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MediBot: Revolutionizing Healthcare with an Intelligent Online Medicine Ordering Assistant

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***Abstract*— The integration of AI (Artificial Intelligence) in healthcare has witnessed significant advancements, contributing to improves patient experiences. This study introduces an AI chatbot designed specifically for medicine ordering, aimed at enhancing accessibility, efficiency, and user satisfaction in the healthcare sector. The chatbot uses Natural Language Processing (NLP) to understand and respond to user needs related to medicine orders. By using a traditional relational database of pharmaceutical information, the chatbot provides accurate details on various available medicines. The chatbot offers a user-friendly interface accessible via various platforms such as web applications, making it convenient for users to interact and place medicine orders. Users can efficiently place medicine orders through the chatbot interface, which facilitates a efficient ordering process. Additionally, the chatbot provides real time order tracking, keeping users informed about the status and tracking orders. By introducing and AI Chatbot for medicine ordering, this research aims to revolutionize the healthcare industry's approach to medication management. This research work represents the Chat flow, components of a chatbot, Implementation using Dialogflow.**

Keywords-Chatbot, Artificial Intelligence, Dialogflow, Advantages.

I. INTRODUCTION

In recent years, artificial intelligence (AI) has made remarkable strides in revolutionizing various industries, and healthcare is no exception. One noteworthy application of artificial intelligence in healthcare is the production of intelligent chatbots for specific purposes. This paper introduces an AI chatbot designed specifically for medicine ordering a technological solution aimed at enhancing accessibility, efficiency, and user experience in the pharmaceutical domain.

The AI chatbot leverages cutting-edge Natural Language Processing (NLP) to engage in meaningful conversations with users, facilitating the seamless process of ordering medications. Its primary objective is to simplify the often complex and time-consuming task of acquiring prescribed medicines while ensuring accuracy, personalization, and adherence to healthcare standards. This technological innovation addresses the growing need for user-friendly interfaces in healthcare in healthcare systems. By providing a platform that understands and responds to users' medication-related inquiries, the AI chatbot aims to streamline the ordering process. Through personalized recommendations, secure order placement, and real-time tracking, this AI chatbot aims to bring about a positive transformation in the way individual's access and manage their medications. The primary objectives of the AI chatbot are to streamline the medicine ordering process, enhance user experience, and improve overall healthcare outcomes. The chatbot aims to provide users with a seamless platform for medications-related inquiries, order placement, and tracking.

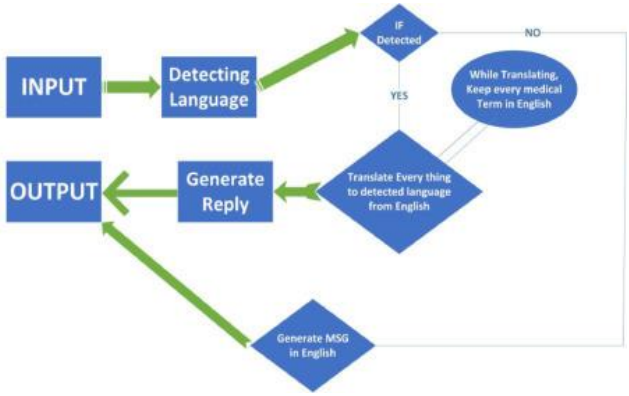

Fig 1: Chat flow

This fig 1, talks about the internal structure of chat flow means how user gives the input, how dialogflow analyse that input and gives output back to the user. Chatbots dependent on fixed principles just react to explicit orders and address a fixed.

Key Features:
The AI chatbot integrates several features to achieve its objectives:
• NLP (Natural language Processing) : Enables the chatbot to understand and respond to user needs in a conversational manner, enhancing the user experience.
• Secure Order Placement: Provides a secure and user-friendly platform for placing medication orders.
• Real-time Order Tracking: Enables users to monitor the status and delivery times of their orders, promoting transparency and reducing uncertainty.
• Integration with Healthcare Providers: Collaborates with healthcare systems to validate prescriptions, ensuring compliance with medical standards and regulations.

This AI chatbot represents a significant advancement in the realm of healthcare technology, offering a comprehensive solution to streamline medicine ordering process. By empowering users with a user-friendly interface, personalized recommendations, and secure transactions, the chatbot aims to enhance patient adherence to prescriptions, ultimately contributing to improved health outcomes. As the healthcare industry continues to embrace digital transformation, this AI chatbot emerges as a crucial tool for reshaping and optimizing the medication ordering experience.

II. *RELATED WORK*

AI chatbots, or artificial intelligence chatbots, are system programs designed to stimulate conversation with human users, offering a way for people to associate with machines using natural language. These chatbots leverage various technologies, including Natural Language Processing (NLP), machine learning, and sometimes even elements of Artificial Intelligence. Instructive chatbots can possibly help understudies, educators and schooling staff. They gave helpful data in instructive areas for inquiries.

Chatbot focus on completing specific transactions, such as processing orders, handling payments, and managing customer accounts in e-commerce. transactional chatbots in e-commerce streamline the buying process, enhance customer engagement, and provide to a more structured and satisfying shopping experience. They leverage technology to handle routine tasks, allowing human support teams to focus on more difficult issues and providing a 24/7 customer service presence [1].

Chatbots designed for providing information, these chatbots excel in customer service by answering queries, offering FAQs, and guiding users through troubleshooting processes [2].
Chatbots specialized in healthcare, these chatbots assist users with preliminary medical advice, symptom checking, and medication reminders, contributing to accessible and timely healthcare information [3].
Chatbots aid in education by offering personalized learning experiences, providing study resources, and assisting students with needs related to their coursework. Chatbots analyse individual student performance, preferences, and learning styles to deliver personalized learning experiences. They can provide customized study plans, recommend relevant resources, and adapt content to suit the pace of each learner [4].
Chatbots tailored for the finance sector, these chatbots provide ability investments, help with financial planning, and answer queries related to banking and account management [5].
The chatbots streamline HR processes, assisting with employee onboarding, answering HR policy questions, and managing leave requests [6].
Chatbots specifically crafted for the travel industry, these chatbots assist users in booking flights, hotels, and rental cars, travel recommendations and local information [7].
Chatbots that engage potential customers, answer product-related queries, and guide users through the sales process, enhancing marketing and sales efforts [8].
In the entertainment sector, these chatbots provide recommendations for movies, music, or games, creating interactive and engaging experiences for users [9].
Chatbots specializing in legal information, these chatbots help users understand legal terminology, provide information on legal processes, and generate basic legal documents [10].
Proposed a suitable recommendation system for particular process and task for consumer perspective so that use can navigate with error free [11].

III. *BASIC* STRUCTURE *OF A CHATBOT:*

Chatbot is an application of Artificial Intelligence (AI), represent a significant advancement in the field of artificial intelligence. These digital conversational agents are designed to simulate human-like interactions and provide users with information, assistance, or entertainment.

AI chatbots leverage NLP (Natural Language Processing) techniques to understand and interpret human language. This allows them to comprehend user inputs, whether they are in the form of text or spoken words. Chatbot gains from each discussion it has with the clients. It goes through the past communication to upgrade the current reaction. This action assists with improving the productivity of bot reaction. Also,

assists with understanding your client's decisions and inclinations.

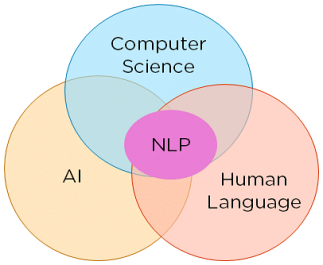

Fig 2: Basic components of a chatbot

Fig 2 represents basic components of chatbot which is and Artificial Intelligence (AI) application that has a component Natural Language Processing (NLP). NLP (Natural Language Processing) is a field of AI (Artificial Intelligence) that focuses on the interaction between computers and human languages. It generates human-like dialect in a way that is both meaningful and contextually relevant.

Implementing an AI Chatbot should be done thoughtfully, considering the specific goals and requirements of the business. When implemented efficiently, chatbots can contribute significantly to improved customer service, operational efficiency, and overall business success enhance customer service by providing round-the-clock support, ensuring quick and consistent responses to inquiries. The cost savings are substantial, as chatbots automate routine tasks, reducing the need for additional human agents and improving overall operational efficiency.

The scalability of chatbots allows businesses to handle increased workloads seamlessly, without proportional increases in staffing.

A. Applications:

The applications of Chatbot are customer service where it is used to give the services to the users, then it is used in E-commerce and also used for education purpose. Here the main application is Health care where we use in this project as medibot.

B. Advantages of Chatbot:

Chatbots offer a myriad advantage across various sectors revolutionizing the way business interact with customers and streamline operations. One of the key advantage lies in their ability to provide instant and round the clock customer support, enhancing user experience. They are 24/7 available and also these chatbots are cost-effective to the users. They also give instant response to the customers without any delay. Furthermore, their scalability and consistency ensure a uniform experience for users, regardless of the volume of inquiries.

Benefits:

Chatbots offer a multitude of benefits across industries, transforming the way business operate and interact with their customers. In the retail sector, chatbots provide personalized shopping experience, guiding users through product recommendations and purchases, thereby boosting sales and customer satisfaction. In healthcare, they streamline appointment scheduling, providing medical information and offer support for patients, improving access to healthcare services and enhancing patient outcomes.

Fig 3: Chatbot versus Apps

Fig 3 shows the Chatbot versus Apps taken resource from the recent survey.

C. Methodology

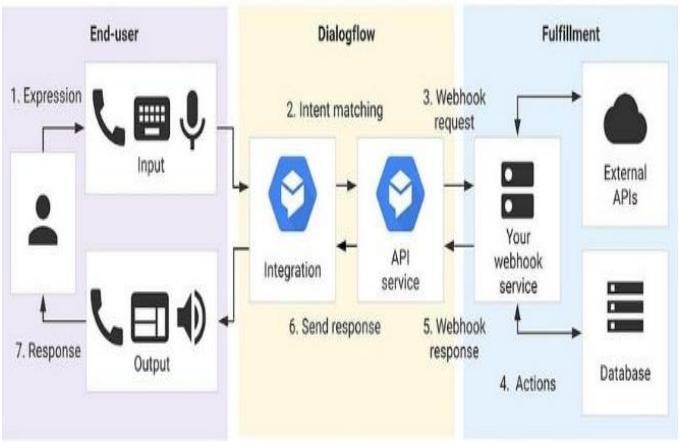

Fig 4: Architecture model of Medibot

Fig 4 represents the overall integrated workflow of Medibot. It comprises of Web Technology (HTML, CSS), Dialogflow (NLP) and Database (MySQL).

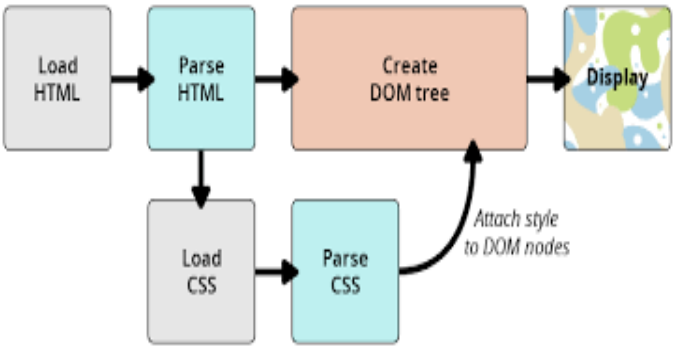

Fig 4.1: Working flow of HTML, CSS

Fig 4.1 explains Step 1: The first step uses HTML, CSS to create the front end for AI Chatbot. Developing and AI Chatbot for medicine ordering involves a structured process. To begin, we define the features and capabilities we want the chatbot to have, like browsing medicines and facilitating orders. Using HTML and CSS, we can build a user interactive model.

Fig 4.2 explains Step 2: The second step uses dialogflow to make interaction with the users using NLP (natural language processing). To create an AI Chatbot for ordering medicines using Dialogflow, we follow a step-by-step approach. Using dialogflow user-friendly interface, we design the chatbot abilities to understand and answer to user's request.

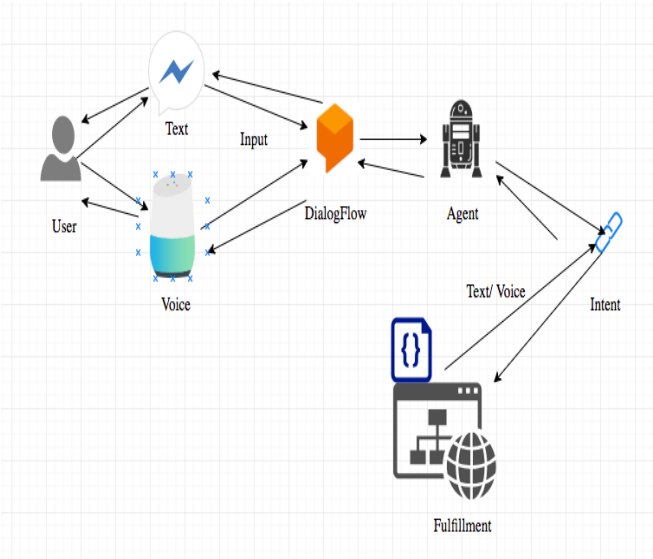

Fig 4.2: Working flow with dialogflow

Fig 4.3 explains Step 3: The third step uses MYSQL and Fast API to store the data about medicines and to retrieve it. For the backend, we choose Fast API and SQL to handle data storage. Fast APIs are used to create the backend application, defining routes to manage various actions like fetching medicine details and processing orders.

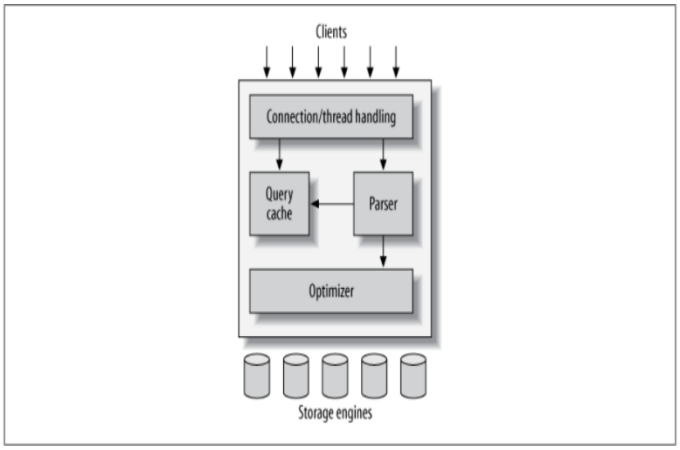

Fig 4.3: Working flow with SQL

D. Implementation using Dialogflow:

Dialogflow: Dialogflow is an NLP (Natural Language Processing) platform developed by Google for building conversational interfaces such as chatbots and voice-based applications. It allows developers to create applications that can understand and answer to user inputs in a natural and conversational way.

Agent: When a user interacts with a system using natural language, dialogflow processes the input through its client agent to determine the user's intent and extract relevant details. The agent then generates an appropriate response or triggers fulfilment to carry out specific actions.

Intent: An intent represents the goal or action that the user wants to perform. Developers define intents and provides examples of user input to train the agent on how to recognize different intents. Dialogflow supports both predefined and custom intents.

Entities: Entities are used to extract specific information from user input, such as dates, locations, or product names. Developers define entities to help the agent understand and extract relevant details from user queries.

Training phrases: Training phrases are examples of user query that used to train the agent natural language processing capabilities. Developers provide a different types of training phrases to help the agent recognize different ways users might express the same intent.

Responses: For each intent, developers specify response that the agent should provide when that intent is recognized. Responses can be static text or dynamically generated using fulfilment (integration with external services).

Fulfilment: Fulfilment means the action taken by the agent once an intent is recognised. It can involve calling external APIs, processing business logic, or retrieving and presenting information. Dialogflow allows developers to fulfil user requests by integrating with custom backend services.

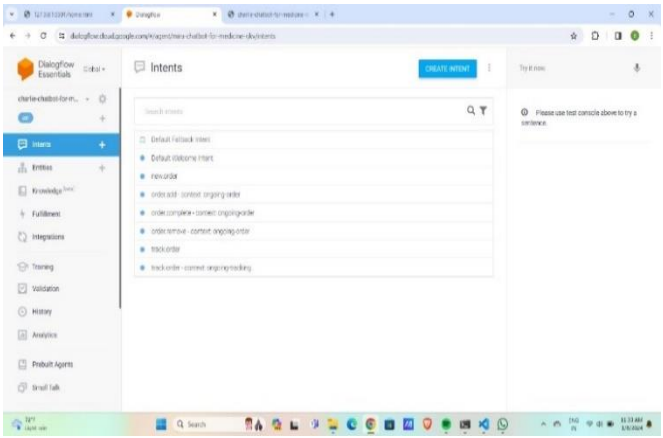

Fig 5: Dialogflow window

This fig 5 shows a window of dialogflow, is a platform to build and train a chatbot using its attributes such as agent, intents, entities, action parameters, quick replies etc.

D. Execution using a dashboard:

The execution of an AI Chatbot for medicine ordering within a dashboard involves a process consisting of development, integration and deployment. Initially, need to analyse the specific requirement for the medicine ordering system, identifying key features and functionalities. The chatbot is designed using a suitable tool using a dialogflow, integrating essential components such as intents, entities, and fulfilment logic for processing orders. Simultaneously, a user-friendly dashboard is developed to serve as the interface for users to interact with the chatbot. Integration between the chatbot and dashboard is established, enabling users to access and navigate the ordering system efficiently.

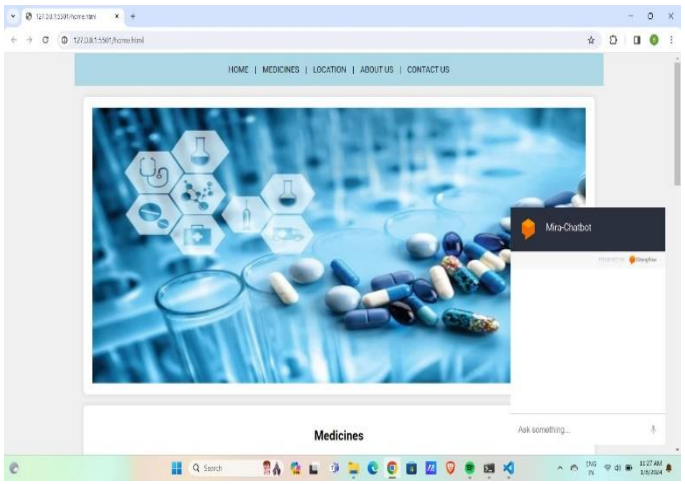

Fig 6: Working of chatbot

This fig 6 shows how a chatbot is working in dialogflow before connecting it to the dashboard

IV. RESULT

The outcome of implementing an AI chatbot for online medicine ordering using Dialogflow is a user-friendly and efficient system that simplifies the process of purchasing medicines. Using Dialogflow's natural language processing capabilities, the chatbot is adapt at understanding user queries related to medicine order. The integration of Dialogflow ensures that the chatbot can comprehend prescription details, answer queries accurately, and guide users seamlessly. The chatbot's deployment allows user to interact effortlessly, making the online medicine ordering experience more accessible and streamlined. Overall, the utilization of Dialogflow in building this AI chatbot enhances the interaction between users and the ordering system, contributing to a more user-friendly and efficient online medicine purchasing platform.

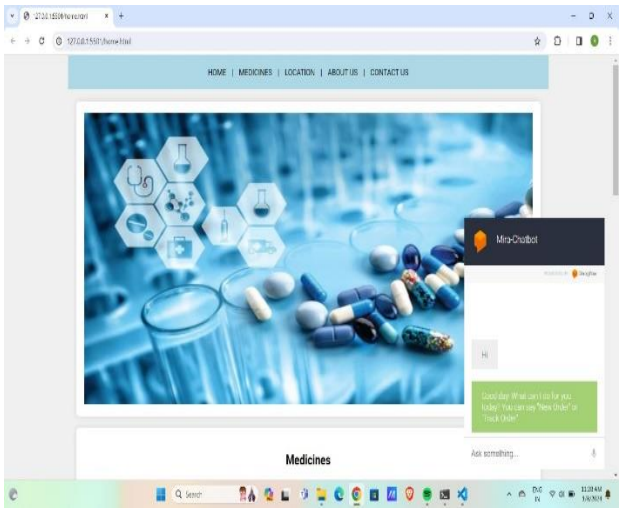

Fig 7: Chatbot with dashboard

Table 1: Performance of Existing system

Existing system features	Performance	Percentage of working based on features
Time	Takes more time (execution time) (0.52 sec)	90.18%
Tabs	Opens in multiple tabs while executing	89.71%
Storage	Occupies more space in RAM.	92.56%
Database	Cannot store more data.	91.25%
Text Recognition	Cannot understand complex inputs.	90.88%

Especially for performance of the existing system, few disadvantage are Time taken to execute is more, also a new tab is opened whenever there are any operations done, more data cannot be stored inside the database and cannot recognize some of the text inputs. Therefore, system performance is better than the existing feature fusion techniques.

Table 2: Evaluation of the Existing system

	Complexity	Non-Complexity
True	90.226	91.56
False	0.01%	0.23%

Overall system accuracy = 93.98%

Table 3. Performance of proposed system

Proposed system features	Performance	Percentage of Working based on features
Time	Takes less time (0.02 secs)	91.8%
Tabs	Opens in same tab	90.25%
Storage	Occupies less space in RAM	93.66%
Database	Stores more data	92.36%
Text Recognition	Understands complex inputs	93.56%

Overall system accuracy = 95.56%

V. CONCLUSION

In conclusion, the implementation of an AI chatbot for medicine ordering, which is integrated into a user-friendly dashboard, makes a significant advancement in enhancing the accessibility and efficiency of pharmaceutical services. This innovative solution enhances the user experience, allowing individuals to interact naturally with the system and place medicine orders with ease. The combination of natural language processing and order processing logic ensures a reliable platform for users. With the user understandable dashboard providing a convenient interface, users can manage their orders while the chatbot processes requests, checks medicine availability, and updates order statuses. This AI-driven approach not only enhances the efficiency of medicine ordering but also represents the online

healthcare services for more accessible and user-friendly experience.

For future work, Authentication will be implemented for security purpose, also voice and multimodal interaction will be implemented to improve the model's performance. Moreover, we plan to use personalized recommendations where the AI chatbots can analyse user preferences, past orders, and health history to provide personalized medication recommendations.

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