International Journal of
DATA SCIENCE AND IOT MANAGEMENT SYSTEM
Peer Reviewed, Referred & Indexed Journal
ISSN: 3068-272X www.ijdim.com Original Research Paper

Artificial Intelligence – Driven Chatbot for Public Health Disease Awareness

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ABSTRACT- This project presents an AI-Driven Public Health Chatbot for Disease Awareness that provides reliable healthcare information and promotes preventive healthcare using Artificial Intelligence (AI) and Natural Language Processing (NLP). The chatbot delivers accurate information on common diseases, symptoms, causes, preventive measures, vaccination, nutrition, hygiene, mental health, and basic first aid. Developed using Python, Flask, HTML, CSS, JavaScript, SQLite, and Llama 3 (Ollama), it generates intelligent, context-aware responses through an interactive web interface. The system offers instant access to trustworthy health information, helping reduce misinformation and improve public health awareness. It is designed for educational purposes only and encourages users to consult healthcare professionals for medical diagnosis and treatment.

KEYWORDS: Artificial Intelligence (AI), Public Health Chatbot, Disease Awareness, Preventive Healthcare, Ollama (Llama 3), Machine Learning, Conversational AI, SQLite, Health Education, Disease Prevention.

LITERATURE SURVEY

Artificial Intelligence (AI) has gained significant attention in recent years due to rapid advancements in machine learning, Natural Language Processing (NLP), and Large Language Models (LLMs). AI-driven healthcare systems are increasingly being adopted to improve public health awareness and provide disease-related information. Healthcare chatbots are intelligent virtual assistants designed to interact with users through natural conversations, enabling quick access to reliable medical guidance. The primary objective of these systems is to educate users about diseases, symptoms, preventive measures, healthy lifestyle practices, and general healthcare information. Researchers have developed various healthcare chatbot models capable of answering health-related queries and providing symptom-based guidance. However, many existing systems rely on predefined responses, possess limited domain knowledge, and struggle to understand complex user queries. Recent advancements in NLP and LLM-based conversational AI have significantly improved chatbot intelligence, enabling more accurate, context-aware, and interactive communication, making AI-driven public health chatbots an effective solution for disease awareness and health education.

RELATED WORK

Several researchers have contributed to the development of AI-based healthcare chatbots with the aim of improving disease awareness, health education, and access to reliable medical information. Initial research in this domain focused on rule-based healthcare chatbots that responded to user queries using predefined questions and answers. These systems relied on fixed knowledge bases and keyword matching techniques, offering limited conversational

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ability and personalization. With the advancement of Artificial Intelligence, Natural Language Processing (NLP), and Large Language Models (LLMs), modern healthcare chatbots have become more intelligent and capable of understanding natural language, providing context-aware responses, and delivering accurate health-related guidance. These advancements have significantly enhanced user interaction and made AI-driven public health chatbots more effective in promoting disease awareness and preventive healthcare.

EXISTING SYSTEM

Existing healthcare information systems mainly rely on websites, hospitals, helplines, and basic rule-based chatbots. Users must manually search for health information, while traditional chatbots provide predefined responses with limited understanding of user queries. These systems lack intelligent interaction, personalization, context-aware guidance, and real-time disease awareness. As a result, users may receive incomplete information, reducing the effectiveness of disease awareness and preventive healthcare.

PROPOSED SYSTEM

The proposed system implements an AI-Driven Public Health Chatbot to provide reliable healthcare information and improve disease awareness. It uses Artificial Intelligence (AI) and Natural Language Processing (NLP) to understand user queries and generate accurate responses. The chatbot provides

information on diseases, symptoms, preventive measures, vaccination, nutrition, hygiene, and healthy lifestyle practices. Developed using Python, Flask, HTML, CSS, JavaScript, SQLite, and Llama 3 (Ollama), it offers instant access to trustworthy health information through a user-friendly web interface. The system is intended for educational purposes and encourages users to consult healthcare professionals for diagnosis and treatment.

SYSTEM ARCHITECTURE

The architecture of the AI-Driven Public Health Chatbot for Disease Awareness consists of a user interface, chatbot application, AI and Natural Language Processing (NLP) module, knowledge base, database, and response generation module. Users enter health-related queries through the web interface, which are processed by the chatbot application. The AI and NLP module analyzes the user's input, identifies the intent, and retrieves relevant healthcare

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information from the knowledge base. Using Llama 3 (Ollama), the system generates accurate and context-aware responses related to diseases, symptoms, preventive measures, vaccination, nutrition, hygiene, and healthy lifestyle practices. The generated response is displayed instantly, providing reliable health awareness and encouraging users to consult healthcare professionals for proper diagnosis and treatment.

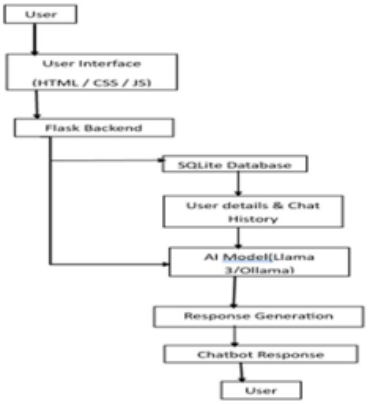


Fig 1 : System Architecture

METHODLOGY DESCRIPTION

The methodology of the AI-Driven Public Health Chatbot for Disease Awareness is designed to provide reliable healthcare information through intelligent interaction using Artificial Intelligence and Natural Language Processing (NLP). The system follows a structured approach that includes user query input, text preprocessing, intent recognition, AI-based response generation, and response delivery. User queries are analyzed to understand their intent, relevant health information is retrieved from the knowledge base, and accurate, context-aware responses are generated using Llama 3 (Ollama). The chatbot then presents the information through a user-friendly web interface, enabling users to access disease awareness, preventive measures, vaccination, nutrition, hygiene, and healthy lifestyle guidance in real time.

RESULTS AND DISCUSSION



Fig 2: Home Page

The Home Page is the main entry point of the AI-Driven Public Health Chatbot. It introduces the chatbot and its health awareness services. Users can access options like Login, Sign Up, and About. The Get Started button allows users to begin using the chatbot. It provides a simple and user-friendly interface.



Fig 3: Dashboard

The Dashboard is the main page displayed after a successful login. It provides quick access to Chatbot,

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Resources, Health Tips, and Emergency modules. Users can easily navigate to these features or securely Logout from the application.

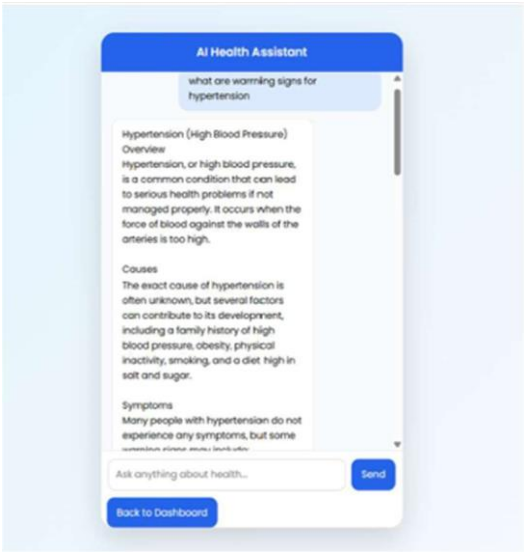


Fig 4: AI Assistant

The AI Chatbot Interface enables users to ask health-related questions and receive AI-generated responses. It provides information on diseases, symptoms, treatment, and prevention in simple language. The interface is interactive, easy to use, and supports disease awareness.

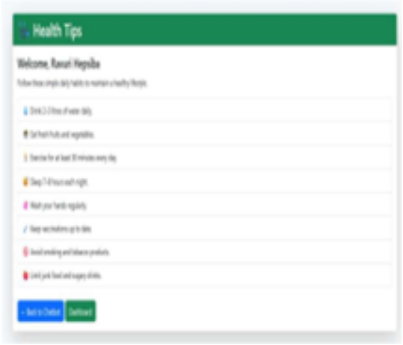


Fig 5: Health Tips

The Health Tips page provides simple daily health recommendations for maintaining a healthy lifestyle. It includes tips on hydration, nutrition, exercise, sleep, hygiene, and vaccination. The page helps users adopt healthy habits and prevent common diseases.

CONCLUSION

The AI-Driven Public Health Chatbot successfully provides reliable health information using AI and NLP technologies. It promotes disease awareness, preventive healthcare, and healthy lifestyle practices through an interactive web-based platform. Overall, the system improves public health education by providing accurate and accessible healthcare guidance anytime.

FUTURE SCOPE

The chatbot can be enhanced with multilingual and voice support. It can include hospital appointment booking and medicine reminders. Real-time health monitoring and wearable device integration can improve healthcare services. The chatbot can also be developed as a mobile application for Android and iOS. Advanced AI models will provide more accurate and reliable health information.

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