

ShopEZ: Full Stack E-commerce Platform

Complete Project Documentation

1. Introduction

Project Title: ShopEZ One-Stop Shop for Online Purchases

Team Members

- **Chundru Pavan Kumar** – Full Stack Developer: Manages end-to-end development, authentication systems, and deployment.
- **Galam Bhanu Prakash** – Frontend Developer: Responsible for React.js UI components, user experience design, and client-side functionality.
- **Ganta Chandini Priya** – Backend Developer: Handles Node.js/Express.js server development, API creation, and database integration.
- **Ganta Manikanta Anjaneya** – Database Administrator: Designs MongoDB schemas, optimizes queries, and manages data relationships

2. Project Overview.

Purpose

ShopEZ is a comprehensive e-commerce platform designed to revolutionize the online shopping experience by providing a seamless interface for customers while empowering sellers with robust management tools. The platform bridges the gap between buyers and sellers through an intuitive, secure, and scalable solution that handles everything from product discovery to order fulfillment.

Key Features

- **User Management:** Secure registration, login, and profile management with role-based access control
- **Product Catalog:** Dynamic product listings with advanced filtering, search, and categorization
- **Shopping Cart:** Persistent cart functionality with real-time updates and quantity management

- **Secure Checkout:** Streamlined checkout process with multiple payment options and delivery tracking
- **Order Management:** Comprehensive order tracking from placement to delivery
- **Admin Dashboard:** Powerful administrative tools for managing products, orders, users, and platform analytics
- **Responsive Design:** Mobile-first approach ensuring optimal experience across all devices
- **Real-time Updates:** Live inventory updates, order status changes, and notification systems
- **Personalization:** User-specific recommendations and browsing history
- **Banner & Categories Management:** Dynamic content management for promotional materials and product organization

3. Architecture Frontend Architecture (React.js)

The frontend follows a component-based architecture utilizing React.js for building dynamic user interfaces:

Component Hierarchy:

- **App Component:** Root component managing routing and global state
- **Layout Components:** Header, Footer, Navigation, and Sidebar components
- **Page Components:** Home, Products, Cart, Checkout, Profile, and Admin pages
- **Feature Components:** ProductCard, FilterBar, SearchBox, CartItem, OrderSummary
- **Utility Components:** Loading spinners, error boundaries, and modal dialogs

State Management:

- Implements Context API for global state management

Manages user authentication state, cart data, and application-wide settings

- Local component state for form handling and UI interactions **Routing:**
- React Router for client-side navigation
- Protected routes for authenticated users and admin panels
- Dynamic routing for product categories and individual product pages

Backend Architecture (Node.js & Express.js)

The backend follows a RESTful API architecture with clear separation of concerns:

Server Structure:

- **app.js:** Main application file with Express configuration
- **Routes:** Organized API endpoints for different functionalities
- **Controllers:** Business logic handlers for each route
- **Middleware:** Authentication, validation, error handling, and logging
- **Models:** Mongoose schemas defining data structures
- **Utils:** Helper functions, validation schemas, and utility modules **API**

Design:

- RESTful endpoints following standard HTTP methods (GET, POST, PUT, DELETE)
- Consistent response format with proper HTTP status codes
- Input validation and sanitization for all incoming requests
- Error handling middleware for centralized error management

Database Architecture (MongoDB)

MongoDB provides the NoSQL foundation with the following collections:

Core Collections:

- **Users:** Stores user credentials, profiles, and authentication data
- **Products:** Contains product information, images, pricing, and inventory

□

- **Cart:** Manages shopping cart items linked to specific users
- **Orders:** Comprehensive order data including delivery and payment information
- **Categories:** Product categorization for organized browsing
- **Banners:** Promotional content and featured product displays
- **Admin:** Administrative user data and permissions **Relationships:**
- One-to-Many: User to Cart items, User to Orders
- Many-to-Many: Products to Categories
- Referenced relationships using ObjectId for data integrity

4. Project Setup & Installation Prerequisites

Ensure the following software is installed on your system:

- **Node.js** (version 14.x or higher)
- **npm** or **yarn** package manager
- **MongoDB** (version 4.x or higher) or MongoDB Atlas account
- **Git** for version control
- **Code Editor** (VS Code recommended)

Setup Instructions

1. **Clone** the

Repository:

<https://github.com>

[/vyshu0111/Shops](https://github.com/vyshu0111/Shops)

[ell](#)

2. **Backend Setup:** cd

ShopEZ/backend

npm install

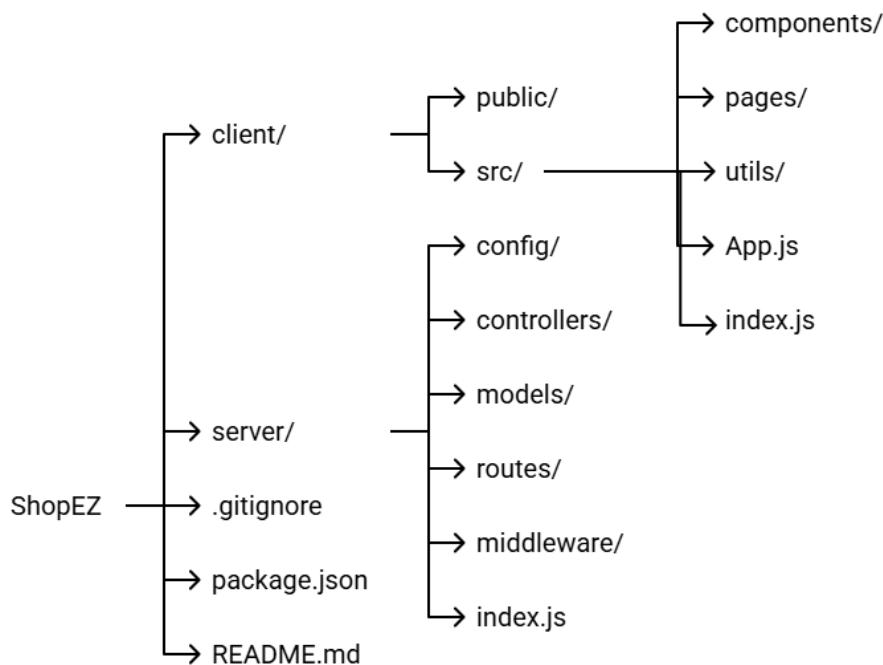
npm start

3. Frontend Setup: cd

```
..../client npm install
```

```
npm start
```

4. Folder Structure



5. System Workflow – End-to-End Scenario Scenario:

Sarah's Birthday Gift

1. Effortless Product Discovery

○ Sarah visits ShopEZ to find a birthday gift.

- Navigates to the "Fashion Accessories" category.
- Applies filters ("Bracelets", price range, style preferences).

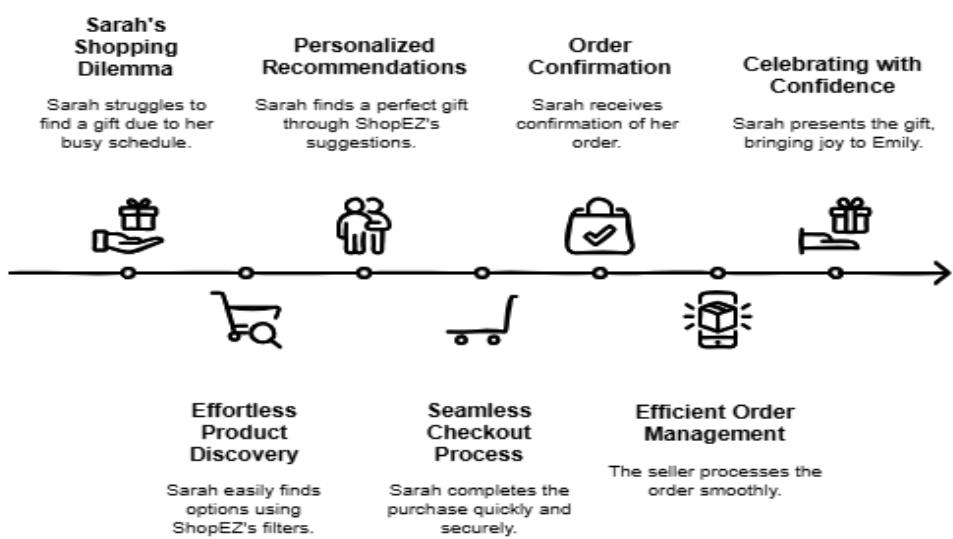
2. Personalized Shopping Experience

○ Sarah notices a "Recommended for You" section.

- Based on her search pattern and user profile, she is shown curated results.

- She selects a gold bangle and adds it to her cart.
- 3. Seamless Checkout Process** ○ Sarah enters delivery details (Emily's address). ○ Selects preferred payment method.
- Confirms order with secure checkout.
- 4. Order Confirmation & Tracking** ○ Sarah receives an order confirmation email instantly.
- She can track the status via the "My Orders" section.
- 5. Seller Order Notification & Fulfillment** ○ The seller gets notified via the ShopEZ Seller Dashboard. ○ Processes the order, updates shipment status.
- Packs and dispatches the gift promptly.
- 6. Celebration with Confidence** ○ Emily receives the gift on time. ○ Sarah receives delivery confirmation.
- Both are happy and satisfied with the streamlined experience.

Sarah's Birthday Gift Shopping Journey



7. API Endpoint Documentation – ShopEZ

Authentication

- POST /register – Registers a new user (Customer/Admin/Seller).
- POST /login – Logs in a user and returns user data on success.

Product APIs

- GET /fetch-products – Fetch all products.
- GET /fetch-product-details/:id – Get details of a single product by ID.
- POST /add-new-product – Add a new product (Admin only).
- PUT /update-product/:id – Update an existing product by ID (Admin only).
- GET /fetch-categories – Fetch all product categories.
- POST /update-banner – Update banner image (Admin only).
- GET /fetch-banner – Get current homepage banner.

Order APIs

- POST /buy-product – Buy a product directly.
- POST /place-cart-order – Place order for all cart items.
- GET /fetch-orders – Get all placed orders.
- PUT /cancel-order – Cancel a specific order.
- PUT /update-order-status – Admin updates the order status (e.g., dispatched, delivered).

Cart APIs

- GET /fetch-cart – Fetch all cart items.
- POST /add-to-cart – Add a product to cart.
- PUT /increase-cart-quantity – Increase quantity of a cart item.

- PUT /decrease-cart-quantity – Decrease quantity or remove item if 0.
- DELETE /remove-item/:id – Remove item from cart by ID.

User/Admin APIs

- GET /fetch-users – Get all registered users.

8. Authentication & Authorization – ShopEZ

User Signup

- Users register via POST /register, providing:
 - username, email, usertype (admin/user/seller), password
 - Passwords are hashed securely using **bcrypt**.
- Duplicate email check is implemented.

User Login

- Endpoint: POST /login □ Validates credentials.
- On success, returns user data (currently no JWT used, but session/tokenbased auth can be added).

Authorization Logic

□ Usertype Roles:

- admin: Can manage products, categories, users, and orders.
- seller: Will get access to seller dashboard (future enhancement).
- user: Can browse, add to cart, and place orders.

Protected Actions (by logic)

- Product management, banner updates → Admin only.
- Order placing, cart → Logged-in users.

- Order status update → Admin.

9. User Interface

1. Landing page

The screenshot shows the ShopEZ landing page. At the top, there's a navigation bar with the logo "ShopEZ", a search bar, and a "Login" button. Below the navigation is a horizontal row of five category cards: "Fashion" (a woman holding shopping bags), "Electronics" (various electronic devices), "Mobiles" (two smartphones), "Groceries" (a person grocery shopping), and "Sports Equipments" (a soccer ball and boots). On the left side, there's a sidebar with "Filters" and "Categories". The "Filters" section includes "Sort By" (with "Popular" selected), "Price (low to high)", "Price (high to low)", and "Discount". The "Categories" section includes "Gender" with options "Men", "Women", and "Unisex". The main content area is titled "All Products" and displays a grid of five products: "jean" (a person in jeans), "Redmi Note 13 Pro+" (a smartphone), "tv" (a television screen), "football" (a soccer ball on a field), and "Ethnic wear" (a person in traditional Indian attire). Each product card shows the name, a small image, a brief description, and a price with a discount percentage.

Authentication

The screenshot shows the ShopEZ registration page. At the top, there's a navigation bar with the logo "ShopEZ", a search bar, and a "Login" button. The main content area is titled "Register" and contains four input fields: "Username", "Email address", "Password", and a dropdown menu for "User type". Below these fields is a blue "Sign up" button. At the bottom of the form, there's a link "Already registered? Login".

All Users

ShopEZ (admin)

Home Users Orders Products New Product Logout

All Users

User ID	User Name	Email Address	Orders
685ae539c92658c898613cc1	Srujan	sruju@gmail.com	0
685c3c882403cf1149dd0a2d	asha	asha@gmail.com	1

Admin Dashboard

ShopEZ (admin)

Home Users Orders Products New Product Logout

Total users 2 View all	All Products 5 View all	All Orders 1 View all	Add Product (new) Add now
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Update banner

[Update](#)

Orders

ShopEZ (admin)

Home Users Orders Products New Product Logout

Orders

 jean Comfortable and stylish denim jeans perfect for everyday wear. Size: Quantity: 1 Price: ₹ 900 Payment method: upi Userid: 685c3c882403cf1149dd0a2d Name: asha Email: asha@gmail.com Mobile: 7780625095 Ordered on: 2025-06-25 Address: door number 11-220, near chinna high school,panditivari palem,pidugurala Pincode: 522413 Order status: cancelled
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Products

The screenshot shows the ShopEZ admin dashboard. At the top, there's a blue header bar with the text "ShopEZ (admin)" on the left and navigation links "Home", "Users", "Orders", "Products", "New Product", and "Logout" on the right. Below the header is a sidebar titled "Filters" containing sections for "Sort By" (Popularity selected), "Categories", and "Gender". The main area is titled "All Products" and displays four product cards:

- jean**: A denim jacket and jeans outfit. Details: "Comfortable and stylish denim ...", "₹ 900 1000 (30% off)", "Update".
- Redmi Note 13 Pro+**: A smartphone. Details: "Redmi Note 13 Pro+ features a ...", "₹ 25000 25000 (0% off)", "Update".
- tv**: A television. Details: "VIZIO 59" Class HDTV (1080p) S...", "₹ 30000 50000 (40% off)", "Update".
- football**: A soccer ball. Details: "Football at Hazel Anderson blo...", "₹ 435 500 (13% off)", "Update".

11. Known Issues

1. No Email Notification Support

- The system doesn't send emails for order confirmations, cancellations, or account events.

2. No Real-Time Unread Message Indicators

- While basic functionality exists, there's no badge or indicator for unread chats/messages.

3. Minimal Front-End Validation

- Required field checks exist, but format checks (like email format or password strength) are minimal.

12. Future Enhancements

- **✉️ Email/SMS Notifications** for order status and promotional offers.
- **💡 Real-Time WebSocket Chat** using Socket.IO for buyer-seller communication.
- **📊 Admin Analytics Dashboard** with charts (product views, sales trends, user growth).
- **📱 Mobile Responsiveness** for all pages.
- **🔍 Advanced Search & Filtering** (by category, price, brand, reviews, etc.)
- **💬 Product Reviews and Ratings**

□  **Wishlist Feature** for users