MedWise: AI/ML Powered Healthcare Web Application

**Abstract—Seeking healthcare in an appropriate amount of time is often costly and time-consuming, requiring people to see doctors even for minor health issues. This becomes inconvenient, especially when it is not an emergency condition and requires a long wait. This paper presents a smart application based on Artificial Intelligence (AI) and Machine Learning (ML), called MedWise, which aims to enhance healthcare services by making them more efficient and available.  
  
The responsive AI chatbot is one of the most crucial components of MedWise, enabling users to receive health tips on request, get instructions tailored to their issues, analyze their symptoms, and better understand health and diseases. The chatbot also provides possible solutions, allowing people to address health concerns without needing to visit a physician every time.  
  
To improve the disease modeling capabilities of the web application, it is complemented with advanced machine learning techniques for disease modeling and Convolutional Neural Networks (CNNs) for medical imaging diagnosis. This integrated approach bridges self-health management with professional healthcare through the MedWise application, making it more optimal and versatile.  
  
These factors transform healthcare by making it more accessible, affordable, and faster, enabling users to manage their health and acquire relevant health advice when needed.**

***Keywords: Machine learning, Deep learning, Artificial intelligence, Healthcare system***

I. INTRODUCTION

Right to good health is a basic right of every individual as reiterated by the World Health Organization of the United Nations. It is a right that every person should have regardless of where the person is located, or their social and economic status, and so on. But in the case of India, a country whose population today has gone beyond one point four two billion, the healthcare system still has a number of deficiencies that makes it unable to attend to the health care needs of all the citizens in the society. India is populated by a large mix of people who live in different regions, have different cultural practices and come from different income groups. This mix is a reason for the unequal distribution of healthcare services, and the wide gap existing between urban and rural areas in terms of structures, types of medical professionals, and their levels of income. Even majority of people in different places are faced with the challenge of getting appropriate healthcare services in the right time. The COVID-19 pandemic highlighted these systemic healthcare gaps. During the crisis, millions of people faced challenges such as misinformation about the virus, delays in accessing accurate medical advice, and shortages of healthcare resources.

One of the prominent challenges which India’s healthcare system has to resolve is the relatively scarce number of doctors and other health care personnel in rural communities. Despite urban areas having better infrastructure and more healthcare facilities, urban residents face their own set of challenges, such as busy schedules and logistical difficulties, which deter timely medical consultations. Financial constraints exacerbate the situation, with many individuals unable to afford regular medical check-ups or treatments. These problems in large part tend to afflict and accentuate chronic health issues among the rural poor. The unavailability of local health experts compels the residents to seek medical help from distant towns. This travel is not only lengthy but expensive and as such not many poor rural folks get the health care. More so, non-availability of essential primary health care services such as lack of proper diagnostic facilities to aid in early detection of illnesses to well equipped hospitals lead ordinary illnesses to develop into life threatening conditions. These were existing challenges before COVID-19, which makes me want to reiterate that these require immediate fixes.

MediWise is presented as a transformative solution intended to bridge the gaps and address the systemic issues in this challenge. By integrating artificial intelligence (AI) and machine learning (ML), MediWise provides a radical change in healthcare as it improves the ease of access, convenience and cost effectiveness to everyone. MediWise has potential of the patients or target groups engaging user-friendly interaction and health assistance that incorporate new technologies capable of addressing a wide range of issues including advanced support for early diagnosis of health conditions and anticipating disease outlook for preventive health care.

MediWise has an intelligent chat bot integrated within the app whereby the user can interact with the health app quite naturally with guidance of RAG technology and conversational AI models developed by OpenAI. The chat bot acts as the first port of call for people looking for medical help articulating symptoms or asking general health questions. The Max of the device is updated with what is termed relevant into the RAG model which assists in real time responses making the bot or assistant auto relevant and contextually relevant at all times. This enables users to receive timely advice and valuable information about the disease, which, in turn, enables the people to make informed choices with the information.

The application incorporates advanced AI-based tools, such as disease and image analysis predictive models. Such functions allow users to gather information on possible threats to their health and make decisions regarding treatment at an earlier stage. For example, disease prediction instruments can make use of the data provided by users to establish the risks of complications of diabetes and also primary and secondary heart disease as well as liver disease. Also, using same models, image analysis features help in detection of critical medical conditions such as brain tumours and arthritis through assessment of various medical images. These diagnostic features make MediWise an all-encompassing platform that transits through the prediction of diseases, prompt diagnosis, and prognostic evaluation, all with online convenience.