Project Report

1. INTRODUCTION

1.1 Project Overview

ShopEZ is an ecommerce web-application designed to facilitate. It allows customers to easily browse through products, add them to cart, and pay for them online and COD.

1.2 Purpose

The purpose of this project is to streamline the online shopping experience, provide a user-friendly interface, and offer a secure and efficient platform for both buyers.

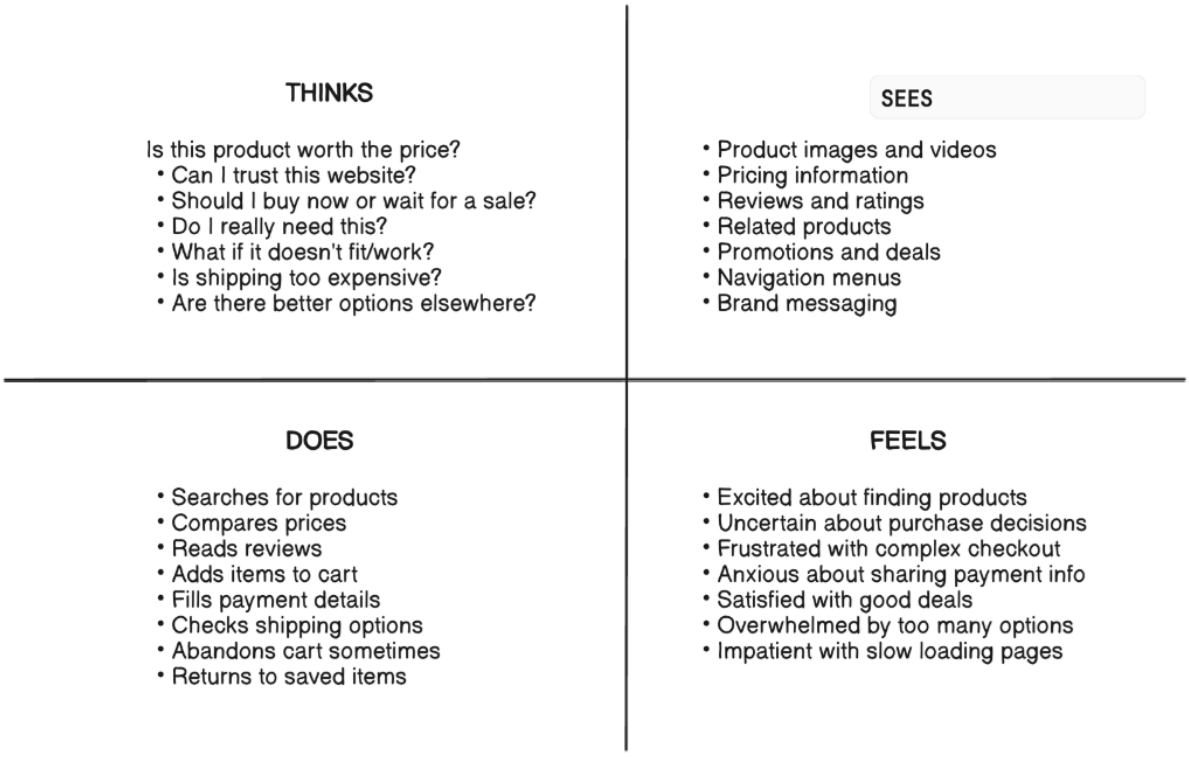
2. IDEATION PHASE

2.1 Problem Statement

Many existing e-commerce platforms lack user-friendly design, essential features, or secure payment options. This project addresses these issues by developing a responsive and secure e-commerce app that offers smooth navigation, efficient order processing, and safe transactions.

PS	I'm trying to	But	Because	Which makes me feel
Customer	shop online easily and securely	many e-commerce platforms are not user-friendly and lack essential features	they have cluttered interfaces, limited options, and weak security	frustrated, overwhelmed, and untrusting
Admin	manage products and orders efficiently	most platforms don't offer simple, centralized admin controls	The systems are either too complex or lack flexibility	restricted, confused, and less productive

2.2 Empathy Map Canvas



2.3 Brainstorming

Step 1: Team Gathering, Collaboration, and Selecting the Problem Statement

- **Date of Brainstorming Session**: March 28, 2025

- **Team Mevmbers**: Vaibhav (22BHI10087), Shubham Gupta (22BAI10187), Arihant Bhandari (22BCE11373) , Om Varma (22BCE11399)
- **Selected Problem Statement**:
  "Many existing e-commerce platforms lack user-friendly design, essential features, or secure payment options. This project addresses these issues by developing a responsive and secure e-commerce app that offers smooth navigation, efficient order processing, and safe transactions."

💡 Step 2: Brainstorming, Idea Listing & Grouping

Idea Category	Brainstormed Features
User Authentication & Authorization	- Sign up/login via email or social accounts (Google, Facebook) - Password reset through email - Admin vs Customer role-based access control
Product Features	- Advanced filtering (price, rating, brand) - Product variants (size, color) - Real-time stock info - Recommendations (popular, trending, related)
Cart & Wishlist	- Add to cart and wishlist - Save for later - Quantity adjustment in cart
Order & Checkout	- Step-by-step checkout process - Multiple payment gateways (Stripe, Razorpay, UPI, COD) - Apply coupons/promo codes - Shipping method & invoice
User Engagement	- Product reviews and ratings - Email and push notifications for order updates - Personalized recommendations
Admin Panel	- Add/edit/delete products - View customer data & order history - Manage inventory
Security & Performance	- SSL integration - Secure payment handling - Input validation/sanitization - Lazy loading & optimized image performance

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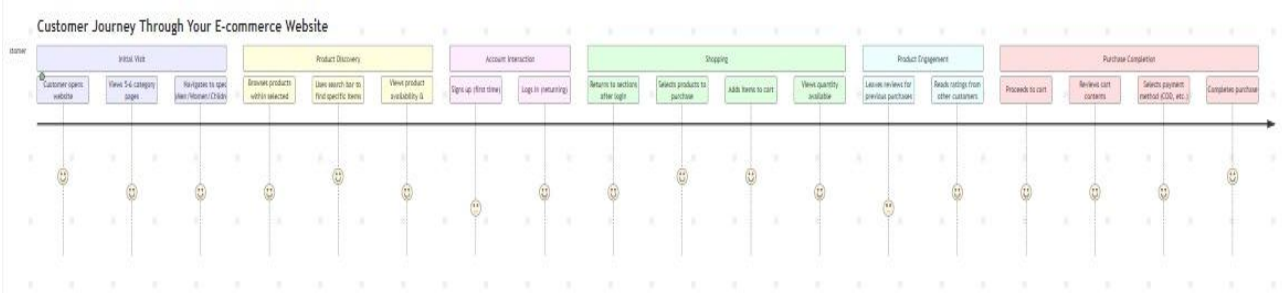
🚦 Step 3: Idea Prioritization

Priority Level	Features
High Priority	- User authentication system - Product listing & filtering - Add to cart & checkout - Payment gateway integration - Admin product management
Medium Priority	- Wishlist & save for later - Ratings, reviews, and notifications - Promo code system - Secure order tracking
Low Priority	- Personalized recommendations - Lazy loading for performance - Advanced analytics (Admin) - Multi-language or regional support

(future)

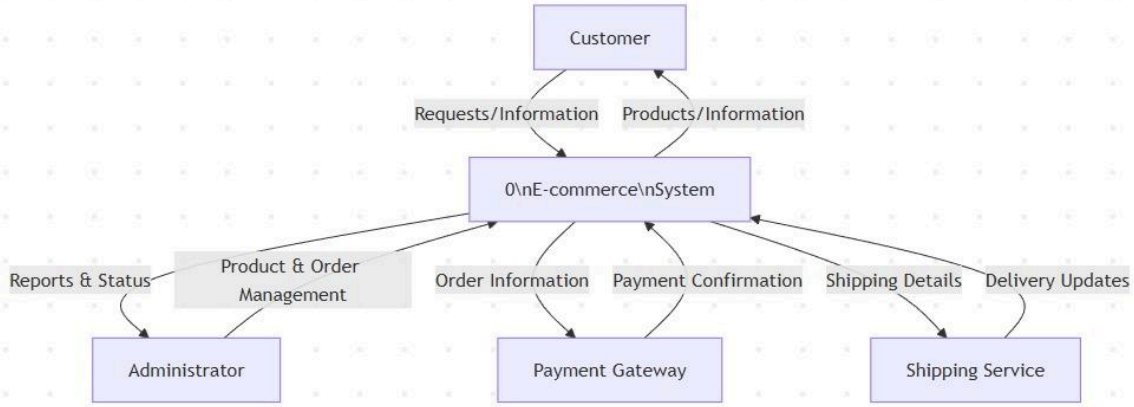
3. REQUIREMENT ANALYSIS

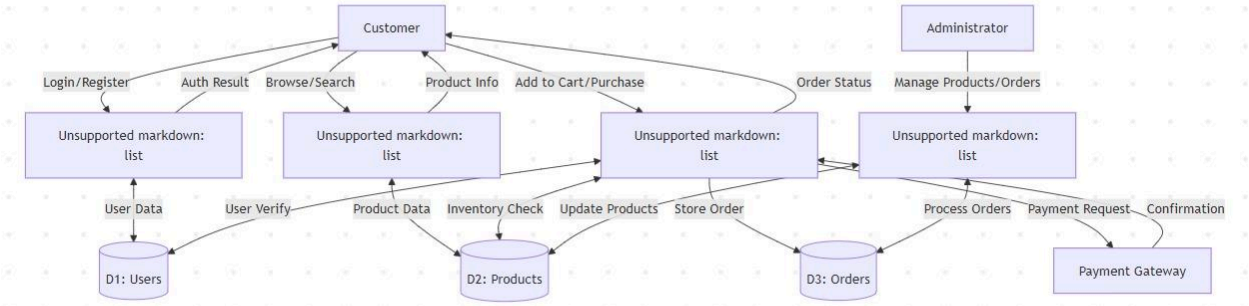
3.1 Customer Journey map



3.2 Solution Requirement

3.3 Data Flow Diagram





User Stories for E-commerce Website

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile/Web user)	Registration	USN-1	As a user, I can register for the website by entering my email, password, and confirming my password.	I can access my account/dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the website	I can receive confirmation email & click confirm	High	Sprint-1
	Login	USN-3	As a user, I can log into the website using my email and password	I can successfully access my account	High	Sprint-1
	Browse Categories	USN-4	As a user, I can view 5-6 product categories on the website	I can see all available categories	High	Sprint-1
		USN-5	As a user, I can navigate to specific sections (Men/Women/Children/Electronics)	I can access section-specific products	High	Sprint-1
	Product Search	USN-6	As a user, I can search for products using the search bar	I can find specific products quickly	Medium	Sprint-1
		USN-7	As a user, I can view product availability and quantity before purchase	I can see if products are in stock	Medium	Sprint-1
	Shopping Cart	USN-8	As a user, I can add products to my cart	Products appear in my cart	High	Sprint-1
		USN-9	As a user, I can review and modify items in my cart	I can update quantities or remove items	Medium	Sprint-1
	Purchase	USN-10	As a user, I can complete purchases using various payment methods including COD	I can successfully complete a purchase	High	Sprint-1
	Reviews	USN-11	As a user, I can leave reviews and ratings for products	My reviews are visible on product pages	Low	Sprint-2
		USN-12	As a user, I can read reviews from other customers	I can see ratings and comments from others	Low	Sprint-2
Administrator	Product Management	USN-13	As an admin, I can add new products to the website	New products appear in appropriate categories	High	Sprint-1
		USN-14	As an admin, I can update product inventory	Product availability information is current	High	Sprint-1
	Order Management	USN-15	As an admin, I can view and process customer orders	Orders are fulfilled correctly	High	Sprint-1

3.4 Technology Stack

📊 Table-1: Components & Technologies

S.No	Component	Description	Technology
1	User Interface	Web UI used by customers and admins	HTML, CSS, JavaScript, React.js (with Vite)
2	Application Logic-1	Handles user login, cart logic, admin access, order flow	Node.js with Express
3	Application Logic-2	Not applicable	—
4	Application Logic-3	Not applicable	—
5	Database	Stores users, products, orders, cart, reviews	MongoDB
6	Cloud Database	Hosted database for scalability	MongoDB Atlas
7	File Storage	Product images and assets	Local File System / Cloudinary (optional)
8	External API-1	Payment integration	Razorpay API
9	External API-2	(Optional future) for address validation or KYC	Aadhaar API / Google Maps API
10	Machine Learning Model	Not implemented yet (future scope: recommendation system)	—
11	Infrastructure (Server/Cloud)	Hosting of app on cloud platforms	Local Server / Render / Vercel / Railway

📈 Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Frameworks used for frontend and backend	React.js, Express.js, Node.js
2	Security Implementations	Authentication, input sanitization, HTTPS, secure payments	JWT, Helmet.js, HTTPS, Razorpay secure gateway
3	Scalable Architecture	Modular codebase with separation of concerns and cloud DB	REST API, MongoDB Atlas, Modular Express Routes
4	Availability	High uptime with cloud deployment and fallback support	Vercel, Railway, Render
5	Performance	Uses lazy loading, fast build (Vite), indexing, and optimized images	Vite, React Lazy Load, MongoDB Indexing

4. PROJECT DESIGN

4.1 Problem Solution Fit

The primary problem identified was the lack of seamless, secure, and user-friendly online shopping experiences, especially in platforms that are either too complex or not optimized for performance.

Our solution directly addresses this issue by providing a streamlined, responsive e-commerce platform with essential features such as easy product browsing, secure checkout, order tracking, and account management. The app simplifies the shopping experience for users of all backgrounds and device types, reducing friction and increasing satisfaction.

4.2 Proposed Solution

The solution consists of the following key components:

- **Product Management**
  Admins can add, update, or delete products. Each product includes images, descriptions, prices, stock info, and variants (e.g., color, size).

- **Shopping Cart**
  Users can add products to their cart, update quantities, or remove items. Cart state is saved between sessions (if logged in), allowing a smooth continuation of shopping.

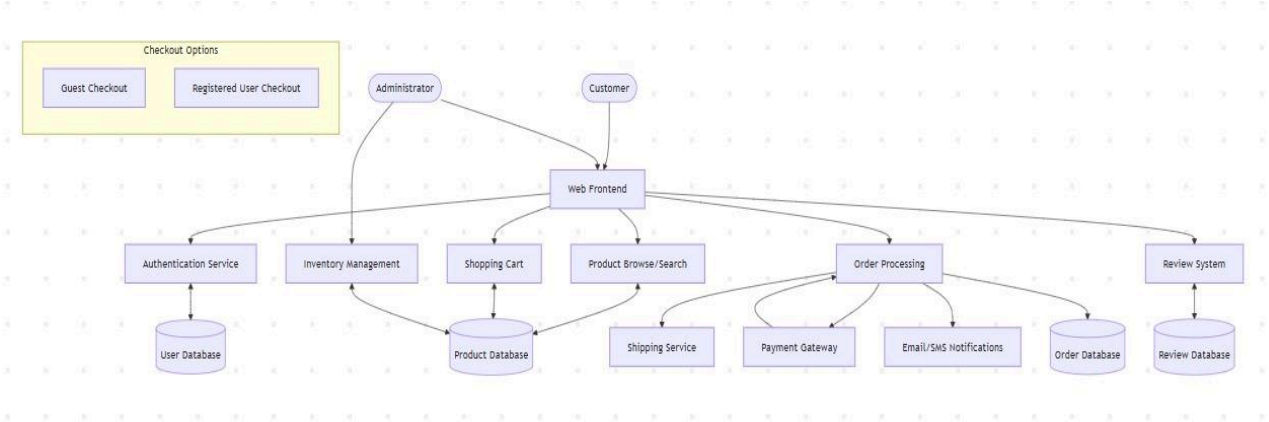
- **Payment Gateway Integration**
  Secure payment options are provided using [e.g., Razorpay / Stripe], supporting multiple modes like UPI, credit/debit cards, and wallets.

- **Order Tracking**
  After checkout, users receive real-time updates on order status — from confirmation to delivery. A dedicated order history page lets users track and manage their past purchases.

- **User Authentication & Roles**
  Secure sign-in and sign-up for customers, with an admin dashboard to manage products and orders.

- **Search and Filtering**
  Users can search for products and filter them by categories, price ranges, ratings, and other attributes.

4.3 Solution Architecture



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

March 26–27 (Project Initiation):

The team began by defining the project scope and objectives. The initial problem statement was drafted, and core features were identified based on user needs and current market gaps.

March 28–29 (Requirement Analysis):

During this phase, the team created an empathy map to better understand user behavior and expectations. Key requirements were outlined, including customer journey mapping and a high-level understanding of how the solution would meet user needs. A data flow diagram was also conceptualized.

March 30–31 (Design Phase):
UI/UX wireframes were created for both the customer interface and admin dashboard. The solution architecture was finalized, and the overall structure of the application (including page layouts and navigation flow) was locked in.

April 1–4 (Frontend Development):
The frontend was developed using **React.js**. Core pages such as the homepage, product listings, individual product view, cart, login/signup, and user profile were implemented. Key features like product filtering, search, and responsive design were also added during this period.

April 5–7 (Backend Development):
The backend was built using **Node.js with Express**, and **MongoDB** was used as the database. RESTful APIs were created for product management, user authentication (using **JWT**), and order processing. Admin features such as product editing and order viewing were also developed.

April 8 (Payment Integration):
Secure payment integration was implemented using **Razorpay** or **Stripe**, enabling multiple payment methods including UPI, credit/debit cards, and cash on delivery (COD).

April 9 (Admin Panel & Order Tracking):
A complete admin panel was developed to manage products, view customer data, and track orders. The user-facing order tracking system was finalized, allowing users to view order history and current status updates.

April 10 (Testing & Optimization):
Functional and performance testing was conducted to identify and fix bugs. UI responsiveness was improved, and lazy loading was applied for better performance. Validation and security checks were also added to safeguard user data and ensure transaction safety.

April 11 (Final Touches):
Final adjustments were made, including the implementation of product ratings and reviews, email notifications, and UI enhancements. The user experience was polished to ensure smooth navigation and consistency across all devices.

April 12 (Deployment & Demo):
The final version of the application was deployed. A demo video was recorded, and the project was submitted along with the GitHub repository link and presentation materials.

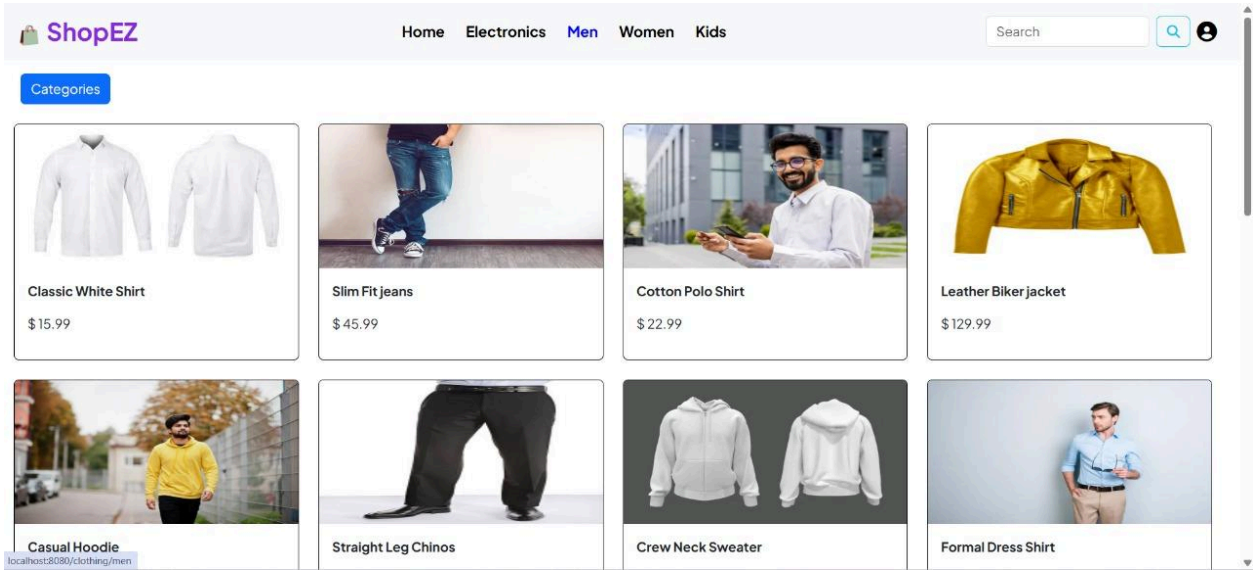
6. FUNCTIONAL AND PERFORMANCE TESTING

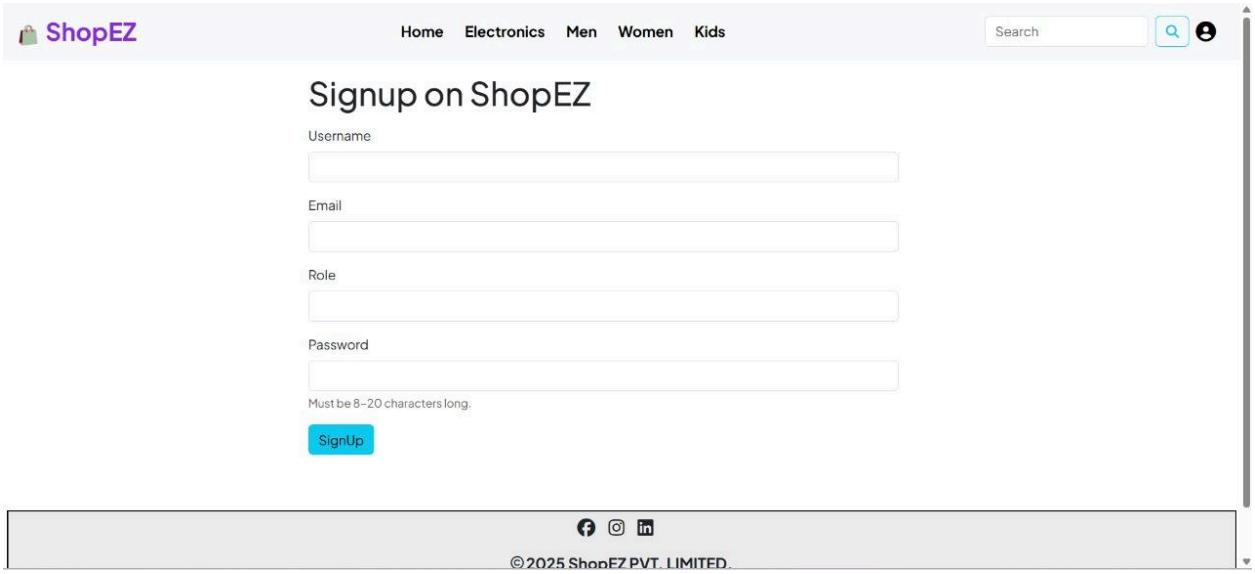
6.1 Performance Testing

- Load tested product browsing and checkout flows
- Verified response times and database queries
- Ensured optimized image loading and minimal UI lags
- Tested that users can browse all products
- Made sure that the user is able to make the purchase seamlessly

7. RESULTS

7.1 Output Screenshots




ShopEZ
Home
Electronics
Men
Women
Kids
Search
Signup on ShopEZ
Username
Email
Role
Password
Must be 8-20 characters long.
SignUp
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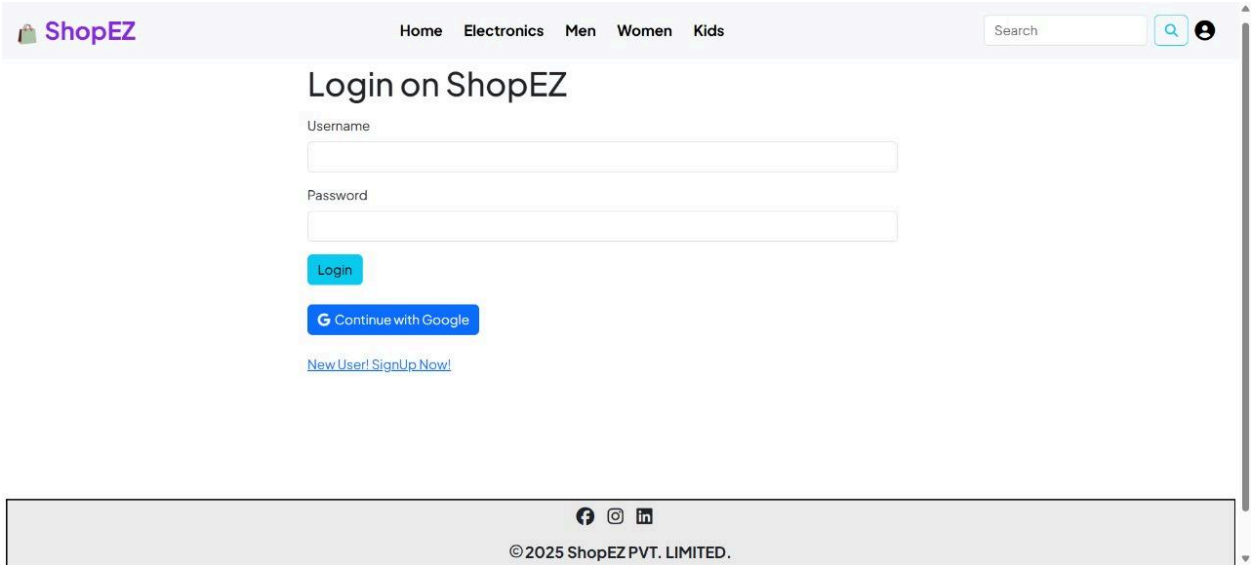
ShopEZ
Home
Electronics
Men
Women
Kids
Search
Login on ShopEZ
Username
Password
Login
Continue with Google
New User! SignUp Now!
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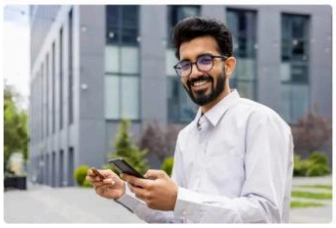
ShopEZ Home Electronics Men Women Kids Search 2 vaibhav bhargav



Cotton Polo Shirt

A classic navy polo shirt made from premium cotton, offering style and comfort.

$ 22.99

Stock Available: 150

Color: Navy Blue

Select Size: ○ M ○ L ○ XL

Add to Cart

Leave a review

Rating:

ShopEZ Home Electronics Men Women Kids Search 2 vaibhav bhargav

item added to cart!!

Your Cart

Cotton Polo Shirt

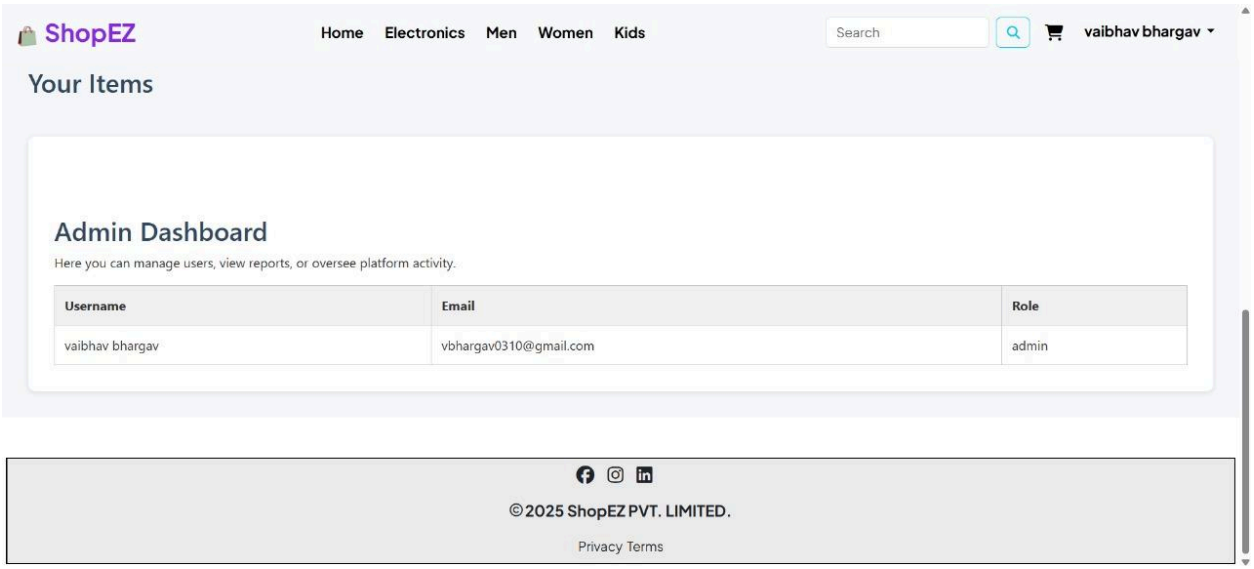
$ 22.99

Buy Now Remove

Samsung galaxy s23 Ultra

$ 699.99

Buy Now Remove



8. ADVANTAGES & DISADVANTAGES

Advantages

- Clean, user-friendly interface
- Secure payment processing
- Responsive design across devices
- Easy to scale and maintain
- Real-time order updates

Disadvantages

- No native mobile app yet
- Currently supports single-vendor only
- Initial setup requires basic tech knowledge

9. CONCLUSION

ShopEZ successfully delivers a functional and efficient e-commerce solution. It simplifies online shopping, enhances security, and provides a customizable platform for future expansion. The project fulfilled all initial goals within a short development cycle.

10. FUTURE SCOPE

- AI-based product recommendations
- Admin dashboard
- Mobile app version
- Multi-vendor support

11. APPENDIX

GitHub & Project Demo Link

Recording 2025-04-13 113408.mp4