



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 3, March 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423



9940 572 462



6381 907 438



ijirset@gmail.com



www.ijirset.com



AI Healthcare Chatbot

Dr.M. Chinnadurai, M. Aijay Mahesver, P. Aruldeva,K. Kaliya Perumal

Professor, Department of Computer Engineering, E.G.S. Pillay Engineering College, Nagapattinam, TamilNadu, India

U.G. Student, Department of Computer Engineering, E.G.S. Pillay Engineering College, Nagapattinam,
TamilNadu, India

U.G. Student, Department of Computer Engineering, E.G.S. Pillay Engineering College, Nagapattinam,
TamilNadu, India

U.G. Student, Department of Computer Engineering, E.G.S. Pillay Engineering College, Nagapattinam,
TamilNadu, India

ABSTRACT: In an era marked by the pervasive influence of technology, healthcare systems worldwide are increasingly turning to artificial intelligence (AI) to enhance accessibility, reliability, and personalization in healthcare services. This abstract presents a comprehensive overview of a proposed AI-based health chatbot system designed to revolutionize the way users access and interact with health information. Leveraging cutting-edge techniques in natural language processing (NLP) and machine learning, this system aims to provide personalized and reliable health assistance to users, thereby empowering them to make informed decisions regarding their well-being. The core objective of the proposed AI-based health chatbot system is to bridge the gap between users and healthcare information, offering a seamless and intuitive platform for accessing medical advice and guidance. By harnessing the power of NLP algorithms, the system can comprehend and interpret user queries expressed in natural language, thereby enabling effective communication between individuals and the digital healthcare interface. This capability is further enhanced by sophisticated machine learning algorithms that continuously refine the system's responses based on user interactions and feedback, ensuring relevance and accuracy in the information provided. One of the distinguishing features of this AI-based health chatbot system is its emphasis on personalization. Recognizing that healthcare needs vary widely among individuals, the system tailors its responses and recommendations to suit the specific requirements and preferences of each user.

KEYWORDS: Artificial Intelligence (AI) , Healthcare Systems,Health Chatbot, Natural Language Processing (NLP)

I. INTRODUCTION

In the realm of modern healthcare, the integration of artificial intelligence (AI) has revolutionized the way we approach medical assistance and support. Among the forefront innovations stands the AI-driven human health chatbot—a sophisticated tool designed to bridge the gap between patients and healthcare providers. These intelligent conversational agents are meticulously crafted to emulate human interaction, offering a personalized and accessible avenue for individuals to address their health concerns and queries. By leveraging advanced machine learning algorithms and natural language processing techniques, these chatbots can comprehend, analyze, and respond to a diverse array of health-related inquiries with accuracy and empathy. With their round-the-clock availability and ability to sift through vast amounts of medical information swiftly, AI-powered health chatbots present a promising solution to enhance healthcare accessibility, efficiency, and patient engagement. As the intersection of AI and healthcare continues to evolve, these chatbots represent a pivotal advancement in empowering individuals to take proactive control of their well-being. AI in healthcare refers to the use of machine learning, natural language processing, deep learning and other AI technologies to enhance the experiences of both healthcare professionals and patients.

The data-processing and predictive capabilities of AI enable health professionals to better manage their resources and take a more proactive approach to various aspects of healthcare. These systems are capable of self-learning and knowledge restoration with the aid of people or online resources. This application is quite basic because it involves knowledge is kept ready in advance. To respond to customer inquiries, the system application employs a chatbot that follows the question and response protocol. This system was created to save users' time and money on medical expenses because they are unable to see doctors or other specialists when they need them.

The user's query and the knowledge base will inform the response to the question. The important terms are extracted from the sentence and used as the response to those sentences. An answer or a list of comparable responses will be shown if a match or significant answer is found.

II. LITERATURE SURVEY

Ragda Mamoun ; Mohamed Nasor, With the increased awareness of people to the importance of regular health checkup, healthcare-providing facilities such as hospitals and clinics are struggling to cope with the demands of an ever-increasing population. This problem is even worse in countries with weak healthcare facilities. The overload on hospitals affects the quality of healthcare services. Many patients spend long hours searching for prescribed medications; others wait for long times to get appointment to see their doctors. Access to ambulance services in critical cases can also be very difficult. All of these factors in addition to the high cost of treatment at hospitals make remote delivery of healthcare the most practical option for many patients. In this paper, a healthcare mobile application prototype was developed successfully and installed on an Android smartphone. The application offers convenient telemedicine services that enable patients to be diagnosed online by medical specialists. The application also facilitates the ordering of medications using online payment. Medications can be delivered directly to the desired location, and in emergency cases, patients can call for ambulance service. The system enables medical doctors and nurses to monitor their patients' health continuously. Pharmacies can also use the application to offer and deliver their medical products to patients.

Alireza Nobakht ; Mohadeseh Gholamhosseinzadeh , In recent years, there has been a growing need for effective system health management in various industries, including aerospace, manufacturing, and healthcare. The use of deep learning for the analysis and diagnosis of biomedical and healthcare problems has received unprecedented attention in the last decade. This technique has so far produced several achievements that have made it difficult to discover meaningful features by other methods and human experts as a promising approach to deal with these challenges. DL is a type of machine learning algorithm with multiple layers of similar functions stacked in the network and has the capability to create meaning from medical big data. These algorithms can learn to identify patterns indicative of diseases, helping physicians make more accurate diagnoses and potentially reducing errors. deep learning models can extract and classify relevant information from Electronic Health Records.

Kübra Arslanoğlu; Mehmet Karaköse, Recently, the increased use of artificial intelligence in healthcare has significantly changed the developments in the field of medicine. Medical centres have adopted AI applications and used it in many applications to predict disease diagnosis and reduce health risks in a predetermined way. In addition to Artificial Intelligence (AI) techniques for processing data and understanding the results of this data, Explainable Artificial Intelligence (XAI) techniques have also gained an important place in the healthcare sector. In this study, reliable and explainable artificial intelligence studies in the field of healthcare were investigated and the blockchain framework, one of the latest technologies in the field of reliability, was examined. Many researchers have used blockchain technology in the healthcare industry to exchange information between laboratories, hospitals, pharmacies, and doctors and to protect patient data. In our study, firstly, the studies whose keywords were XAI and Trustworthy Artificial Intelligence were examined, and then, among these studies, priority was given to current articles using Blockchain technology. Combining the existing methods and results of previous studies and organizing these studies, our study presented a general framework obtained from the reviewed articles. Obtaining this framework from current studies will be beneficial for future studies of both academics and scientists.

Poonam Tanwar; Karan Bansal, Artificial intelligence (AI) and automation have exploded in the space across many industries, including healthcare. One of the most popular forms of artificial intelligence and automation in healthcare is the use of chatbots.

Chatbots in healthcare are computers designed to simulate conversations with human users and provide personalized and supportive services. There exist some applications (Chat bots) have non-user-friendly environment, inappropriate responses, less control over created content. To overcome these gaps a new application has been proposed that enables the users to access interactive content for an school going students. The application is able to answers the frequently asked questions (FAQ) in a hierarchical way and allow user to inerate with the system using front end interface whereas the user can get the solution of small problems of healthcare. The application was developed using Google Dialogflow as a simple way to generate and train a natural language model and other advantage of this is its ability to automatically collect the data that is potentially useful for learners. The main purpose of this work is to discuss the methodology and system implementation so that it can be reproduced in different healthcare contexts. There are

currently many articles, news and blogs discussing the possibilities, uses and effects of chatbots in general, but there is almost no information about their replacement for treatment. In this case, we created four main elements that model the content of the class and focus on quick implementation, ease of Modification and extensibility.

G. Jegan; P Kavi Priya, Healthcare is essential for a healthy existence. Scheduling a doctor's appointment for each health concern, however, could be incredibly difficult. Statistics show that most people already have heart or lung illness, even though many report never having been to a doctor. Most people do not have the medical knowledge to assess or diagnose their health issues accurately. In advanced human-computer interaction, natural language processing research is creating natural interaction modes like chatbots. Corporate and commercial applications are using chatbots to answer user enquiries in natural language. The objective is to create an artificial intelligence-powered medical chatbot that can diagnose illnesses and offer guidance on how to manage them effectively prior to the need for direct consultation with a physician. The suggested chatbot model acquires information about their health and then provides personalized responses and suggestions for dealing with each user's health issues while lowering healthcare expenses.

Ronak Surve; Tushar Purohit, The healthcare sector is undergoing a paradigm shift with the integration of Artificial Intelligence (AI) chatbots into patient care. This research paper explores the transformative potential of AI chatbots in healthcare, focusing on their role in improving patient engagement and support. As healthcare systems worldwide face challenges such as rising patient volumes, limited resources, and the need for continuous care delivery, AI chatbots emerge as innovative tools to address these issues. This research paper includes study and implementation of a web-based chatbot and all the tools we have used to build our AI chatbot and a detailed study of each algorithm used for prediction along with their accuracy. Among all the algorithms K-nearest neighbour has the greatest accuracy and it is implemented in our chat application.

III. METHODOLOGY

A. Proposed Method

The proposed method for an AI-based health chatbot system is designed to revolutionize healthcare accessibility by offering users personalized and reliable health information and assistance. By harnessing the power of natural language processing (NLP) and machine learning algorithms, this system can comprehend and respond to user queries effectively, providing tailored guidance and support. Leveraging state-of-the-art AI techniques, the chatbot ensures that users receive accurate and relevant information, empowering them to take proactive measures towards their health and well-being.

This AI-based health chatbot system represents a significant advancement in healthcare technology, leveraging advanced technologies to deliver personalized and accessible healthcare assistance. By offering tailored guidance and reliable information, the chatbot enables users to make informed decisions about their health, ultimately promoting better outcomes and improved quality of life. With its ability to understand and respond to user queries effectively, this system serves as a valuable tool in enhancing healthcare accessibility and empowering individuals to take control of their health journey.

B. Proposed Architecture

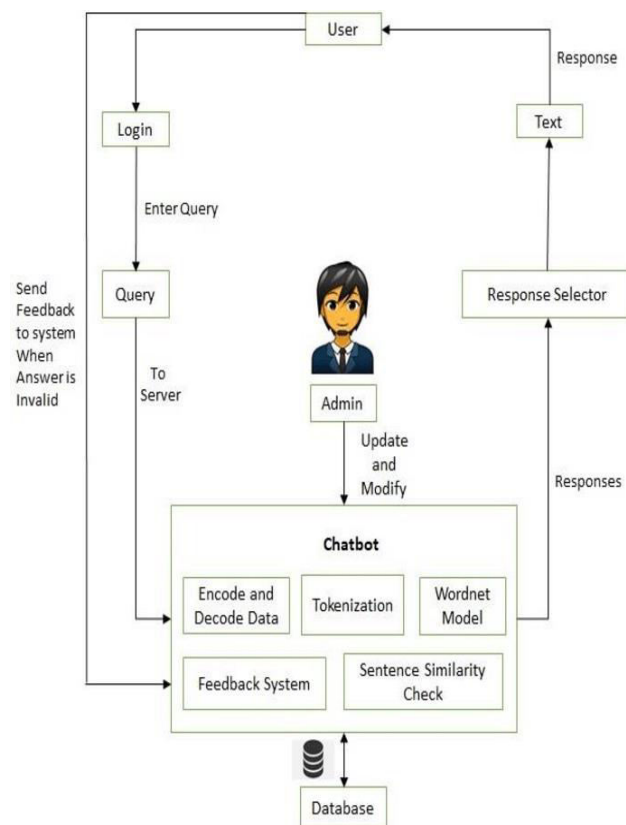


Fig 3 : Proposed Block diagram

The AI-based health chatbot system offers numerous benefits to users, including personalized assistance, reliability, and accessibility. By leveraging advanced technologies, such as NLP and machine learning, the system can deliver tailored responses based on individual needs and preferences. This personalized approach ensures that users receive relevant and accurate information, ultimately enabling them to make informed decisions about their health. Additionally, the accessibility of the chatbot makes it a valuable resource for individuals seeking healthcare assistance anytime, anywhere, thereby promoting proactive health management and improving overall well-being.

IV. SYSTEM IMPLEMENTATION

The implementation process for the AI-based health chatbot system involves several key stages to ensure the effective deployment and functionality of the system. Firstly, the system architecture is designed to incorporate state-of-the-art AI techniques, including natural language processing (NLP) and machine learning algorithms. This architecture forms the foundation for the chatbot's ability to understand and respond to user queries effectively, ensuring a seamless user experience. Next, data collection and preprocessing are essential steps in training the machine learning models that power the chatbot's functionality. Health-related datasets, including medical literature, patient records, and publicly available health information, are gathered and cleaned to extract relevant features and insights. This data preprocessing phase is crucial for enhancing the accuracy and reliability of the chatbot's responses. Once the data is prepared, the machine learning models are trained using supervised learning techniques. These models are trained to understand the nuances of natural language and extract relevant information from user queries. Through iterative training and validation, the models learn to generate accurate and contextually relevant responses to a wide range of health-related inquiries.

Simultaneously, the chatbot's user interface is developed to provide an intuitive and user-friendly experience for users. The interface allows users to interact with the chatbot seamlessly, inputting their health-related queries and receiving personalized responses in real-time. User feedback mechanisms are also integrated into the interface to continuously improve the chatbot's performance and user satisfaction.

As the implementation progresses, rigorous testing and validation procedures are conducted to evaluate the chatbot's accuracy, reliability, and performance. Testing involves both automated testing scripts and manual evaluation by domain experts to ensure that the chatbot's responses align with medical best practices and guidelines. Finally, the AI-based health chatbot system is deployed to the target platform, whether it be a web application, mobile app, or integrated into existing healthcare systems. Continuous monitoring and maintenance are essential post-deployment to address any issues, update the chatbot's knowledge base with new medical information, and incorporate user feedback for ongoing improvement.

A. Algorithm

Natural Language Processing (NLP) algorithms lie at the heart of modern chatbot systems, enabling them to understand and respond to human language in a manner akin to human conversation. These algorithms are designed to process and interpret text input from users, extract meaningful information, and generate appropriate responses. One prominent approach in NLP for chatbots is the use of machine learning techniques, particularly supervised and unsupervised learning, along with deep learning models like recurrent neural networks (RNNs) and transformers.

In supervised learning, NLP algorithms are trained on large datasets containing pairs of input text and corresponding target responses. These algorithms learn patterns and associations between input-output pairs, allowing them to generate contextually relevant responses to new user queries. Techniques such as sequence-to-sequence models, often based on recurrent neural networks (RNNs) or transformer architectures like BERT (Bidirectional Encoder Representations from Transformers), have been widely used for this purpose. These models can handle sequential input data and capture complex linguistic patterns, enabling chatbots to produce human-like responses. Conversely, unsupervised learning approaches for NLP focus on extracting meaningful representations and structures from unlabeled text data. Techniques such as word embeddings, where words are mapped to high-dimensional vector spaces based on their context in a corpus, enable chatbots to understand semantic relationships between words and phrases. Algorithms like Word2Vec and GloVe are commonly used for generating word embeddings, which capture semantic similarities and relationships between words, thus enhancing the chatbot's ability to comprehend and generate natural language responses.

B. Module Description

Admin Module

The Admin Module for the AI-based health chatbot system serves as the central hub for managing and overseeing the platform's operation. Administrators have access to a range of functionalities including user management, content management, chatbot configuration, data analytics, integration management, security and compliance, system maintenance, and user support.

Through the Admin Module, administrators can effectively govern the chatbot platform to ensure its smooth operation, compliance with healthcare regulations, and continuous improvement to meet user needs.

User Module

The User Module for the AI-based health chatbot system provides users with a seamless and intuitive interface to interact with the chatbot and access personalized health assistance. Users can easily register and authenticate their accounts, update their profiles, and engage in conversations with the chatbot to seek health-related information, advice, and support.

The module offers features such as symptom assessment, medication reminders, appointment scheduling, and access to relevant health resources and FAQs.

V. RESULT

The proposed AI-based health chatbot system represents a cutting-edge approach to delivering personalized and reliable healthcare assistance to users. By harnessing the power of natural language processing (NLP) and machine learning algorithms, the system aims to understand and respond to user queries effectively, thereby enhancing accessibility and user experience in the realm of healthcare.

Through the utilization of state-of-the-art AI techniques, the system can analyze and interpret user inputs, enabling it to provide tailored responses and recommendations based on individual needs and preferences. This personalized approach not only increases the relevance and usefulness of the information provided but also fosters a deeper level of engagement and trust between users and the system.

Moreover, the AI-based health chatbot system leverages advanced technologies to ensure the reliability and accuracy of the information it delivers. By continuously learning from user interactions and feedback, the system can refine its responses over time, adapting to changing user needs and preferences. This iterative learning process enhances the system's ability to provide timely and relevant healthcare assistance, ultimately improving the overall quality of care and support available to users.

The system's emphasis on accessibility ensures that users from diverse backgrounds and with varying levels of health literacy can benefit from its services. By offering a user-friendly interface and intuitive interaction capabilities, the system removes barriers to accessing healthcare information and assistance, empowering individuals to take control of their health and well-being.

VI. CONCLUSION

An excellent tool for conversation is a chatbot. In this case, the application is designed to deliver high-quality responses quickly. By employing an expert system to send the response straight to the user, it relieves the answer provider of some of the burden. The initiative was created to save the user time when seeking medical advice from professionals or physicians. Here, we created an application that extracts the keyword from the user query using the N-gram and TF-IDF. Every term is evaluated to determine the appropriate response for the inquiry. The web interface is designed with users' input queries in mind.

REFERENCES

1. Siddique, Sarkar, and James CL Chow. "Machine learning in healthcare communication." *Encyclopedia* 1.1 (2021): 220-239.
2. Xu, Lu, et al. "Chatbot for health care and oncology applications using artificial intelligence and machine learning: systematic review." *JMIR cancer* 7.4 (2021): e27850.
3. Ayanouz, Soufyane, Boudhir Anouar Abdelhakim, and Mohammed Benhmed. "A smart chatbot architecture based NLP and machine learning for health care assistance." *Proceedings of the 3rd international conference on networking, information systems & security*. 2020.
4. Kandpal, Prathamesh, et al. "Contextual Chatbot for healthcare purposes (using deep learning)." *2020 Fourth World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4)*. IEEE, 2020.
5. Athota, Lekha, et al. "Chatbot for healthcare system using artificial intelligence." *2020 8th International conference on reliability, infocom technologies and optimization (trends and future directions)(ICRITO)*. IEEE, 2020.
6. Mathew, Rohit Binu, et al. "Chatbot for disease prediction and treatment recommendation using machine learning." *2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI)*. IEEE, 2019.
7. Rahman, Md Moshir, et al. "Disha: An implementation of machine learning based bangla healthcare chatbot." *2019 22nd International Conference on Computer and Information Technology (ICCI)*. IEEE, 2019.
8. Farheen Naaz and Farheen Siddiqui, "modified n-gram based model for identifying and filtering near-duplicate documents detection", *International Journal of Advanced Computational Engineering and Networking*, vol. 5, no. 10, Oct. 2017.
9. "N-gram Accuracy Analysis in the Method of Chatbot Response", *International Journal of Engineering & Technology*, 2018.
10. V.K Shukla and A Verma, "Enhancing LMS Experience through AIML Base and Retrieval Base Chatbot using R



Language", 2019 *International Conference on Automation Computational and Technology Management (ICACTM)*.

11. K. Oh, D. Lee, B. Ko and H. Choi, "A Chatbot for Psychiatric Counseling in Mental Healthcare Service Based on Emotional Dialogue Analysis and Sentence Generation", *2017 18th IEEE International Conference on Mobile Data Management (MDM)*, pp. 371-375, 2017.
12. Jinwen Liang, Zheng Qin, Liang Xue, Xiaodong Lin and Xuemin Shen, "Efficient and privacy-preserving decision tree classification for health monitoring systems", *IEEE Internet of Things Journal*, vol. 8, no. 16, pp. 12528-12539, 2021.
13. Mitanshi Rastogi, Vijarania, Meenu, Goel and Neha, "Role of Machine Learning in Healthcare Sector", August 20, 2022, Proceedings of the International Conference on Innovative Computing & Communication (ICICC) 2022.
14. P. Singh, G. Singh and S. Bharti, "The Predictive Model of Mental Illness using Decision Tree and Random Forest classification in Machine Learning", *2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)*, pp. 01-05, 2022.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details