

# AI Health Chatbot using ML

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## ABSTRACT

This project aims to develop a personalized and interactive healthcare chatbot leveraging natural language processing and machine learning. It offers tailored advice based on user symptoms, medical history, and preferences. Integrated with healthcare databases, it provides reliable information and services like symptom analysis, triage recommendations, medication details, and personalized health tips. Seamlessly accessing patient records and appointment schedules within existing healthcare systems ensures a cohesive user experience. The AI healthcare chatbot optimizes services by reducing communication burdens, improving information accessibility, and enhancing patient engagement. Preliminary evaluations demonstrate promising results in user satisfaction and healthcare administration efficiency gains.

**Keywords:** Healthcare chatbot, Symptom analysis, Disease Prediction, Medication information and Machine learning.

## I. INTRODUCTION

Artificial intelligence (AI) chatbots are increasingly recognized as valuable tools in healthcare, offering personalized and engaging interventions to promote health behavioural changes. These chatbots have the potential to revolutionize digital health interventions by providing scalable and personalized solutions for behaviour change. In the context of mental health care, AI chatbots can address challenges such as professional shortages, stigma, cost barriers, and limitations of human therapists. Furthermore, AI chatbots have shown promise in improving patient care and public health.

The integration of AI chatbots in healthcare settings, including the development of AI-powered chatbots for specific health conditions like prostate cancer, has been highlighted as a growing trend. Studies have also explored the acceptance and perceptions of AI chatbots among healthcare workers and medical researchers, emphasizing the importance of ensuring the trustworthiness and dependability of these tools for successful implementation in healthcare.

This research paper introduces an AI health chatbot designed to provide personalized healthcare assistance, information, and support to users. The chatbot leverages cutting-edge AI technologies, including natural language

processing (NLP), machine learning (ML), and deep learning, to interpret user queries, provide relevant responses, and offer tailored recommendations. By seamlessly integrating into existing digital platforms or communication channels, such as websites, mobile apps, or messaging services, the AI health chatbot aims to enhance accessibility to healthcare resources and services. While AI chatbots offer benefits in various healthcare domains, including wound care, chronic health management, and COVID-19 response, they also present challenges that need to be addressed. These challenges include navigating ethical considerations, ensuring data security, and overcoming potential biases in AI algorithms. Additionally, the feasibility of using AI chatbots in public health education and their potential to enhance medical education have been subjects of investigation.

In conclusion, AI chatbots have the potential to significantly impact healthcare by providing personalized interventions, improving patient care, and enhancing health education. However, to fully realize these benefits, it is essential to address challenges related to ethics, security, and bias in AI algorithms, while also ensuring the acceptance and trust of healthcare professionals and patients in these innovative technologies.

## II. LITERATURE SURVEY

[1] Recent studies highlight the development and effectiveness of AI-powered healthcare chatbots. Bushra Kidwai and Nadesh RK (2020) created a diagnostic chatbot using decision trees for symptom mapping and diagnosis, emphasizing its interactive nature and performance evaluation using Round-Trip Time.

[2] Papiya Mahajan et al. (2020) proposed a healthcare chatbot employing NLP techniques to offer personalized diagnoses based on user symptoms. However, the study lacked performance evaluation metrics.

[3] Harsh Mendapara et al. (2021) developed a healthcare chatbot integrating AI and NLP for self-diagnosis and disease information retrieval. The study reported precise and quick results, highlighting the chatbot's effectiveness in assisting users with healthcare queries.

[4] This provides a text-to-text conversational agent that asks the user about their health issue. The user can chat as if chatting with a human. The bot then asks the user a series of questions about their symptoms to diagnose and gives suggestions about the different symptoms to clarify the disease. Doesn't give detailed information No features such as duration, intensity of symptoms etc.

[5] The proposed method is a chatbot based mobile healthcare service that can immediately respond to the accidents that arise in everyday life and to the condition changes of chronic-disease patients. Also proposes a framework for the human-robot interaction that can endure an efficient implementation of the chatbot service. It is a text-based bot irrespective of having all advanced features.

[6] Conversational agents have many technical, design and linguistic challenges. They introduced the nature of conversation user interface(CUI) for health and described UX design. Some technical limitations like voice message are not accurate, some corruptions are faced due to the network, so the timing of bot remainders is corrupted.

[7] The Bot Transition program provides a framework and resources based on AAP, AFP and ACP recommendations to promote skill attainment in self-care. A scripted text messaging platform is feasible and appears to be well-received by patients and caregivers. It is designed only for people with special health needs transitioning into adolescents.

[8] The system uses a question-and-answer protocol in the form of a chatbot to answer users' queries. The complex questions and answers present in the database are viewed and answered by an expert. This chatbot is comparatively time consuming.

[9] This chatbot is an attempt to let users understand the symptoms they are facing and get a basic diagnosis about the disease they could be having. Complex interface, time consuming, high installation cost.

[10] A chatbot is an interactive software application to simulate natural user interactions based on AI modelling. We have proposed a dataset for the commonly occurring medical conditions together with a prototype model to

provide quick assistance to the patients. It only gives solutions for the common medical conditions.

[11] Uses both KNN algorithm and decision tree classifier and from that more accurate one is taken and shows the output. As it uses both algorithms it is time consuming.

### III. EXISTING SYSTEM

In the current healthcare landscape, traditional methods of healthcare delivery rely heavily on face-to-face interactions between patients and medical professionals. While these interactions offer personalized care, they are often constrained by factors such as geographical barriers and limited availability of healthcare providers. In response to these challenges, digital health solutions have emerged, including mobile health applications, wearable devices, and telemedicine platforms. These solutions aim to improve healthcare access by offering remote monitoring and consultations, leveraging technologies like mobile apps and video conferencing.

However, existing digital health solutions still face challenges such as integration issues, interoperability, and user adoption. Many lack advanced AI capabilities needed to provide personalized and intelligent assistance to users. Moreover, concerns about data privacy, security, and regulatory compliance remain significant barriers to widespread adoption.

In this context, AI-driven healthcare chatbots have garnered attention for their potential to address existing gaps in healthcare delivery. These chatbots offer intelligent, conversational interfaces that can assist users with various healthcare tasks, including symptom assessment, disease diagnosis, medication management, and health education. By leveraging AI technologies like natural language processing (NLP) and machine learning (ML), these chatbots can understand user queries, provide personalized recommendations, and continuously improve their performance through user interactions.

### IV. PROPOSED SYSTEM

The proposed system integrates a Django-based backend for predictive healthcare analysis with a React-based frontend featuring an AI-driven chatbot interface. This hybrid system aims to provide users with comprehensive healthcare assistance, including predictive analysis for heart disease detection and interactive chatbot interactions for personalized health guidance and support.

#### 4.1 Django Backend:

The Django backend serves as the foundation for predictive healthcare analysis. It includes a pre-trained machine learning model for heart disease prediction, loaded using the joblib library. The index view renders the main web page where users can interact with the chatbot interface. The predict view handles incoming POST requests containing user data, performs prediction using the loaded model, and returns the predicted result as a JSON response.

#### 4.2 React Frontend with Chatbot:

The React frontend features an interactive chatbot interface powered by the React Chatbot Kit. The chatbot is configured with a custom MessageParser to interpret user messages and an ActionProvider to handle responses and actions. Additionally, the frontend includes a Header component to enhance the user experience by providing context and branding.

#### 4.3 Integration:

The integration of the Django backend and React frontend enables seamless communication between the predictive healthcare analysis and the chatbot interface. Users can input their health data through the chatbot interface, which sends a POST request to the Django backend for prediction. The backend processes the request, performs prediction using the pre-trained model, and sends the result back to the frontend. The frontend displays the prediction to the user and provides additional support and information through the chatbot interface.

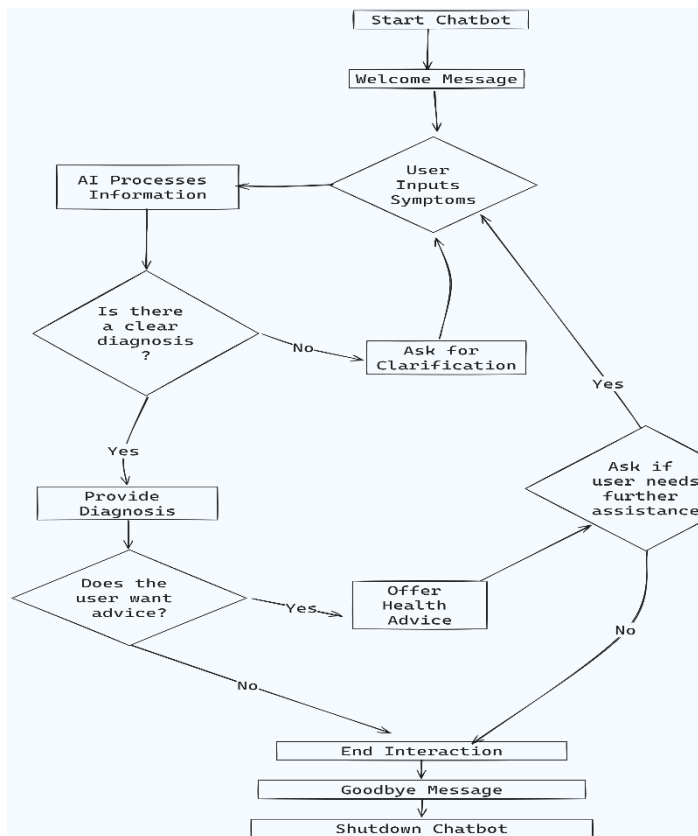


Figure 1. Working functionality of the chatbot.

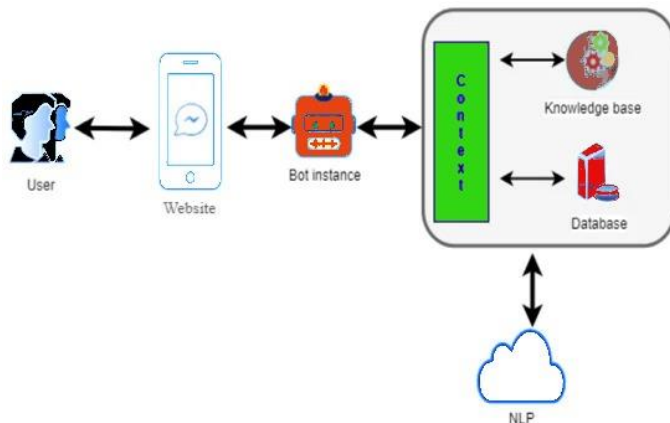


Figure 2. The design of AI chatbot functionality.

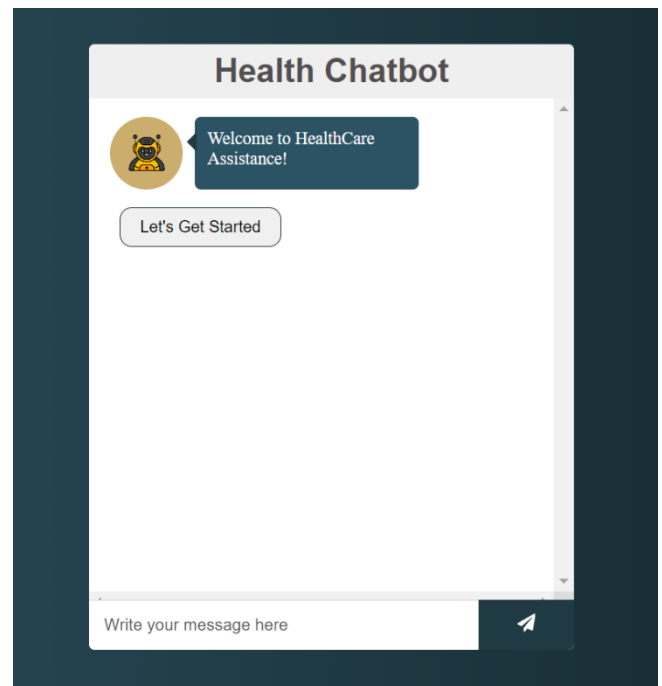


Figure 3. Screenshot 1

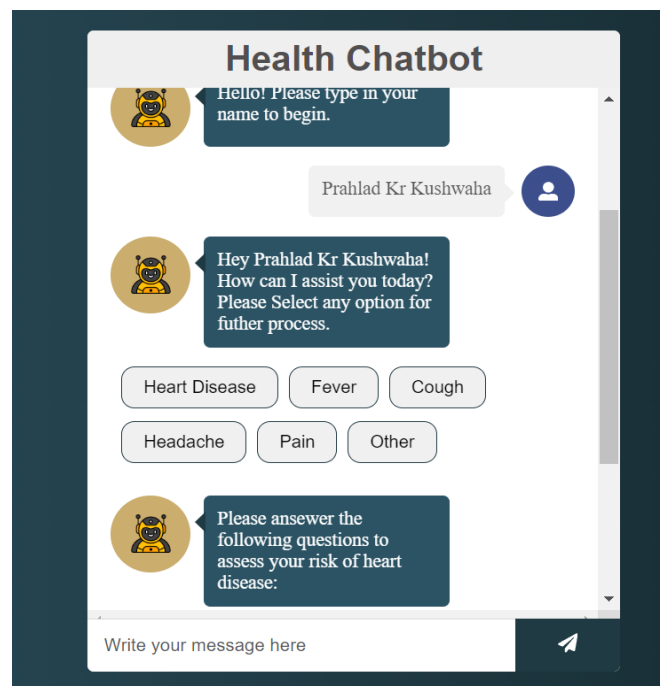
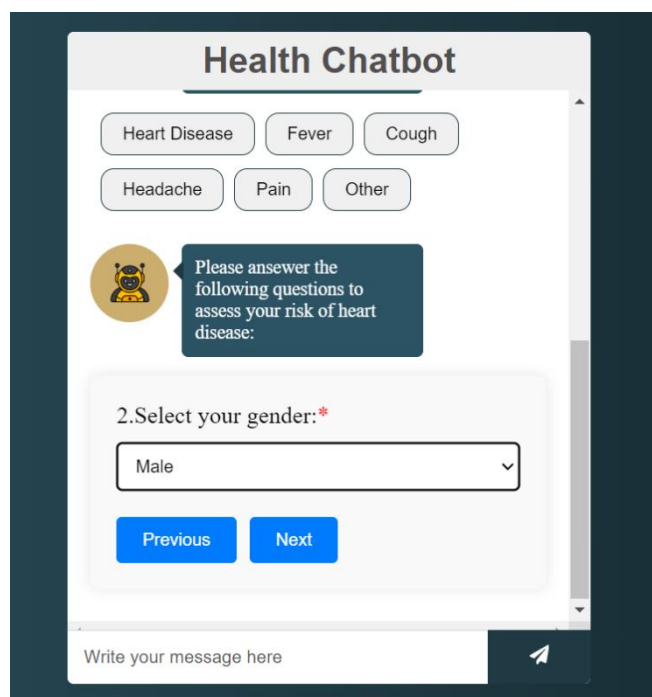


Figure 4. Screenshot 2



**Figure53.** Screenshot 3

## V. RESULT AND DISCUSSION

The proposed system offers an efficient, cost-effective, and user-friendly solution for patients to engage in one-on-one conversations with a healthcare chatbot, facilitating effective health management. By leveraging the chatbot interface, users can effortlessly communicate their symptoms and receive prompt assistance and guidance. Accessible from anywhere and at any time, the system ensures convenience and availability, operating round the clock.

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