

# **E-Commerce – Full Stack MERN Project Documentation**

## **1. Introduction**

Project Title: E-Commerce – Online Shopping Platform

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## **2. Project Overview**

Purpose

The E-Commerce system is designed to provide a complete online shopping experience for customers, enabling them to browse products, add items to cart, place orders securely, and track purchase history. The platform eliminates traditional offline buying limitations and brings all essential shopping features into one centralized digital ecosystem.

**The system aims to:**

- Provide customers with a fast, responsive, and user-friendly shopping platform.
- Allow administrators to manage products, categories, users, and orders.
- Offer a scalable MERN-based architecture that ensures high performance.
- Automate product listing, inventory management, and order handling.

## **Features**

- User Registration & Login (JWT Authentication)
- Product Listing, Filtering & Search
- Product Categories & Detailed View
- Add to Cart, Update Cart, Remove Items
- Checkout & Order Placement
- Admin Dashboard
- Product Management
- Order Management
- Secure REST APIs
- Responsive UI with Bootstrap

### **3. Architecture**

#### **Frontend (React.js)**

- React with Hooks and Context API / Redux
- Axios for API communication
- React Router for navigation
- Protected Routes for secure access

#### **Backend (Node.js + Express.js)**

- RESTful API structure
- Authentication & authorization middleware
- Product, Cart, Order, User controllers
- Payment gateway integration support

#### **Database (MongoDB + Mongoose)**

- Collections: Users, Products, Categories, Orders, Cart Items
- Schema validation for data integrity
- Indexing for faster product search

### **4. Setup Instructions**

#### **Prerequisites**

- Node.js (v16+)
- MongoDB / MongoDB Atlas
- Git

#### **Installation Steps**

1. Clone the repository.
2. Install dependencies in client & server folders: npm install
3. Create .env file in backend with:
  - MONGO\_DB="mongodb\_connection\_string"
  - JWT\_SECRET="your\_secret\_key"

4. Start the backend: npm start

5. Start the frontend: npm start

## 5. Folder Structure

### Client (React)

- /src/components – Reusable UI components
- /src/pages – Main screens
- /src/context – Global state management
- /src/services – API services
- /src/assets – Images, icons, banners

### Server (Node.js)

- /routes – API endpoints
- /controllers – Business logic
- /models – Mongoose schemas
- /middleware – Auth & validation
- /config – DB connection & environment setup

## 6. Running the Application

Frontend: npm start

Backend: nodemon index.js

## 7. API Documentation

### User APIs

- POST /api/user/register
- POST /api/user/login
- GET /api/user/profile

### Product APIs

- GET /api/products

- GET /api/products/:id
- POST /api/products/create
- PUT /api/products/update/:id
- DELETE /api/products/:id

#### Cart APIs

- POST /api/cart/add
- GET /api/cart/user
- PUT /api/cart/update/:id
- DELETE /api/cart/remove/:id

#### Order APIs

- POST /api/orders/place
- GET /api/orders/user
- GET /api/admin/orders

#### Admin APIs

- GET /api/admin/users
- GET /api/admin/products
- GET /api/admin/orders

## 8. Authentication

- JWT-based authentication
- Access tokens stored in localStorage
- Role-based access (User, Admin)

## 9. User Interface

- Product grid layout
- Responsive navbar
- Product filters & categories
- Cart UI with quantity update
- Admin dashboard

## 10. Testing

- Token validation
- Browser compatibility testing

## 11. Screenshots / Demo

shopsite (admin)

Home Users Orders Products New Product Logout

The screenshot shows a top navigation bar with links for Home, Users, Orders, Products, New Product, and Logout. Below the navigation is a large promotional banner with a circular badge on the left reading "NEW SALE UP TO 50 % OFF". The banner features a cartoon-style illustration of a shop window displaying clothes, surrounded by balloons and a gift box.

**Filters**

Sort By

- Popular
- Price (low to high)
- Price (high to low)
- Discount

**All Products**

A grid of product thumbnails. The first row contains a smartphone (Realme), a cricket bat, and a laptop (Apple). Each thumbnail includes a small "Update" button below it.

shopsite (admin)

Home Users Orders Products New Product Logout

The screenshot shows a detailed view of the "All Products" section. On the left is a sidebar with filters for Sort By (Popularity selected), Categories (mobile phones, outdoor games, laptop, grocery, headphones, clothes), and Gender (Men, Women, Unisex). The main area displays three products: a Realme smart phone, a bat, and an apple laptop. Each product card includes a thumbnail, the product name, a brief description, the original price, the discounted price, and a percentage off. Below each card is a blue "Update" button.

A second row of product thumbnails, continuing from the first. It includes a mobile phone, a bat, and a laptop. Each thumbnail has an "Update" button below it.

## **12. Known Issues**

- Search delay on large data
- File upload depends on hosting
- Mobile UI improvements needed

## **13. Future Enhancements**

- Payment gateway
- Wishlist system
- Live tracking
- Delivery partner module