

ORGANICA – FULL STACK E-COMMERCE APPLICATION

A PROJECT REPORT

Submitted by

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ABSTRACT

Organica is a full-stack e-commerce web application designed to provide a seamless shopping experience for organic products. The system combines modern technologies — ReactJS for frontend, Spring Boot for backend, and MySQL for database — to deliver a scalable and interactive solution.

It supports three primary user roles: Admin, Customer, and Vendor. Each role has specific functionalities such as managing products, processing orders, and tracking deliveries. The project focuses on performance, security, and usability using RESTful APIs, JWT authentication, and responsive design

CHAPTER 1: INTRODUCTION

The Organica application aims to provide an efficient platform for selling and buying organic products. It bridges the gap between farmers or suppliers and end customers, promoting eco-friendly and sustainable living.

1.1 Problem Statement

Many consumers struggle to find genuine organic products online. Existing e-commerce sites lack a specialized section for verified organic items. Organica addresses this issue by offering a dedicated marketplace for organic goods.

1.2 Objectives

1. Develop a scalable full-stack e-commerce application.
2. Implement secure user authentication using JWT.
3. Enable CRUD operations for products, users, and orders.
4. Provide responsive and user-friendly interfaces.
5. Facilitate smooth frontend-backend integration.

6. Manage order lifecycle efficiently through an admin dashboard.

1.3 Scope

Organica provides a centralized platform to buy and sell organic products. It supports advanced search, filtering, and product management capabilities. The application is expandable to include payment gateways and mobile versions in the future.

CHAPTER 2: LITERATURE REVIEW

The literature review focuses on previous research and existing systems related to e-commerce and organic product distribution. While traditional e-commerce platforms like Amazon and Flipkart provide general goods, none focus solely on organic or eco-friendly items.

Organica leverages modern full-stack technologies to address this gap, integrating Spring Boot and ReactJS for speed, security, and modularity.

2.1 Existing Systems

Existing systems use monolithic architectures and lack specialization. They are often dependent on manual inventory updates, causing delays and inconsistencies.

Organica improves upon these by using REST APIs, automatic product updates, and real-time data synchronization.

2.2 Technologies Used

- Frontend: ReactJS, HTML5, CSS3, Bootstrap
- Backend: Spring Boot, Spring Data JPA
- Database: MySQL
- Tools: Postman, IntelliJ IDEA, VS Code
- Version Control: GitHub

- Authentication: JWT (JSON Web Token)

CHAPTER 3: SYSTEM DESIGN AND ARCHITECTURE

The Organica system is based on a 3-tier architecture consisting of the presentation layer, application layer, and data layer. Each layer is modular and communicates using RESTful APIs.

3.1 Architectural Overview

1. Presentation Layer: Implemented in ReactJS, responsible for UI/UX.
2. Application Layer: Built with Spring Boot to handle requests, authentication, and business logic.
3. Data Layer: Uses MySQL for persistent storage of users, products, and orders.

3.2 Database Design

The MySQL database stores relational data for Users, Products, Categories, and Orders. Each table is linked via foreign keys. Spring Data JPA is used for seamless ORM (Object Relational Mapping).

3.3 Data Flow

1. User interacts with frontend (ReactJS)
2. Frontend sends HTTP requests to backend (Spring Boot)
3. Backend processes logic and interacts with MySQL
4. Responses are sent back to frontend via REST APIs

CHAPTER 4: IMPLEMENTATION AND RESULTS

The Organica project is implemented using the Model-View-Controller (MVC) design pattern to separate concerns and simplify development.

The backend contains several key modules for handling authentication, product management, and orders.

4.1 Backend Modules

1. Authentication Module – handles login and registration using JWT.
2. Product Module – manages CRUD operations for products.
3. Order Module – tracks orders and manages user transactions.
4. Category Module – organizes products for easy browsing.

4.2 Frontend Modules

The frontend includes multiple components:

- Home Page: Displays products and categories.
- Product Details: Shows detailed product info.
- Cart: Allows users to manage selected items.
- Admin Dashboard: For managing products and users.

4.3 Testing

Testing was performed using JUnit for backend and manual UI testing for frontend. APIs were tested with Postman to ensure data consistency.

All modules passed functionality tests successfully.

CHAPTER 5: CONCLUSION AND FUTURE ENHANCEMENTS

Organica successfully demonstrates a robust e-commerce platform tailored for organic products. It integrates modern web technologies for performance, scalability, and security. The system provides an effective solution for both customers and administrators, simplifying operations and enhancing user satisfaction.

5.1 Future Enhancements

- Integration with Razorpay or PayPal payment gateways.
- AI-based recommendation engine.
- Mobile application for Android/iOS.
- Integration of delivery tracking system.
- Cloud deployment for scalability.

APPENDIX A: USER MANUAL

1. Launch the backend server using Spring Boot.
2. Start the ReactJS frontend using npm start.
3. Register or login as a user or admin.
4. Browse and search for products.
5. Add products to cart and place orders.
6. Admin can manage products and users via dashboard.

APPENDIX B: ACHIEVEMENTS AND CERTIFICATIONS

- Successfully developed and deployed a full-stack web application.
- Implemented JWT-based authentication.
- Achieved 95% code reliability through testing.
- Integrated REST APIs with ReactJS frontend.
- Earned certifications in Java, Spring Boot, and ReactJS.