DRUG RECOMMENDATION SYSTEM

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Abstract: In medical emergencies, receiving quick and accurate medicine recommendations is crucial, especially when healthcare professionals are unavailable. This paper presents a Drug Recommendation System that functions as a web application, offering users two treatment options: Allopathy and Ayurvedic remedies. Based on the user's selection and symptoms, the system suggests suitable medicines or herbal treatments. The recommendation process is guided by predefined symptom-drug mappings and expert medical insights to ensure accuracy and reliability. This study highlights how such a system can assist individuals when immediate medical attention is unavailable, when reaching a doctor is difficult, or when dealing with initial-level symptoms. Additionally, it compares our system with existing drug recommendation platforms, emphasizing its ease of use and practical implementation.

Index Terms – Symptoms-based, Allopathy and Ayurvedic Recommendations, Medical Web Application

1. INTRODUCTION

1.1 Current Scenario

In situations like travelling, living in rural areas, or facing symptoms at night, it's often hard to get quick medical help. People may take medicines on their own or ask a pharmacist, which can sometimes cause side effects or allergies. Our Drug Recommendation System helps in such cases by suggesting safe medicines and remedies based on symptoms entered by the user. It uses a trusted dataset created with help from doctors, making it useful when a doctor isn't easily available.

1.2 Problem Statement

Design and develop a web application that recommends suitable Allopathy medicines and Ayurvedic remedies based on the symptoms entered by the user, helping them get quick and safe suggestions when medical help is not immediately available

1.2 Objectives

1. Provide accurate medication to patients.
2. Implement authentication of the user.
3. Providing user friendly interface.
4. Immediate recommendation of medication.

2. REQUIREMENT ANALYSIS AND LITERATURE SURVEY

2.1 Research Contributions

- Collection and study of medicines through visits to doctors and healthcare professionals to gather accurate, real-world information.

- Acquisition of a dataset from Kaggle to enhance the recommendation system, providing a broader range of medicines and remedies for better accuracy.

2.2 Literature Review

Several studies have explored different approaches to drug recommendation systems:

[1] **Drug Recommendation System Based on Sentiment Analysis of Drug Reviews Using Machine Learning** (Dubba et al., 2024): This study leverages sentiment analysis of drug reviews to develop a recommendation system. It utilizes machine learning algorithms to analyse patient sentiments and improve drug recommendations, enhancing patient satisfaction by aligning drugs with user experiences and needs.

[2] **Drug Recommendation System in Medical Emergencies** (Saleem et al., 2023): This research focuses on developing a drug recommendation system tailored for medical emergencies, emphasizing the need for rapid and accurate drug suggestions. It highlights the importance of integrating real-time data for quick decision-making in high-pressure healthcare settings.

[3] **DRUG RECOMMENDATION SYSTEM** (Tanna et al., 2023): The paper provides an overview of various machine learning algorithms used in drug recommendation systems, comparing their effectiveness. It contributes insights into how different models can be applied in practical healthcare scenarios, enhancing understanding of algorithmic strengths and weaknesses.

4] **Extraction of Drug Review Polarity Using Sentimental Analysis** (Marappan et al., 2022): This study uses sentiment analysis to determine the polarity of drug reviews, employing computational techniques to understand patient sentiments. It informs drug recommendation strategies by providing a nuanced view of public opinion on different drugs.

[5] **Drug Recommendation System based on Sentiment Analysis of Drug Reviews using Machine Learning** (Garg, 2021): This conference paper explores using machine learning for sentiment analysis in drug recommendation systems. It emphasizes the effectiveness of combining these technologies to improve the predictive accuracy of drug recommendations based on textual data.

[6] **Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow** (Géron, 2020): This book provides an in-depth guide to machine learning techniques and frameworks like Scikit-Learn, Keras, and TensorFlow. It serves as a resource for implementing machine learning models, which can be adapted for use in drug recommendation systems.

2.3 Life Cycle Model

The Agile Model was selected due to the dynamic nature of the project, for continuous update in the dataset use of SQL for user authentication.

3. SYSTEM STRUCTURE AND DESIGN

3.1 System Structure

Proposed system consists of:

1. **User Interface**: Allows users to enter symptoms and personal details of authentication and registration.
2. **Backend Server**: Manages data storage, authentication and dataset of medicines.
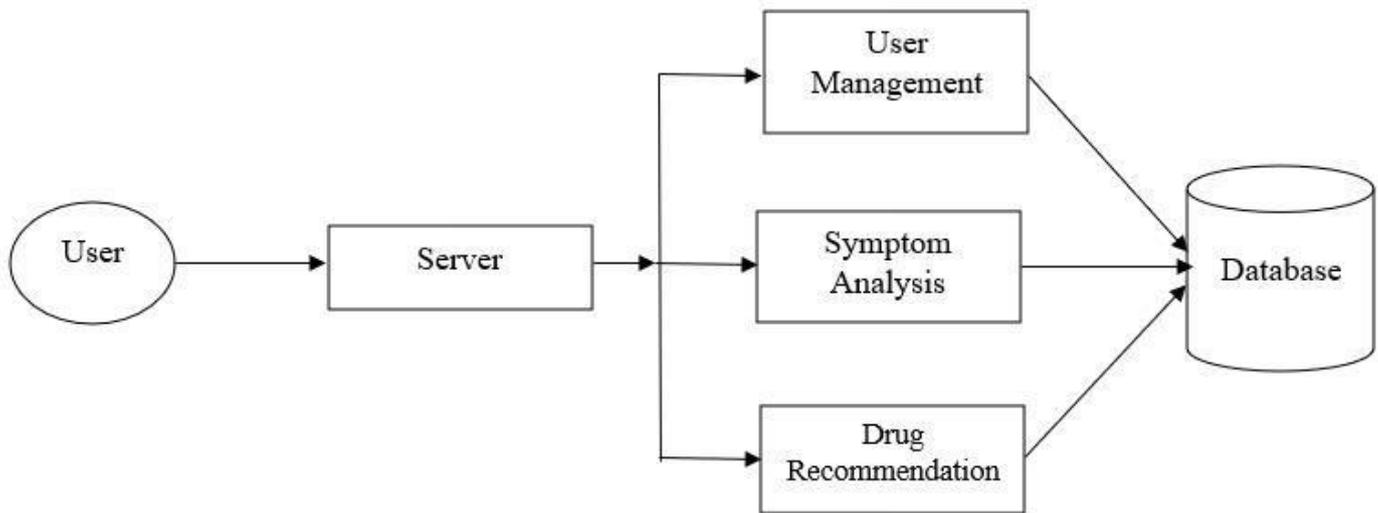3. **Database**: Stores user profiles.

3.2 Block Diagram

Fig. 1 block diagram

3.3 Workflow

The workflow of the drug recommendation system follows these steps:

1. **User Login & Authentication**: Secure login with email verification.
2. **Recommendation Page**: Entering symptoms and choosing Allopathy and Ayurvedic medication.
3. **Recommendation**: Recommendation as per the choice of medication and symptoms of the patient.
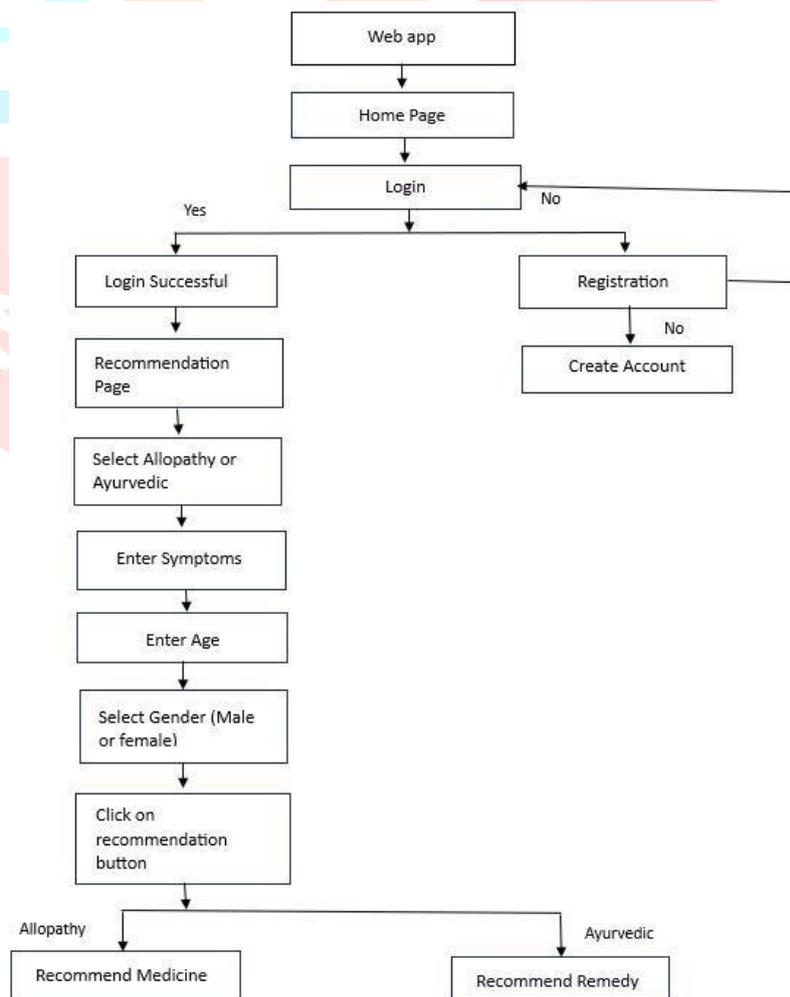

Fig. 2 work flow diagram

3.4 Modular Structure

I. Authentication Module

The Authentication Module is responsible for managing user access to the system. It includes user registration, which allows new users to create an account by entering their details. Once registered, users can log in securely using their credentials, ensuring that only authorized people can access the system

II. Recommendation Module

The Recommendation Module helps users get suitable medicine suggestions based on their health issues. First, users can enter their symptoms into the system. Then, they can choose their preferred type of medication, such as Allopathy and Ayurvedic. Based on this input, the system will recommend the most appropriate medicines or remedies tailored to the user's choice and symptoms.

III. Backend Server

The Backend Server is the core part of the system that works behind the scenes. It handles API requests and responses, meaning it takes in data from the frontend (like user inputs) and sends back the required results. It also manages the business logic, which includes all the rules and decision-making processes, like how to recommend medicines based on symptoms. Additionally, the backend connects with the database and authentication service to store user data, verify logins, and ensure smooth communication between different parts of the system.

IV. Database Module

The Database Module is where all the important information for the system is safely stored and managed. It stores user data, including email addresses, passwords, and their recommendation history. It also keeps records of user ratings, which can help improve the quality of future suggestions. Additionally, the database holds details about different medication types, such as Allopathy and Ayurvedic, so the system can offer accurate recommendations based on user preferences.

V. User Interface Module

The User Interface Module is the part of the system that users interact with directly. It features a clean and responsive design, making it easy to use on both computers and mobile devices. There is a form where users can enter their symptoms, helping them get personalized recommendations. Once the data is processed, the module displays the recommended medicines or remedies in a clear and easy-to-read format, so users can quickly understand and act on the suggestions.

4. IMPLEMENTATION & TECHNOLOGIES USED

4.1 Frontend Development

i. **Languages & Frameworks**: HTML, CSS, JavaScript.

ii. **Features**: Responsive and user-friendly interface.

4.2 Backend Development

i. **Languages**: PHP, Python.
ii. **Database**: MySQL for storing user data.
iii. **Dataset**

5. TESTING AND RESULTS

5.1 Test Cases

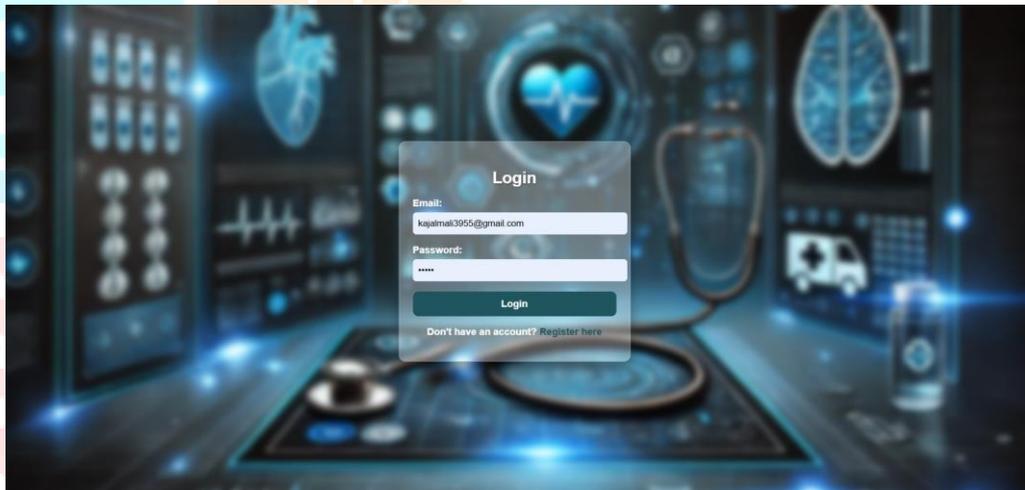| Test Case	Expected Result	Status
User Registration/Login	Successful login/signup	Pass
Allopathy recommendation	Displays allopathy medicine based on given symptoms.	Pass
Ayurvedic recommendation	Displays ayurvedic remedy	Pass

5.2 Results

Fig 3. home page

Fig 4. login Page
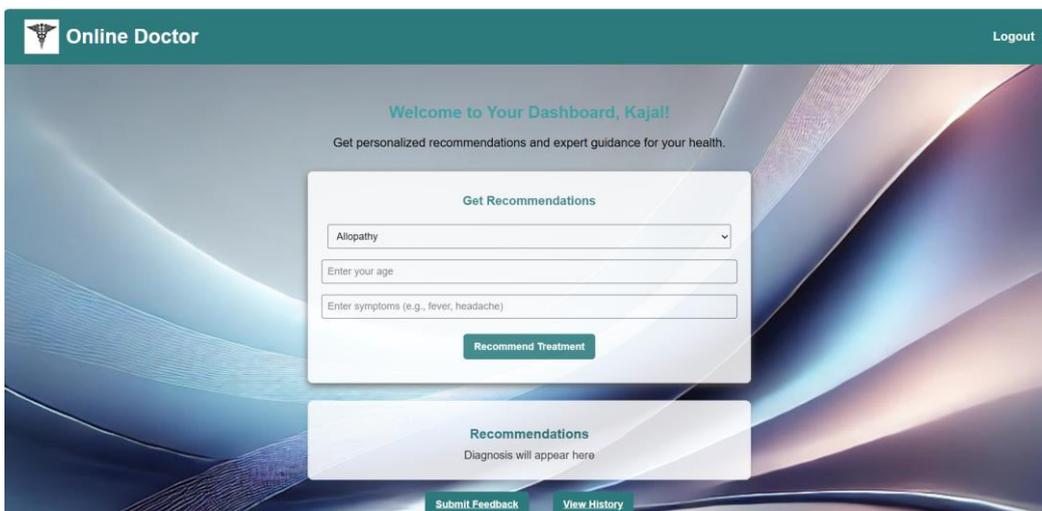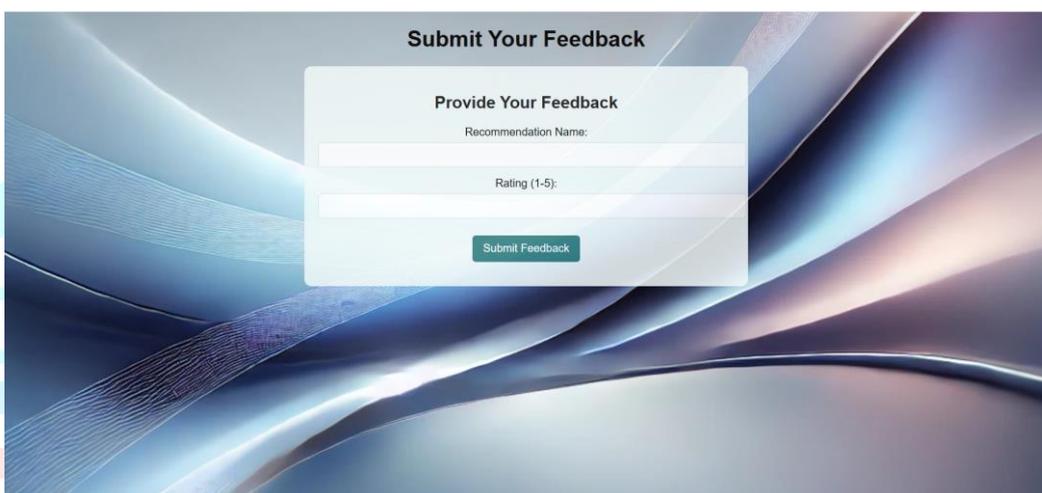

Fig 5. registration Page

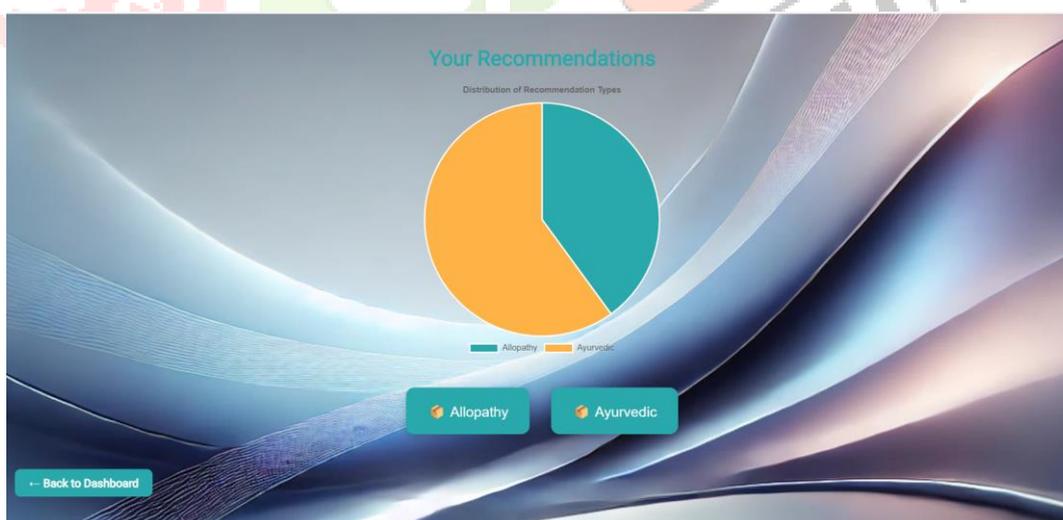Fig 6. dashboard

Fig 7. feedback

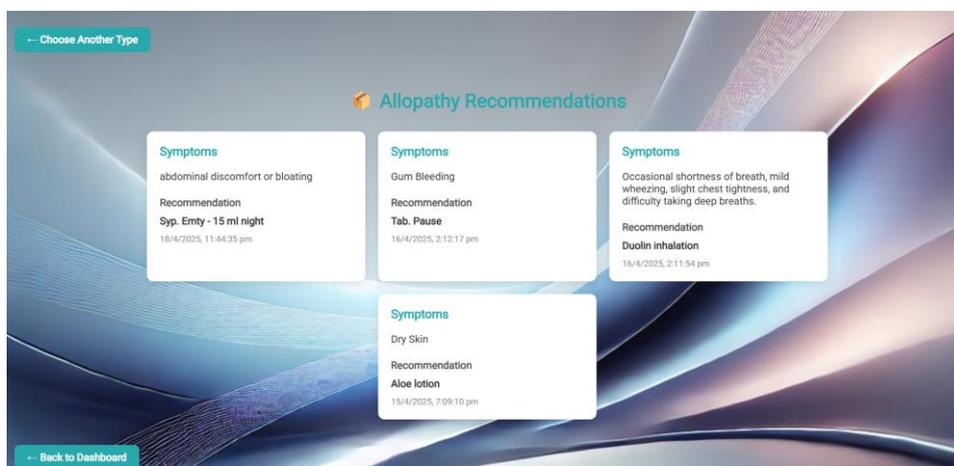Fig 8. pie chart according to recommendation type

Fig 9. previous history of Allopathy Recommendations

Fig 10. previous history of Ayurvedic Recommendations

6. CONCLUSION AND FUTURE WORK

This Drug Recommendation System provides symptom-based medication suggestions for both Allopathy and Ayurvedic treatments. This recommendation based on the symptoms entered by the patient and it get matched with the symptoms present in the dataset created by the help of doctors and experts. The system demonstrates efficiency, making it a valuable tool for emergency healthcare assistance. Future enhancements will focus on expanding the dataset, improving usability, and integrating real-time updates for greater reliability. Allowing voice-based symptom reporting for easier interaction and review analysis using Natural Language Processing (NLP).

7. REFERENCES

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