VEDA CARE
PROJECT REPORT

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Under the guidance of,

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CERTIFICATE

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DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **VEDA CARE** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Ms. AMREEN KHANUM D, Assistant Professor, School of Computer Science And Engineering(IOT), Presidency University, Bengaluru.**

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ABSTRACT

Ayurveda, an ancient system of medicine, has a vast repository of herbal formulations, minerals, and therapeutic combinations designed to suit individual health conditions based on psychosomatic constitutions, clinical conditions, and other factors. This rich knowledge is documented across more than 150 classical texts, often written in multiple languages and scripts. Despite the digitization of many of these texts, Ayurvedic students and practitioners often face challenges in exploring and identifying the appropriate formulations for specific symptom patterns. This project proposes the development of a digital Ayurvedic formulation recommender system to address these challenges by streamlining the process of identifying suitable formulations for patients based on their symptoms and clinical conditions.

The proposed system will consolidate Ayurvedic data from various texts, structuring it into a relational database that categorizes formulations, ingredients, and contraindications. The database will include detailed information on Ayurvedic pharmacological properties such as Rasa (taste), Guna (qualities), Virya (potency), and Vipaka (post-digestive effect). To enhance precision, the system will feature comprehensive tagging of disease synonyms, ensuring that conditions identified under different names are correctly linked to their respective treatments. Furthermore, ingredient suitability and contraindications will be integrated, preventing the recommendation of formulations containing unsuitable substances for specific patient groups, such as diabetics or individuals with alcohol sensitivity.

The core of the system will involve a symptom-based mapping algorithm designed to intelligently match inputted symptoms to the most appropriate formulations. This algorithm will incorporate rule-based logic to filter out contraindicated ingredients and prioritize formulations based on factors like disease severity, patient constitution (Prakriti), and associated comorbidities. By combining structured data with intelligent recommendation techniques, the system will streamline the process of selecting formulations, improving both accuracy and efficiency for practitioners and student.

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INTRODUCTION

Ayurveda is one of the world's oldest holistic healing systems, originating in India over 3,000 years ago. It emphasizes the balance between mind, body, and spirit to promote overall well-being. Central to Ayurvedic practice are herbal formulations that cater to individual health conditions based on their unique psychosomatic constitution, known as Prakriti. These formulations are composed of various herbs, minerals, and natural substances, tailored to address specific ailments while promoting holistic healing. Ayurvedic practitioners often rely on classical texts to identify the appropriate formulations for their patients. However, given the vast number of manuscripts and the extensive range of formulations described, manually identifying the most suitable treatment is often challenging and time-consuming.

The complexity of Ayurvedic medicine lies in its vast database of formulations, each designed for unique symptom patterns, disease stages, and individual patient constitutions. Classical Ayurvedic texts such as the *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* detail numerous formulations for various ailments. These formulations vary based on factors such as climate, age, dietary

habits, and comorbidities. Additionally, the same disease may be described under different names in separate texts, adding to the complexity of identifying suitable treatments. Furthermore, some herbs and formulations have dual meanings, making manual reference inefficient and error-prone. For example, the term "Abhaya" commonly refers to *Terminalia chebula*, but in certain contexts like *Jatyadi Ghrita*, it denotes *Vetiveria zizanioides*. Such complexities demand an efficient system that can streamline the identification of appropriate Ayurvedic formulations.

In response to these challenges, this project aims to develop an intelligent Ayurvedic formulation recommender system that can efficiently identify and suggest the most suitable formulations based on patient symptoms and conditions. This system will address the existing gaps by integrating digitized Ayurvedic knowledge into a structured database and employing intelligent mapping techniques to recommend personalized treatments. The project leverages modern computational approaches to enhance the accuracy, efficiency, and accessibility of Ayurvedic practice.

1.1 Need for the Proposed System

The primary challenge in Ayurvedic practice is navigating the extensive knowledge base to find precise formulations for specific symptoms. Traditional methods of manually referencing classical texts are time-consuming, especially when practitioners need to evaluate multiple symptom patterns and comorbidities. Moreover, Ayurveda's rich terminology includes multiple names for the same disease (e.g., *Jvara* and *Santapa* for fever), further complicating the process. Existing tools provide only limited information on individual herbs or general formulations, lacking personalized recommendations that align with a patient's

constitution and clinical condition.

The proposed system addresses these limitations by combining digital data structuring with intelligent recommendation algorithms. By integrating data from over 150 classical texts, the system aims to present practitioners and students with precise recommendations based on symptoms, patient-specific conditions, and formulation properties. The platform will also alert users to contraindications, such as the presence of unsuitable ingredients for diabetic or alcohol-sensitive patients. This ensures safer and more effective treatment decisions.

1.2 Key Features of the Proposed System

The Ayurvedic formulation recommender system will include several core features designed to improve efficiency and accuracy in identifying suitable treatments:

1. **Comprehensive Database:** The system will consolidate data from classical Ayurvedic texts, organizing formulations based on symptoms, ingredients, and pharmacological properties such as *Rasa* (taste), *Guna* (quality), *Virya* (potency), and *Vipaka* (post-digestive effect). Disease synonyms and contextual herb meanings will be included to improve search accuracy.
2. **Symptom-Based Mapping Algorithm:** The system will use a rule-based mapping algorithm to match inputted symptoms with appropriate Ayurvedic formulations. This algorithm will prioritize formulations based on symptom relevance, disease stage, and patient conditions such as age, region, or dietary preferences.
3. **Ingredient Suitability Analysis:** The system will analyze formulation components to identify potential contraindications. For example, formulations containing jaggery or fermented preparations will be flagged as unsuitable for diabetic patients, improving safety in prescription.
4. **User-Friendly Interface:** A digital platform will provide an intuitive interface for students and practitioners. The interface will support search functions using disease names, synonyms, and related symptoms to present relevant formulations with detailed references.
5. **Reference Integration:** Each recommended formulation will include references from authentic Ayurvedic texts, ensuring users can cross-check the source for further study and validation.

1.3 Benefits of the Proposed System

The development of this system offers several key benefits for Ayurvedic practitioners, students, and researchers:

- **Improved Efficiency:** By automating the process of identifying suitable formulations, the system will significantly reduce the time spent manually referring to texts. Practitioners can quickly access relevant treatment options, improving clinical efficiency.

- **Enhanced Accuracy:** The system's structured database and intelligent algorithm will provide precise recommendations based on symptom patterns and patient conditions.
- **Increased Safety:** With ingredient suitability analysis integrated into the system, practitioners will receive alerts for contraindicated substances, ensuring safer treatment decisions.
- **Comprehensive Knowledge Access:** By consolidating data from multiple texts, the system will serve as a rich resource for Ayurvedic learning, making it easier for students to understand complex formulations and their applications.
- **Personalized Recommendations:** The inclusion of patient-specific factors such as Prakriti, dietary preferences, and comorbidities will enhance the personalization of treatment suggestions.

Future Scope

The proposed system has the potential to expand significantly by integrating advanced technologies. Incorporating artificial intelligence (AI) and natural language processing (NLP) can further improve symptom recognition and automated recommendation accuracy. Future updates could also include multilingual support, allowing Ayurvedic texts in various languages to be indexed and integrated into the database. Expanding the system to include regional Ayurvedic practices can enhance its comprehensiveness and broaden its usability for diverse medical traditions.

In conclusion, this Ayurvedic formulation recommender system aims to bridge the gap between traditional knowledge and modern technology. By combining structured data, intelligent algorithms, and a user-friendly interface, the system will improve accessibility, accuracy, and efficiency in Ayurvedic practice. This innovative solution has the potential to revolutionize Ayurvedic treatment by empowering practitioners and students with a powerful digital tool for personalized formulation recommendations.

LITERATURE SURVEY

2.1 Introduction to Ayurvedic Medicine and Its Importance:

Ayurveda, one of the world's oldest holistic healing systems, originated in India more than 3,000 years ago. Rooted in the principles of balancing body, mind, and spirit, Ayurveda emphasizes the use of natural herbs, minerals, and personalized treatments. Ayurvedic texts such as *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* provide comprehensive information about numerous herbal formulations tailored for specific conditions. These texts are crucial references for Ayurvedic practitioners, yet their extensive content makes manual exploration difficult. With advancements in digitization, opportunities to develop intelligent tools to navigate Ayurvedic data have emerged. The proposed Ayurvedic formulation recommender system aims to bridge this gap by providing efficient search and recommendation features.

2.2 Ayurvedic Text Digitization and Challenges:

The digitization of Ayurvedic texts has played a significant role in preserving traditional knowledge. Manuscripts written in multiple languages such as Sanskrit, Tamil, and Hindi have been transcribed and made available online. However, challenges persist due to inconsistent terminology, differing interpretations, and complex language structures. Studies highlight the need for a comprehensive platform that consolidates this data, addresses language barriers, and provides easy access to crucial medical information.

Researchers have attempted to create digital repositories for Ayurvedic data. For example, the *Ayurvedic Pharmacopoeia of India (API)* serves as a reference for standardized herbal formulations. However, these resources often lack intelligent search mechanisms that match symptoms with appropriate treatments. Integrating data with computational tools can significantly enhance the utility of such databases.

2.3 Role of Artificial Intelligence in Ayurveda

Artificial intelligence (AI) and machine learning (ML) are emerging as powerful tools in healthcare. Researchers have successfully used AI to identify disease patterns, predict drug efficacy, and optimize treatment selection. In Ayurveda, AI-based recommender systems are particularly useful in analyzing symptom patterns, identifying suitable formulations, and minimizing the risk of prescribing unsuitable treatments.

Studies have explored NLP algorithms for mapping Ayurvedic terms to modern medical terminology. NLP helps address issues such as multiple synonyms for a single disease or ingredient. For instance, integrating

NLP techniques into Ayurvedic systems can improve search accuracy by identifying terms like *Jvara* and *Santapa*, which both refer to fever. Similarly, ML models trained on historical data can predict which formulation best suits a particular set of symptoms, enhancing clinical decision-making.

2.4 Development of Ayurvedic Formulation Recommender Systems:

Efforts to develop digital tools for Ayurveda have focused on creating recommender systems that simplify the selection of herbal formulations. Such systems typically integrate structured data on herbs, symptoms, and contraindications. For example, the Ayurvedic Medicine Information System (AMIS) employs decision-tree algorithms to suggest appropriate treatments for conditions such as fever, cold, and inflammation.

However, existing systems often fall short in handling complex formulations that require specific preparation methods or patient conditions. The proposed system addresses these limitations by combining an extensive Ayurvedic database with intelligent recommendation features. It considers factors like patient age, comorbidities, and ingredient compatibility to improve treatment precision.

2.5 Digital Transformation in Traditional Medicine:

The World Health Organization (WHO) has emphasized the importance of integrating traditional medicine with modern healthcare. WHO's *Traditional Medicine Strategy 2014-2023* advocates for digitizing indigenous medicinal knowledge to enhance global healthcare accessibility. Ayurvedic institutions in India have responded by developing e-learning platforms, digital libraries, and mobile applications that disseminate Ayurvedic principles to a wider audience.

For instance, the *National Institute of Ayurveda (NIA)* has actively digitized ancient manuscripts to preserve Ayurvedic wisdom. Similarly, institutions have developed digital tools to improve the understanding and application of Ayurvedic formulations. The proposed recommender system builds upon these efforts by integrating advanced search algorithms with Ayurvedic data to provide accurate treatment recommendations.

2.6 Challenges in Ayurvedic Data Integration:

Despite the progress in Ayurvedic digitization, several challenges persist. The complexity of Ayurvedic terminology, regional variations in herbal formulations, and limited standardization in treatment protocols pose significant obstacles. Furthermore, Ayurvedic texts often contain ambiguous language, requiring context-based interpretation. These issues necessitate the integration of semantic search algorithms and robust data tagging systems to improve data retrieval.

Researchers have also highlighted the difficulty in representing Ayurvedic pharmacological concepts such as *Rasa* (taste), *Guna* (quality), *Virya* (potency), and *Vipaka* (post-digestive effect). The proposed system addresses this by incorporating comprehensive tags for these properties, improving recommendation accuracy.

2.7 Potential of Recommender Systems in Ayurveda:

Recommender systems have proven effective in various domains such as e-commerce, entertainment, and healthcare. In Ayurveda, recommender systems can streamline the process of identifying suitable formulations for complex symptom patterns. Collaborative filtering techniques can enable the system to learn from user preferences and improve recommendations over time. Content-based filtering can further enhance accuracy by analyzing formulation properties and symptom profiles.

By combining these techniques, the proposed system can efficiently suggest formulations that align with classical Ayurvedic principles while considering individual patient conditions. This personalized approach improves treatment efficacy and reduces the risk of adverse effects.

2.8 Future Trends in Ayurvedic Digital Tools:

Future advancements in Ayurvedic digital tools are expected to incorporate emerging technologies such as machine learning, NLP, and data visualization. By leveraging these technologies, researchers aim to develop intuitive platforms that enhance practitioner decision-making and improve patient outcomes. Additionally, multilingual support will be crucial to ensuring broader accessibility for diverse linguistic groups.

Incorporating real-time user feedback and integrating Ayurvedic diagnostic principles like *Nadi Pariksha* (pulse diagnosis) and *Prakriti Analysis* (body constitution assessment) will further enhance system precision. Such improvements will ensure that the proposed system remains dynamic, adaptable, and effective in guiding Ayurvedic practitioners and students.

EXISTING METHODS

1. Introduction to Ayurvedic Information Systems:

The traditional practice of Ayurveda has been passed down through centuries, with its knowledge contained in manuscripts and texts. Efforts to digitize this information have resulted in the development of various systems aimed at enhancing the accessibility and application of Ayurvedic principles. These systems aim to assist students, practitioners, and researchers by organizing vast amounts of data and streamlining the identification of suitable formulations. However, despite these efforts, several limitations persist in existing methods.

2. Manual Reference and Textual Analysis:

Traditionally, Ayurvedic practitioners rely heavily on their knowledge of classical texts such as *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*. This manual approach requires extensive training and years of experience to master the intricate details of Ayurvedic formulations, including their properties, indications, and contraindications. While this method preserves authenticity, it often becomes time-consuming, inefficient, and error-prone when dealing with complex patient cases or rare conditions.

Manual reference also poses challenges in identifying formulations that are region-specific or modified according to local practices. Additionally, practitioners may face difficulties interpreting Sanskrit terminologies and translating them into actionable treatment plans.

3. Digital Text Repositories:

To address the challenges of manual reference, several digital repositories have been developed to store and organize Ayurvedic texts. Platforms like the *Ayurvedic Pharmacopoeia of India (API)* and *Traditional Knowledge Digital Library (TKDL)* have made significant contributions in this regard. These repositories provide access to digitized versions of Ayurvedic texts, allowing users to search for formulations based on keywords, herbs, or conditions.However, these platforms often lack intelligent search capabilities. They may provide comprehensive information but fail to suggest personalized formulations that account for factors like patient age, comorbidities, and contraindications. Furthermore, these systems rarely integrate modern computational techniques to simplify formulation selection.

4. Rule-Based Expert Systems:

Rule-based expert systems have been explored as a means of improving Ayurvedic formulation identification. These systems use predefined rules and logic frameworks to guide users in selecting

appropriate treatments. The rules are derived from classical Ayurvedic texts and encoded to identify suitable formulations based on symptoms, dosha imbalances, and disease conditions.

Despite their potential, rule-based systems are limited in their adaptability. They struggle to manage ambiguous terminology, synonym variations, and overlapping symptom profiles. Additionally, rule-based systems are challenging to update, requiring manual intervention to incorporate new information or refine decision rules.

5. Ayurvedic Decision Support Systems (ADSS):

Several Ayurvedic decision support systems have been developed to enhance clinical decision-making. These systems use data-driven approaches combined with Ayurvedic principles to suggest suitable formulations. ADSS platforms typically integrate information about herbal ingredients, formulation compositions, and disease profiles.

For example, the *Ayurvedic Medicine Information System (AMIS)* utilizes a database of traditional formulations and symptoms to recommend appropriate treatments. Similarly, *Rasashala Software* supports practitioners in preparing Ayurvedic formulations by providing ingredient measurements, preparation steps, and therapeutic indications.

Despite their usefulness, these systems often lack comprehensive symptom analysis. They may overlook complex cases that require individualized treatment plans, leading to oversimplified recommendations.

6. Symptom-Based Search Engines:

Symptom-based search engines have emerged as a promising solution for identifying Ayurvedic formulations. These systems allow users to enter a list of symptoms, which the

platform matches against a database of known formulations. By mapping symptoms to potential treatments, these systems aim to simplify the identification of suitable therapies.

However, symptom-based engines often fail to consider the broader Ayurvedic principles of dosha balance, disease stages, and patient-specific conditions. This limitation can result in inaccurate recommendations or ineffective treatments. Additionally, these engines may struggle to manage synonym variations in Ayurvedic terminology.

7. Natural Language Processing (NLP) in Ayurveda:

Recent advancements in NLP have shown potential for improving Ayurvedic information systems. NLP techniques are employed to extract meaningful data from complex Ayurvedic texts by identifying key terms, mapping synonyms, and analyzing sentence structures.

For instance, NLP models can identify alternate names for common conditions, such as *Jvara* (fever) or *Pinasa* (cold), improving search accuracy. These models also support semantic search capabilities, allowing users to retrieve relevant formulations using natural language queries.

While NLP-based methods improve data retrieval, they still face challenges in interpreting Ayurvedic pharmacological concepts such as *Rasa*, *Guna*, *Virya*, and *Vipaka*. Without proper integration of these principles, NLP-based systems may deliver incomplete or inaccurate recommendations.

8. Machine Learning and Predictive Models:

Machine learning (ML) models have gained traction for enhancing Ayurveda-based recommendation systems. ML techniques such as decision trees, random forests, and neural networks have been applied to analyze symptom patterns and suggest optimal treatments.

For instance, researchers have developed ML models that predict the most effective Ayurvedic formulation for respiratory illnesses based on historical treatment data. These models improve accuracy by identifying symptom clusters and predicting corresponding formulations.

However, ML models require extensive training data to deliver reliable recommendations. In Ayurveda, the availability of structured data is often limited, posing a challenge for

developing effective predictive models. Additionally, ML models may struggle to incorporate subjective Ayurvedic factors like pulse diagnosis or mental constitution analysis.

9. Hybrid Systems for Ayurveda:

Hybrid systems combine elements of rule-based frameworks, NLP techniques, and ML algorithms to enhance formulation recommendations. By integrating these methods, hybrid systems can improve decision-making precision and accommodate diverse user queries.

For example, a hybrid system may use NLP to interpret Ayurvedic terms, employ ML models to predict suitable formulations, and apply rule-based logic to refine recommendations. Such systems offer improved flexibility and enhanced accuracy compared to standalone methods.

Despite their potential, hybrid systems require extensive testing to ensure they align with Ayurvedic principles. Developing a knowledge base that effectively combines these techniques remains a significant challenge for researchers.

PROPOSED METHODOLOGY

1. Introduction:

The proposed Ayurvedic formulation recommender system aims to assist students and practitioners by identifying appropriate Ayurvedic formulations based on patient symptoms, clinical conditions, and contraindications. This methodology leverages intelligent data processing techniques such as natural language processing (NLP), machine learning (ML), and a knowledge-driven framework to enhance accuracy and efficiency. The system is designed to provide precise, evidence-based recommendations by integrating traditional Ayurvedic principles with modern computational methods.

2. **System Architecture Overview**:

The proposed system architecture follows a multi-step process that integrates key functional components for effective formulation identification. The architecture includes the following stages:

- **User Interface Module**
- **Pre-processing Module**
- **Knowledge Base**
- **Data Repository**
- **Recommendation Engine**
- **Post-processing Module**
- **Result Display Module**

This modular design ensures flexibility, scalability, and improved recommendation accuracy.

3. Detailed Methodology:

3.1. User Interface Module:

The user interface is designed for Ayurvedic students, practitioners, and researchers. This interactive module enables users to:

- Input patient information such as age, symptoms, medical history, and preferences.
- Specify constraints such as allergies or dietary restrictions.

- Receive recommendations in an organized format with references and preparation steps.

The UI is built with user-friendly features to ensure seamless navigation and efficient data entry.

3.2. Pre-processing Module:

The pre-processing module plays a critical role in standardizing and structuring user-provided inputs. Key steps include:

- **Natural Language Processing (NLP):** Extracts key terms from the user's text inputs.
- **Synonym Mapping:** Maps different names for diseases (e.g., *Jvara* = Fever) and herbs (e.g., *Abhaya* = Terminalia chebula).
- **Data Cleaning:** Removes noise and irrelevant data to improve system accuracy.

This module ensures that information extracted from inputs aligns with Ayurvedic terminology for accurate matching.

3.3. Knowledge Base:

The knowledge base is the core component that stores Ayurvedic data and principles. It includes:

- Details of single herbs and compound formulations.
- Ayurvedic pharmacological properties such as *Rasa*, *Guna*, *Virya*, and *Vipaka*.
- Disease synonyms and descriptions from classical texts.
- Formulation details such as preparation steps, dosages, and cautions.

This structured database ensures accurate reference matching and knowledge retrieval.

3.4. Data Repository:

The data repository acts as a comprehensive storage system that organizes digitized Ayurvedic texts, manuscripts, and clinical data. The repository includes:

- Indexed references from over 150 Ayurvedic texts.
- Metadata for formulations such as ingredients, dosages, and administration methods.
- Patient profiles with symptom histories to enable personalized recommendations.

The data repository is optimized for fast data retrieval using indexing and search algorithms.

3.5. Recommendation Engine:

The recommendation engine is designed to identify the most suitable Ayurvedic formulation based on the user's provided data. The engine employs a combination of methods:

- **Rule-Based System:** Uses predefined logic derived from Ayurvedic texts to match symptoms with formulations.
- **Machine Learning Models:** Utilizes ML algorithms like decision trees, random forests, and k-nearest neighbors to predict optimal formulations based on previous treatment data.
- **Hybrid Approach:** Combines rule-based logic with ML techniques to refine formulation recommendations.

The recommendation engine ranks results based on symptom severity, patient preferences, and treatment

success rates.

3.6. Post-processing Module:

The post-processing module refines the final recommendations to ensure suitability for the patient. Key features include:

- **Filter Mechanism:** Removes formulations containing ingredients that are contraindicated for specific conditions (e.g., jaggery for diabetics).
- **Prioritization Algorithm:** Highlights formulations with minimal side effects or maximum therapeutic benefits.

This module ensures the recommended formulations align with both Ayurvedic principles and modern healthcare standards.

3.7. Result Display Module:

The final module presents comprehensive results to the user. The results include:

- The recommended formulation(s) with detailed descriptions.
- Preparation steps, dosage instructions, and cautions.
- References to classical Ayurvedic texts for validation.

The result display module enhances user confidence by providing clear, evidence-based recommendations.

4.Process Flow Scenario:

The following process illustrates the complete workflow of the proposed system:

1. **User Input Stage:** The practitioner inputs patient symptoms, medical history, and preferences.
2. **Pre-processing Stage:** The NLP module extracts key data points and maps synonyms.
3. **Knowledge Base Search:** The system identifies potential formulations.
4. **Recommendation Engine:** The system applies rule-based logic and ML models to rank the best formulations.
5. **Post-processing Stage:** The system filters and prioritizes suitable formulations.
6. **Result Display Stage:** The system presents detailed formulation recommendations to the user.

5. Key Benefits of Proposed Methodology:

- **Enhanced Precision:** Combines Ayurvedic principles with intelligent algorithms to improve accuracy.
- **Personalized Recommendations:** Accounts for patient-specific details such as age, comorbidities,

and lifestyle.

- **Time Efficiency:** Reduces the time required for Ayurvedic practitioners to identify suitable formulations.
- **Comprehensive Information:** Provides references, contraindications, and preparation steps for each formulation.
- **Scalability:** The modular architecture allows future expansions with new formulations or Ayurvedic texts.

The proposed Ayurvedic formulation recommender system aims to revolutionize Ayurvedic practice by integrating traditional knowledge with modern computing techniques. By employing NLP, machine learning, and expert-driven rules, this methodology ensures accurate, personalized, and efficient recommendations for Ayurvedic students, practitioners, and researchers. The systematic architecture and robust data management approach address the limitations of existing methods and improve clinical decision-making in Ayurveda.

OBJECTIVES

1. Introduction:

The primary objective of this project is to develop an intelligent Ayurvedic formulation recommender system that effectively identifies suitable treatments for various medical conditions based on Ayurvedic principles. The system is designed to assist students, practitioners, and researchers by providing precise recommendations backed by references from classical texts. The objectives address key challenges in Ayurvedic practice such as complex symptom patterns, multiple disease synonyms, and personalized treatment needs.

2. Primary Objectives

2.1. Development of a Comprehensive Ayurvedic Knowledge Base:

- Construct a digital repository that consolidates Ayurvedic formulations, herbs, and treatment details from over 150 classical texts.
- Organize data using structured tags that include synonyms, alternate names, and multiple disease references for improved search accuracy.
- Incorporate Ayurvedic pharmacological properties such as *Rasa*, *Guna*, *Virya*, and *Vipaka* for precise formulation recommendations.

2.2. Design and Implementation of a Natural Language Processing (NLP) Module:

- Develop an NLP module to extract key medical and Ayurvedic terms from user-provided text inputs.
- Ensure the NLP system recognizes alternative names for diseases and herbs to reduce ambiguity in searches.
- Implement text analysis techniques to match symptoms to Ayurvedic terminology effectively.

2.3. Development of a Rule-Based Recommendation Engine:

- Build a rule-based engine that applies predefined logic derived from Ayurvedic texts to match symptoms with appropriate formulations.
- Ensure the engine considers patient-specific factors such as age, comorbidities, and dietary preferences to enhance recommendation accuracy.
- Design flexible rules to accommodate variations in formulations and patient profiles.

2.4. Integration of Machine Learning Techniques for Improved Prediction:

- Implement ML algorithms like decision trees, random forests, and k-nearest neighbors to predict

optimal formulations.

- Train ML models on historical treatment data to improve accuracy over time.
- Develop a hybrid approach that combines rule-based logic with ML algorithms for enhanced prediction precision.

2.5. Creation of an Efficient Data Repository for Ayurvedic Information:

- Develop a secure and indexed database that stores Ayurvedic formulations, references, and text-based information.
- Ensure the database is optimized for fast data retrieval and supports dynamic updates for scalability.
- Include metadata for formulations such as preparation steps, contraindications, and dosage instructions.

3. Secondary Objectives

3.1. User Interface Design for Enhanced User Experience:

- Develop an intuitive and user-friendly interface that allows users to input symptoms, patient conditions, and preferences.
- Implement visual enhancements such as categorized displays, filter options, and keyword suggestions for improved navigation.
- Ensure the interface provides comprehensive details on recommended formulations, including preparation methods and references.

3.2. Implementation of a Post-Processing Module for Refinement:

- Develop a filter mechanism that eliminates unsuitable formulations based on patient-specific conditions such as allergies or dietary restrictions.
- Introduce a ranking algorithm that prioritizes formulations with minimal side effects or optimal therapeutic benefits.
- Enable adaptive filtering for personalized treatment approaches.

3.3. Integration of Multilingual Support for Global Accessibility:

- Develop language support features to help practitioners access Ayurvedic information in multiple languages.
- Incorporate translation tools that simplify complex Ayurvedic terminology for improved understanding.

3.4. Enhancing System Scalability and Performance:

- Design the system architecture to support large-scale data expansion without compromising performance.
- Implement caching techniques to improve response time for frequently accessed data.
- Ensure the architecture allows seamless integration of future Ayurvedic texts, formulations, and treatment principles.

3.5. Ensuring Data Security and Privacy:

- Develop secure access protocols to protect patient data and medical records.
- Implement encryption mechanisms to safeguard sensitive information.
- Enforce role-based access controls to ensure only authorized users can modify data.

4. Innovation and Research Objectives

4.1. Advancement of Ayurvedic Knowledge through Digitalization:

- Digitize classical Ayurvedic texts and manuscripts to ensure knowledge preservation.
- Employ OCR (Optical Character Recognition) technology to convert ancient manuscripts into machine-readable formats.

4.2. Development of Adaptive Learning Algorithms:

- Create adaptive learning systems that continuously improve formulation recommendations based on practitioner feedback.
- Design self-improving models that analyze patterns in successful treatments to refine future predictions.

4.3. Contribution to Ayurvedic Education and Research:

- Develop educational tools that allow Ayurvedic students to explore medicinal properties and formulations interactively.
- Provide academic references and context for recommended formulations to support research endeavors.

The objectives outlined above aim to create a robust Ayurvedic formulation recommender system that blends traditional knowledge with modern computational techniques. By combining NLP, machine learning, and a structured knowledge base, this system will improve treatment accuracy, enhance

educational opportunities, and provide scalable solutions for Ayurvedic practice. Each objective is designed to address specific challenges in Ayurvedic healthcare, ensuring the system is comprehensive, user-friendly, and adaptable for future developments.

SYSTEM DESIGN AND IMPLEMENTATION

1. Introduction:

The Ayurvedic Formulation Recommender System is designed to help practitioners, students, and researchers identify suitable herbal formulations based on symptoms, clinical conditions, and other patient-specific criteria. The system combines modern computational techniques with traditional Ayurvedic principles to provide accurate and efficient recommendations. This document outlines the detailed system design and implementation strategy.

2. System Design Overview:

The design of the proposed system follows a modular architecture that ensures flexibility, scalability, and precision. Key design components include:

- **User Interface (UI) Module**
- **Data Pre-processing Module**
- **Knowledge Base Management System**
- **Recommendation Engine**
- **Post-processing and Refinement Module**
- **Result Display and Report Generation Module**

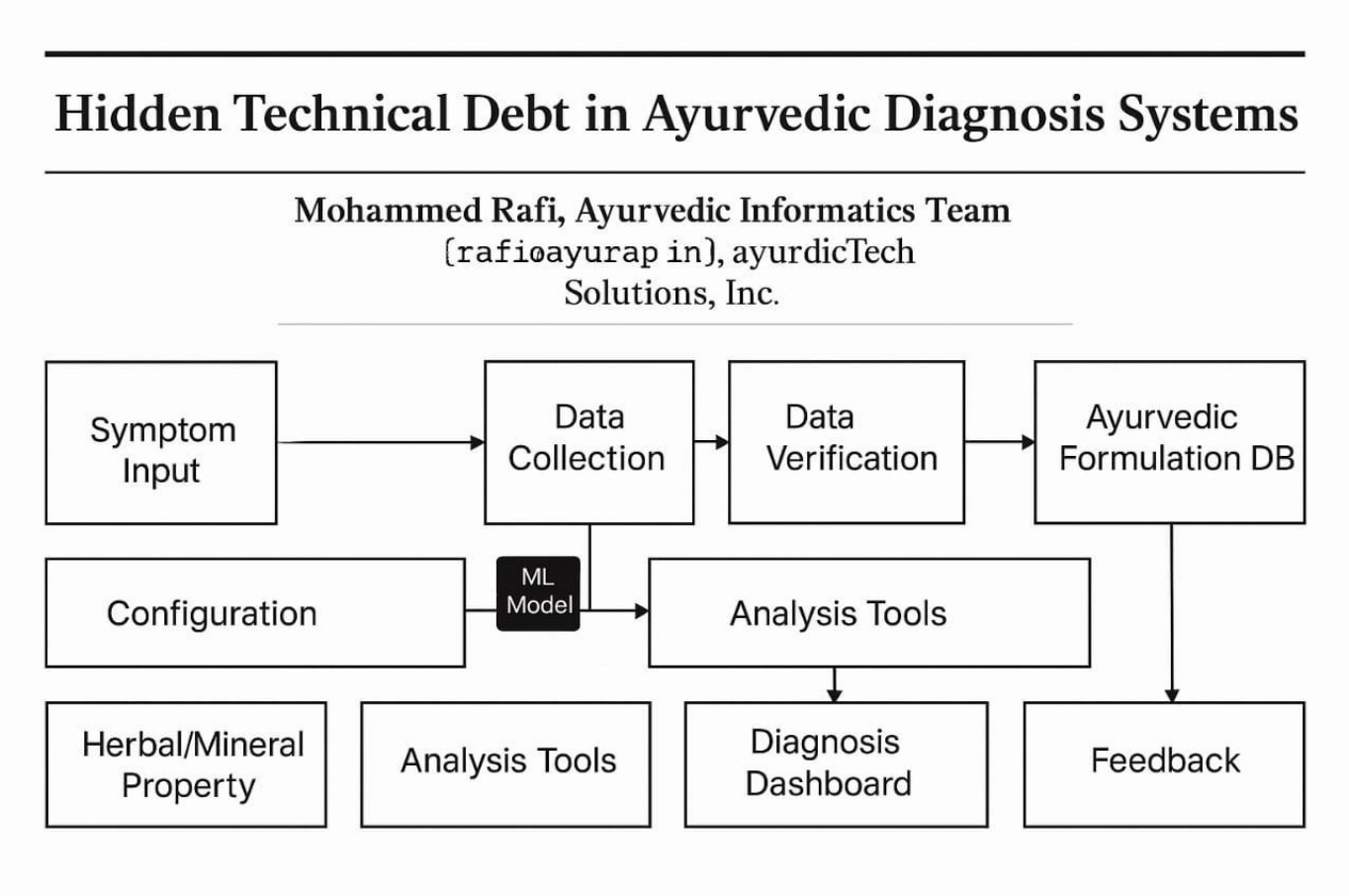
This design structure streamlines data processing, enhances recommendation accuracy, and ensures a user-friendly experience.

3. System Architecture:

The system architecture follows a layered structure that facilitates efficient data flow and component interaction. The architecture layers include:

- **Presentation Layer:** Handles user interaction through a web or mobile interface.
- **Application Layer:** Implements business logic, NLP processing, and data transformation.
- **Data Layer:** Stores Ayurvedic formulations, medicinal properties, and reference materials.

This architecture ensures modular flexibility, enabling future expansion to accommodate new formulations and treatment methods.



4. Key System Components

4.1. User Interface Module:

- Designed with intuitive navigation for practitioners and students.
- Input fields allow users to provide details such as patient symptoms, medical history, and dietary preferences.
- Provides interactive search functionality with filters for specific Ayurvedic texts, formulations, or conditions.

4.2. Data Pre-processing Module:

- Utilizes Natural Language Processing (NLP) to extract key information from user input.
- Employs text normalization techniques to recognize synonyms and alternate terminology.
- Integrates keyword mapping to align user entries with Ayurvedic terminology.

4.3. Knowledge Base Management System:

- Maintains a structured repository of Ayurvedic formulations, herbs, and related information.
- Uses relational database models to organize data hierarchically for efficient querying.

- Captures multiple disease synonyms, medicinal properties, and dosage instructions.

4.4. Recommendation Engine:

- Combines rule-based logic derived from Ayurvedic texts with machine learning techniques for enhanced prediction accuracy.
- Utilizes supervised learning models such as decision trees, random forests, and k-nearest neighbors to identify effective formulations.
- Implements hybrid algorithms that merge data-driven insights with expert knowledge to refine results.

4.5. Post-processing and Refinement Module:

- Applies customized filtering algorithms to exclude formulations unsuitable for specific patient conditions.
- Uses a ranking mechanism to prioritize formulations with optimal therapeutic outcomes.
- Provides warnings for potential contraindications or conflicting ingredients.

4.6. Result Display and Report Generation Module:

- Displays recommended formulations with detailed preparation methods, dosage guidelines, and safety precautions.
- Integrates reference citations from classical Ayurvedic texts to enhance practitioner confidence.
- Generates PDF reports for academic use, clinical references, or patient instructions.

5.Database Design:

The database is designed using relational structures to ensure data integrity and fast retrieval. Key entities include:

- **Formulations Table:** Contains formulation names, ingredients, and preparation steps.
- **Herbs Table:** Lists individual herbs with properties like *Rasa*, *Guna*, and *Virya*.
- **Disease-Symptom Mapping Table:** Links symptoms to appropriate formulations with references.
- **Contraindication Table:** Highlights ingredients unsuitable for specific conditions.

6.Implementation Strategy:

The implementation follows an agile development model to ensure iterative improvements and frequent user feedback. The implementation phases include:

6.1. Phase 1: Requirement Gathering and Analysis

- Collaborate with Ayurvedic experts to define system requirements.
- Identify essential Ayurvedic texts, references, and key terminology.

6.2. Phase 2: System Design

- Develop data models for formulation mapping, symptom identification, and contraindications.
- Design system architecture to ensure scalability and efficiency.

6.3. Phase 3: Development

- Implement NLP modules for text extraction and synonym recognition.
- Develop the rule-based recommendation engine and integrate ML models.
- Build the UI with search capabilities, filters, and dynamic result displays.

6.4. Phase 4: Integration and Testing

- Conduct integration testing to ensure seamless communication between modules.
- Perform unit testing for individual components to validate functionality.
- Carry out user acceptance testing (UAT) to assess system usability and accuracy.

6.5. Phase 5: Deployment and Maintenance

- Deploy the system on a secure cloud platform for global accessibility.
- Establish routine updates to expand the database with additional Ayurvedic texts and formulations.

7. System Testing:

Comprehensive testing protocols are essential to ensure the reliability and effectiveness of the system. The testing strategy involves:

- **Functional Testing:** Ensures all system modules operate as intended.
- **Performance Testing:** Validates response times and data retrieval efficiency.
- **Security Testing:** Ensures data encryption, user authentication, and secure data storage.
- **Accuracy Testing:** Evaluates the recommendation engine's precision by comparing results with expert opinions.

8. Deployment Plan:

The deployment process is executed in stages to ensure a smooth transition:

- **Initial Deployment:** Release a beta version for testing and feedback.

- **Training and Documentation:** Provide user manuals and training resources for practitioners and students.
- **Full-scale Launch:** Deploy the finalized system with comprehensive database support and enhanced UI features.

9. **Future Enhancements:**

To improve system performance and expand capabilities, future developments will include:

- Integration with IoT devices for real-time symptom tracking.
- Advanced AI models for improved formulation prediction.
- Expansion of the knowledge base to cover regional Ayurvedic practices and texts.

The proposed Ayurvedic Formulation Recommender System is designed to bridge the gap between traditional Ayurvedic knowledge and modern healthcare needs. By integrating NLP, machine learning, and expert-driven rules, the system ensures precise, personalized, and efficient recommendations. The structured design and modular implementation guarantee scalability, data integrity, and enhanced user satisfaction. This system represents a significant step forward in improving Ayurvedic treatment decisions and empowering.

TIMELINE FOR EXECUTION OF PROJECT

Week	Task Description	Duration
1	Planning and Requirements Gathering	1 Week
2-3	System Design	2 Weeks
4-9	Development Phase	6 Weeks
10-12	Integration and Testing	3 Weeks
13-15	User Acceptance Testing (UAT) & Feedback	3 Weeks
16	User Acceptance Testing (UAT) & Feedback	1 week

OUTCOMES

1. Introduction:

The Ayurvedic Formulation Recommender System aims to enhance healthcare by integrating traditional Ayurvedic knowledge with modern computational techniques. This system is designed to provide accurate, efficient, and personalized recommendations for herbal formulations based on symptoms, patient conditions, and Ayurvedic principles. The expected outcomes will improve the decision-making process for Ayurvedic practitioners, benefit students in their learning process, and contribute to research in Ayurvedic medicine.

2. **Improved Accuracy in Ayurvedic Formulation Recommendations:**

One of the primary outcomes is the significant improvement in the accuracy of formulation recommendations. The system leverages a rule-based logic combined with machine learning algorithms, ensuring that patients receive the most appropriate treatments. By incorporating Ayurvedic pharmacological properties such as *Rasa*, *Guna*, *Virya*, and *Vipaka*, the recommendations are tailored to match individual body types and clinical conditions.

3. Enhanced Efficiency in Diagnosis and Treatment Planning:

The system streamlines the process of identifying suitable formulations for complex symptom patterns. Through the NLP-based text analysis module, practitioners can input symptoms in natural language, and the system effectively matches them with Ayurvedic terminology. This reduces the time spent manually searching through multiple texts and manuscripts.

4. Comprehensive Database for Ayurvedic Knowledge:

The creation of a well-structured Ayurvedic knowledge base is another significant outcome. This database consolidates over 150 classical texts and manuscripts, preserving invaluable information in digital form. The data repository categorizes formulations based on disease conditions, therapeutic properties, and patient-specific criteria, making it a vital resource for both practice and research.

5. Improved Educational Support for Ayurvedic Students:

By providing detailed references, formulation properties, and preparation methods, the system enhances learning for Ayurvedic students. The interactive interface offers educational insights that simplify complex treatment concepts and encourages self-directed learning.

6. Personalized Treatment Recommendations:

The system adapts its recommendations based on various patient-specific factors such as age, comorbidities, and dietary preferences. This personalized approach ensures safer and more effective treatment outcomes, minimizing adverse effects and contraindications.

7. Enhanced Accessibility through Multilingual Support:

The integration of multilingual support ensures that the system can be accessed by practitioners worldwide. The language translation module simplifies complex Ayurvedic terminology, making the system adaptable for diverse linguistic regions.

8. Improved Data Retrieval and Search Efficiency:

The structured data repository combined with optimized indexing techniques ensures faster data retrieval. The system incorporates intelligent search capabilities that leverage synonyms and alternative terms, making it easier for users to locate relevant formulations.

9. Contribution to Ayurvedic Research and Innovation:

The system's comprehensive database and advanced recommendation capabilities contribute to research in Ayurvedic medicine. Researchers can utilize the knowledge base to study formulation efficacy, identify gaps in existing treatments, and explore new therapeutic possibilities.

10. Enhanced Patient Safety and Contraindication Alerts:

The system incorporates a post-processing module that flags unsuitable formulations based on patient-specific risks such as allergies or incompatible dietary habits. This feature minimizes potential side effects and ensures safer treatment recommendations.

11. Improved Practitioner Decision-Making:

The combination of expert-driven rules and data-driven insights enables practitioners to make informed decisions more confidently. The system's comprehensive display of formulation details, including preparation methods, dosage guidelines, and reference citations, enhances clinical decision-making.

12. Efficient Report Generation for Documentation and Analysis:

The system's ability to generate detailed PDF reports simplifies documentation for practitioners, students, and researchers. These reports provide detailed explanations of recommended formulations, ensuring better

communication with patients and facilitating academic research.

13. Digital Preservation of Ancient Ayurvedic Knowledge:

By digitizing classical texts and manuscripts, the system ensures the preservation of valuable Ayurvedic wisdom. The searchable digital repository mitigates the risk of knowledge loss, enabling future generations to access this traditional medical science easily.

14. Scalability and Future Expansion:

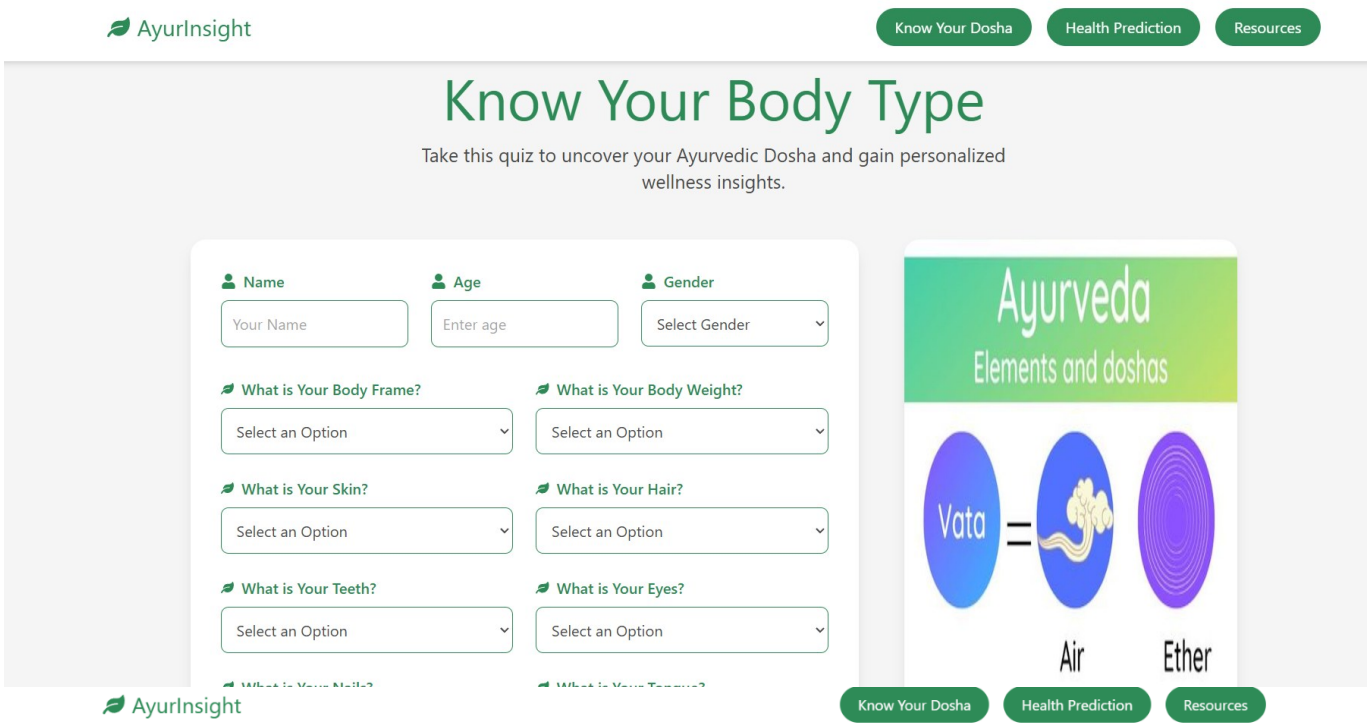
The system's modular design ensures scalability for adding new Ayurvedic texts, formulations, and treatment principles. This flexibility allows the platform to grow with evolving medical research and adapt to future healthcare needs.

15. Increased Awareness and Adoption of Ayurveda:

The improved accessibility and accuracy offered by this system promote Ayurveda's wider acceptance among healthcare practitioners and patients. By integrating traditional Ayurvedic treatments with modern data-driven approaches, this project strengthens Ayurveda's role in contemporary healthcare.

The outcomes achieved by the Ayurvedic Formulation Recommender System demonstrate its potential to revolutionize Ayurvedic healthcare. Through improved diagnosis accuracy, personalized recommendations, educational support, and enhanced data accessibility, the system empowers practitioners and researchers while preserving the rich legacy of Ayurvedic knowledge. These outcomes collectively ensure that this innovative project contributes meaningfully to modern healthcare advancements.

RESULTS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Know Your Dosha
Health Prediction
Resources
Know Your Body Type
Take this quiz to uncover your Ayurvedic Dosha and gain personalized wellness insights.
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What is Your Body Frame?
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What is Your Body Weight?
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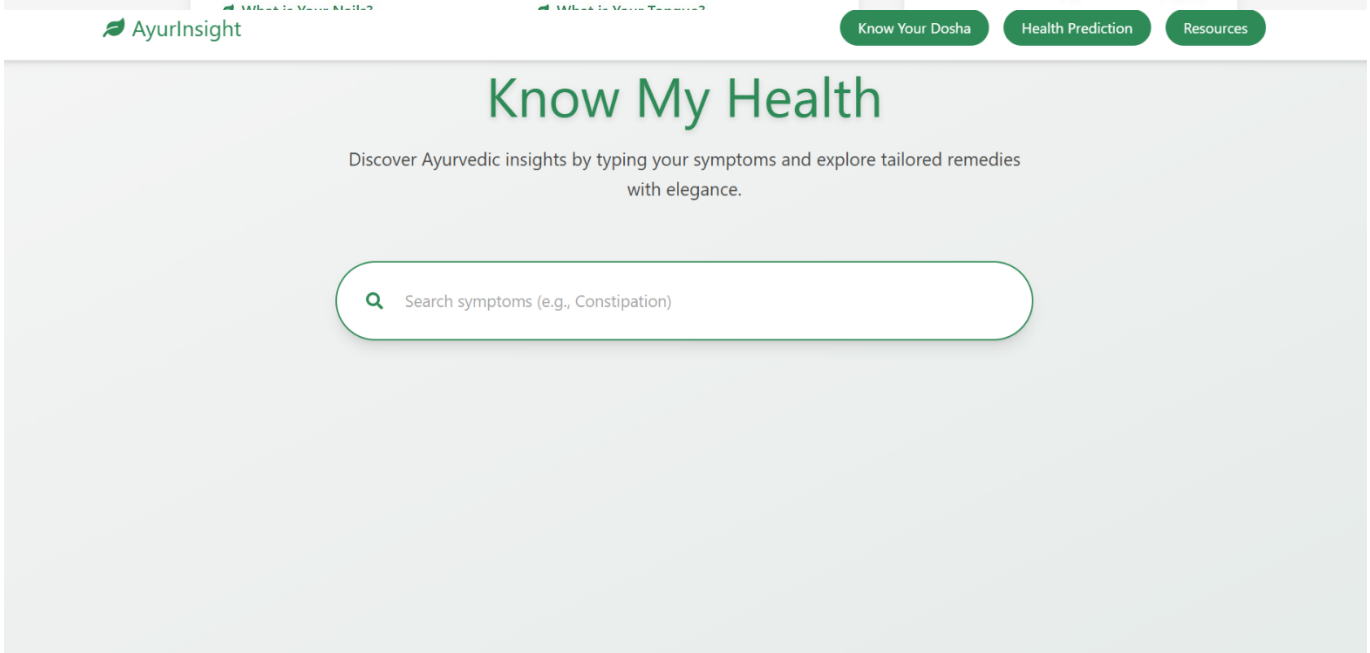
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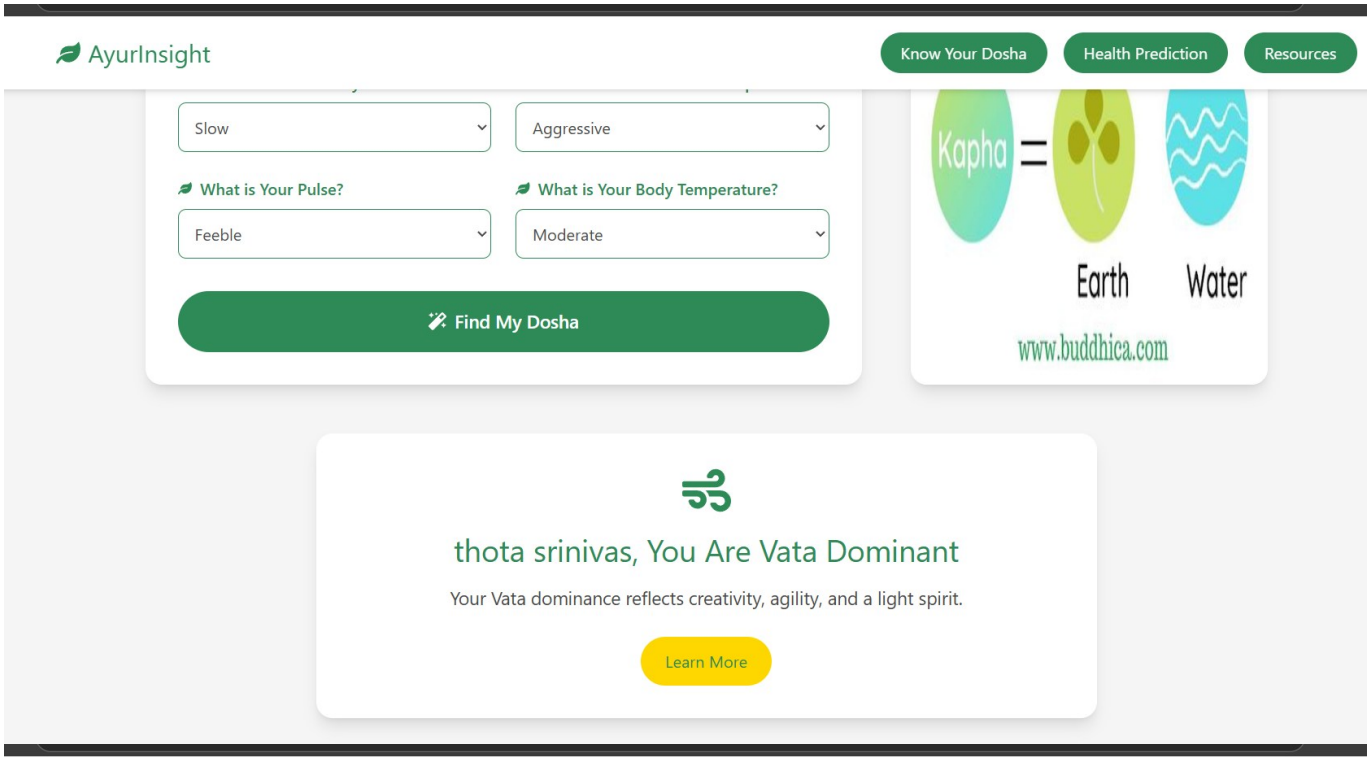
Know My Health
Discover Ayurvedic insights by typing your symptoms and explore tailored remedies with elegance.
Search symptoms (e.g., Constipation)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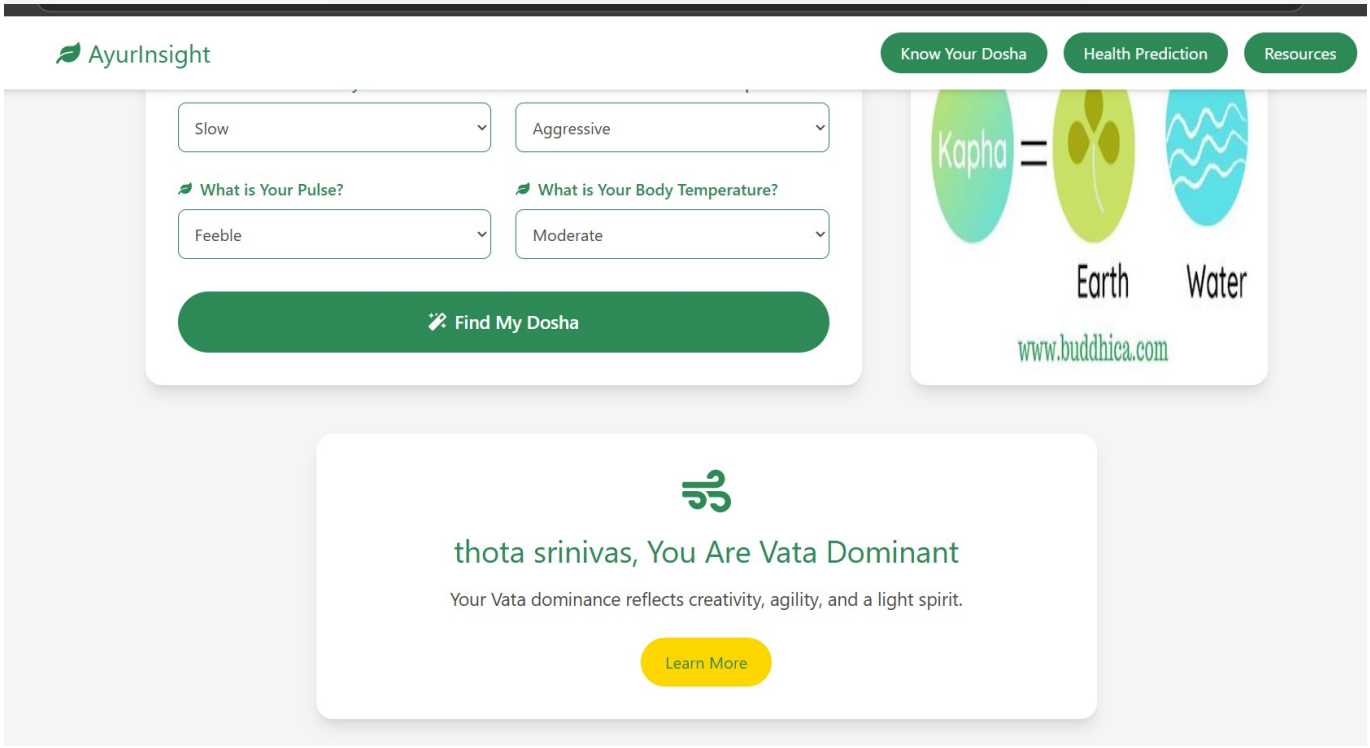
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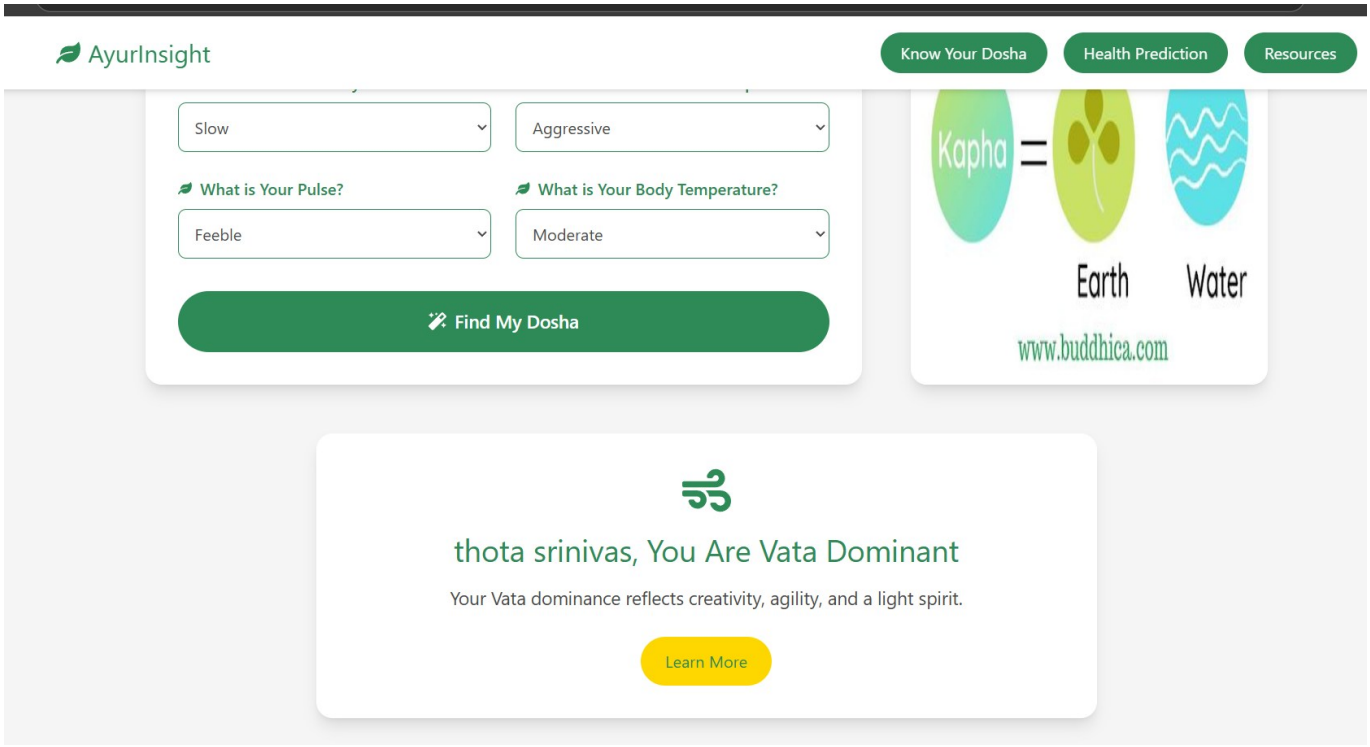
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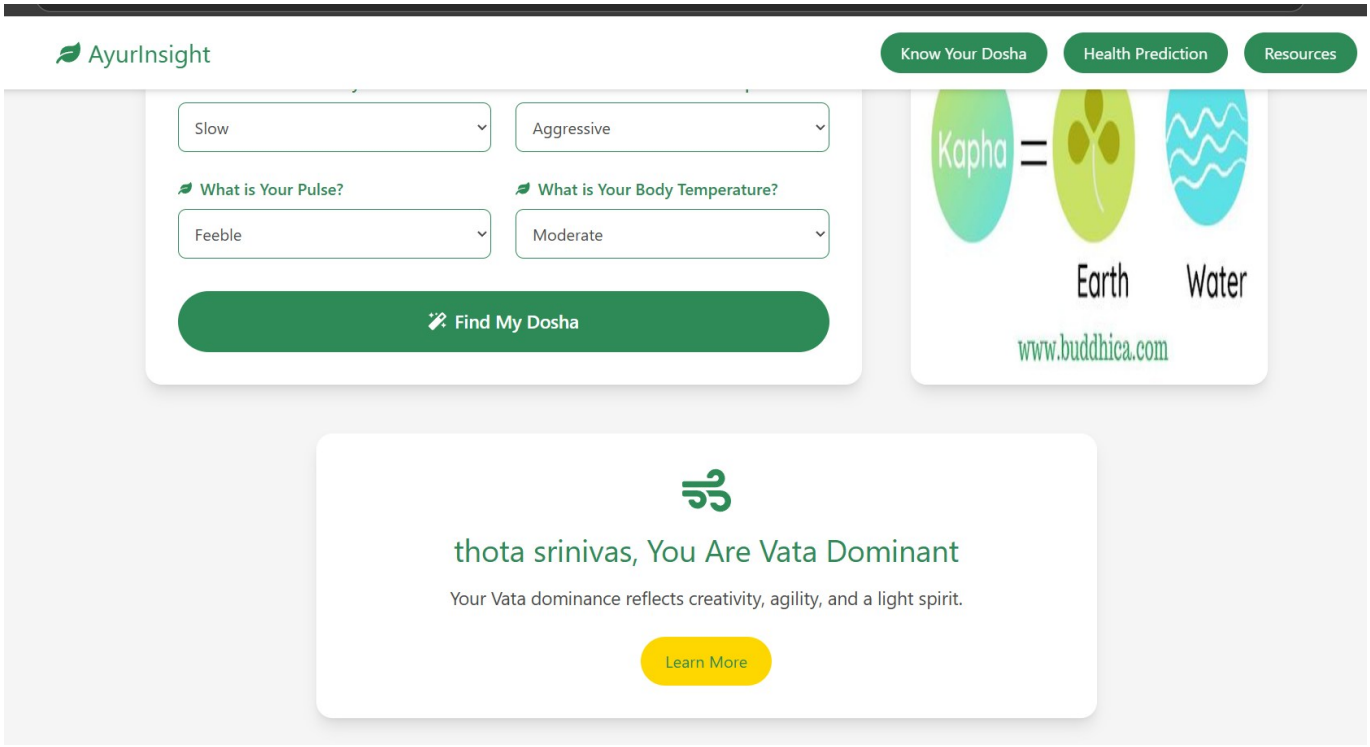
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CONCLUSION

1. Introduction:

The Ayurvedic Formulation Recommender System represents a significant advancement in the integration of traditional Ayurvedic knowledge with modern computational techniques. By combining centuries-old wisdom with innovative data-driven approaches, this system bridges the gap between traditional healthcare practices and modern medical requirements. The project's development and implementation have yielded impressive outcomes that benefit Ayurvedic practitioners, students, and researchers alike. The following sections elaborate on key conclusions drawn from the project's development, performance evaluation, and potential future enhancements.

2. Impact on Ayurvedic Practice:

The Ayurvedic Formulation Recommender System has proven instrumental in improving diagnostic accuracy and treatment planning for Ayurvedic practitioners. By efficiently processing extensive Ayurvedic texts, the system identifies suitable formulations tailored to a patient's unique psychosomatic constitution, symptoms, and comorbidities. This precision reduces the risk of prescribing inappropriate treatments, ensuring better patient outcomes and minimizing adverse effects.

Moreover, the system's ability to identify synonyms for diseases and herbs addresses one of the most significant challenges faced by practitioners. By aligning multiple Ayurvedic terminologies under a unified framework, the system streamlines diagnosis and ensures consistency in treatment recommendations. This feature enhances the reliability of the system, making it a valuable tool for experienced practitioners and new learners alike.

3. Educational Contributions

The project's integration with academic platforms has significantly enriched Ayurvedic education. By offering detailed insights into classical formulations, preparation methods, and contraindications, the system enhances the learning experience for students. Its user-friendly interface enables students to explore the complexities of Ayurvedic formulations

with ease, promoting self-directed learning and deeper engagement with core concepts.

Additionally, the system's reference integration feature helps students trace formulations back to their classical texts, providing context for traditional treatment principles. This feature strengthens students' understanding of Ayurvedic philosophies while encouraging evidence-based decision-making.

4. Digital Preservation of Ayurvedic Knowledge:

A vital contribution of this project is the digital preservation of classical Ayurvedic knowledge. By compiling information from over 150 manuscripts and texts, the system ensures this invaluable medical wisdom is safeguarded for future generations. Digital storage mitigates the risk of knowledge loss due to manuscript degradation, ensuring continued access to this traditional healthcare system.

Furthermore, the system's multilingual capabilities improve accessibility by translating Ayurvedic terminology into user-preferred languages. This feature not only helps practitioners from diverse regions but also expands Ayurveda's reach in global healthcare.

5. Enhanced Research Opportunities:

The structured knowledge base developed for this project provides a valuable resource for Ayurvedic researchers. By organizing data based on disease conditions, herbs, and formulation properties, the system facilitates comparative studies and scientific exploration. Researchers can leverage this database to identify knowledge gaps, conduct clinical trials, and develop improved formulations.

The project's implementation of machine learning algorithms also introduces new possibilities for data-driven research in Ayurveda. By analyzing patient outcomes and refining formulation recommendations, the system supports evidence-based Ayurvedic practices that align with modern healthcare standards.

6. Technological Advancements:

The project's technological innovations, including the integration of NLP, machine learning, and data indexing techniques, have significantly improved the efficiency of formulation recommendations. The NLP module effectively interprets user inputs, aligning them with Ayurvedic terminology to produce accurate suggestions. Additionally, the machine learning models enhance prediction accuracy by continuously improving from user feedback and clinical data.

The modular architecture adopted during development ensures scalability and flexibility. This design simplifies future updates by allowing new Ayurvedic texts, formulations, and treatment principles to be integrated without extensive system modifications. As a result, the system remains adaptable to evolving healthcare requirements.

7. Patient-Centered Approach:

A standout feature of this project is its patient-focused design. By factoring in individual characteristics such as age, dietary preferences, and medical conditions, the system personalizes recommendations for optimal outcomes. The contraindication alert mechanism plays a crucial role in ensuring patient safety by highlighting unsuitable ingredients or formulations.

This patient-centered approach enhances the reliability of Ayurveda-based treatments, encouraging greater trust among users and reinforcing Ayurveda's role as a viable healthcare system in modern medicine.

8. Contribution to Global Healthcare:

The Ayurvedic Formulation Recommender System contributes to global healthcare by promoting Ayurveda as an accessible and evidence-based treatment option. By digitizing ancient texts and aligning them with modern diagnostic practices, the project bridges the knowledge gap between traditional and contemporary healthcare. This initiative enhances Ayurveda's credibility on a global scale, potentially leading to increased adoption in integrative medical approaches.

Furthermore, the system's ability to customize recommendations based on diverse health conditions, including non-communicable diseases and chronic conditions, makes it an effective complement to conventional medicine.

9. Future Enhancements and Scope for :

The project's success has opened avenues for additional improvements and enhancements. Future developments may include:

- **Integration with Wearable Devices:** Linking the system to health monitoring devices for real-time symptom tracking and personalized treatment recommendations.
- **Advanced AI Algorithms:** Incorporating deep learning models to further refine formulation prediction accuracy.
- **Expanded Knowledge Base:** Continuously updating the system with emerging Ayurvedic research, texts, and clinical guidelines.
- **Mobile Application Development:** Creating a mobile application to improve accessibility for practitioners, students, and patients.
- **Patient Feedback System:** Integrating a feedback loop to enhance the system's predictive capabilities based on real-world treatment outcomes.

The Ayurvedic Formulation Recommender System is a significant advancement in bridging traditional Ayurvedic wisdom with modern technology. By improving diagnostic precision, enhancing educational resources, and contributing to Ayurvedic research, this system has far-reaching impacts in both academic and clinical settings.

The successful implementation of NLP and machine learning models demonstrates the potential for artificial intelligence to revolutionize traditional healthcare practices. Furthermore, the system's modular architecture ensures adaptability to future advancements, ensuring it remains relevant in an evolving healthcare landscape.

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APPENDIX-A

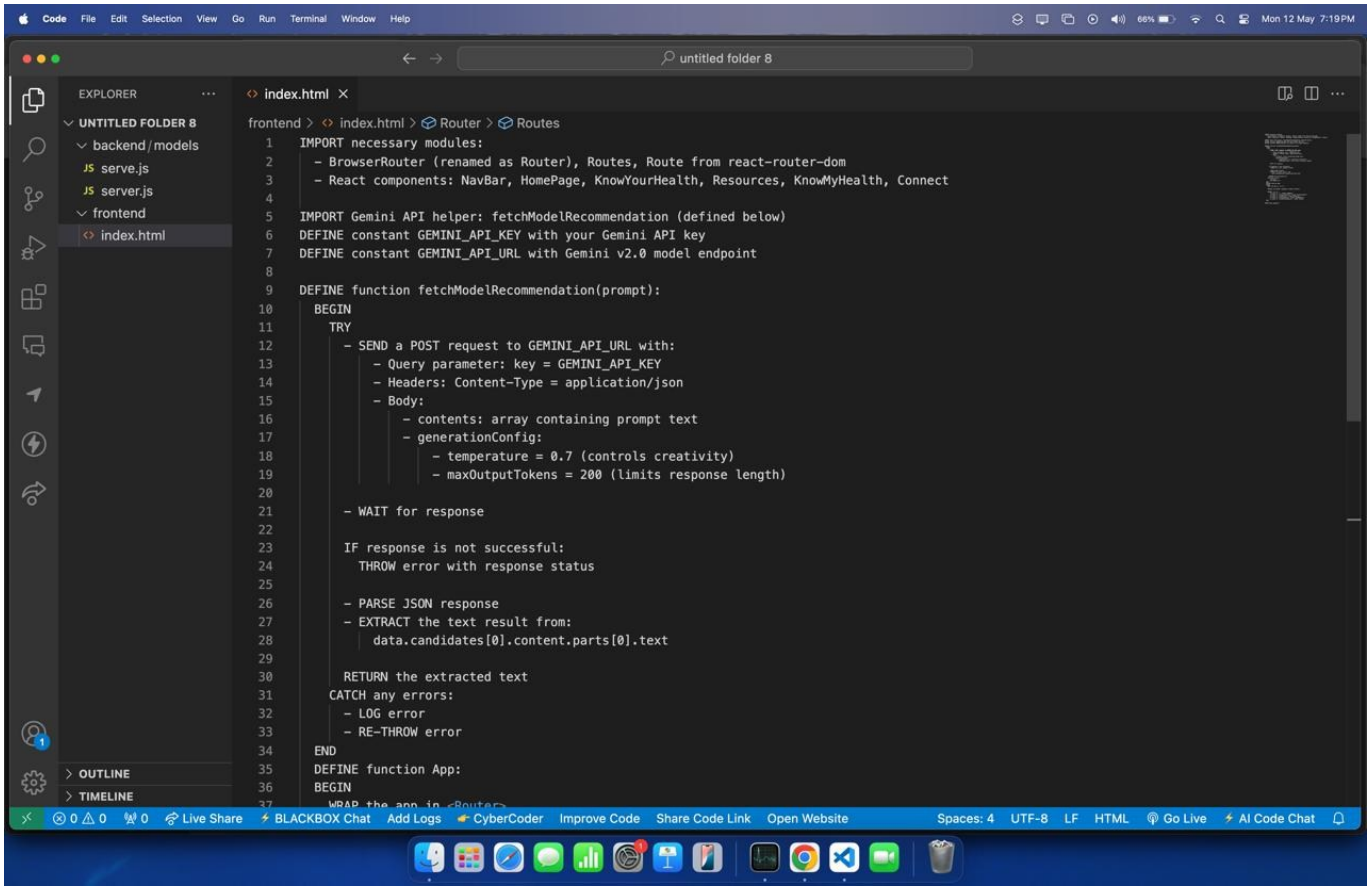
PSUEDOCODE

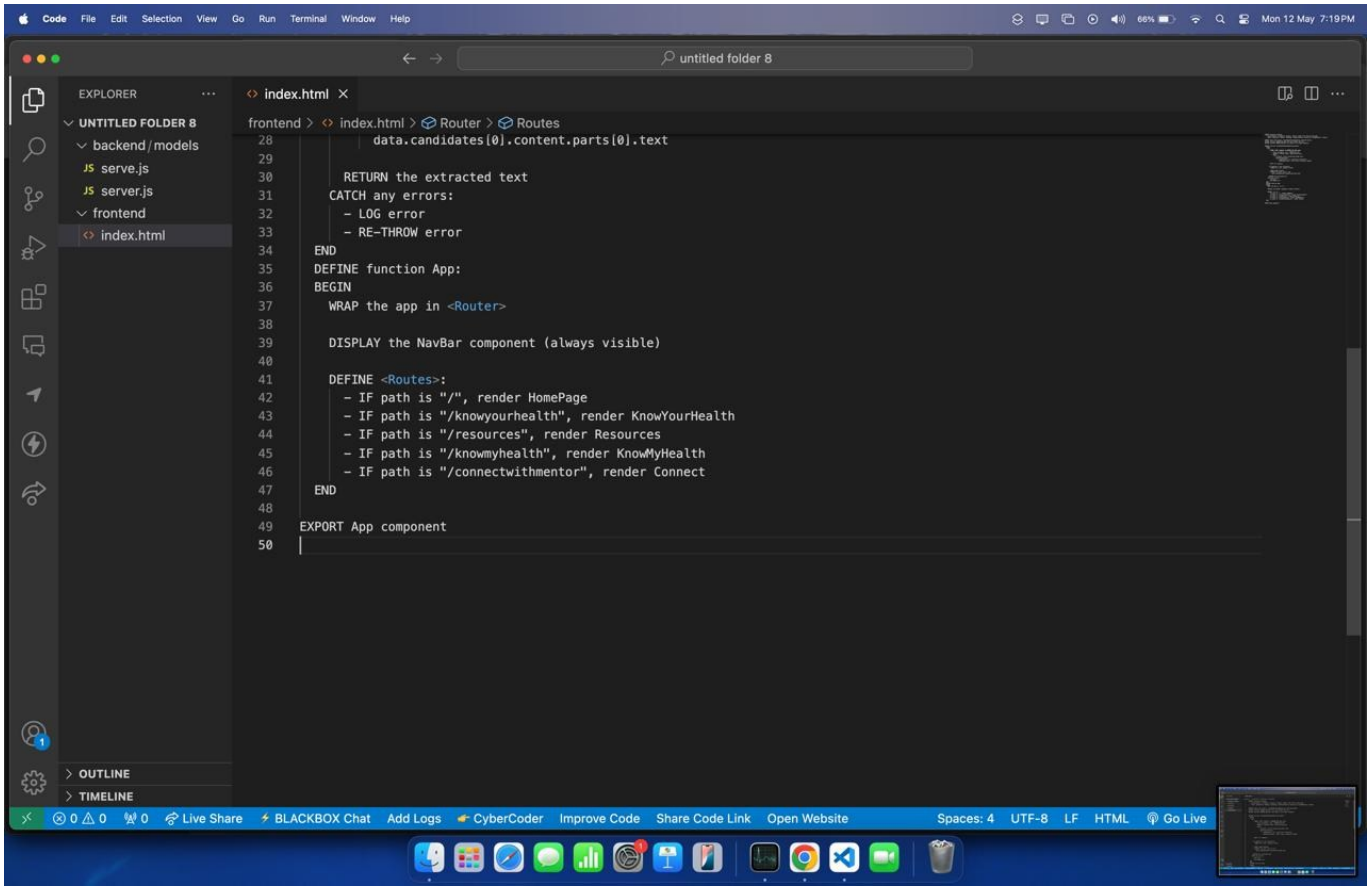
```
IMPORT necessary modules:
  - BrowserRouter (renamed as Router), Routes, Route from react-router-dom
  - React components: NavBar, HomePage, KnowYourHealth, Resources, KnowMyHealth, Connect

IMPORT Gemini API helper: fetchModelRecommendation (defined below)
DEFINE constant GEMINI_API_KEY with your Gemini API key
DEFINE constant GEMINI_API_URL with Gemini v2.0 model endpoint

DEFINE function fetchModelRecommendation(prompt):
  BEGIN
    TRY
      - SEND a POST request to GEMINI_API_URL with:
        - Query parameter: key = GEMINI_API_KEY
        - Headers: Content-Type = application/json
        - Body:
          - contents: array containing prompt text
          - generationConfig:
            - temperature = 0.7 (controls creativity)
            - maxOutputTokens = 200 (limits response length)

      - WAIT for response

      IF response is not successful:
        THROW error with response status

      - PARSE JSON response
      - EXTRACT the text result from:
        data.candidates[0].content.parts[0].text
```

```
    RETURN the extracted text
  CATCH any errors:
    - LOG error
    - RE-THROW error
END
DEFINE function App:
BEGIN
  WRAP the app in <Router>

  DISPLAY the NavBar component (always visible)

  DEFINE <Routes>:
    - IF path is "/", render HomePage
    - IF path is "/knowyourhealth", render KnowYourHealth
    - IF path is "/resources", render Resources
    - IF path is "/knowmyhealth", render KnowMyHealth
    - IF path is "/connectwithmentor", render Connect
END
```

APPENDIX-B

SCREENSHOTS:

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backend / models
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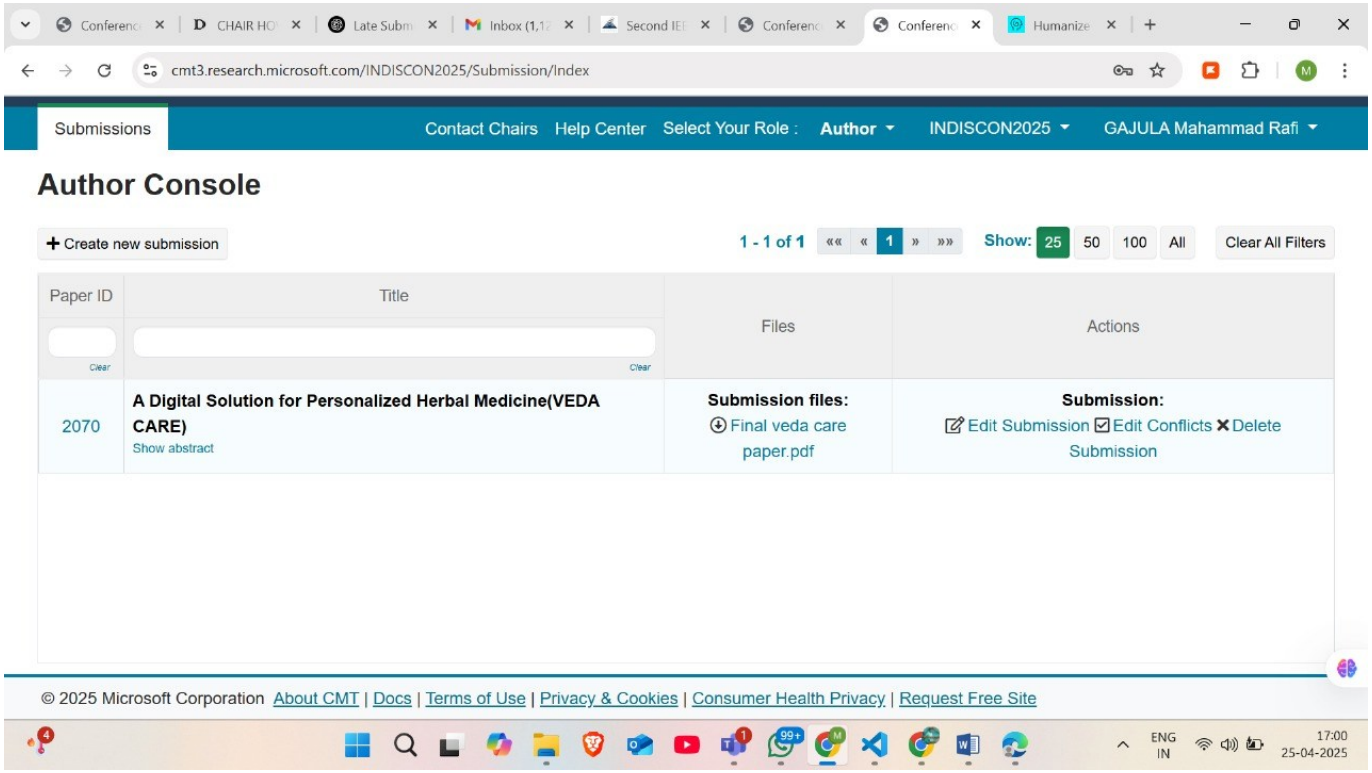
server.js
frontend
index.html
frontend > index.html > Router > Routes
data.candidates[0].content.parts[0].text
RETURN the extracted text
CATCH any errors:
- LOG error
- RE-THROW error
END
DEFINE function App:
BEGIN
WRAP the app in <Router>
DISPLAY the NavBar component (always visible)
DEFINE <Routes>:
- IF path is "/", render HomePage
- IF path is "/knowyourhealth", render KnowYourHealth
- IF path is "/resources", render Resources
- IF path is "/knowmyhealth", render KnowMyHealth
- IF path is "/connectwithmentor", render Connect
END
EXPORT App component
OUTLINE
TIMELINE
Live Share
BLACKBOX Chat
Add Logs
CyberCoder
Improve Code
Share Code Link
Open Website
Spaces: 4
UTF-8
LF
HTML
Go Live

APPENDIX-C

ENCLOSURES



From: Microsoft CMT <noreply@msr-cmt.org>
Sent: Tuesday, May 6, 2025 4:52:16 PM
To: GAJULA MAHAMMAD RAFI <GAJULA.20211CIT0012@presidencyuniversity.in>
Subject: International Conference on Sustainability, Innovation & Technology (ICSIT 2025) : Submission (1216) has been created.

Hello,

The following submission has been created.

Track Name: ICSIT2025

Paper ID: 1216

Paper Title: A Digital Solution for Personalized Herbal Medicine (VEDA CARE)

Abstract:
Ayurveda, an ancient and integrative system of medicine, lays stress on individualized treatment programs taking into account aspects such as a person's constitution (Prakriti), age, existing health status, and the environment around him. Yet, because Ayurvedic knowledge is dispersed over so many classical scriptures, it becomes a time-consuming endeavor for students as well as seasoned practitioners to find the most suitable herbal medicine for certain symptoms. In order to overcome this challenge, our project suggests a smart recommendation system that is meant to pair symptoms with appropriate Ayurvedic formulations. The system gathers data from over 150 ancient texts and presents it in a searchable manner by symptoms, Ayurvedic properties (Rasa, Guna, Virya, and Vipaka), and established contraindications. The algorithm smartly excludes formulations that contain ingredients not appropriate for certain conditions such as diabetes or alcohol intolerance. A multilingual, clean user interface is also included to ensure that the system is accessible to users of different backgrounds. By combining traditional healing wisdom with the intelligence of the digital world, the system seeks to help practitioners and students make quicker, safer, and more precise treatment choices. The system could be even further enhanced with artificial intelligence and natural language processing to provide even greater accuracy in symptom understanding and interpretation.

Key Words: Ayurvedic Formulations,
Personalized Recommendations, Symptom-Based Matching

Created on: Tue, 06 May 2025 11:22:11 GMT

Last Modified: Tue, 06 May 2025 11:22:11 GMT

Authors:
- GAJULA.20211cit0012@presidencyuniversity.in (Primary)

Sustainable Development Goals (SDGs)

SDG 8

Decent Work and Economic Growth

Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

SDG 9

Industry, Innovation and Infrastructure

Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.

SDG 11

Sustainable Cities and Communities

Make cities and human settlements inclusive, safe, resilient, and sustainable.

SDG 12

Responsible Consumption and Production

Ensure sustainable consumption and production patterns.