial intelligence and machine learning technologies. The specific architecture of ChatGPT is based on the GPT-3.5 model, which is a refinement of the GPT-3 model developed by OpenAI. The development of ChatGPT can be traced back to the early days of natural language processing (NLP), when researchers first began exploring the possibility of using computers to understand and respond to human language. In the 1950s and 1960s, early pioneers such as Alan Turing and John McCarthy laid the foundations for modern artificial intelligence, including NLP. Over the next several decades, researchers continued to refine NLP techniques, developing new algorithms and models for parsing, analyzing, and generating human language. In recent years, the development of deep learning algorithms and the availability of large amounts of training data have greatly advanced the field of NLP, leading to breakthroughs in tasks such as language translation, sentiment analysis, and chatbot development.

The GPT (Generative Pre-trained Transformer) series of language models, of which ChatGPT is a part, was developed by OpenAI to address some of the limitations of earlier NLP models. The GPT models use transformer architectures to process text, allowing for the generation of highly accurate and contextually appropriate responses to user queries. ChatGPT specifically was trained on a massive corpus of text from the internet, which allowed it to learn a wide range of patterns and structures in human language. Its evolution has been marked by ongoing refinement and updates to its architecture and training data, as well as the development of new tools and techniques for fine-tuning its responses to specific applications and domains. As AI and NLP continue to advance, it is likely that ChatGPT and other language models will continue to evolve and improve, leading to new possibilities for human-machine interaction and communication.

ChatGPT, GOOGLE AND ALEXA

ChatGPT, Google Assistant, and Alexa are all language models designed to understand and respond to user queries. However, there are some differences between them:

3.1 Training Data: ChatGPT has been trained on a large corpus of text data, whereas Google and Alexa are based on a combination of machine learning and rule-based systems.

3.2 Open-ended Conversations: ChatGPT is designed to have open-ended conversations with users, whereas Google and Alexa are designed to provide specific answers to user queries.

3.3 Personalization: ChatGPT can provide personalized responses to users based on their previous conversations, whereas Google and Alexa can only provide responses based on the current query.

3.4 Language Capabilities: ChatGPT is designed to understand and respond to a wide range of languages and dialects, whereas Google and Alexa are primarily designed for English-speaking users.

3.5 Accessibility: ChatGPT is a public language model that anyone can access and use, whereas Google and Alexa are primarily available through their respective platforms and devices.

Overall, while all three language models share some similarities, ChatGPT's open-ended nature, personalized responses, and multilingual capabilities make it a unique and powerful tool for conversational AI.

HOW TO USE CHATGPT ?

To use ChatGPT, simply ask it a question or start a conversation on any topic. ChatGPT is designed to respond with natural language in a conversational style, just like a human would. Here are some steps you can follow to use ChatGPT effectively:

1. Think of a question or topic that you would like to discuss.
2. Type your question or topic into the chat window (Fig. 1)
3. ChatGPT will generate a response based on its training data and algorithms.
4. Read the response and continue the conversation by asking follow-up questions or providing additional information.
5. Keep the conversation going as long as you like, exploring different topics and asking for more information.
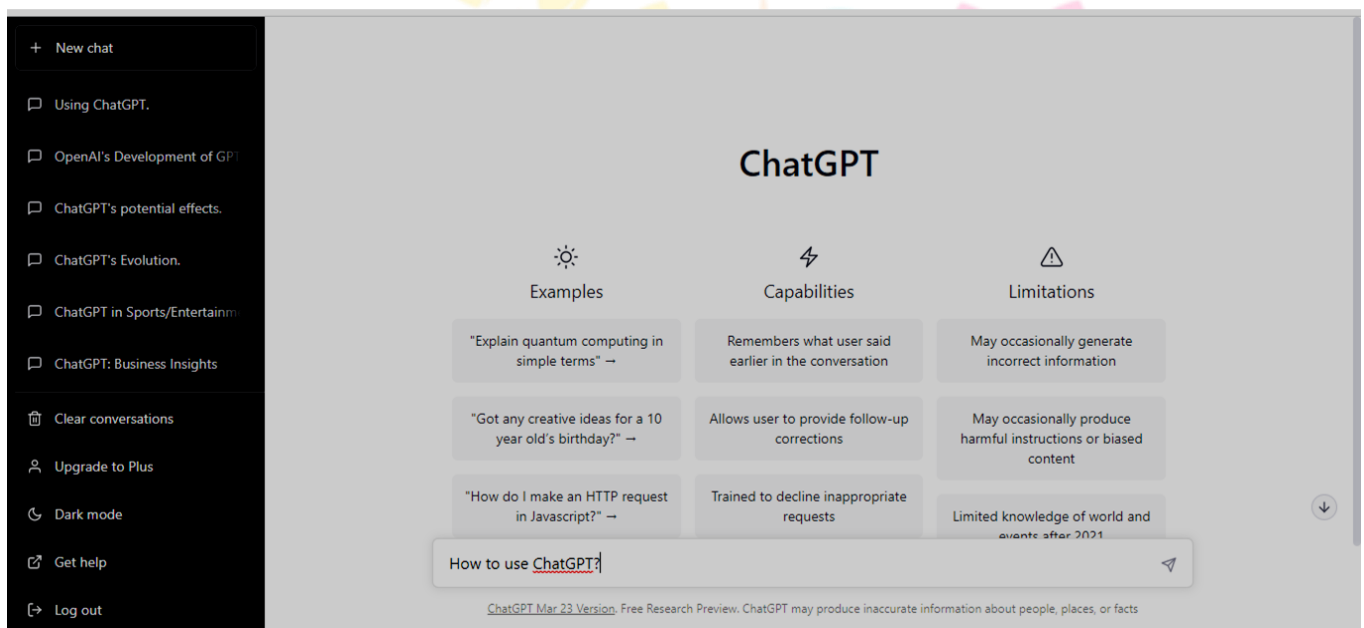

Fig. 1 Dashboard frontpage of ChatGPT website https://chat.openai.com

Note that ChatGPT is a language model and can only provide responses based on the data it has been trained on. While it can generate helpful and informative responses, it may not always be accurate or provide the exact answer you are looking for.

SCOPE OF ChatGPT

As an AI language model, the scope of ChatGPT is vast and covers a wide range of topics, including but not limited to:

5.1 General knowledge and trivia

As an AI language model, ChatGPT is capable of processing and providing information on a wide range of topics, including general knowledge and trivia. ChatGPT can provide information on various subjects, including history, geography, science, politics, and more.

ChatGPT can also assist in expanding one's general knowledge and trivia by answering questions, providing explanations, and suggesting related topics for further exploration. With its vast database of information and ability to understand and analyze natural language, ChatGPT can help users learn new information and improve their general knowledge and trivia.

However, it is essential to keep in mind that ChatGPT's knowledge is based on the data it has been trained on, and its responses are limited to that scope. Therefore, users should always verify information from other sources and use critical thinking when evaluating ChatGPT's responses.

5.2 History and culture

As a language model, ChatGPT has access to a vast amount of information and can provide insights on various topics, including history and culture. ChatGPT has been trained on a wide range of historical and cultural texts, allowing me to provide information on various historical events, movements, and figures, as well as cultural practices, traditions, and values.

ChatGPT can also provide perspectives on the intersection of history and culture, such as how cultural movements have shaped historical events and how historical events have influenced cultural practices. Additionally, it can provide information on the history and culture of specific regions or countries, including their art, music, literature, cuisine, and customs.While it can provide general information and insights on history and culture, it's important to note that its knowledge cutoff is in 2021. Therefore, any events, developments, or cultural phenomena that have occurred after that date may not be within its scope of knowledge.

5.3 Science and technology

As an AI language model, ChatGPT has been trained on a vast amount of text data, including scientific and technical literature. Therefore, ChatGPT can provide assistance on various scientific and technological topics. ChatGPT can provide insights into scientific theories, principles, and concepts across a wide range of disciplines, including physics, chemistry, biology, and earth science. It can also provide explanations on engineering, computer science, and technology-related topics such as artificial intelligence, machine learning, and robotics. Moreover, ChatGPT can assist in answering questions related to research methodology, experimental design, data analysis, and statistical inference. It can help with scientific writing, including the preparation of research papers, reports, and presentations.

However, it is important to note that ChatGPT is an AI language model and cannot replace human experts in scientific research and technology. Its responses are based on the patterns found in the text data it has been trained on, and its accuracy may vary depending on the specific context and the quality of the input.

5.4 Mathematics and statistics

As an AI language model, ChatGPT is capable of answering a wide range of questions related to mathematics and statistics. Some examples of the types of questions it can answer include:

5.4.1   **Calculus:** Derivatives, integrals, limits, series, differential equations, etc.

5.4.2   **Linear algebra:** Matrix operations, determinants, eigenvectors and eigenvalues, vector spaces, etc.

5.4.3   **Probability theory:** Probability distributions, random variables, expected values, conditional probability, etc.

5.4.4   **Statistics:** Hypothesis testing, confidence intervals, regression analysis, ANOVA, chi-square tests, etc.

5.4.5   **Geometry:** Euclidean geometry, trigonometry, analytic geometry, topology, etc.

5.4.6   **Number theory:** Prime numbers, divisibility, modular arithmetic, Diophantine equations, etc.

However, please note that my responses may not be perfect or complete, and that ChatGPT may not be able to provide solutions to extremely complex or specific problems. It's always a good idea to double-check any mathematical or statistical information you receive from any source, including me.

5.5 Literature and the arts

As a language model, ChatGPT is capable of generating responses and providing information on a wide range of topics, including literature and the arts. I can answer questions and provide information on various aspects of literature, such as authors, genres, styles, and literary movements, as well as different forms of art, such as painting, sculpture, music, and theater.

However, it is important to note that my responses on literature and the arts are based on my programming and training data, which includes a wide variety of sources, including books, articles, and websites. While I can provide general information and insights on these subjects, my responses may not always reflect the nuanced opinions and perspectives of individual authors or experts in the field.

5. 6 Politics and current events

As an AI language model, ChatGPT is designed to provide information and insights on a wide range of topics, including politics and current events. However, it is important to note that its responses are based on the data and information available to me up to the knowledge cutoff date of September 2021, and may not reflect the most up-to-date developments in politics and current events.

That being said, ChatGPT is capable of providing analysis and commentary on various political topics, including government policies, international relations, elections, and more. ChatGPT can also provide information on current events, such as breaking news stories, major events, and trends happening around the world.

However, it is important to note that my responses are based on data and information available to it and may not necessarily reflect the views of any particular political or ideological group. Additionally, as an AI language model, it does not have the ability to predict the future or provide certainty on future events or outcomes.

5.7 Health and medicine

As an AI language model, ChatGPT can provide information and insights on a wide range of topics, including health (Cappon et al., 2017; Charron and Gorey, 2021; Javaid et al., 2022; Aknin et al., 2022; Heidari et al., 2022, Saravanakumar et al., 2022; Malik Sallam, 2023) and medicine (Clauson et al., 2022). However, it is important to note that ChatGPT is not a substitute for medical advice or diagnosis from a qualified healthcare professional. In the context of health and medicine, ChatGPT can provide general information on topics such as:

1. Symptoms of common illnesses and diseases
2. Causes and risk factors of various health conditions
3. Treatment options and medications for specific conditions
4. Preventative measures and lifestyle changes to maintain good health
5. The latest medical research and advancements in healthcare

However, it is important to emphasize that ChatGPT is not qualified to provide personalized medical advice or treatment recommendations. If you have concerns about your health or a specific medical condition, it is recommended to consult with a healthcare professional who can evaluate your individual situation and provide appropriate guidance (Javaid et al., 2022).

5.8 Philosophy and ethics

As a language model, ChatGPT can provide information and insights on a wide range of topics, including philosophy and ethics (Chowdhury, 2023). However, it's important to note that ChatGPT's knowledge is based on the data it was trained on and its ability to generate responses based on patterns in that data.

Regarding philosophy, ChatGPT can provide information on various philosophical schools of thought, their origins, key figures, and contributions to philosophy. It can also discuss philosophical concepts such as metaphysics, epistemology, ethics, aesthetics, and logic (Chowdhury, 2023).   Regarding ethics, ChatGPT can provide information on different ethical theories such as consequentialism, deontology, and virtue ethics. It can also discuss ethical dilemmas and provide guidance on how to approach ethical decision-making in various contexts.

However, it's important to note that ChatGPT's responses should be taken as informational rather than authoritative or prescriptive. It's always best to consult with trained professionals or academic experts in the relevant fields when seeking in-depth knowledge and guidance on philosophy and ethics.

5.9 Business and economics

As an AI language model, ChatGPT can provide information and insights on a wide range of topics (Fig. 2), including those related to business and economics. Some of the areas in which ChatGPT can be helpful in this regard include:

5.9.1   **Business Strategy:** ChatGPT can provide information on different business strategies and their pros and cons. It can also help with analyzing market trends and identifying potential opportunities and threats.

5.9.2   **Marketing and Advertising:** ChatGPT can help with developing marketing strategies, understanding consumer behavior, and creating effective advertisements.

5.9.3 Financial Analysis: ChatGPT can provide insights on financial analysis, including understanding financial statements, identifying key financial ratios, and evaluating investment opportunities.

5.9.4 Entrepreneurship: ChatGPT can assist with starting and growing a business, including creating a business plan, identifying funding sources, and understanding legal and regulatory requirements.

5.9.5 International Business: ChatGPT can provide insights on international business, including understanding cultural differences, identifying potential markets, and developing export strategies.
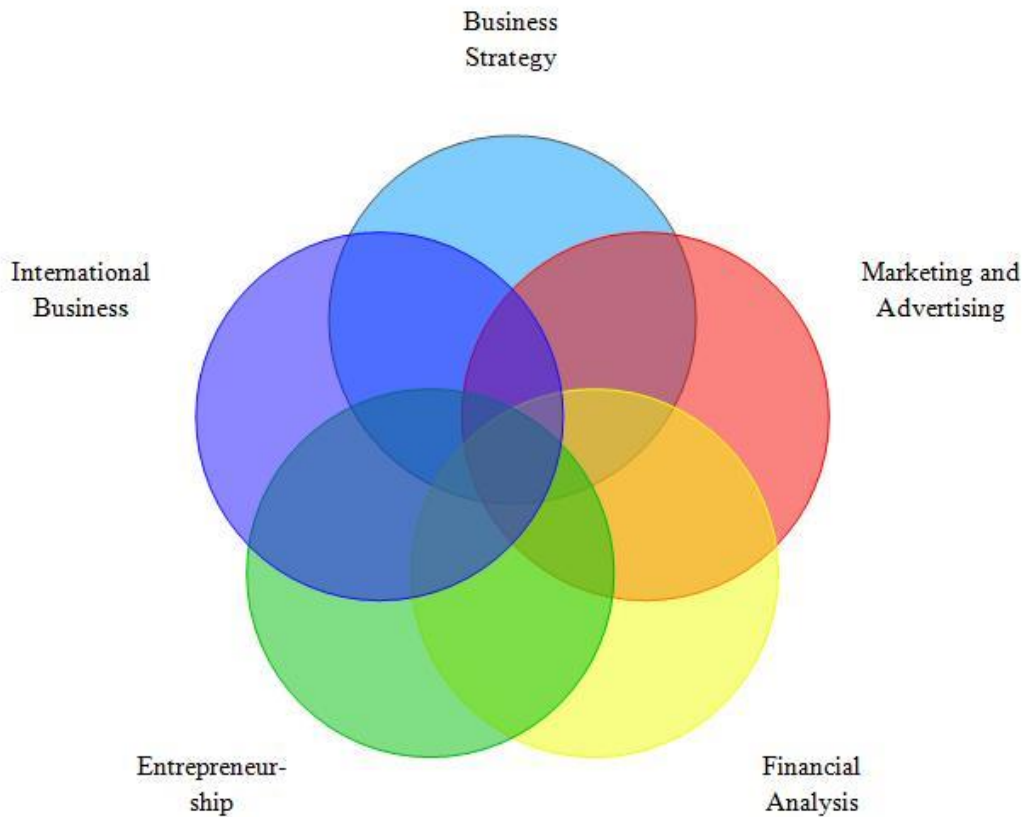

Fig. 2 Scope of ChatGPT in Business and Economics

Overall, ChatGPT can be a valuable resource for individuals and organizations seeking information and insights on business and economics.

5.10 Sports and entertainment

As an AI language model, ChatGPT can assist in answering questions and providing information related to sports and entertainment. One potential consequence of the development of ChatGPT and other advanced AI systems is the automation of many jobs. As machines become increasingly capable of performing tasks that were previously done by humans, many people may find themselves out of work. This could lead to significant social and economic disruptions.

Another potential consequence of the development of ChatGPT is the creation of new industries and job opportunities. As AI systems become more advanced, there may be a growing demand for people with the skills to design, develop, and maintain them. Some examples of how ChatGPT can be helpful in these fields include:

1. Providing information about sports teams, players, events, and statistics.

2. Offering recommendations for movies, TV shows, music, and other forms of entertainment.

3. Providing insights and analysis on sports games, matches, and tournaments.

4. Answering trivia questions related to sports and entertainment.

5. Generating content, such as articles or social media posts, related to sports and entertainment topics.

6. One of the most significant potential consequences of the development of ChatGPT is its impact on communication and relationships between humans. As machines become more human-like, people may begin to develop emotional connections with them. This could lead to a blurring of the line between humans and machines, raising questions about what it means to be human.

7. Additionally, as AI systems become more advanced, they may become better at predicting and influencing human behavior. This could have significant implications for areas such as marketing, politics, and social media (Whang et al., 2003; Aguiar-Castillo et al., 2021; Javaid et al., 2022; Soni et al., 2023). There is a risk that these systems could be used to manipulate people in ways that are harmful to them (Mäkitalo et al., 2020; Embarak et al., 2022).

However, it's important to note that ChatGPT's responses are based on the data it has been trained on, and its knowledge is limited to what has been inputted into the model. Additionally, ChatGPT is not a substitute for expert opinions or professional advice in these fields.

POTENTIAL EFFECTS OF ChatGPT ON HUMAN SOCIETY

As a language model, ChatGPT has the potential to affect human society in a number of ways (Deng qnd Lin, 2022, Haleem et al., 2022). Here are some possible effects (Fig. 3):

5.10.1 Improved communication: ChatGPT can help improve communication by providing accurate and relevant information in a timely manner. This could be especially beneficial in fields such as education, healthcare, and customer service.

5.10.2 Job displacement: As ChatGPT becomes more advanced, it could potentially displace some jobs that involve routine or repetitive tasks, such as data entry or customer support.

5.10.3 Bias amplification: If the data used to train ChatGPT is biased, it could amplify that bias and perpetuate social inequalities. Efforts must be taken to ensure that ChatGPT is trained on unbiased data and is designed to minimize bias.

5.10.4 Accessibility: ChatGPT could help make information more accessible to people who may have difficulty accessing it, such as those with disabilities or those who speak different languages.

5.10.5 Privacy concerns: As ChatGPT becomes more advanced, it may be able to generate highly personalized responses based on individual user data. This raises concerns about privacy and data protection.

5.10.6 Ethical considerations: As ChatGPT becomes more advanced and autonomous, there will be ethical considerations to take into account, such as accountability, transparency, and the potential for misuse.
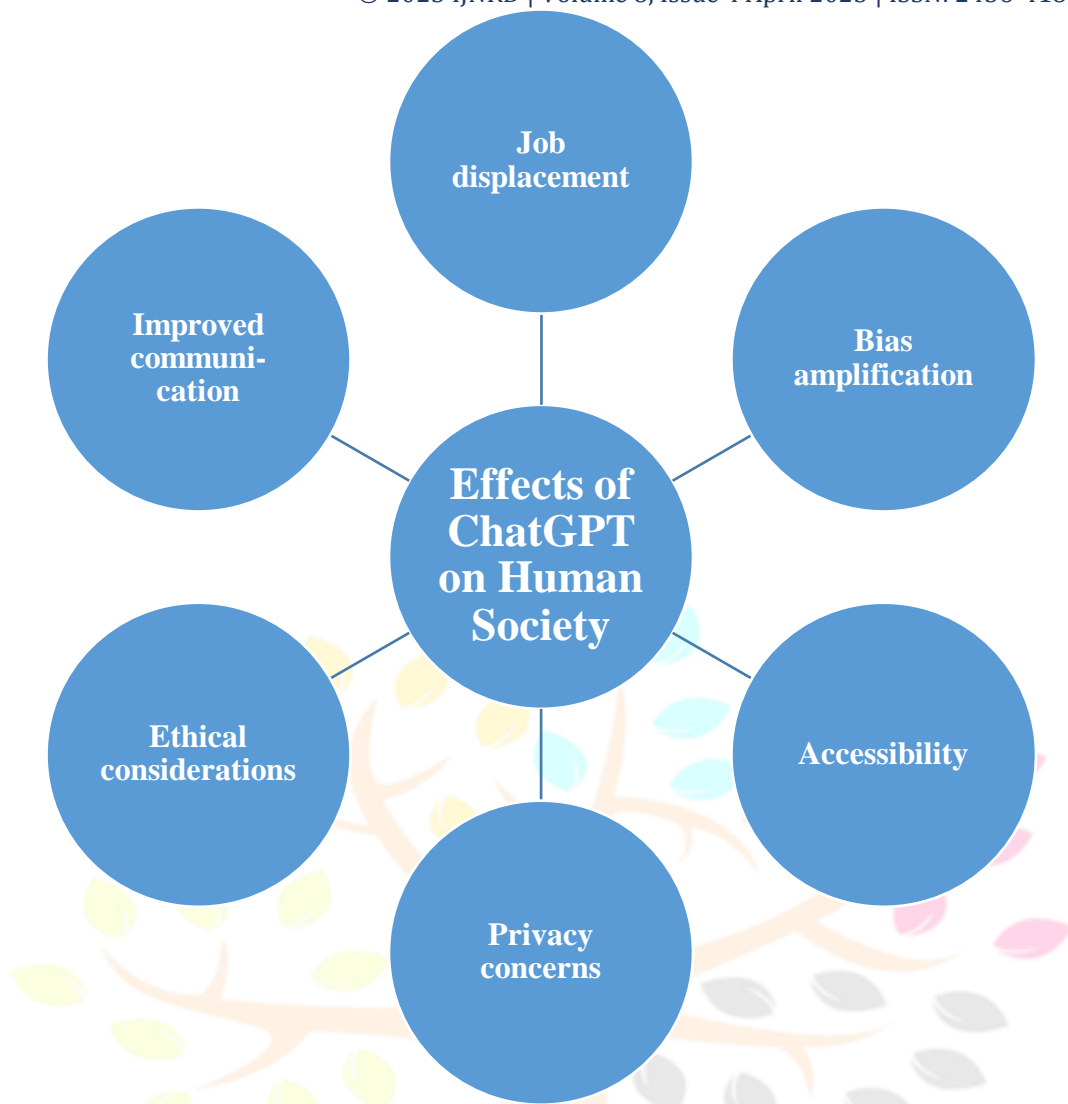
Fig. 3 Scope of ChatGPT in Business and Economics

Despite these potential consequences, the development of ChatGPT and other AI systems also presents many opportunities for positive change. These systems could be used to help solve some of the world's most pressing problems, such as climate change, poverty, and disease.

Overall, the impact of ChatGPT on human society will depend on how it is developed and used. It has the potential to bring significant benefits, but it is important to ensure that it is used in a responsible and ethical manner.

RISK MONITORING OF ChatGPT

As an AI language model, ChatGPT is not inherently exposed to physical or financial risks. However, there are still important risks that need to be monitored and managed to ensure the safe and effective operation of the model. One key risk is related to the data used to train and test the model (Helberger and Diakopoulos, 2023). It is important to ensure that the data used is diverse, representative, and unbiased to avoid any potential discrimination or other ethical concerns. Regular monitoring of the data sources and evaluation of the model's performance on new data can help mitigate this risk erecting laws and policies (Eliot, 2022; Helberger and Diakopoulos, 2023). Another important risk is related to the potential for the model to generate inappropriate or harmful responses. While ChatGPT is designed to provide helpful and informative responses, it is possible that the model could generate offensive or inappropriate content based on the input it receives. Regular monitoring of the conversations and feedback from users can help identify and address any issues that arise. Finally, it is important to monitor the security of the model and ensure that it is protected against potential hacking or other cyber threats. This includes regular updates to the software and security protocols, as well as ongoing monitoring and testing of the system. Overall, regular monitoring and risk management practices are essential to ensure the safe and effective operation of ChatGPT.

LIMITATIONS OF ChatGPT

As an AI language model, ChatGPT has some potential demerits (Deng and Lin, 2022). These limitations are appended below:

7.1 Bias: AI models like ChatGPT can perpetuate and amplify societal biases if not trained properly. This is because they learn from the language and data they are exposed to, which may contain biased or prejudiced views.

7.2 Limited Understanding: ChatGPT can only understand and respond to language-based input, and may not have a deep understanding of context or real-world situations beyond what it has learned from the data.

7.3 Lack of Emotion: ChatGPT does not have emotions or emotional intelligence, which means it may not be able to empathize with users or respond appropriately to emotional input.

7.4 Limited Creativity: While ChatGPT can generate responses and even creative content, it does not have true creativity in the way that humans do, as it is still limited to the patterns and data it has been trained on.

7.5 Technical Issues: Like any technology, ChatGPT can face technical issues, such as system crashes or incorrect responses due to errors in its programming or training data.

7.6 Privacy Concerns: As an AI model, ChatGPT requires access to large amounts of data, which may raise privacy concerns for some users who are uncomfortable sharing personal information.

7.7 Limited Expertise: ChatGPT may not have expertise in certain fields or subjects, which can limit its ability to provide accurate or helpful responses in those areas.

CONCLUSION

In conclusion, the development of ChatGPT and other advanced AI systems has the potential to bring about significant changes in human society. While these changes could be positive, there are also risks associated with the development of these systems. It is important for society to carefully consider the implications of AI and to work to ensure that these technologies are used in ways that benefit everyone.

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