

E-Commerce Web Application Project Report

Introduction

This project is a modern e-commerce web application developed using Next.js and MongoDB. It features user and admin functionalities, including product browsing, cart management, and payment integration via Razorpay. The application was designed with a clean and responsive UI, ensuring an optimal user experience across devices.

Abstract

The goal of this project was to create a full-stack e-commerce platform where users can interact with a product catalog, manage a shopping cart, and proceed to checkout using Razorpay. Admins can manage products and oversee user activity through a secured dashboard. The system includes authentication mechanisms, user context management, and database modeling using Mongoose.

Tools Used

- Frontend: Next.js, React.js, Tailwind CSS
- Backend: Node.js, Next.js API Routes
- Database: MongoDB Atlas, Mongoose ORM
- Payment Gateway: Razorpay (Test Mode)
- IDE: Visual Studio Code
- Other: FPDF for report generation, REST API, React Context API

Steps Involved in Building the Project

1. Initialized a Next.js project and configured Tailwind CSS for styling.
2. Designed pages for admin and user flows using React components and dynamic routing.
3. Created a CartContext to maintain cart state across the app.
4. Built and connected MongoDB models for products and users with Mongoose.
5. Developed secure admin login functionality with credential verification.
6. Implemented product CRUD APIs and integrated them into the admin dashboard.

7. Integrated Razorpay and handled test payments on the frontend securely.
8. Performed local testing, added toast messages, and styled for production-readiness.

Conclusion

This project was an excellent exercise in modern full-stack web development. It brought together concepts such as authentication, payment processing, REST API development, state management, and responsive design. The final product serves as a robust prototype for real-world e-commerce deployments and provides a foundation for future scalability with features like product search, filtering, order history, and email notifications.