Review 1

GlowSprig

Project Category: RESEARCH

Guide Name
Dr.S.Vidhya

Student Name & Registration Number
Raghav Gupta [RA2211003011681]
Tanisa De [RA2211003011649]

Abstract

The project aims to create a virtual platform for natural skincare using herbal plants. The system leverages facial recognition to classify skin types and recommends suitable herbal treatments. It integrates AI-driven skin analysis and chatbot assistance to provide personalized, sustainable skincare solutions, bridging traditional herbal knowledge with modern technology. The platform also includes a virtual herbal garden, allowing users to explore plants and their skincare benefits.

Introduction

- Natural skincare solutions often lack personalization and accessibility.
- This project addresses the gap by creating a virtual platform for natural skincare.
- Uses herbal / medicinal plants and AI-driven skin analysis.
- Features include a skin analyzer and chatbot for personalized recommendations.
- Aims to make natural skincare sustainable, user-friendly, and tailored to individual needs.

Literature Survey

S. No	Title	Methodology	Identification of gaps and limitations.
1	Khalid, M., Jubbair, M., Gupta, M., Singh, S. P., & Kumar, A. (2025). Herbal harmony: Fusing tradition and modernity in skincare. High Technology Letters, 31(1). https://doi.org/10.37896/HTL31.1/11911	• Herbal ingredients like neem, aloe vera, and turmeric have antibacterial and anti-inflammatory benefits. • Combines traditional herbs with modern skincare for better stability and efficacy. • Highlights growing consumer demand for herbal skincare over synthetic products.	• Lacks large-scale clinical trials for diverse skin validation. • Does not focus on region-specific herbal formulations. • No strategies to improve consumer trust in herbal skincare.
2	Sirawit Saiwaeo , Sujitra Arwatchananukul, Lapatrada Mungmai , Weeraya Preedalikit , Nattapol Aunsri (2023.)Human skin type classification using image processing and deep learning approaches. https://www.sciencedirect.com/science/article/pii/S2405844023083846?via%3Dihub	• Develop skin analysis, recommendation engine, and UI. • Integrate herbal garden with region-based plant data. • Implement chatbot, multilingual support, and e-commerce. • Conduct testing, data collection, and AI model training.	• Dataset Imbalance • Bias in Image Quality • Feature Overlap • Limited Generalization • Loss Rate -21.68% • No mention of model performance in real-world conditions.

Limitations (Research Gaps)

- **Lack of comprehensive data on region-specific herbal plants –** Existing research primarily focuses on general herbal skincare, but there is limited information on herbs specific to different regions and their effectiveness for various skin concerns.
- **Challenges in user adoption due to trust issues –** Many users prefer commercial skincare products over herbal alternatives due to a lack of awareness, scientific validation, and concerns about effectiveness.
- **Need for better AI models for accurate skin analysis –** Current AI-based skin classification models face challenges in accuracy, particularly for diverse skin types, and require more robust datasets and algorithms.

Research objectives

- **Develop an AI-powered tool for skin analysis and personalized herbal skincare –** Implement advanced techniques to accurately determine skin type and suggest suitable herbal solutions.
- **Create an interactive platform integrating herbal knowledge and modern technology –** Combine AI-driven recommendations, chatbot assistance, and an easy-to-use interface to enhance user engagement and learning.
- **Promote sustainable and eco-friendly skincare solutions –** Focus on the use of natural, locally available herbal ingredients while ensuring sustainability in sourcing and product packaging.

Product Backlogs- Researcher Perspective

- **Extract and process data on herbal plants and skin types –** Gather scientific data on herbs, preprocess skin images for AI training, and build a structured knowledge base for recommendations.
- **Develop AI/ML models and chatbot for personalized skin care guidance –** Train machine learning models for skin type classification and implement a chatbot for real-time user interaction and product suggestions.
- **Design a user-friendly platform with real-time recommendations –** Develop a responsive web application that seamlessly integrates skin analysis, herbal skincare advice, and chatbot assistance.

Technique to implement the objectives

- **Use AI & ML for skin analysis and personalized recommendations –** Implement convolutional neural networks (CNN) for skin classification, optimize models using transfer learning, and enhance accuracy with diverse datasets.
- **Implement NLP-based chatbot for user interaction –** Utilize advanced natural language processing (NLP) techniques to build a chatbot capable of answering skincare queries and providing personalized herbal suggestions.
- **Develop a scalable and accessible web platform –** Use modern web technologies for a smooth user experience, ensuring the platform is accessible on different devices while maintaining performance and reliability.

System Architecture
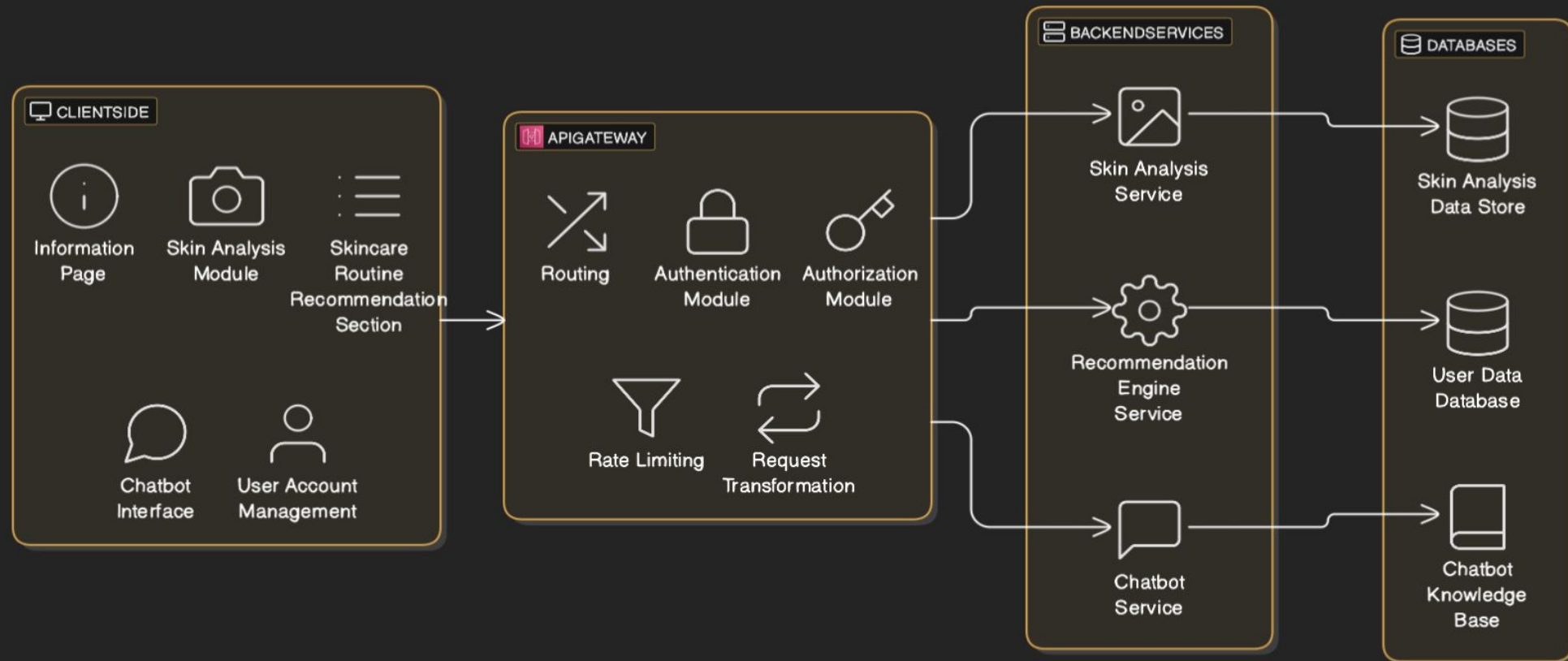
Project SDG

Holistic Health (SDG 3):

- Integrates herbal skincare for overall well-being.
- **Empowering Knowledge:** Provides skin health & routine information for user management.
- **Affordable Skin care Access:** Delivers accessible and localized skin knowledge, recommendations via apps.
- **Proactive Prevention:** Early skin analysis for preventing potential issues, and tracking via scientific approaches.
- **Culturally Sensitive Remedies:** Skin customization to match to distinct dermatological cases and ethnic regions in deployment patterns to improve local implementation efficacy.
- **Less Chemical Dependency:** Creates alternatives that enable local economic empowerment opportunities from decreased conventionalized practices.

Plan of action (Timeline)
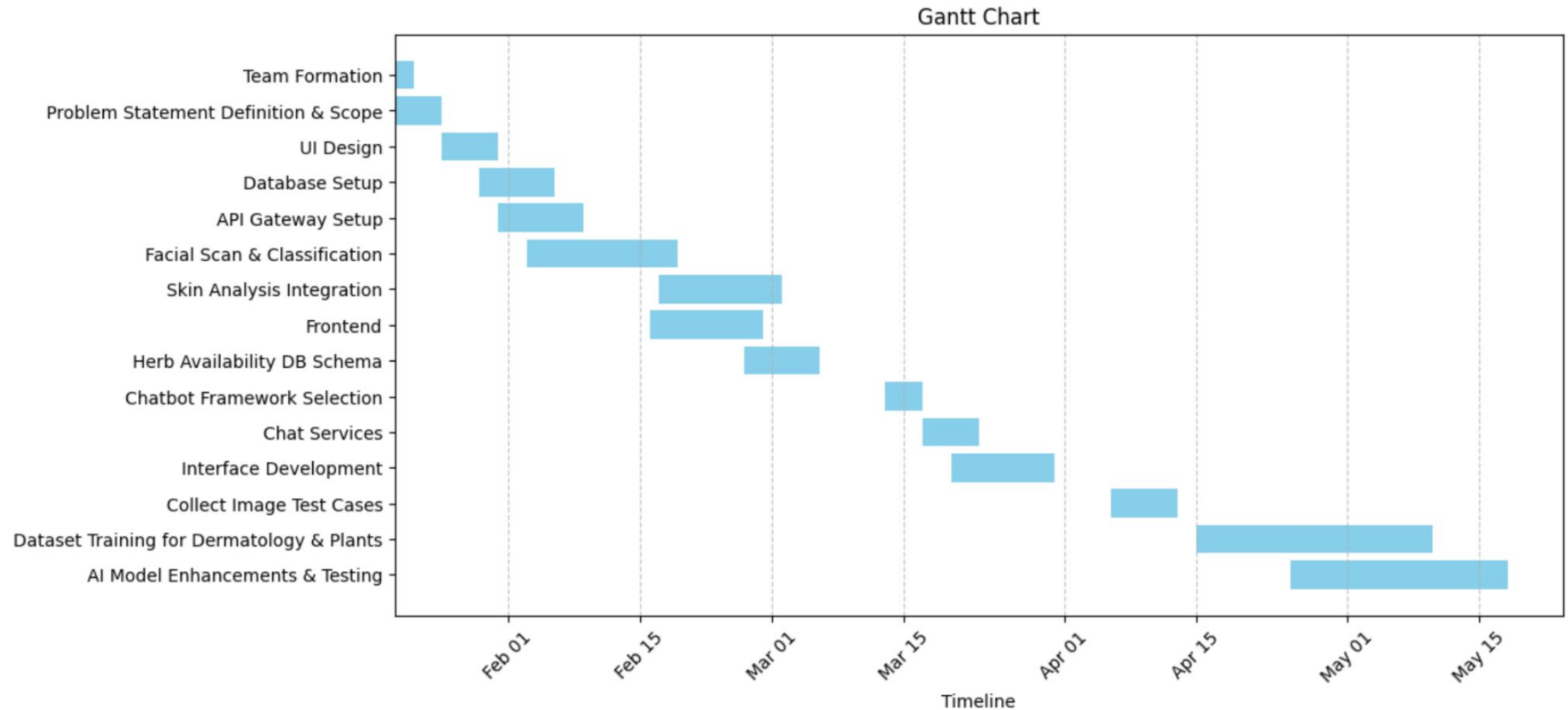
References

- Antal DS, Avram Ș, Heinrich M. Editorial: Skin: benefits of natural products in topical applications. Front Pharmacol. 2023 Nov 10;14:1305705. doi: 10.3389/fphar.2023.1305705. PMID: 38026951; PMCID: PMC10667924.

- Singh, P.A., Dash, S., Choudhury, A. et al. Factors affecting long-term availability of medicinal plants in India. J. Crop Sci. Biotechnol. 27, 145–173 (2024). https://doi.org/10.1007/s12892-023-00219-y

- Sara Dassouli, Harit Satt, Nissrine Senhaji ,International Journal of Pharmaceutical and Healthcare Marketing- Attitude and behavior towards chatbots: case of the beauty care industry

- ISSN: 2663-2187, B. Lokesh, Assistant Professor, MGIT Anjali Devarakonda, UG Student, MGIT G Srinivas, UG Student, MGIT Nitish Kumar Naik, UG Student, MGIT, African Journal of Biological Sciences- INTELLIGENT FACIAL SKIN CARE RECOMMENDATION SYSTEM

Thank You