

Enterprise-Level MERN Stack E- Commerce Project

★ Project Overview

Project Name: Trendify - Modern Clothing E-Commerce Platform

Domain: Web Development (MERN Stack - Full Stack E-Commerce Application)

Objective:

"Trendify" is an **AI-powered, modern e-commerce platform** for selling clothing and fashion items. It will feature **real-time product reviews, personalized recommendations, a secure checkout system, an admin dashboard for managing products, orders, users, and analytics**, and an optimized UI/UX similar to **Bewakoof.com** and **TheSouledStore.in**.

* Key Features & Implementation Details

1 User Management & Authentication

Features:

- **✓** User Registration/Login (Email, Google, Facebook, OTP)
- **✓** Role-Based Access (User, Admin, Vendor, Super Admin)
- **✓** □ JWT Authentication & Secure Sessions
- **✓** □ User Profile with Wishlist & Order History

Implementation:

- Use **JWT & bcrypt.js** for authentication.
- Implement OAuth 2.0 (Google, Facebook, Apple login).
- Secure user data with **MongoDB Atlas**.

2 Dynamic Product Catalog & Categories

Features:

- **✓** Multiple Categories (Men, Women, Kids, Accessories, Footwear, etc.)
- **✓** □ Filter by Brand, Color, Size, Price, Discount
- **✓** □ AI-Based Personalized Recommendations
- **✓** □ Live Search with Auto-Suggestions

Implementation:

- Use **MongoDB with Mongoose** for product schema.
- Implement **Algolia or ElasticSearch** for live search.
- Store category & brand hierarchy in **NoSQL format**.

3 Product Pages with Live Reviews & Ratings

Features:

- ✓ □ Product Details (Price, Material, Fit, Sizes, Images, Reviews, Offers)
- **✓** ☐ User-Generated Reviews (Images, Ratings, Comments, Likes, Dislikes)
- ✓ ☐ AI-Moderated Review System (Spam Detection & Sentiment Analysis)
- **✓** □ Stock Availability & Delivery Estimator

Implementation:

- Use **MongoDB Aggregation** for review insights.
- Implement **NLP-based sentiment analysis** for review filtering.
- Use Cloudinary/AWS S3 for product & review image storage.

4 Secure Shopping Cart & Checkout System

Features:

- ✓ Add, Remove, Update Items in Cart
- **✓** Apply Coupons & Discounts (AI-Based Dynamic Pricing)
- **✓** ☐ Multiple Payment Options (UPI, Card, PayPal, COD, BNPL Buy Now Pay Later)
- **✓** Secure Transactions (Razorpay, Stripe, PayU Integration)
- **✓** □ Auto Tax Calculation & Invoice Generation

Implementation:

- Use **Redux Toolkit** for cart state management.
- Integrate **Stripe**, **Razorpay**, **PayPal** for payment processing.
- Implement automatic coupon & discount system.

5 Order Management & Tracking

Features:

- **✓** Real-Time Order Tracking with Notifications
- **✓** □ Order Cancellation & Refund Management
- **✓** □ AI-Powered Delivery Time Predictions
- **✓** □ Email & SMS Notifications for Order Updates

Implementation:

- Use **MongoDB & Node.js** for order processing.
- Integrate **Shiprocket API** for real-time order tracking.
- Implement **Nodemailer & Twilio** for email & SMS notifications.

6 Admin Panel - Product & Order Management

Features:

- ✓ Add, Edit, Remove Products (With Variations & Inventory)
- **✓** ☐ Manage Orders (View, Process, Cancel, Refund)
- **✓** ☐ Manage Users (Suspend, Edit Roles, Delete)
- ✓ ☐ Analytics Dashboard (Sales, Revenue, User Activity, Top Products)

Implementation:

- Use React Admin Dashboard (React-Admin, Ant Design, Material-UI).
- Implement Node.js Express APIs for CRUD operations.
- Use Chart.js & D3.js for interactive analytics.

7 AI-Powered Features & Personalization

Features:

- **✓** □ Personalized Product Recommendations (Based on Browsing & Purchase History)
- **✓** □ AI-Generated Outfit Suggestions (Style AI)
- **✓** □ Smart Search with Voice & Image-Based Search

Implementation:

- Use **TensorFlow.js** for image-based search.
- Implement Recommendation Engine using Collaborative Filtering.
- Integrate Google Vision API for AI-based fashion detection.

8 Wishlist & Save for Later

Features:

- \checkmark Save Favorite Items for Future Purchase
- **✓** □ Notify When Wishlist Items Are on Sale
- **✓** □ Wishlist-Based Recommendations

Implementation:

- Use MongoDB Collections for Wishlist Management.
- Implement WebSockets for real-time wishlist updates.
- Send email alerts for wishlist sales.

9 Customer Support & Chatbot

Features:

- **✓** □ AI-Powered Chatbot for Quick Support
- **✓** □ Live Chat with Customer Care Representatives
- **✓** □ Ticket-Based Support System

Implementation:

- Use **Dialogflow** (**Google**) **or Rasa** for AI chatbot.
- Implement Socket.io for real-time chat.
- Store support queries in **MongoDB**.

10 Security & Performance Optimization

Features:

- **✓** □ Role-Based Access Control (RBAC)
- **✓** □ Secure APIs with Rate Limiting & CSRF Protection
- **✓** □ Performance Optimization with Caching & CDN

Implementation:

- Use **Redis & Memcached** for caching.
- Implement **JWT & OAuth2.0** for API security.
- Deploy Cloudflare or AWS CloudFront for CDN caching.

★ Entity-Relationship Diagram (ERD)

```
[User] --- (places order) ---> [Order]
[User] --- (adds to cart) ---> [Cart]
[User] --- (writes) ---> [Review]
[Product] --- (belongs to) ---> [Category]
[Order] --- (has) ---> [Payment]
[Admin] --- (manages) ---> [Inventory]
```

★ System Flowchart

★ Technology Stack

Category Technology

Frontend React.js, Redux, Tailwind CSS

Backend Node.js, Express.js
Database MongoDB Atlas

Authentication JWT, OAuth2.0 (Google, Facebook)

Payment GatewayRazorpay, Stripe, PayPalSearch & FiltersAlgolia, ElasticSearch

AI & ML TensorFlow.js, Google Vision API

Chatbot Dialogflow, Rasa

Cloud & DevOps AWS S3, Docker, Kubernetes
Security OAuth2, JWT, AES Encryption

* Development Roadmap

Phase 1 UI/UX Design & Database Schema
 Phase 2 Authentication & User Management
 Phase 3 Product Catalog & Cart Implementation
 Phase 4 Order & Payment Integration
 Phase 5 Admin Dashboard & AI Features
 Phase 6 Optimization & Final Testing

★ Final Deliverables

- \checkmark Complete MERN Stack E-Commerce Platform
- \checkmark Secure Admin Dashboard for Order & Inventory Management
- **✓** □ AI-Powered Personalization & Search Features
- **7** This is an industry-level project with all modern e-commerce functionalities.