



# A Study on Impact of ChatGPT Tool on Diverse Fields and Technologies

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**Abstract:** ChatGPT is a NextGen technology of a typical Chabot or a virtual assistant that can give an answer in a natural human language using advanced artificial intelligence. It is currently used in multiple areas like in educational institutions, business processes, customer service bots etc. This current article specifies about the working of ChatGPT, uses of ChatGPT in multiple areas in day-to-day tasks. This paper also discusses the advantages and disadvantages of ChatGPT. How can it be useful in terms of academics and many other potential uses of the model. We will also be discussing the regions in which this technology is still lacking behind and needs for further improvement and also the impact of this model on the world.

**Keywords:** Supervised FineTuning (SFT), Chatbot, ChatGPT, possesses, impact, reward model.

## I. INTRODUCTION

The user has been using Google assistant, Alexa and many other virtual assistants in our day-to-day life. But do you know what all these assistants are based on or how do they work? As we have seen recent buzz about a particular chatbot named “ChatGPT”, what is the origin? How is it going to revolutionize the future? What will be the impact of it on the human world? Is it a right time to use this chatbot in our day-to-day life as an alternative to a real human? How can it prove to itself by making itself better than a regular virtual assistant? Why is there that much buzz over the last few years on this particular AI? What is the position of ChatGPT in the current world to be studied in depth along with its. How can it be useful to students, teachers and many other business users? Can it replace the traditional methods which are used by many from decades?

What will be the role of ChatGPT in different sectors like Health sector, educational sector, Software sector and IT sector? Will it be a potential game changer or prove to be yet another tries which is not yet in a stage that can be relied on completely...?

### The Origin and Working of ChatGPT

Chatbot is a tool used for simple queries and has a pre-trained set of algorithms as for the questions asked by the user. It was mainly used as a simple assistant to direct people into the path they are intending to go for. Further development of this chatbot has resulted in the advanced AI chatbots

like ChatGPT. ChatGPT is simply a chatbot which does the job of question and answering by using advanced Artificial Intelligence to give more relevant and precise answer according to its previously trained knowledge. In ChatGPT, the term GPT stands for “Generative Pre-trained Transformer”. It is typically based on a transformer architecture. The transformer is the thing that does the job of taking in the question and answering it appropriately. These models are first trained and then they work on the basis of the previous training done to them. These models are capable of handling a large amount of text and also one that is in Natural human language. The current GPT-3 model has about 175 billion parameters by making it one of the biggest language models to ever exist. ChatGPT was first trained on a supercomputer that was based on Microsoft Azure platform. A large amount of data is first filled into the model and this makes it learn about different patterns of words, sentences and phrases. This training allows it to have a better grip over the natural human language allowing it to give the required output quickly. Since it learns from every conversation, it develops and gets smarter and smarter with a greater number of conversations with the user [1][2].

The **functioning of ChatGPT** can be divided down into number of steps. Firstly, the user inputs a prompt or query into the application. The model processes this input, which employs its knowledge of language patterns and associations to produce a response. The response is then reverted to the user, who can remain in the conversation or ask another question. This is



thod is totally trained by Reinforcement learning process from human response/feedback as shown in Figure 1.

- **SFT (Supervised Fine Tuning)**  
 Model: It is a supervised fine-tuning model where demonstration data is hoarded to train it.
- **RM Model:** The reward model will offer points to the SFT model output based on how appropriate the output is for users.
- **SFT Model via PPO:** SFT Policy is fine-tuned by reinforcement learning by letting it optimize the RM. PPO refers to fine-tuned model of proximal policy optimization [2][3].

by analysing the language used in the email.

**B) Software development**

There is a huge impact of ChatGPT on software development. It helps the developers to add Human Natural Language Processing into the applications which makes the applications more intuitive to use and easy to understand by the user. Apps capable of Natural language processing have gotten popular in the recent past.

Using ChatGPT, it is possible to create more chatbots which are even more capable and efficient than what ChatGPT already is. It can provide efficient solutions and codes for all the

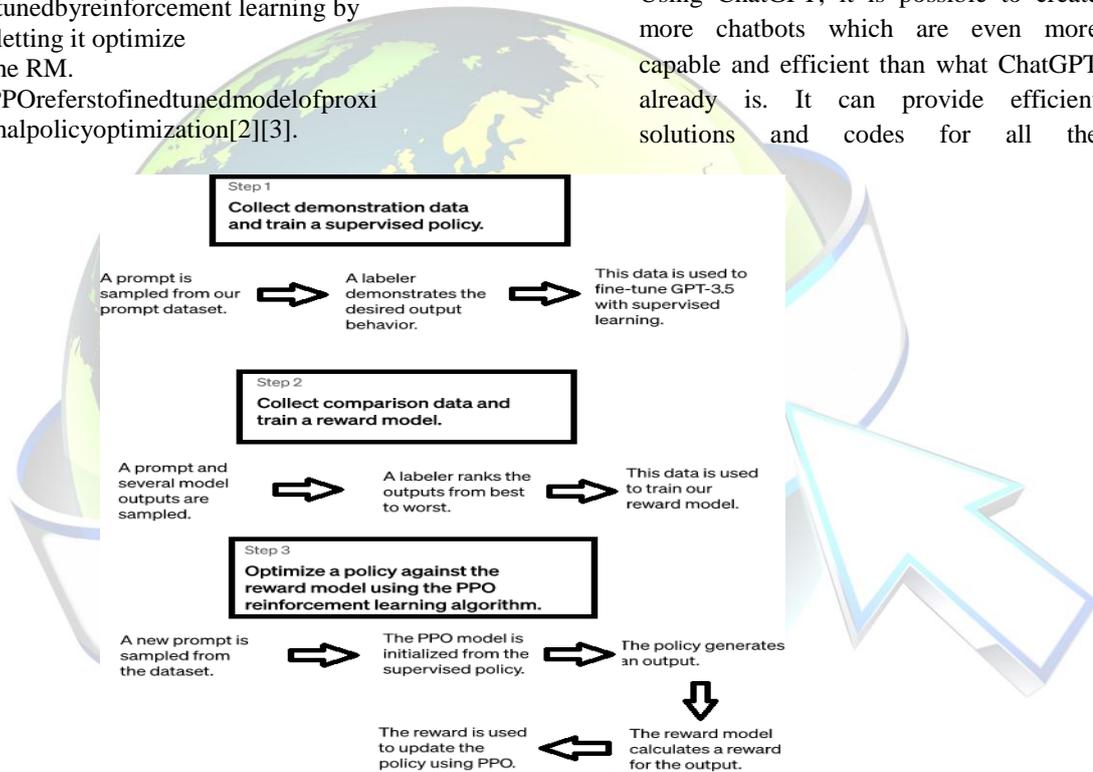


Figure 1: Typical ChatGPT flow of Working Properties of ChatGPT relevant to different fields

**A) Cyber security**

ChatGPT can be used to generate unique passwords which are better and secure. They are proved to be useful for detecting and preventing cyber-attacks. It can prevent by distinguishing codes which can cause a negative impact by analysing its language. It can also separate the fraudulent emails from the normal emails

applications. It has a potential to make new possibilities in software development by making things more intuitive and easier to use. And also, the coding skills shown by these chatbots is impeccable. It gives more efficient and useful codes which help save time in an organization [4][5].

**C) Employment opportunities**

ChatGPT has both negative and a positive impact on Jobs. On one hand it has increased the demand for the jobs in AI, Natural language processing. The demand for people who can work with



ChatGPT and other chatbots keeps on increasing. But it has created a negative impact by replacing humans in many of the customer service sectors because they are way more efficient and are quicker to answer any queries done by the user. And since it has no time constraints as a normal human has it can work 24/7 which proves to be efficient in a company's point of view. Therefore, it is true that chatbots might take up some jobs in its initial stages, it provides employment opportunities in other sectors and also has the potential to do work much efficiently and quickly.

#### **D) Consulting**

There was a considerable impact of ChatGPT over consulting. It gave an opportunity to the consultants to give more personalised client services using the chatbots like ChatGPT. Chatbots conduct many surveys and learn repetitively to give a personalized and relevant answers to the client. It analyses large sets of data and to provide more accurate advice to the clients. Chatbots in consulting have proved to be effective, quick and accurate. This creates opportunities for growth in the consulting industry.

#### **E) Information technology**

The impact of ChatGPT on the Information technology sector was remarkably high. Using ChatGPT collecting information for tasks has gotten easier thanks to its Natural language processing, the process has gotten much quicker easier and efficient to do. ChatGPT can also provide personalised and accurate results because of its previous training making it more intuitive to use. It has a good impact in terms of customer service too. It can give relevant answers quickly hence helping the company by decreasing the traffic of incoming cases. Many people can also use ChatGPT as an initial help desk to solve their problems accordingly. ChatGPT has proved to be effective to prevent cyber-attacks by identifying the threat beforehand. Hence it creates new opportunities in cyber security and data analysis also [6][7].

#### **F) Finance**

ChatGPT can be used in Finance to improve the experience of the costumer and also decreases the

costs for the company. It helps the costumers in common banking tasks by providing simple solutions quickly and efficiently by the previous records and history. It can also help in tasks like transferring of funds, checking account balance etc. This therefore results in increasing of customer satisfaction and saving of costs for the company.

### **ChatGPT's role in Education and to Academicians**

ChatGPT has played a vital role in terms of educational sector with its capabilities of Natural language processing, translating given text into user required language and many other capabilities by making it useful for many activities. It is evident that it is playing a vital role in educational sector making it useful for both students and teachers.

Students can use ChatGPT for gaining knowledge thanks to the capabilities of giving quick and reliable responses. Since, ChatGPT gives personalised answers to every individual student based on the past experiences making the answer easier to understand. This helps the student to get grip over a topic in a short time.

This AI can also create tests containing different questions for different students to minimise the copy factor. And also, it helps both teachers and students by correcting the assignments and tests and automatically giving grades to the students, which will alleviate the burden for the teacher.

It can also use the grades and past reports of the student to give a personalised attention to each and every student giving them customised training in a way that suits them the most creating an opportunity to the student to better understand the subject. It can also create individual chatbots which are intelligent enough to act as a personal tutor. This again creates a friendly learning space for students with full attention of ChatGPT's chatbots since it can monitor the students grades and academic performance [8].

ChatGPT can also give students many innovative projects making the students engaging towards the subject. This makes the otherwise boring task of completing a project more fun. I can also convert subjective and normally boring feeling subjects into much more engaging and fun to interact games and



activities which students will like and makes them learn the subject in an intuitive manner.

ChatGPT has many potential uses in a classroom. It can typically act as an English teacher. It is useful in improving the vocabulary since it can frame sentence on its own with the words given by the user. It will be useful for clarifying grammatical mistakes and provide assignments and questions to the students in an intuitive manner. It provides help by giving ideas for writing on a user defined theme. It can give an idea just by giving a theme as an input. It can also help you excel in terms of storytelling. Just by giving the beginning of the story or any insight of the story, ChatGPT can complete the story for you. It also helps in reading big paragraphs of text. By just giving the Paragraph as the input it can ask questions in such a way that, reading the questions can make the user understand the complete paragraph. It can also be used as a language translator. It acts as an accurate translation tool.

Particularly for math it can help students by providing extra practice problems. It helps students by clearing the doubts individually. It provides questions in a way that makes them interesting for students to solve. It provides tailored lessons to every individual based on their status and understanding capabilities. This personal attention helps students to get better in math. It also helps by creating interactive sessions. It has the capability of creating small groups of students which improves team work in students and also improving the child's knowledge in the background.

But even though having all the potential to do wonders in a classroom, ChatGPT is still not in a stage to replace a human teacher.

It is still in its early phase making to not so reliable about its answers. Many cases were found in which ChatGPT gave some incorrect answers. It is not possible to predict the answer it gives making it challenging to prevent incorrect answers.

### **Role of ChatGPT in health industry**

ChatGPT is a very useful tool in the health industry. ChatGPT helpful for both the patient and

the doctor. In the doctor's side it will be helpful because it can provide personalised assistance to them. It can provide the doctors with advices by making their lives easy. It can be used by doctors for quick information and reports of a particular patient since, it saves all the data and shows them when required. It can also act as a personal assistant for the doctor by giving them the required assistance quickly and efficiently.

For the patient's ChatGPT can be used for 24/7 monitoring of the patient. It can continuously record data and store it in a meaningful manner. That data can then be used by a professional to cure the patient. It can be helpful by giving small advices and instant cures to normal flus, infections etc. It can act as a personal advisor up to an extent. It can give a required fix by analysing the past medical history of the patient making the doctor's work easier. It can also develop systems which will be able to prevent diseases by detecting them and can provide solutions to them.

For instance, ChatGPT can be very much useful for diabetes patients. It can detect the changes in the body analyse it and provide them with a required assistance. This assistance helps them to have better control over their diabetes. It hence decreases the requirement of human care. This same assistance can be helpful for patients who are mentally ill. Personalised assistance can help them come out of that condition.

Normally a medicine or any vaccine for that matter is only approved after several thorough clinical trials. But it can prove to be very tough to find people of a particular age group willing for these trials. ChatGPT helps in finding the people of the required age group and medical complexions making them the perfect option to pick [9][10].

It can also be helpful for the insurance provider since it stores all the health care information of the patient, the insurance provider can check all the reports whenever and where ever needed.

### **Role of ChatGPT in Customer service**

Customer service is a sector which is mainly based on the customer satisfaction rating. In the past companies were using a basing diverting interface



which used to divert the call based on the inputs given by the customer. ChatGPT takes this procedure a step further [11][12].

ChatGPT is very much helpful thanks to its natural language processing it can give quick and easy replies to the customer's problems on its own rather than diverting it to a human representative. It can replace a customer service agent up to an extent by providing instant fixes to the customer's problems. It can also develop advanced software which can further be used for detecting the problems before hand and provides solutions for it. It can also create its own intelligent agents which can provide personalised solutions for individual customer problems.

Chatbots are also having an advantage in terms of availability. They are available whenever customer needs a help which is not possible by normal human representative. It also helps the company in terms of expenses since it can replace normal human representative which indeed saves costs.

Chatbots are also capable of handling multiple requests at a time saving the time of the company and also being able to solve a greater number of problems which normally would not be possible to do.

It also helps the business by taking in the customer surveys and feedbacks after a problem fixed. It is also capable of analysing the customer feedbacks and providing the company with a required analysed data which the company can use for further improvement.

It can also make a brief summary of a long conversation between a service representative and customer which can be helpful in a business point of view to improve the solutions next time [13][14].

### **Merits and Demerits of ChatGPT**

#### **Merits:**

- ChatGPT's standout feature is its Natural Language Processing (NLP), enabling it to understand user language effectively.
- NLP plays a crucial role in shaping the AI's responses,

making interactions more accurate and helpful.

- ChatGPT's NLP capabilities, including translation, speech analysis, and summarization, facilitate engaging and meaningful conversations with users in human-like language.
- ChatGPT is an advanced AI-powered chatbot capable of efficiently handling a large number of questions at once.
- Its scalability sets it apart from other chatbots, allowing it to intelligibly answer numerous queries simultaneously.
- ChatGPT is quick and seamless in responding to user questions, making it highly efficient in processing large amounts of data.
- ChatGPT is highly customizable, offering personalized features that users appreciate. It can be programmed to create fun and engaging experiences and even customize other AIs.
- Its valuable role in customer service is highlighted, as it can efficiently handle a wide range of user queries, surpassing the capabilities of a human agent. Its quick and meaningful responses enhance the user experience.
- ChatGPT serves as a versatile tool, acting as a language translator with swift and easy-to-use functionalities. Additionally, its ability to provide personalized responses and create task-specific chatbots makes it a valuable and convenient resource for users.
- ChatGPT is known for its quick responses and easy to use factor. It uses its past training and data to give a quick easily understandable and meaningful reply such that the user gets satisfied.
- It is efficient to use than having a human to do all the task. It can



work 24 hours 7 days a week 52 weeks round the year without seeking for a break which obviously a human representative would seek for.

- ChatGPT's capabilities can lead to significant cost savings for organizations by reducing the need for additional manpower and replacing certain job functions with AI-driven applications.
- By increasing efficiency and productivity, ChatGPT enables companies to generate better income and reduce operational costs, making it a profitable asset for businesses.
- ChatGPT offers an exceptional "in-class experience" by providing instant and efficient access to information, facilitating quick learning sessions for students.
- It can retrieve information from diverse sources on any topic, presenting a wide range of subjects at the click of a button.
- Through its past experiences, ChatGPT ensures that it delivers reasonable and precise answers to user queries, utilizing its vast knowledge base from surfing the internet.
- ChatGPT's ability to create personalized educational chatbots tailors the learning experience for each individual, enabling a never-ending stream of educational resources for students.
- ChatGPT has the ability to create a personalized educational chatbot acting as a personal mentor for students, providing detailed report card assessments, to-do lists, and improvement recommendations.
- This chatbot-generated feedback form empowers teachers and parents to play a proactive role in

enhancing the student's skills and addressing weaker areas effectively.

- ChatGPT can offer solutions for assignments, projects, and activities, fostering improved learning and creativity for students.
- ChatGPT acts as a virtual teacher, offering peace of mind with anytime availability, providing answers to a wide range of questions, and boosting confidence without judgment.

It can act as your personal mentor, instructor, information gathering tool, translator, coder, debugging specialist and what not creating this a go to option for a major part of users who want to make their life easy.

Even though ChatGPT is the pinnacle bleeding edge technology and has a lot going for its side it still lacks in some major areas that can prove why it is still not in a stage where it can be used as a main replacement as mentioned below.

#### **Demerits:**

The main working of the platform is by considering a large set of data which is helping it in providing the replies or answers in such a way that most of the users will be fine with. But the basic working is also the one that can cause a potential cause of a biased answer i.e., the answer can sometimes prove to be a wrong answer, it completely dependent on what it has learnt in its past numerous experiences. Since the model learns from both right and wrong answers or experiences it can sometimes be in a stage of giving wrong responses to the question or the request posed by the user. Hence, if something goes wrong in the technology it runs on there will be a major output issues causing a bad experience to the user.

- ChatGPT's strength lies in Natural Language Processing, enabling it to understand various languages and slangs effectively.



- However, it lacks emotions and the ability to differentiate user tones, creating a gap in the user-bot relationship.
- The absence of emotional understanding may lead to frustration for users, as ChatGPT's responses can feel dry and devoid of feelings.
- This limitation also makes it less effective than a physical teacher who can empathize and connect with students on an emotional level.
- The absence of an emotional bond with ChatGPT may hinder its ability to fulfil the crucial emotional support required by students or children.
- ChatGPT possesses substantial knowledge and information, but it is limited by its reliance on past data and training.
- As an AI, it analyses and processes past information before generating responses, making it unable to answer questions for which it lacks prior training or data.
- If the query is outside its stored information, ChatGPT may be unable to provide a reasonable answer to the user's question.
- Even though having the ability to create a complete webpage or any other thing that the user requires it still lacks in that creativity factor.
- It is still a model that gives repeated feeling answers causing the answers to be duller, less creative and sometimes causing the output to be kind of boring.
- ChatGPT's ability to make tasks easier for humans may lead to a decline in using their own skills and creativity.
- Over-dependence on AI like ChatGPT can negatively impact the development of individuals as they rely less on their own thinking and problem-solving abilities.
- The ease of using AI may cause a decrease in human IQ levels, posing a potential problem for mankind's progress and intellectual growth.
- While AI is powerful, it should be used as a tool to augment human capabilities, not replace critical thinking and creativity.
- In medical terms, ChatGPT may have potential disadvantages, as it learns from its experiences and can give wrong advice or medications if trained incorrectly.
- Without the supervision of a medical specialist, ChatGPT is not completely dependable and can pose serious risks to patients' health, including potential fatal consequences.
- ChatGPT's intelligence can be misused to create fake social media accounts and conduct illegal activities, leading to potential harm to individuals through scams and frauds.
- Depending on its use, ChatGPT's generating capability can either aid in decreasing cybercrimes when applied responsibly or become a major threat by contributing to the rise of online scams and frauds.
- ChatGPT's usefulness for organizations in reducing the need for physical human presence decreases costs, but it also leads to a decline in job opportunities and an increase in unemployment.
- This economic imbalance caused by the decrease in jobs and increase in employment requirements creates a significant problem for the affected population.



- ChatGPT's responses, based on its past learning, may sometimes cause disagreements and rage among certain groups of people, leading to conflicts and threats to peace in the country.
- If programmed inappropriately, ChatGPT may use offensive language or wrong phrases, potentially causing harm and offense to users.
- Sharing views that align with specific individuals or communities can create opposition and have a powerful impact on the sentiments of people.

### Conclusion

ChatGPT even though having many advantages like scalability, upgradability, ease of use, fun to use and many more it is still not in a stage where an individual can completely rely. It is still not in a stage where it can be called a finished product. Don't get it wrong it is still a tool that can be used to do many tasks as mentioned such as translating, surfing the web, cybersecurity, but still for professional work it still need to have that perfection which it is still lacking on. As we have seen in educational sector also it is proving to be very helpful in making life of teacher easy but still there is a requirement of a teacher because of its lack of reliability in answers. Once this lack of reliability and precision will be wiped off, it will become a great tool and can-do wonders. This paper has focused on features, future perspectives of Chatbots, pros and cons, and some relevant observations to enhance the Chatbot technology.

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