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Shopping Cart System

[1]Vrushay Bohra, [2]Vishvas Choubisa, [3]Tanya Singh, [4]Dr. Devesh Bandoi, [5]Dr Vishal Shri Vashtav

[1,2,3]Student, Arya College of Engineering and IT, Kukas, Jaipur.

[4,5]Professor, Arya College of Engineering and IT, Kukas, Jaipur.

Abstract

The E-Commerce Shopping Cart System is designed to simplify online shopping by providing users with an efficient platform to browse, select, and purchase products. This project integrates secure authentication, dynamic product management, and smooth checkout processes using both online and offline payment options. The system ensures scalability, reliability, and security for businesses moving toward digital platforms. Developed using Java Spring Boot, Thymeleaf, MySQL, and AWS, it offers real-time data connectivity and robust performance. Overall, the project aims to enhance customer experience while reducing manual operational effort for businesses.

Keywords: E-Commerce, Spring Boot, Online Shopping, Auth0 Security, AWS Cloud, MySQL Database, Thymeleaf, Web Application.

Introduction

In today's digital era, businesses increasingly rely on online platforms to reach customers, manage orders, and streamline sales operations. However, many small and medium enterprises face challenges such as secure login systems, product catalog management, and payment integration. The Shopping Cart System aims to solve these challenges by providing a dynamic, secure, and user-friendly e-commerce platform.

This system allows users to register, browse products, add items to a shopping cart, and complete payments seamlessly. Administrators can efficiently manage categories, products, user accounts, and orders through an intuitive admin dashboard. By leveraging technologies such as Spring Boot, Auth0, MySQL, and AWS Cloud, the project ensures fast performance, high scalability, and strong data protection.

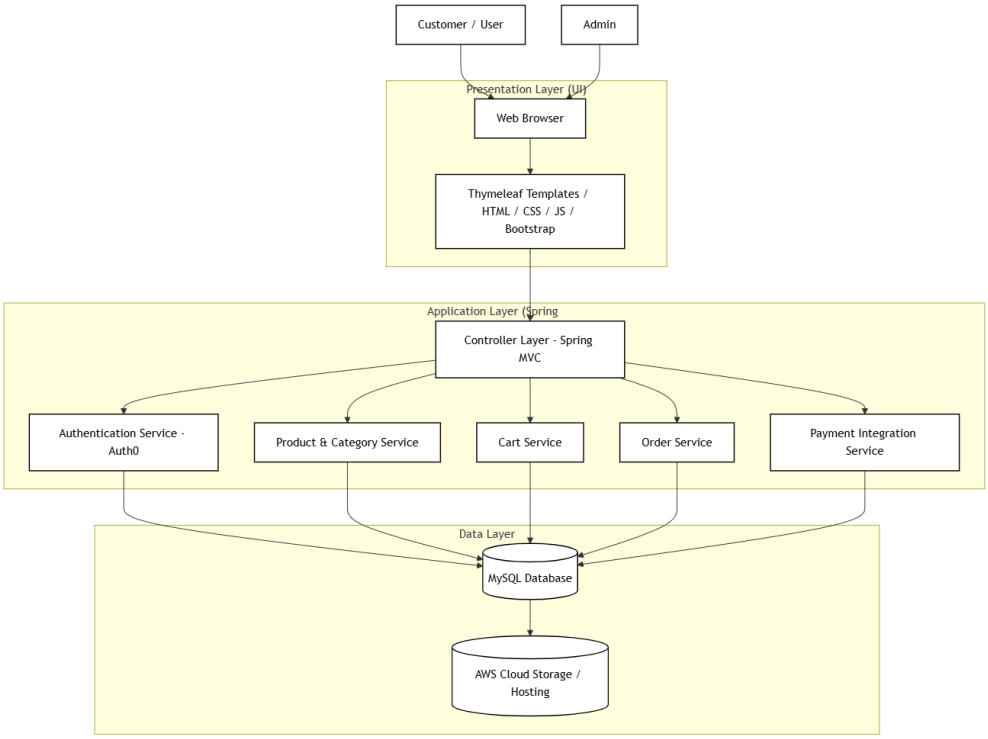
Overall, the system enhances the online shopping experience and supports businesses in transitioning from traditional to digital commerce.

Literature Review

- I studied several e-commerce development books and online resources to understand the structure, modules, and workflow of a modern shopping system.
- Concepts were derived from books on software engineering, database management, and Java web application development.
- Research papers explored included:
- Websites such as Oracle Documentation, Spring Boot Documentation, AWS Developer Guides, and Auth0 security articles provided real-time knowledge used to design the system.

Methodology

Workflow Diagram



Step 1: Requirement Analysis

The first step was to identify system requirements such as user registration, login, product browsing, cart management, and admin control features. Tools like use-case diagrams and requirement tables helped document user needs clearly.

Step 2: System Design

The architecture was designed using structured diagrams like DFD, ERD, and UML diagrams. Spring Boot layered architecture (Controller Service–Repository) and MySQL schema were prepared to maintain data flow and integrity.

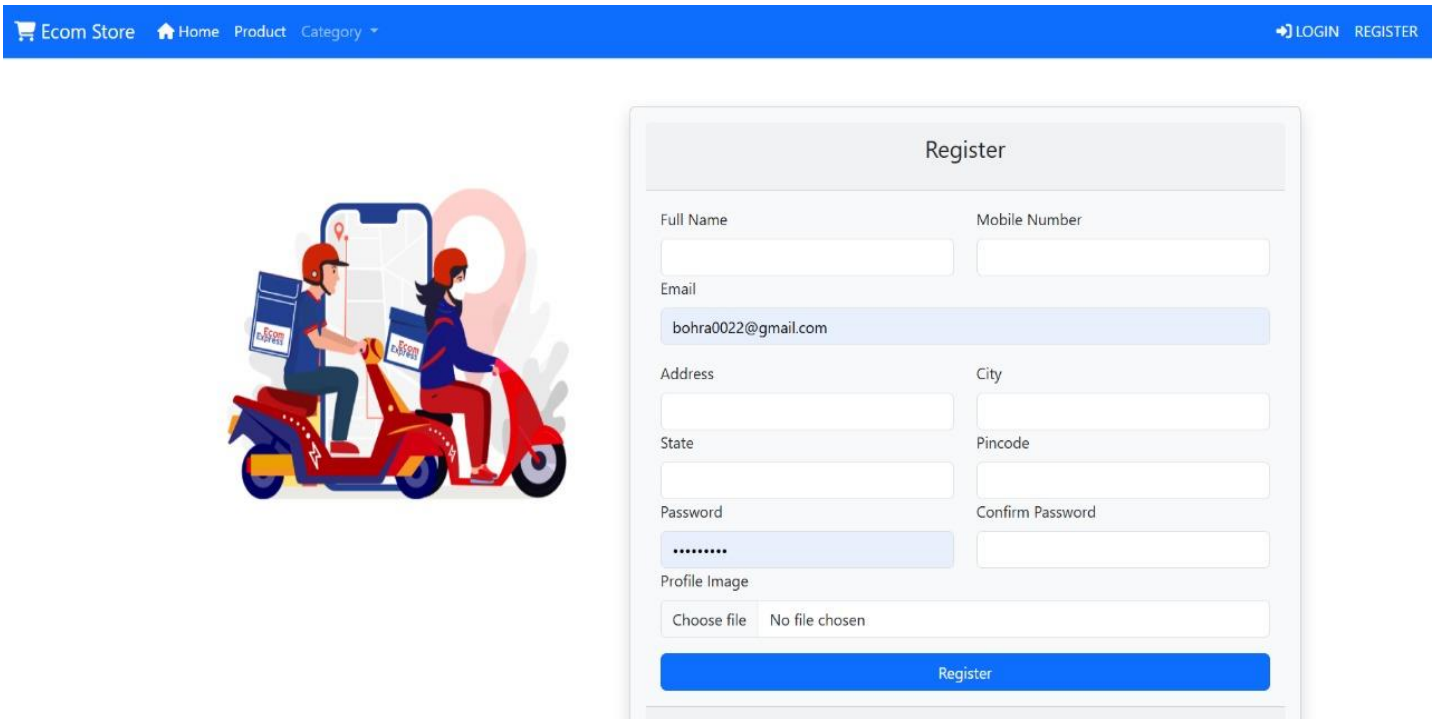
Step 3: Development Phase

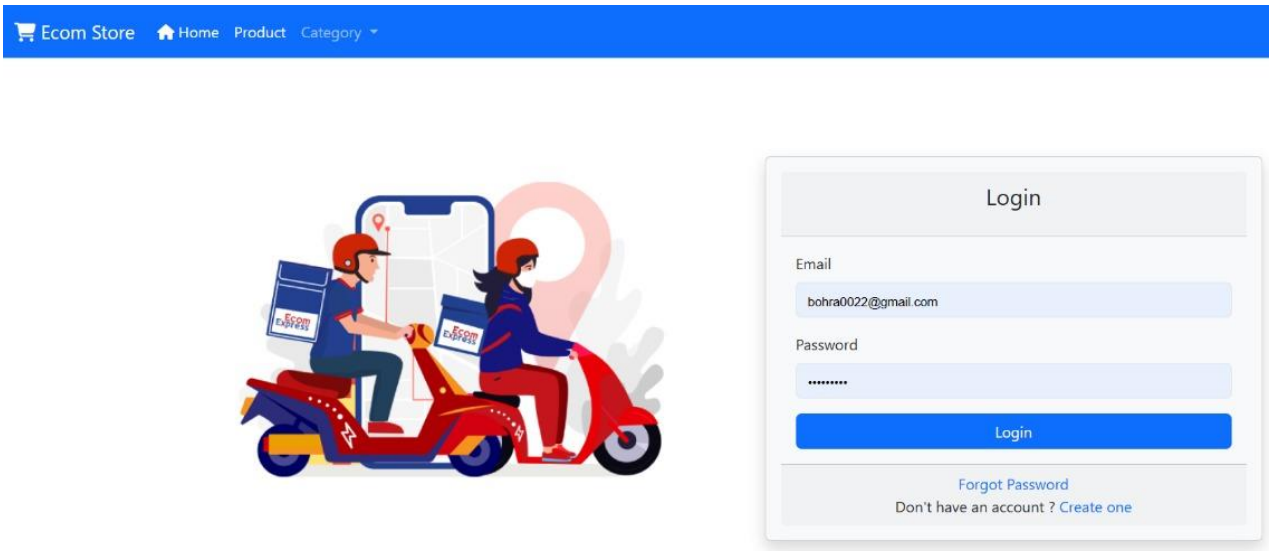
Backend APIs were developed using Java Spring Boot, while frontend pages were created using Thymeleaf, HTML, CSS, and Bootstrap. Authentication was implemented using Auth0. Integration of cart operations, product filters, and payment gateway functionality was completed.

Step 4: Testing and Deployment

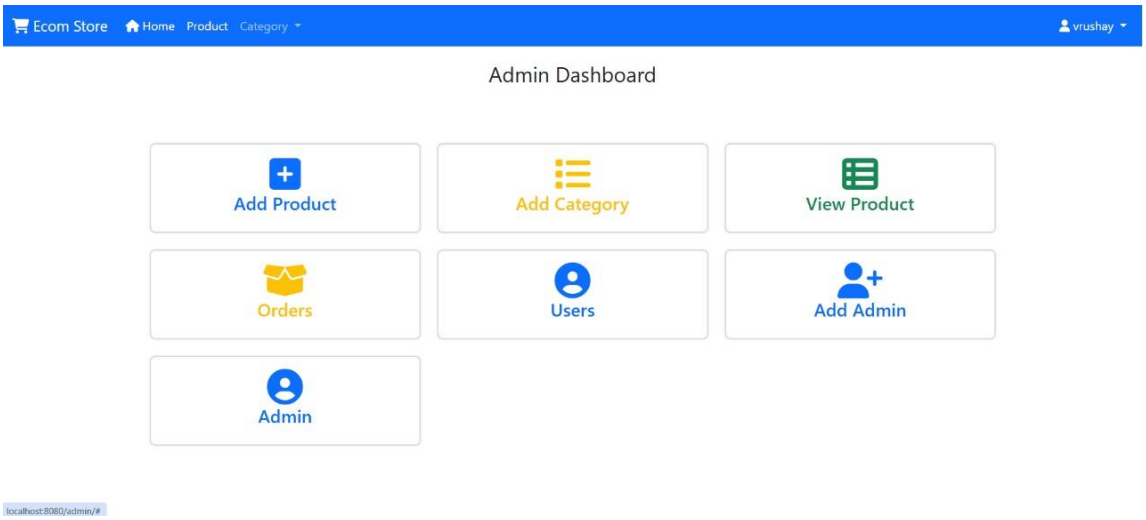
The system was tested for functionality, performance, and security. After successful testing, the application was deployed using AWS cloud services for high availability and scalability.

Register and Login Page

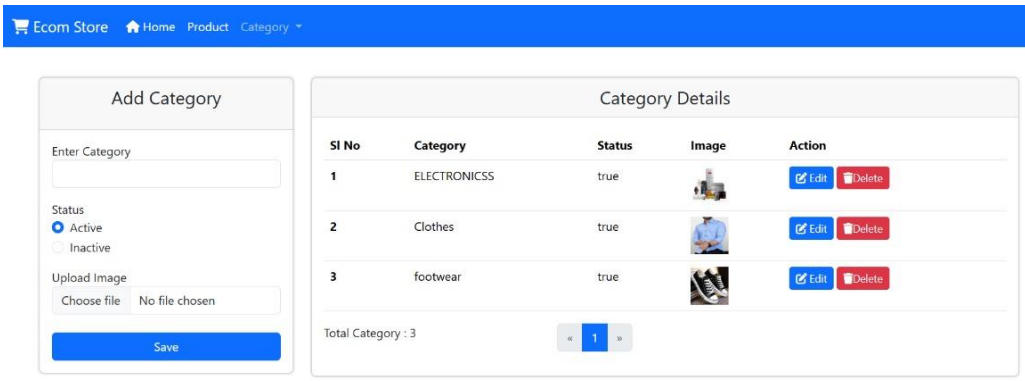




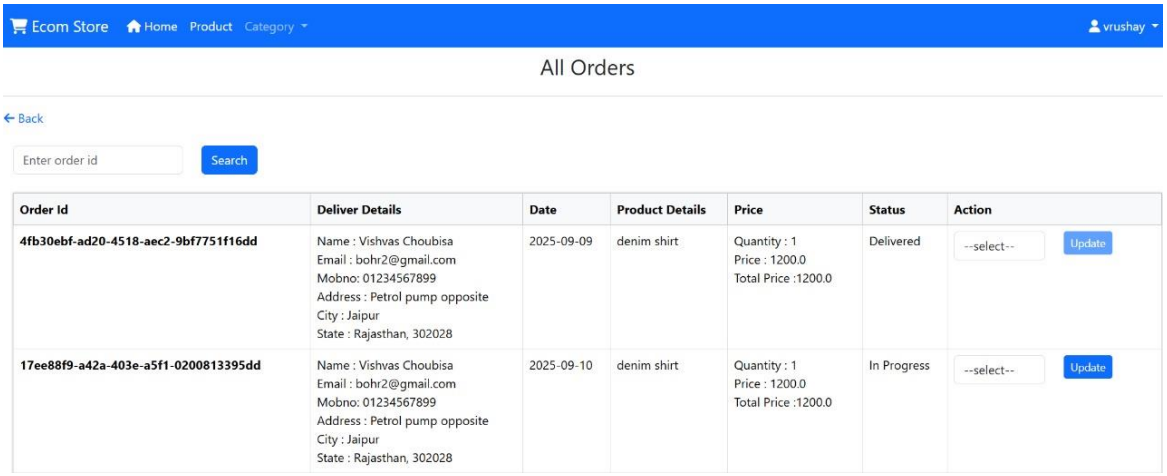
Admin Panel



Add Category / Product Page:



Order Page:



Conclusion

The E-Commerce Shopping Cart System successfully provides a secure, scalable, and user-friendly platform for both customers and administrators. It automates purchasing, order management, and product handling, making shopping easier for users and business management more efficient. With core technologies like Spring Boot, Auth0, MySQL, and AWS, the system ensures high performance and security. This project demonstrates how modern web technologies can be combined to deliver a complete real-world online shopping solution.

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