

A
Mini-Project Report on

Medi-ChatBot

Submitted in partial fulfillment of the requirements
for the degree of
BACHELOR OF ENGINEERING
IN
Computer Science & Engineering
Artificial Intelligence & Machine Learning

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CERTIFICATE

This is to certify that the project entitled “**Medi-ChatBot**” is a bonafide work of Sahil Shaikh (22206004), Milind Chavan (22206007), Harshal Deshmukh (22206008), Aryan Bane (22206009) submitted to the University of Mumbai in partial fulfillment of the requirement for the award of **Bachelor of Engineering in Computer Science & Engineering (Artificial Intelligence & Machine Learning)**.

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Project Report Approval

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We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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ABSTRACT

Medi-ChatBot have emerged as a transformative technology in healthcare, providing innovative solutions to improve patient care and access to medical information. These AI-powered chatbots provide an easily accessible 24/7 platform for patients to seek medical advice, receive medication reminders, schedule appointments, and access a wealth of health-related information . By providing anonymous and judgment-free interactions, chatbots are effectively bridging the healthcare gap, especially in remote areas, and meeting the diverse needs of the population. Global. Their ability to provide information quickly and accurately, as well as the scalability to handle multiple requests, significantly reduces the administrative workload of healthcare professionals. In addition, chatbots provide personalized healthcare information and support, personalized recommendations, behavioral change coaching, and adaptive responses to individual needs. As a result, they contribute to improved patient outcomes, increased healthcare service efficiency, and enhanced patient satisfaction. With applications ranging from mental health support to chronic disease management and diagnostic assistance, medical chatbots are poised to play a pivotal role in the future of healthcare, supporting early detection, intervention, and the reduction of healthcare costs while ultimately improving the overall healthcare experience.

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CHAPTER 1

INTRODUCTION

1. INTRODUCTION

The birth of medical chatbots represents a revolutionary step forward in the field of healthcare and artificial intelligence. These intelligent chatbots have disrupted traditional healthcare delivery by providing patients and healthcare providers with a 24/7 digital interface to find information, medical advice and support. Leveraging natural language processing and machine learning, medical chatbots provide a flexible and accessible platform to meet a wide range of healthcare needs, from symptom assessment and medication management to “make appointments and monitor chronic diseases”.

Their ability to operate around the clock, coupled with their ability to provide consistent, evidence-based information, reduces barriers to accessing health care resources. This accessibility is especially beneficial for patients living in remote or underserved areas where in-person health care services may be limited. Additionally, medical chatbots serve diverse populations by providing multilingual support, eliminating language and cultural barriers that can hinder healthcare communication.

In addition to providing accurate and timely health information, medical chatbots help improve health care efficiency. They speed up administrative tasks such as appointment scheduling and medication reminders, helping healthcare professionals relieve routine, non-clinical tasks. Their scalability and ability to handle a multitude of needs simultaneously helps further streamline healthcare processes.

In addition, medical chatbots bring a sense of personalization to healthcare. They can tailor recommendations, provide support for behavior change, and tailor responses to individual needs, leading to better compliance and better patient outcomes. This personalization extends to tracking health and fitness metrics, helping individuals in their quest for better health.

As these AI-based chatbots continue to grow, their applications in the healthcare ecosystem are also expanding. From mental health support to remote patient monitoring and diagnostic support, medical chatbots play a key role in improving patient experience, reducing healthcare costs, and optimizing patient care resource allocation.

This introduction introduces the transformative potential of medical chatbots, highlighting their role as catalysts for improving access, efficiency and patient outcomes in the healthcare context increasingly digital.

CHAPTER 2

LITERATURE SURVEY

2. LITERATURE SURVEY

2.1-HISTORY

The history of medical chatbots is rooted in the development and evolution of artificial intelligence (AI) and healthcare technology. Here is a brief history of medical chatbots:

- Early concepts of AI (1950s-1960s):

The earliest origins of AI date back to the mid-20th century. Pioneers of AI like Alan Turing and John McCarthy laid the foundations for computational intelligence. These basic concepts eventually paved the way for AI-based chatbots.

- Eliza (1960s):

In the 1960s, Joseph Weizenbaum developed Eliza, one of the first examples of a chatbot. Although not specific to the healthcare field, Eliza mimicked a Rogerian psychotherapist, engaging in text conversations with users. Eliza's approach laid the foundation for future medical chatbots by demonstrating the potential of AI-driven conversations.

- Parry (1970s):

Another notable chatbot of this era was Parry, developed by Kenneth Colby. Parry simulates a person with paranoid schizophrenia and is designed for therapeutic purposes, providing a unique opportunity for the application of chatbots in mental health.

- Internet and World Wide Web (1990s):

The widespread use of the Internet and World Wide Web in the 1990s provided the foundation for the development of chatbots. As more information becomes available online, the potential for AI-powered health applications, including chatbots, has begun to gain momentum.

- The emergence of health information websites (1990s-2000s):

As the Internet developed, health information websites and portals began to provide mass information about Health Care. This laid the foundation for the need for AI-based interfaces to help users navigate and access medical information effectively.

- Symptom checkers (2000s):

In the early 2000s, the concept of symptom checkers and healthcare consultation chatbots began to gain popularity. Websites and chatbots like WebMD and the Mayo Clinic Symptom Checker have given users tools to enter symptoms and receive recommended diagnoses and advice.

- Modern Healthcare Chatbots (2010s to Present):

The past decade has seen significant growth in the development of healthcare chatbots. These chatbots are more complex and powered by AI, capable of providing personalized advice, medication reminders, appointment scheduling, and mental health support.

2.2-LITERATURE REVIEW

A review of the literature on medical chatbots reveals a growing body of research and studies exploring various aspects of this emerging technology. Here are some key findings and trends from the literature:

- **Improving access to healthcare:**
Many studies highlight the role of chatbots in improving access health care service. They provide a way for individuals to seek medical information, advice and support, particularly in areas where access to medical services is limited. Chatbots have been proven to lower the barrier to entry, allowing patients to receive information and support 24/7.
 - **Improving patient engagement:**
The document highlights the ability of chatbots to engage patients in their healthcare journey. Chatbots provide personalized information and reminders, encouraging individuals to take an active role in managing their health. This has proven to be especially helpful for medication adherence and chronic disease management.
 - **Efficiency and cost savings:**
Researchers have explored the impact of chatbots on the efficiency of the healthcare system. By automating administrative tasks, such as scheduling and triaging appointments, chatbots help reduce the workload of healthcare workers. This can lead to cost savings and more streamlined healthcare processes.
 - **Diagnostic Support:**
Some studies investigate the potential of chatbots in diagnostic assistance. While they are not a replacement for healthcare professionals, chatbots can help users assess symptoms and provide guidance on when to seek medical attention. These tools can contribute to early detection and intervention.
 - **Mental Health Support:**
The literature underscores the growing importance of mental health support through chatbots. Chatbots offer a non-judgmental and anonymous platform for individuals to discuss their mental health concerns. They can provide coping strategies, crisis intervention, and resources for mental health care.
- Chronic disease management:
- **Patient satisfaction:**
Several studies evaluated patient satisfaction with medical chatbots. Results indicate that patients often find chatbots convenient, accessible, and helpful in answering their healthcare questions. High patient satisfaction can lead to increased patient compliance and better outcomes.

CHAPTER 3

Problem Statement

3. Problem Statement

Limited Accessibility: Many individuals, particularly in remote or underserved areas, face limited access to healthcare resources, making it difficult to obtain timely information about their health concerns.

Overloaded Healthcare Facilities: Healthcare facilities are often inundated with inquiries, many of which are non-urgent and could be addressed through a more efficient system.

Health Information Overload: The abundance of health-related information on the internet can lead to confusion and misinformation, potentially resulting in poor health decisions.

Privacy Concerns: People are rightfully concerned about the privacy of their health data and may be reluctant to share sensitive information online.

Problem Description

The development and integration of medical chatbots into the healthcare ecosystem has posed a number of challenges and issues that need to be resolved. These issues include technical, ethical, and operational aspects and affect both patients and healthcare providers.

- **Accuracy and reliability:**

Medical chatbots, although very advanced, do not always provide accurate medical information or diagnoses. Their responses may be based on general knowledge or outdated medical data, potentially leading to inaccurate advice. This can damage a patient's confidence and even affect their safety.

- **Data privacy and security:**

Medical chatbots collect and store sensitive patient health information. Ensuring the safety and security of this data is essential. Data breaches and unauthorized access to health records pose significant risks and can lead to serious legal and ethical consequences.

- **Lack of human supervision:**

Chatbots may lack the ability to recognize complex, critical, or special medical situations that require human intervention. Failure to report these cases to healthcare professionals may result in delayed diagnosis or treatment, negatively affecting patient outcomes.

- **Ethical Dilemmas:**

In emergency situations or when patients disclose sensitive information, chatbots may encounter ethical dilemmas. Deciding on the appropriate course of action while adhering to ethical principles is a challenge for AI-based systems.

- **Limited understanding of context:**

Medical chatbots often struggle to fully understand the broader medical context of a patient's condition. They may miss important details about a patient's medical history, which can lead to incomplete or inaccurate advice.

CHAPTER 4

Experimental Setup

4. Experimental Setup

4.1 Hardware Setup

In this description students have to write Configuration of computer system to run the software.

4.2 Software Setup

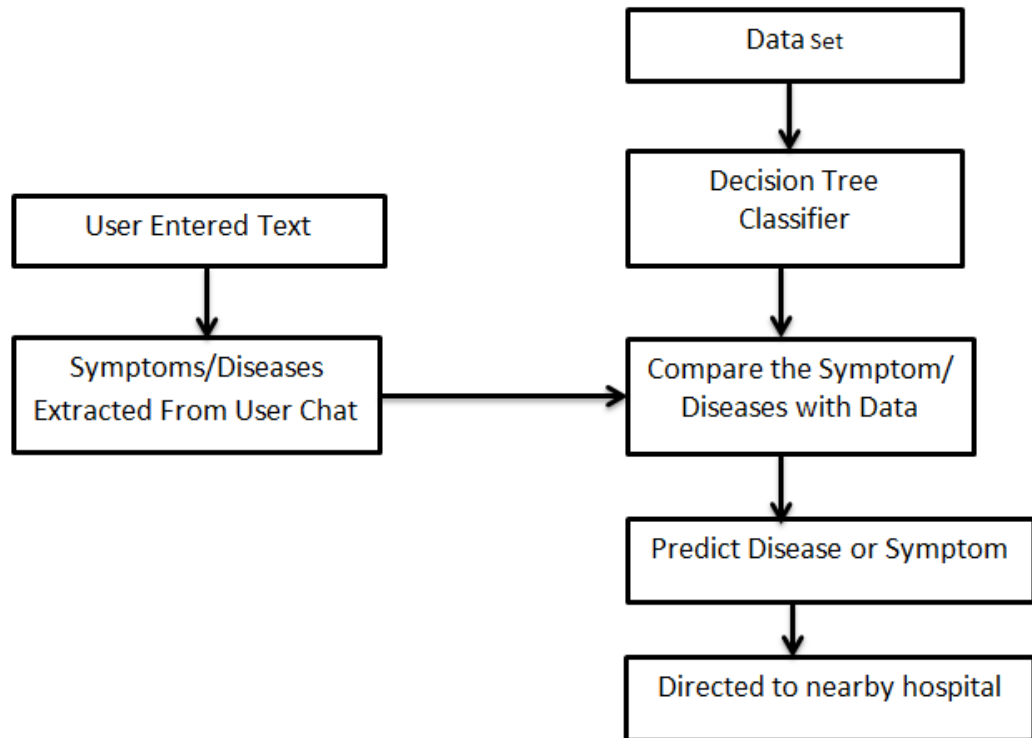
All software tools along with packages are need to be included here.

CHAPTER 5

Proposed System & Implementation

5. Proposed system & Implementation

5.1 Block diagram of proposed system



5.2 Description of block diagram

User Entered Text: The flowchart begins with the user's input in the form of text, which initiates the interaction with the healthcare chatbot.

Symptoms/Disease Extracted from User Chat: The chatbot processes the user's input to extract relevant symptoms or potential diseases mentioned in the conversation.

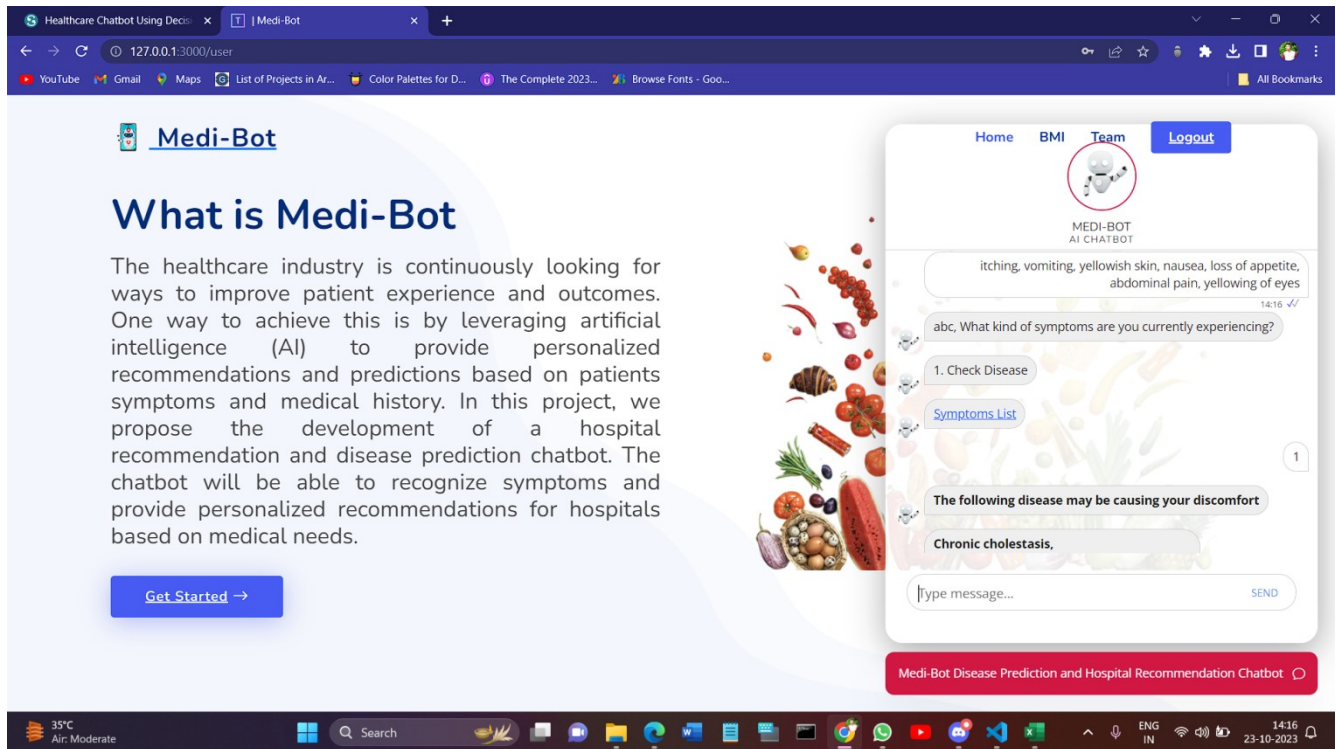
Data Set: The chatbot accesses a dataset containing information about symptoms and diseases. This dataset serves as the reference for making predictions and classifications.

Decision Tree Classifier: The flowchart proceeds to a decision point where the chatbot employs a decision tree classifier. This classifier is designed to analyze and classify the symptoms or diseases extracted from the user's input.

Compare the Symptom/Disease with Data Set: The classifier compares the symptoms or diseases extracted from the user's input with the information in the dataset. This step involves assessing how closely the user's symptoms match known medical conditions.

Predict the Disease/Symptoms: Based on the comparison, the decision tree classifier makes predictions regarding the likely disease or symptoms that the user might be experiencing.

1.3 Implementation



5.4 Advantages/ Application/ result table can be included in this subsection.

Social media messaging apps, such as Facebook Messenger, WhatsApp, and Telegram, can use IVR to provide users with a variety of services, such as customer support, account management, and product information. For example, a user might be able to use IVR to contact customer support for a specific business, reset their password, or learn more about a product.

Standalone messaging platforms, such as Slack and Discord, can also use IVR to provide users with similar services. For example, a user might be able to use IVR to get help from a team member, join a specific channel, or learn more about a feature.

Proprietary websites and apps, such as those used by banks, airlines, and retailers, can also use IVR to provide users with a variety of services, such as account management, account security, and customer support. For example, a user might be able to use IVR to check their balance, transfer money, or report a lost or stolen credit card.

Even on phone calls, IVR can be used to provide users with a variety of services, such as customer support, account management, and product information. For example, a user might be able to use IVR to contact customer support for a specific business, reset their password, or learn more about a product.

CHAPTER 6

Conclusion

6. Conclusion

Medicine chatbots have emerged as a transformative force in healthcare, offering innovative solutions to address various challenges in the industry. While they hold great promise, their implementation and evolution come with significant considerations. In conclusion, the potential benefits of medicine chatbots are clear, but their success hinges on the effective resolution of the challenges outlined in the problem description.

Patient Access and Engagement: Medicine chatbots have the capacity to improve healthcare access by providing information and support 24/7. This accessibility can empower patients to take a more active role in their health management, particularly for non-emergency situations.

Efficiency and Cost Savings: The automation of administrative tasks by chatbots can lead to more streamlined healthcare processes and reduced operational costs. This efficiency can free up healthcare professionals to focus on more complex and critical aspects of patient care.

Personalized Healthcare: Chatbots can offer tailored information and support, encouraging patients to make healthier lifestyle choices and manage chronic conditions effectively. Their potential for continuous learning and improvement makes them valuable tools in personalized medicine.

Mental Health Support: The non-judgmental and readily available nature of chatbots has been instrumental in providing mental health support and crisis intervention, reducing the stigma surrounding mental health issues.

Diverse Populations: By addressing language and cultural barriers, chatbots can reach and assist a broader and more diverse patient population, improving healthcare equity.

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