

AI Driven Public Health Chat Bot for Disease Awareness

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ABSTRACT

The rapid growth of digital healthcare technologies has created opportunities for improving public health awareness through intelligent systems. However, many individuals still struggle to access reliable and timely health information, leading to misinformation and delayed preventive actions. Traditional health information systems are mostly static and lack interactive communication capabilities.

This research proposes an AI-Driven Public Health Chatbot for Disease Awareness, an intelligent system designed to provide real-time health guidance using Natural Language Processing (NLP) and machine learning techniques. The chatbot enables users to ask disease-related questions, receive preventive recommendations, and obtain awareness information through conversational interaction. The system integrates a disease knowledge base, NLP-based intent recognition, and AI-driven response generation to ensure accurate and user-friendly communication.

Implemented as a web-based platform, the chatbot real-time responses, and scalable deployment across devices. Experimental observations demonstrate improved accessibility to health information and enhanced user engagement.

Keywords: Public Health Chatbot, Disease Awareness, NLP, Artificial Intelligence, Healthcare Analytics, Conversational AI.

I. INTRODUCTION

Public health awareness plays a crucial role in preventing diseases and promoting healthy lifestyles. Despite the availability of health information online, many users face difficulties in understanding medical content due to technical language and lack of guidance. This gap often leads to misinformation and poor health decisions.

Recent advancements in Artificial Intelligence and Natural Language Processing have enabled chatbots to act as interactive assistants capable of understanding user queries and providing contextual responses. AI-based health chatbots can bridge the communication gap by offering simplified explanations, preventive guidance, and symptom-related information.

This study introduces an AI-Driven Public Health Chatbot designed to assist users by delivering real-time disease awareness information. The system aims to improve

accessibility, provide personalized guidance, and reduce dependency on static health portals.

II. LITERATURE REVIEW

Existing research highlights the growing use of AI in healthcare applications, particularly for automated assistance and disease awareness.

Traditional health information systems rely on centralized portals and static content, limiting user engagement and personalization. Rule-based chatbots improved interaction but lacked adaptability to complex queries.

Recent approaches integrate NLP and machine learning to improve response accuracy and contextual understanding. Federated learning and privacy-preserving AI techniques have also emerged to ensure secure handling of sensitive health data.

However, many existing solutions still face challenges such as limited multilingual support, scalability issues, and insufficient real-time adaptability. This research addresses these limitations by proposing a scalable and intelligent chatbot framework.

III. EXISTING SYSTEM

Current health information platforms and chatbots mainly provide:

- Static health information portals
- Rule-based response systems
- Limited personalization
- Minimal AI-based learning
- Lack of conversational interaction
- Poor handling of ambiguous queries
- Limited personalization
- No adaptive learning from user interactions
- Weak integration with real-time health data

IV. PROPOSED SYSTEM

The proposed system introduces an AI-driven chatbot capable of delivering disease awareness information through intelligent conversation.

Features

- Conversational health guidance
- Real-time disease updates
- Multi-disease awareness coverage
- Privacy and ethical compliance
- Lightweight and scalable architecture
- Integration with health databases and government portals

System Architecture

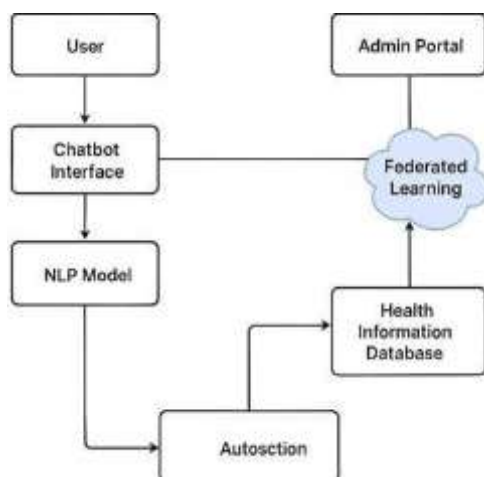


FIGURE 4.1: System Architecture

V. METHODOLOGY

The implementation follows these stages:

1. Data Collection and Preprocessing

User health queries are collected and cleaned using preprocessing techniques such as tokenization and normalization.

2. NLP-Based Query Analysis

The chatbot identifies user intent and extracts important health-related keywords.

3. AI-Based Response Generation

Machine learning models generate appropriate disease awareness responses.

4. Knowledge Base Integration

Responses are validated using medical datasets to ensure reliability.

5. Web Deployment

The chatbot is implemented using React.js frontend, Node.js backend, and Python-based AI models for processing.

VI. RESULTS

6.1 Disclaimer



FIGURE 6.1.1: HealthGuard AI Disclaimer Interface.

6.2 Main Interface



FIGURE 6.2.1: HealthGuard AI Main Interface for Public Health Assistance.



FIGURE 6.2.2: HealthGuard AI Displaying Nearby Clinics Based on User Request.



FIGURE 6.2.3: HealthGuard AI Displaying Vaccination Information with Verified Sources.



FIGURE 6.2.4: HealthGuard AI Displaying Seasonal Flu Symptoms with Verified Sources.

VII. CONCLUSION

The AI-Driven Public Health Chatbot for Disease Awareness demonstrates the potential of artificial intelligence in improving healthcare communication. By integrating NLP and machine learning, the system delivers accurate and accessible health information to users through conversational interaction.

The project successfully reduces dependency on static health awareness methods and promotes proactive disease prevention. It provides a scalable and intelligent platform that can be extended with advanced features such as real-time disease tracking and multilingual voice support.

REFERENCES

- [1] Arnold V. Lim W. A. & Powell L. (2024). Chatbots and COVID-19: Taking stock of the lessons learned. *Journal of Medical Internet Research*.
- [2] Choi E. et al. (2020). Doctor AI: Predicting clinical events via recurrent neural networks. *Lee J. & Lee T. (2021). The indisease diagnosis. International Journal of Medical Informatics* 151 104482.
- [3] Lim W. A. et al. (2024). General characteristics and design taxonomy of chatbots for COVID-19: A systematic review. *Journal of Medical Internet Research*.
- [4] Patel V. L. & A. W. (2019). The role of artificial intelligence in clinical decisionmaking.