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A Survey On : Chatbot Methodologies

Akula .V.S. Siva Rama Rao
Computer Science & Engineering
Sasi Institute of Technology & Engineering
Tadepalligudem,India
shiva.akula@gmail.com

Ganga Bhavani.Vasudeva
gangabhavanivasudeva@gmail.com

Manasa Lakshmi.Kedari
manasamadhu153@gmail.com

Venkateswara Rao .Sure
venkateshitzsure@gmail.com

***Abstract*— In the modern world, people are always on the lookout for new information and ways to learn. However, it can be time-consuming and difficult to find the information we need through traditional methods, such as books, search engines, and online Encyclopedias. Chatbots can provide instant information to the queries in a various of sectors, which includes banking, retail, travel, healthcare, and education. Chatbots are computer applications which are created to imitate real-world user chats. They are powered by artificial intelligence (AI) and natural language processing (NLP) technologies, which enables them to understand human language and respond to it. Chatbots can be employed to carry out activities, offer information, and respond to queries. In this Paper we surveyed various methodologies of chatbot implementation, which includes Long Short-Term Memory (LSTM), Natural Language Generation (NLG), Supervised Machine Learning (SVM), Model Driven Engineering (MDE), Dialogue Management, Human-in-the-Loop (HITL), Audio-Frame Mean Expression (AFME), Random Forest, Support Vector Machine (SVM), Recurrent Neural Network (RNN), and Convolutional Neural Network etc. the cutting-edge methodologies. These techniques are used to create chatbots with more complex natural language comprehension and response capabilities. This paper's objective is to review and contrast several chatbot development approaches in order to determine which is optimal for certain applications. Finally this paper concluded that there are various methodologies and algorithms to implement a chatbot but every method has its own priority based on the specific task requirement, however methodologies evaluation accuracies and suggestion were presented in this survey paper.**

Keywords—CHATBOT, ARTIFICIAL INTELLIGENCE, NATURAL LANGUAGE PROCESSING

I. Introduction

Computer programs known as chatbots replicate conversations with human users by utilizing conversational AI technologies. They frequently work in customer service and healthcare settings where they may respond to inquiries, offer assistance, and find solutions to problems. Additional uses for chatbots include marketing, sales, and education. Chatbots can make our lives easier, more convenient, and more enjoyable in a number of ways. They can answer our questions 24/7, provide personalized recommendations and suggestions, automate many customer service task, to reach customers on a variety of channels, and personalize the customer experience by learning about each customer's preferences. Chatbots are still under development, but they having the ability to drastically alter how we communicate with machines. They are a powerful tool that can be used to improve customer service, reduce costs, and increase efficiency. Students who are struggling with a particular concept or who need more individualized attention can benefit from chatbots in education. Chatbots can make learning more engaging and participatory, which can improve students' learning experiences and increase their interest in the material.

This paper discusses the key technologies that are available for building chatbot for education purpose. In this paper, The vanishing gradient problem is addressed by storing long-term information in a memory cell. Natural Language Generation (NLG), which produces natural language text by using structured data as input. From labeled data, Supervised Machine Learning (SVM) learns that each data point has a known result or label Model. Driven Engineering (MDE), a potent chatbot development platform, may assist businesses in creating high-quality chatbots more quickly and effectively. Dialogue management, which uses both a statistical model and a rule-based system, is in charge of making sure that the discussion goes smoothly and that the user's intent can be recognized by the system and responded to. HITL tasks include fraud detection, object detection, picture classification, and medical diagnosis. AFME (Audio-Frame Mean Expression), a feature extraction approach used in speech processing and music information retrieval, is generated by averaging the values of all samples in an audio frame. A large number of decision trees are built by Random Forest, which then bases forecasts on the trees' consensus votes. Support Vector Machine (SVM) divides the data points into their corresponding classes by locating a hyperplane. And Convolutional Neural Network, both of which have the ability to learn spatial hierarchies in data, is particularly well suited for tasks like picture classification, object detection, and semantic segmentation. A universal solution does not exist to this problem, and the best strategy will be based on the unique circumstances,