# AI FASHION HUB – An AI-Powered Smart Styling & Virtual Try-On Ecosystem

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## ABSTRACT

AI Fashion Hub is an AI-powered fashion ecosystem that transforms how users interact with their wardrobe. The system scans clothes, generates personalized outfit suggestions, builds a 3D body model for virtual try-ons, and connects users with creators and micro-brands. It enables smart styling, sustainable fashion insights, and an integrated creator marketplace. The platform aims to solve wardrobe confusion, poor outfit planning, and limited personalization in existing fashion apps.

## INTRODUCTION

Fashion today is highly dynamic, yet most people struggle with daily outfit decisions, managing their wardrobe efficiently, and

discovering styles that match their body type and preferences. At the same time, independent designers and small brands lack a platform to reach users directly with personalized recommendations.

AI Fashion Hub bridges this gap by integrating artificial intelligence, computer vision, and virtual try-on technologies to create a seamless and intelligent fashion experience.

## PROBLEM STATEMENT

Despite numerous fashion and shopping apps, there is no unified platform that:

- Scans a user's wardrobe
- Offers AI-based outfit suggestions
- Provides realistic virtual try-on
- Supports creators and micro-brands
- Encourages sustainable fashion practices

Users face confusion, poor outfit planning, and difficulty visualizing how clothes will fit. Creators lack visibility. Existing solutions are incomplete and disconnected.

## OBJECTIVES

The main objectives of AI Fashion Hub are:

- To automate outfit planning using AI
- To scan the user's wardrobe and classify clothes
- To generate personalized styling suggestions
- To build a 3D body model for virtual try-on
- To provide a marketplace for creators and micro-brands
- To promote sustainable fashion choices
- To create an end-to-end intelligent fashion ecosystem

## EXISTING SYSTEM & LIMITATION

Current fashion apps primarily focus on:

- Online shopping
- Trends
- Outfit inspiration

However, they lack essential features such as wardrobe scanning, body-fit modeling, personalized outfit generation, and creator tools. They do not combine styling + wardrobe + try-on + marketplace in one system, making the user experience incomplete.

## PROPOSED SOLUTION: AI FASHION HUB

AI Fashion Hub introduces an all-in-one platform that enhances how users interact with fashion.
The proposed solution offers:

**1. Smart Wardrobe Scanner**

Users upload images of their clothes, and AI detects:

- Category (top, bottom, jacket, etc.)
- Fabric
- Color palette
- Suitable combinations

**2. AI Outfit Generator**

Suggests outfits based on:

- Weather
- Events (party, interview, college, office)
- Mood
- Body type
- Personal style preferences

**3. Virtual Try-On**

A 3D body model is generated using user inputs, allowing them to try clothes digitally.

**4. Creator Marketplace**

Creators can upload designs, get AI-optimized product presentations, and directly sell to users.

**5. Sustainable Fashion Insights**

The system tracks wardrobe usage, encourages reusing items, and suggests eco-friendly combinations.

# SYSTEM ARCHITECTURE AND WORKFLOW

The prototype is built entirely using HTML, CSS, and JavaScript, ensuring 0 errors and smooth usability. It includes several integrated modules:

Smart Wardrobe Module

AI Stylist Module

Outfit Builder Module

Creator Marketplace Module

Profile & Personalization Module

Analytics and Sustainability Dashboard

Daily Outfit & Vibe Generator

Virtual Try-On Mock Preview

All modules operate on the front-end using simulated rule-based logic, ensuring fast performance without requiring backend integration.

## FRONTEND

HTML5 – Interface structure and layout

CSS3 – Styling, theme handling, and responsive design

JavaScript (Vanilla JS) – Functionality, interactivity, AI logic, dynamic UI

No backend used – Prototype is purely front-end for simplicity

Optional Extensions: Can be integrated with OpenAI API, Firebase, Flask, or React in future development.

## FEATURES

### 1. Smart Wardrobe (Fully Functional)

Add items with name, color, category, and optional image.

Search and filter items in real-time.

Remove unwanted items dynamically.

Stores items temporarily during session.

Presents an organized grid layout of wardrobe items.

## 2. Outfit Builder (Fully Functional)

Drag-and-drop clothing items into “Top”, “Bottom”, and “Shoes” slots.

Automatically validates category-based placement.

Users can apply the outfit to preview or save it in the lookbook.

## 3. AI Stylist (Rule-Based AI Simulation)

Generates complete outfits from the wardrobe.

Considers factors like:

Occasion (college, party, presentation, etc.)

Vibe (minimal, soft, street, bold)

Comfort (max comfort to sharp)

Weather (sunny, rainy, cold, humid)

Produces a detailed explanation of the look.

Assigns a style score out of 10 based on contextual factors.

## 4. Creator Marketplace (Fully Functional)

Displays curated fashion creators/brands.

Users can like, wishlist, and explore each creator.

Trending creators section updates dynamically.

## 5. Virtual Try-On Mock (Simulated)

Shows a preview of the generated or builder-based outfit.

Displays style score.

Suggests a soundtrack based on vibe and occasion.

Not a real try-on engine—purely a UI mock representation.

## 6. Lookbook (Fully Functional)

Saves outfits generated by AI or built manually.

Displays saved looks with labels, items, scores, and metadata.

## 7. Cost-Per-Wear Calculator

Allows users to input price and estimated wears.

Computes the economic efficiency of the item.

## 8. Sustainability Dashboard (Simulated)

Displays $CO_2$ saved, wardrobe utilization, and outfit repetition metrics.

Values are intelligently estimated from wardrobe size and usage.

### 9. Daily Fit Recommendation

Generates a simple, rewear-friendly outfit suggestion every day.

Uses the user's wardrobe items for authenticity.

### 10. Light/Dark Mode

Complete UI theme transformation at the click of a button .

## CONTROL CASES

- Students planning outfits for daily college
- Working professionals choosing clothes for meetings
- Users styling for festivals, interviews, dates, and events
- Creators uploading outfits and selling digitally
- Individuals tracking wardrobe usage for sustainability

## FUTURE ENHANCEMENTS

- AR-based try-on using real-time camera
- AI-based shopping assistant
- Collaboration with brands for personalized collections

- Voice-based outfit suggestions
- Mobile app version (Flutter/React native)
- Cloud-synced wardrobe

## CONCLUSION

AI Fashion Hub brings together the power of AI, fashion technology, and creator-driven commerce to transform the way people style, shop, and manage their wardrobe. It offers a personalized, convenient, and sustainable approach to modern fashion. With integrated virtual try-on, smart styling, and a unique creator marketplace, the platform has strong potential for real-world impact and large-scale adoption.

## PROTOTYPE

VibeFit – Fashion AI Web App Prototype