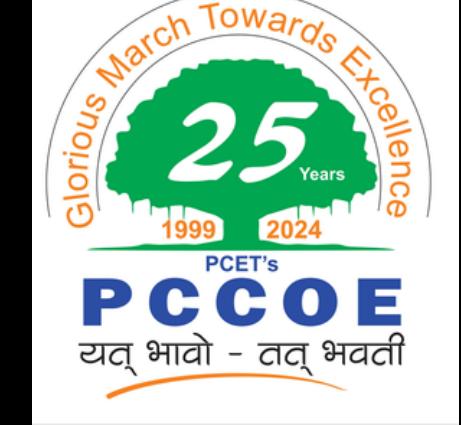


PIMPRI CHINCHWAD EDUCATION TRUST's PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

NBA Accredited | NAAC Accredited with 'A' Grade | An Autonomous Institute | AICTE

Approved | ISO 21001:2018 Certified | Permanently Affiliated to SPPU, Pune

Department Information Technology



Personalized Skincare and Cosmetics Recommendations System

Presented By:

Parth Jadhav - 123B1F034

Shruti Jadhav - 123B1F035

Divya Kathane - 123B1F042

Guided By:

Dr. Gulbakshie J. Dharmale

TABLE OF CONTENTS

01 Introduction

02 Problem Statement

03 Objectives

04 Motivation

05 Dataset Details

06 Literature Survey

07 Proposed Solution & Architecture

08 Methodology

09 Conclusion

10 References



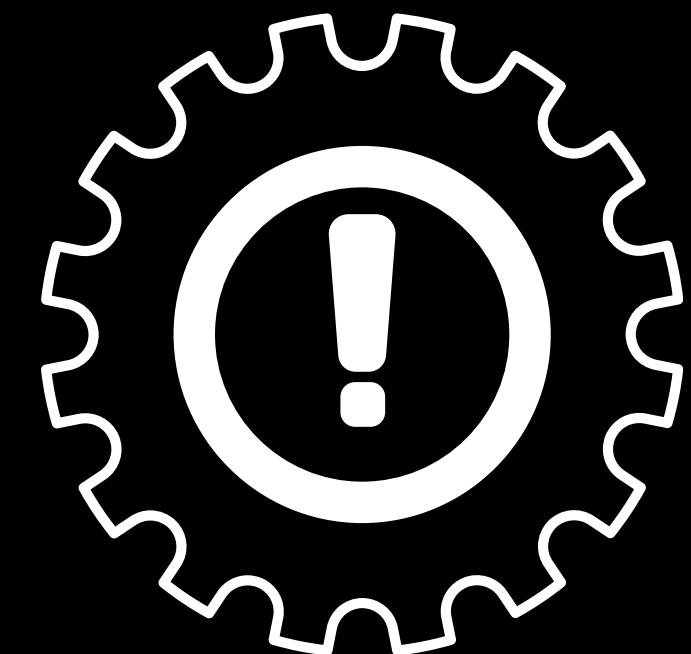
INTRODUCTION

- Skincare and cosmetics are vital for personal grooming and confidence.
- Rapid growth in product offerings leads to overwhelming choices.
- Consumers struggle to identify products that suit their unique skin profiles.
- Personalized recommendations improve product satisfaction and effectiveness.

PROBLEM STATEMENT



- The skincare market is flooded with thousands of products, making choices complex.
- Generic recommendations often lead to unsuitable product use causing skin issues.
- There is no easy way for users to find products tailored specifically for their skin type and concerns.
- Goal: Build a system that personalizes skincare and cosmetic product recommendations using data-driven machine learning techniques.



CHALLENGES



- Multiple skin types (dry, oily, combination, sensitive) and diverse concerns (acne, wrinkles, pigmentation).
- Complex ingredient lists and their varied effects on different skin types.
- Scarcity of labeled datasets mapping products to skin types and conditions.
- Need for an intuitive interface accessible to non-expert users.



OBJECTIVES



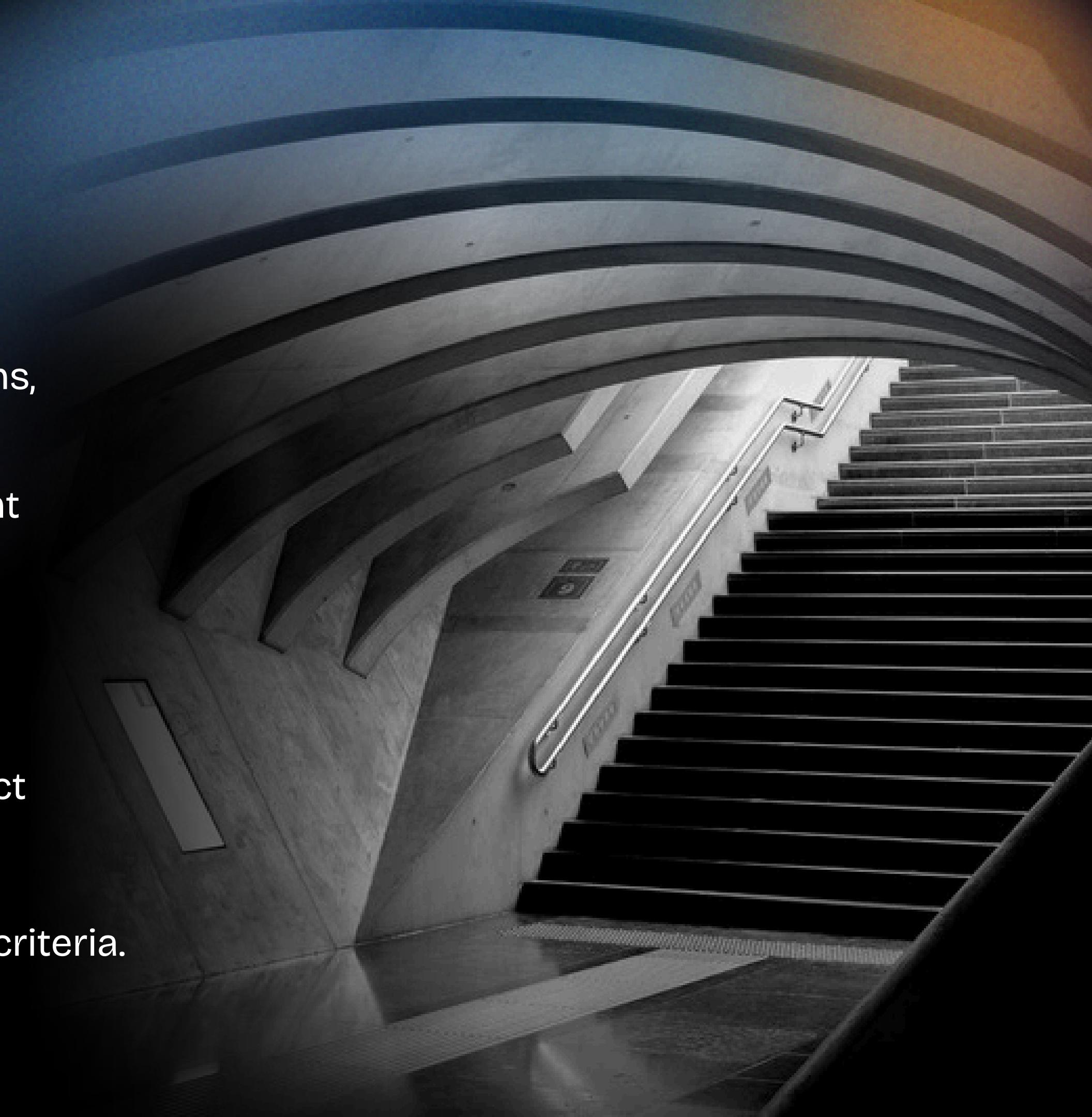
- Gather accurate user skin profile data including skin type and specific concerns.
- Clean and preprocess skincare product datasets emphasizing ingredient and effect information.
- Develop a machine learning model to match user skin profiles with product attributes for personalized recommendations.
- Implement a content-based recommendation system using TF-IDF vectorization and cosine similarity.
- Design an intuitive user interface that enables easy input and delivers relevant, customized product suggestions.



MOTIVATION

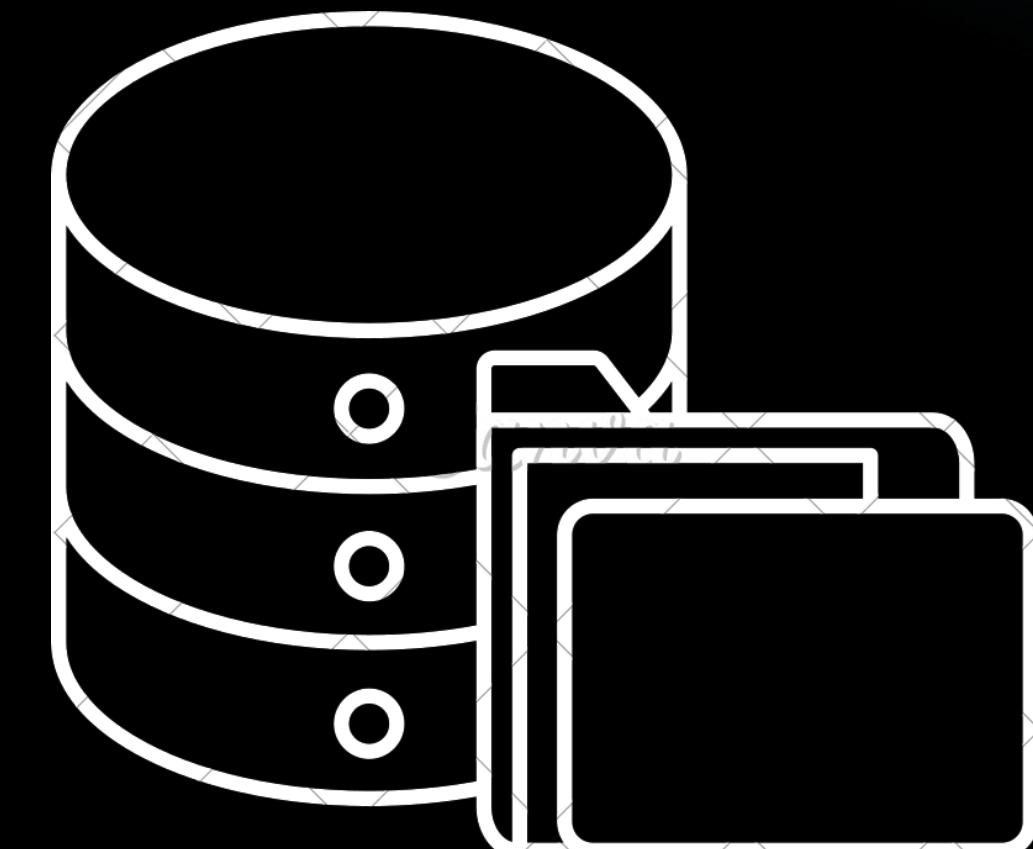


- User input: skin type, specific skin concerns, preferences.
- Text feature extraction: Combine ingredient descriptions and known effects.
- TF-IDF vectorization to represent product descriptions numerically.
- Cosine similarity calculation to find product relevance to user profile.
- Filtering by product categories and other criteria.



DATASET DETAILS

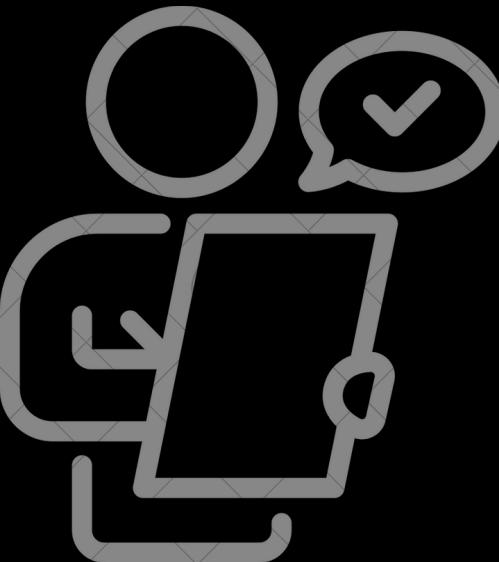
Dataset Name	Description	Key Columns / Features	Source / Link
Skincare Products Clean Dataset	A curated dataset containing skincare and cosmetic product information with ingredient lists.	<code>product_name</code> , <code>product_type</code> , <code>clean_ingredients</code> , <code>price</code> , <code>product_url</code>	Kaggle - Skincare Products Clean Dataset
Yunanouv Skin-Care Recommender	Contains detailed product descriptions focusing on effects and suitability for different skin types.	<code>product_name</code> , <code>brand</code> , <code>notable_effects</code> , <code>skin_type_suitability</code>	GitHub - Yunanouv Skin-Care Recommender



LITERATURE SURVEY



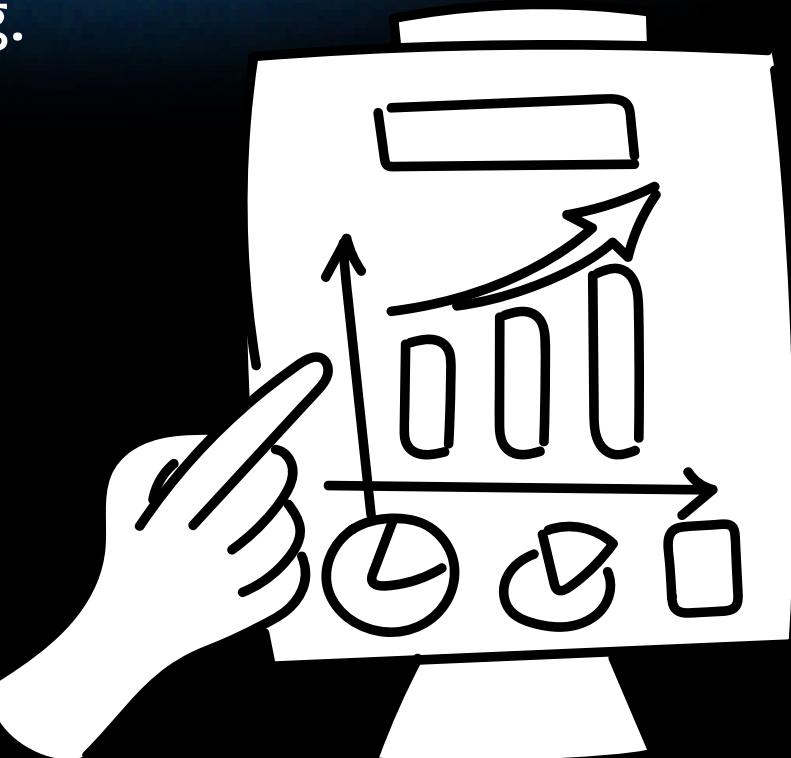
Paper Title	Author & Year	Work Presented	Methodology Used	Key Findings
AI-driven Skincare Recommendation System	Park et al. (2021)	Personalized skincare suggestions	NLP + CNN	Improved satisfaction by 20%
Hybrid Recommendation for Cosmetics E-commerce	Li & Zhang (2022)	Recommendation engine for cosmetics shopping	Hybrid (Content + Collaborative Filtering)	Higher accuracy in matching products
Machine Learning for Skin Disease Detection	Singh et al. (2022)	Skin condition prediction	CNN + KMeans	Helpful for skincare guidance
Consumer Preference Analysis in Cosmetics	Chen (2023)	Product recommendation based on customer feedback	KMeans Clustering	Accurate segmentation of customer groups



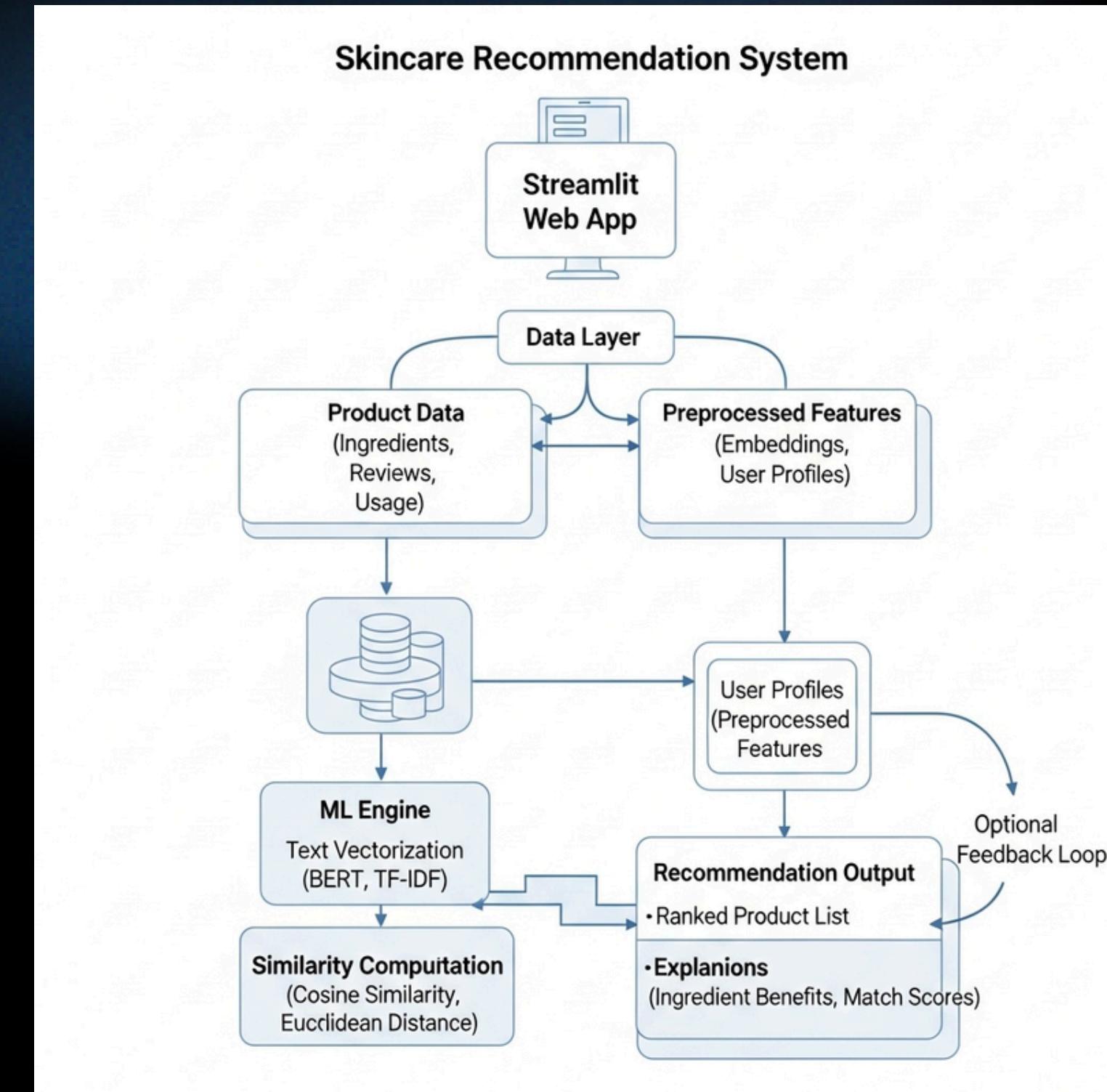
PROPOSED SOLUTION



- Build a personalized skincare recommendation system using machine learning.
- Use product ingredient and effect data from curated skincare datasets.
- Apply TF-IDF and cosine similarity for content-based product matching.
- Collect user skin type and concerns via an easy interface.
- Recommend products that best match individual skin profiles without relying on user ratings.

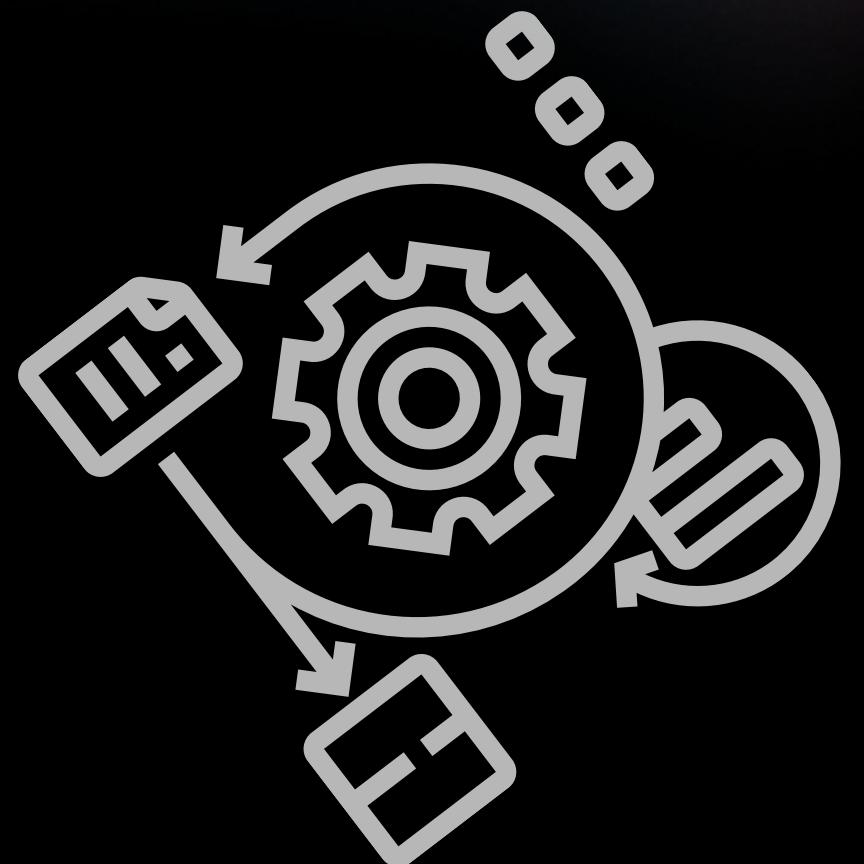


ARCHITECTURE DIAGRAM

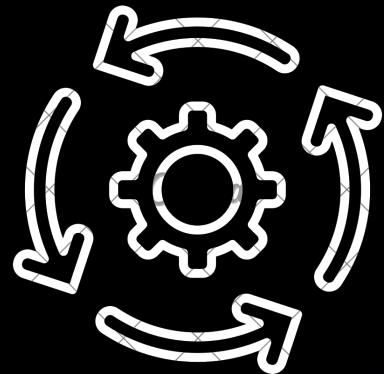


MACHINE LEARNING MODEL

- Converts product ingredients and effects, plus user inputs, into numerical features using TF-IDF vectorization
- Processes user-provided skin type and concerns as text input
- Calculates cosine similarity between user input and all product profiles
- Ranks and recommends products with the highest similarity to the user's needs
- Delivers fast, personalized, and content-based recommendations
- Built using Python, scikit-learn, pandas, and Streamlit



METHODOLOGY



- User input: skin type, specific skin concerns, preferences.
- Text feature extraction: Combine ingredient descriptions and known effects.
- TF-IDF vectorization to represent product descriptions numerically.
- Cosine similarity calculation to find product relevance to user profile.
- Filtering by product categories and other criteria.



CONCLUSION



- Skincare product recommendations need personalization for real impact.
- Machine learning offers effective tools to analyze complex product and user data.
- The proposed system bridges this gap with an intuitive, accurate recommendation engine.
- Encourages healthier skin habits and improved user satisfaction.



REFERENCES

1. Park, J., Kim, S., & Lee, H. (2021). AI-driven Skincare Recommendation System. IEEE International Conference on Consumer Electronics (ICCE). IEEE Xplore
2. Li, Y., & Zhang, W. (2022). Hybrid Recommendation for Cosmetics E-commerce. Springer International Conference on E-Business and Applications. SpringerLink
3. Singh, A., Verma, R., & Gupta, P. (2022). Machine Learning for Skin Disease Detection. Journal of Dermatological Science, Elsevier. [ScienceDirect](#)
4. Chen, L. (2023). Consumer Preference Analysis in Cosmetics. Proceedings of the ACM Conference on Recommender Systems. ACM Digital Library
5. Aggarwal, C. C. (2016). Recommender Systems: The Textbook. Springer.