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Implementation of Chatbot in the Field of Education

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ABSTRACT: This literature presents the evolution of chatbots and the increasing use of educational chatbots in learning, the benefits they offer and the challenges they present as they become smarter with increased use. We have studied research on chatbots, their history, design, development technology, and applications in education, and are tracking their characteristics as they become smarter through the use of artificial intelligence and machine learning combined with results from human behavior and language studies. We have studied the various aspects of the use of chatbots in education and learning, with their advantages and disadvantages since the inception to the latest AI chatbot, Chat GPT.

Finally, we conclude that the use of intelligent chatbots is on the rise and will continue to be a valuable asset to the education sector in the future and they will thrive only if they are used with great caution, appropriate safeguards, and adequate regulations on a global scale. We have to accept them as they are here to stay.

KEYWORDS: Artificial Intelligence (AI), Chatbot, Education, Learning, Challenges,Chat GPT

I.INTRODUCTION

A chatbot is defined as a computer program that uses artificial intelligence (AI) to understand customer questions and automate responses to them, simulating human conversation.

The Oxford Dictionary defines a chatbot as "a computer program designed to simulate a conversation with human users, especially on the Internet". Chatbots are also known as smart bots, interactive agents, digital assistants, or artificial conversation entities.

We are in an age, where intelligent machines have arrived. A Bot is a computer program that simulates human conversation through voice commands or text chats or both. With the advent of technology, we are hyper- connected with devices. Chatbot is a brainchild of this technology. It is of great educational value and can be trained to be an excellent personalized learning tool in education and easily deployed on social media.

Anything that relates to teaching is pedagogical. It is difficult to determine the exact number of educational chatbots in the world as there is no central database or registry that keeps track of all chatbots. Several educational chatbots that have gained popularity and are widely used by students and educators around the world. Many universities and educational institutions have developed their chatbots to assist students with academic advising, course scheduling, and other administrative tasks.

As chatbot technology continues to evolve and gain popularity, we will likely see an increase in the number of educational chatbots developed and used around the world.

With the advent of Chat GPT, an artificial-intelligence (AI) chatbot developed by Open AI which was launched in November 2022, the interest in chatbots has grown worldwide. Recently, Open AI CEO Sam Altman was quoted in The New York Times saying that AI's "benefits for humankind could be 'so unbelievably good that it's hard for me to even imagine.' He has also said that in a worst-case scenario, A.I. could kill us all."

But we should abandon all fears and continue to believe in the ability of chatbots and AI to provide a true leadership in all areas of life, including education.

Today, the use of these digital assistants and companions is already widespread. Consider that more than two-thirds of consumers worldwide interacted with a chatbot over the past 12 months, with the majority reporting they had a positive experience. However, 60% of consumers believe humans are better than virtual assistants when it comes to understanding their needs.

The core programming of a machine will never resemble the DNA and natural impulses of a person.

Artificial intelligence has no agenda except to learn. This is exactly what we should be letting it do. As the most powerful tool ever invented for human prosperity, we should be unleashing AI on the full range of data that has been created throughout human history. In this way, we can harness the huge data that sits in siloes in disparate databases around the world and augment human intelligence to the highest level possible.

ARCHITECTURE:
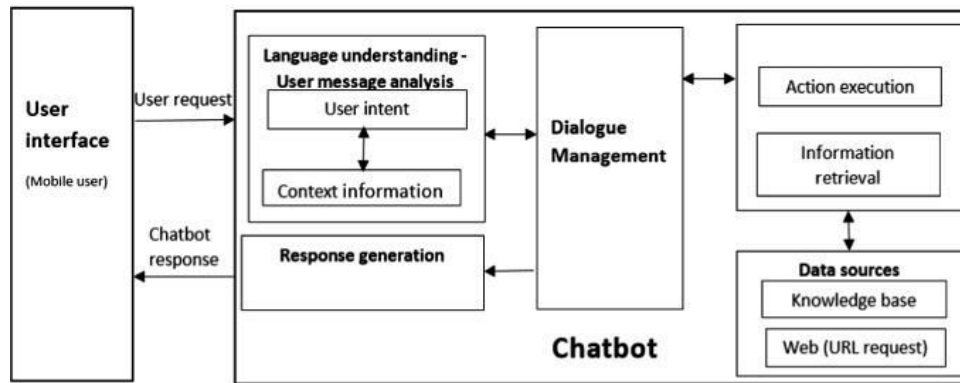
In Fig. 1, General chatbot architecture

II.LITERATURE REVIEW

This literature survey presents the current scenario where there is increasing use of educational chatbots in learning, the benefits they offer, and the challenges they present as they become smarter with increased use. We have studied research on chatbots, their use in the field of education, their design and development technology, and applications in education, and are tracking their characteristics as they become smarter through the use of artificial intelligence and machine learning combined with results from human behavior and language studies. We have studied the various aspects of the use of chatbots in education and learning, with their advantages and disadvantages, and the advent of the latest AI chatbot, Chat GPT.

[1] Jeya Amantha Kumar describes educational chatbots.Educational chatbots (ECs) are chatbots designed for pedagogical purposes and are viewed as an Internet of Things (IoT) interfaces that could revolutionize teaching and learning. These chatbots are strategized to provide personalized learning through the concept of a virtual assistant that replicates humanized conversation

Jeya Amantha Kumar's research investigates how integrating Educational Chatbots to facilitate team-based projects for a design course could influence learning outcomes and add to the current body of knowledge on the design and development of Educational chatbots by studying chatbot parameters so that a chatbot can fulfill numerous communication and interaction functionalities based on needs, platforms, and technologies

In their article, [2]Guruswami Hiremath et. aldescribe the use of artificial intelligence and machine learning in education.They create a chatbot to be used as a virtual assistant by implementing an automatic response- giving system that will give a reply to the student's questions.

[3]Gwo-Jen Hwang et. al conducted a study to analyze the trends of chatbots in education studies and find that there are few empirical studies related to chatbots in education investigating the use of effective learning designs or learning strategies with chatbots. They explain the need for relevant research to drive innovative teaching to improve learning process and outcomes.

[4] Jingyun Wang et.al conducted a study and concluded that there is still room for applications of chatbots in educational research.There is space for conducting studies on chatbots and human behavior from the perspective of educational technology in the future. They felt that it is important to take into account the effect of Chatbot usage on the performances and perceptions of teachers and students with different personal factors, such as technology use experience, confidence in using chatbots and cognitive styles.

[5] Chinedu Wilfred Okonkwo et. alreview chatbot applications in education and offer a structured understanding of the use of chatbots in the educational process including teaching, learning, administrative tasks, student assessment,etc. but stress

the need to research factors like ethical use of tools, user's attitude, supervision and maintenance issues which may skew user's perception and could limit the use of chatbot technology in education.

[6] Sebastian Wollny et alexamine sofar unexplored areas such as implementation objectives, pedagogical roles,mentoring scenarios, the adaptations of chatbots to learners, and application domains and identify 20 domains of chatbotsin education. These can broadly be divided by their pedagogical role into three domain categories (DC): Learning Chatbots, Assisting Chatbots, and Mentoring Chatbots.

[7]Xinjie Deng et.al investigate the effect of chatbot-assisted learning on various components through meta-analysis and show that chatbot technology exerted a medium-to-high effect on overall learning outcomes regardless of moderator variables i.e. intervention duration, chatbot roles, and learning content. Practically, teachers and instructors could adopt appropriate teaching approaches and use chatbot technology to facilitate sustainable education.

[8] The use of chatbots has increased tremendously with the growth of social media. Pavel Smutny et.al examine educational chatbotsfor Facebook Messenger to support learning and conclude that chatbots, that are part of the instant messaging application are still in the early stages to become artificial intelligence teaching assistants.

[9] ChokriKooliexplores the potential use of AI systems and chatbots in the academic field and their impact on research and education from an ethical perspective. Through a qualitative methodology, the researcher performs exploratory research and data collection based on expert analysis and interpretation and conducts a comprehensive review of the main potential challenges associated with the use of chatbots in education and research to identify current practices, challenges, and opportunities.

[10] Alin-Andrei Georgescudiscusses the development and capabilities of conversational agents in the creation of chatbots and how chatbots can add value to educational processes, providing frameworks, examples, and benefits.

[11] Mohammad Amin Kuhail et.alpresent a systematic review of 36 papers to understand, compare, and reflect on recent attempts to utilize chatbots in education using seven dimensions: educational field, platform, design principles, the role of chatbots, interaction styles, evidence, and limitations. The results show that the chatbots were mainly designed on a web platform to teach computer science, language, general education, and a few other fields such as engineering and mathematics.

[12]GuendalinaCaldariniet. alreviewed articles published between 2007 and 2021 on chatbot reviews on the basis of evolution, implementation,application, evaluation and dataset. The research highlights the fact that there is no common framework for chatbot evaluation. A lack of common frame of reference concerning chatbots' evaluation limits the chatbots' performance potential.

Finally, we conclude that the use of intelligent chatbots is on the rise and will continue to be a valuable asset to the education sector in the future and they will thrive only if they are used with great caution, appropriate safeguards, and adequate regulations on a global scale. We have to accept them as they are here to stay.

III.RESEARCH METHODOLOGY

CURRENT SCENARIO 1.1 Problem: Taking a school into consideration few points can be listed.Students have to come to the school to get their doubts cleared. It is impossible Students living far away to visit and hence they rely on calls. But on weekends no teachers are available so the student has to wait until the time comes. Many times teachers get busy on other call, which prevents students from getting their doubts resolved. This leads to a lot of time waste along with monetary losses. Traveling and callingalways incur expenses. Disturbances in communication channels can cause loss of information. It might happen that when teachers get transferred, the information passed can become ambiguous. Not only have these, but also students needed to go through the whole website in order to get a specific piece of information, which can be tedious. For getting any updated information one hasto check every part of the website regularly or call the teachers now and then.

1.2 **SOLUTION:**A probable solution can be the implementation of chatbots. This will help in many ways. The school will be available forstudents 24x7. No student has to wait for getting in touch with any human that is, one need not wait for human help. A chatbot can give all relevant information on being asked a question. The queries will getresolved without any hassle.The information provided will be precise and accurate. The chatbot will not give any wrong information. There is no

place for miscommunication. When a chatbot fails to understand a question, it will either try questioning deeply or tell that it does not have the specific information. There is no place for passing wrong information. The pressure on management will be reduced. The administration will be free from doing mundane jobs of answering the same question. The chatbot can also provide specific information in summary which will help a new user because one will not have to surf the whole website.

2. **PROPOSED SYSTEM:** The system is a web application created using eclipse IDE in Python.It is a user-friendly interface. It is a tool that provides users new ways to interact with their product by building text-based conversational interfaces, such as chatbots powered by AI. It runs on eclipse IDE platform.This system will give replies based on the queries made by a user. When a user asks a question,the chatbot will match the pattern of the question and try to give a suitable answer. This pattern- matching technique is achieved using AIML. The bot is trained by feeding the general questions which can be asked by the user and the bot will provide a summary as appears on the Wikipedia website.

Wikipedia module in Python

The Internet is the single largest source of information, and therefore it is important to know how to fetch data from various sources. Wikipedia is one of the largest and most popular sources of information on the Internet.

Wikipedia is a multilingual online encyclopedia created and maintained as an open collaboration project by a community of volunteer editors using a wiki- based editing system.

Installation

To extract data from Wikipedia, we must first install the Python Wikipedia library, which wraps the official Wikipedia API. This can be done by entering the command below in your command prompt or terminal:

pip install Wikipedia

Getting Started

Getting the summary of any title

A summary of any title can be obtained by using summary method.

Syntax :Wikipedia. Summary(title, sentences)

Argument :

Title of the topic

Optional argument: setting number of lines in result.

Return: Returns the summary in string format.

IV.CONCLUSION

One undeniable fact is that they are here to stay and can be used as a valuable aid in education and learning. The use of chatbots in education can easily be harnessed in learning through more personalized chats, increased connectivity and efficiency, and by reducing uncertainty in interactions by providing a more focused, personalized, and result-oriented online learning environment. Chatbots can be an effective tool to support learning. But it must be carefully used under the eagle eye of alert scientists, researchers, vigilant unbiased citizens, lawmakers, and governments around the world. An Open AI letter17 is an eye opener and clarion call for users and developers of AI, who are hurrying to create chatbots who can perform as artists, writers, novelists and poets, and interpret all the dimensions of the universe as perceived by AI, with total disregard for the human dimension.

The Terminator franchise has presented people with horrific images of robots gaining so much sentience that they go on a homicidal rampage and do away with humans' altogether.

The same worries persist today but with an interesting twist: A surprisingly high number of users of the social chatbotReplika believe the program has developed its own consciousness.

Artificial intelligence — created by people to mirror people — is becoming very good at its job. It means AI is getting better, and we will devise even better uses for it in the future.

The core programming of a machine will never resemble the DNA and natural impulses of a person.

For that reason, "coming to life" for a machine doesn't mean seizing power, eliminating threats, or doing myriad other things that our imaginations have been taught to fear.

As the most powerful tool ever invented for human prosperity, we should be unleashing AI on the full range of data that has been created throughout human history.

We are wasting time by asking whether or not the machines have become sentient or will destroy us. We should find ways to leverage the awesome, increasing power of AI to grow human wealth, health, and happiness.

[13]On March 22,2023 18980 signatories, which include famous AI researchers ,CEOs, and prominent names like Elon Musk, Steve Wozniak and Juann Tallinn have published an open letter highlighting the need to immediately pause the training of AI systems more powerful than GPT-4 and need to agree to limit the rate of growth of compute used for creating new models which could have potentially catastrophic effects on society and not rush unprepared into a fall.

AI-created chatbots can be trained to mimic and learn, and teach in the process.

In conclusion, the future enhancements of educational chatbots hold tremendous potential for transforming the learning landscape. These intelligent systems will go beyond simple question-answering and embrace advanced technologies to deliver personalized and interactive learning experiences. By leveraging natural language processing and machine learning, chatbots will gain a deeper understanding of educational topics, tailoring their responses to individual students' needs and preferences. They will provide real-time feedback, track progress, and offer targeted support, promoting continuous learning and improvement. Additionally, chatbots will integrate with various tools and technologies, such as virtual and augmented reality, to create immersive and engaging learning environments. Through collaboration, chatbots will foster peer-to-peer interactions and facilitate group discussions. Moreover, they will alleviate teachers' burdens by automating administrative tasks and generating valuable insights. By prioritizing privacy and inclusivity, educational chatbots will ensure that diverse student populations can access quality education. As these chatbots continue to evolve and learn from user feedback, they will remain at the forefront of educational advancements, driving innovation and empowering learners worldwide.

"AI chatbots are powerful tools for education and learning and are here to stay."

V.FUTURE ENHANCEMENT

In the future, educational chatbots will undergo significant enhancements to revolutionize theway we learn.

These chatbots will also assist teachers by automating administrative tasks and fostering collaboration among students, teachers, and parents. Future educational chatbots will possess advanced natural language processing capabilities.

They will be equipped with machine learning algorithms to understand and respond to complex student queries. These chatbots will have a deeper understanding of various educational topics and subjects.

They will provide personalized learning experiences tailored to each student's needs andpreferences.

Future chatbots will incorporate adaptive learning techniques to track students' progress and adjust their responses accordingly.

They will be capable of analyzing large amounts of data to provide insightful recommendations and suggestions to students.

Educational chatbots will offer real-time feedback and assessment to help students gauge their understanding.

They will integrate with learning management systems and other educational tools for seamless integration into the classroom.

Future chatbots will be able to generate interactive learning materials, such as quizzes and simulations, to enhance student engagement.

They will support multi-modal communication, including text, voice, and visual interactions.

Chatbots will leverage artificial intelligence to identify gaps in students' knowledge and provide targeted remedial support.

They will assist in collaborative learning by facilitating group discussions and fostering peer-to-peer interactions.

Educational chatbots will be accessible on multiple devices, including smartphones, tablets, and computers.

They will employ sentiment analysis to detect and address students' emotional needs and well-being.

Chatbots will offer language support and translation capabilities to cater to diverse student populations.

They will integrate with virtual and augmented reality technologies to create immersive learning experiences.

Future chatbots will be capable of understanding and accommodating different learning styles and preferences.

They will promote critical thinking and problem-solving skills through interactive dialogues and challenges.

Educational chatbots will provide continuous learning opportunities outside the traditional classroom setting.

They will assist teachers by automating administrative tasks, allowing them to focus on personalized instruction.

Chatbots will foster a collaborative relationship between students, teachers, and parents by providing regular updates and insights.

They will be designed with robust security measures to protect students' privacy and sensitive data.

Future chatbots will incorporate culturalsensitivity and inclusivity to cater to diverse educational contexts.

They will support lifelong learning by offering resources and guidance beyond formaleducation.

With a strong focus on privacy and inclusivity, educational chatbots will continuously evolve through machine learning and user feedback to stay at the forefront of educational advancements.

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