

Project Report

1. INTRODUCTION

1.1 Project Overview

ShopEZ is a full-stack e-commerce web application developed using the MERN stack (MongoDB, Express.js, React.js, Node.js). The system provides an online platform where users can browse products, filter items, add products to their cart, and place orders securely. It also provides an admin dashboard for managing products, users, and orders.

The application focuses on delivering a smooth, fast, and personalized shopping experience while ensuring secure transactions and efficient backend management. The platform is scalable, modular, and responsive across multiple devices.

1.2 Purpose

The main purpose of ShopEZ is to simplify online shopping by providing a single platform where users can easily discover products and complete purchases. It aims to:

Reduce the time required to find products

Provide personalized product recommendations

Ensure secure and fast checkout

Allow sellers to efficiently manage inventory and orders

Deliver a user-friendly shopping experience

2. IDEATION PHASE

2.1 Problem Statement

Modern users often struggle to find products quickly due to scattered online stores, slow checkout processes, and complex navigation systems. Sellers also face difficulty managing orders and analyzing sales across multiple platforms.

Therefore, a centralized platform is needed that enables:

Efficient product discovery

Secure transactions

Simplified seller management

Personalized recommendations

2.2 Empathy Map Canvas

User Thinks:

I want to find products quickly

I need reliable reviews

User Feels:

Overwhelmed by too many websites

Frustrated with slow checkout

User Says:

I want everything in one place

Shopping should be easy

User Does:

Searches multiple websites

Compares prices manually

2.3 Brainstorming

Ideas generated during ideation:

Single-platform shopping solution

Advanced filters and search

Smart recommendations

Seller dashboard

Secure payment module

Order tracking system

Selected idea: Develop a full-stack e-commerce platform with admin and user interfaces.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

1. User visits website

2. Registers or logs in

3. Browses products
4. Applies filters
5. Adds product to cart
6. Enters address and payment details
7. Confirms order
8. Receives confirmation

3.2 Solution Requirement

Functional Requirements

User authentication

Product listing

Cart management

Order placement

Admin dashboard

Non-Functional Requirements

Fast loading time

Secure authentication

Scalable backend

Responsive design

Reliable database

3.3 Data Flow Diagram

Level 0 (Context Diagram): User → ShopEZ System → Database → Response to User

Level 1: User → Login/Register → Server → Database

User → Product Request → Server → Database → Products

User → Order → Server → Database → Confirmation

3.4 Technology Stack

Layer Technology

Frontend React.js, HTML, CSS, Bootstrap

Backend Node.js, Express.js

Database MongoDB

Version Control Git

4. PROJECT DESIGN

4.1 Problem Solution Fit

ShopEZ directly addresses online shopping challenges by offering:

Centralized product browsing

Secure checkout system

Fast navigation

Seller management tools

4.2 Proposed Solution

The proposed solution is a web-based MERN stack application that integrates frontend, backend, and database to provide a seamless e-commerce experience.

Key Modules:

Authentication module

Product module

Cart module

Order module

Admin module

4.3 Solution Architecture

Architecture Layers:

Presentation Layer React frontend handles UI and user interactions.

Application Layer Node.js server processes requests and business logic.

Data Layer MongoDB stores structured collections.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Phase Task

Planning Requirement analysis

Design UI & Database design

Development Frontend + Backend

Testing API + UI testing

Deployment Hosting

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Tests performed:

Page load speed test

API response time test

Database query performance

Multiple user simulation

Results:

Average page load

API response

Stable performance with multiple users

7. RESULTS

The ShopEZ system was successfully implemented and tested. All modules performed as expected.

Features validated:

User authentication works correctly

Products load dynamically

Cart operations function properly

Orders are stored in database

Admin dashboard manages data efficiently

7.1 Output Screenshots

The image contains three screenshots of the ShopEZ application:

- Registration Screen:** A modal window titled "Register" with fields for Username, Email address, and Password. A dropdown menu shows "Customer". A blue "Sign up" button is at the bottom, and a link "Already registered? Login" is below it.
- Login Screen:** A modal window titled "Login" with fields for Email address and Password. A blue "Sign in" button is at the bottom, and a link "Not registered? Register" is below it.
- Admin Dashboard:** A dark-themed dashboard titled "ShopEZ (admin)". It features four cards: "Total users 7" with a "View all" button, "All Products 4" with a "View all" button, "All Orders 5" with a "View all" button, and "Add Product (new)" with a "Add now" button. Below these is a section titled "Update banner" with a "Banner url" input field and an "Update" button.

8. ADVANTAGES & DISADVANTAGES

Advantages

Easy product discovery

Secure login system

Modular architecture

Scalable backend

Responsive UI

Disadvantages

Payment gateway not integrated

Basic recommendation logic

Limited analytics

9. CONCLUSION

ShopEZ successfully demonstrates the development of a full-stack e-commerce platform using modern web technologies. The project achieves its goal of providing a seamless shopping experience while offering efficient management tools for administrators. It showcases practical implementation of full-stack concepts including authentication, database integration, API design, and responsive UI development.

10. FUTURE SCOPE

Future improvements include:

Online payment gateway integration

AI-based recommendations

Mobile application

Multi-language support

Real-time order tracking

Push notifications

11. APPENDIX

GitHub Repository:

<https://github.com/suprajaK-dev/ShopEZ>