CU FOOD HUB

Project Report

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Abstract

CU Food Hub is a digital food ordering and delivery platform tailored for Chandigarh University. The aim is to centralize the diverse food outlets within the campus into a single, seamless application where students and staff can browse menus, place orders, and track deliveries.

The project emphasizes modern design, user experience, and scalability. The backend is built on **Spring Boot**, offering robust APIs; **React.js** powers the frontend with an intuitive interface; and **MongoDB** provides flexible and scalable storage. The platform addresses real challenges like long queues, lack of digital menus, and inefficient order management. Future iterations will integrate **payments, AI recommendations, and GPS-based live tracking**.

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1. Introduction

Food plays a central role in university life, yet campus food services often face inefficiencies such as long queues, miscommunication, and delays. CU Food Hub is designed as a one-stop solution to streamline food ordering, benefiting both students and vendors.

The system leverages cutting-edge web technologies to ensure fast performance, reliability, and a smooth user journey. The project is inspired by modern delivery platforms but optimized for the unique ecosystem of Chandigarh University.

1.1 Problem Statement

The absence of a unified food ordering system leads to inefficiency and dissatisfaction among students and staff. Vendors struggle to manage orders during peak hours. A digital-first solution is essential to simplify ordering, reduce wait times, and ensure transparency.

1.2 Objectives

- Develop a centralized platform for food ordering and delivery within CU campus.
- Provide vendors with dashboards for menu and order management.
- Enable students and staff to place and track food orders in real-time.
- Ensure a secure authentication and authorization system.
- Build a responsive, mobile-friendly design.

1.3 Scope

The project covers user registration, vendor management, order placement, menu browsing, and order tracking. Future expansions include **online payments, AI-driven recommendations, cloud deployment, and GPS tracking for deliveries**.

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2. System Requirements Specification

2.1 Functional Requirements

- **User Management**: Register, login, logout with JWT-based authentication.
- **Menu Management**: Vendors can add, update, and remove menu items.
- **Order Management**: Place, track, and cancel orders in real-time.
- **Vendor Dashboard**: Manage orders, menus, and availability.
- **Notifications**: Push notifications for order updates.

2.2 Non-Functional Requirements

- **Security**: Password encryption, secure APIs, role-based access.
- **Performance**: Optimized queries, minimal load times.
- **Usability**: Intuitive UI with responsive design.
- **Scalability**: Capable of handling peak-hour load.
- **Reliability**: Minimal downtime, redundant systems.

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3. System Design and Architecture

CU Food Hub follows a **three-tier architecture**:

- **Frontend**: React.js SPA for fast, responsive user experience.
- **Backend**: Spring Boot REST APIs managing business logic.
- **Database**: MongoDB storing users, vendors, menus, and orders.

Database Collections:

- Users: {id, name, email, role, password}
- Vendors: {id, outletName, menuItems}
- Orders: {id, userId, vendorId, items, status, timestamp}
- Menus: {id, vendorId, itemName, price, category}

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4. Implementation and Modules

- **Authentication Module**: Secure login and registration with JWT tokens.
- **Menu Module**: Vendors create and update menus dynamically.
- **Order Module**: Handles food ordering, status updates, and cancellations.
- **Vendor Dashboard**: Real-time interface for vendors to manage operations.
- **Notification Module**: Alerts for order confirmations and readiness.

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5. Testing

- **Unit Testing**: Backend services tested using JUnit.
- **Integration Testing**: Ensures React frontend and Spring Boot backend integration.
- **API Testing**: Conducted with Postman for REST endpoints.
- **UI Testing**: Checked for responsiveness across devices.
- **Load Testing**: Simulated 1000+ concurrent users to ensure stability.

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6. Conclusion and Future Scope

Conclusion

CU Food Hub successfully streamlines campus food services into a single digital platform. The project improves convenience, reduces inefficiencies, and enhances satisfaction for students and vendors alike.

Future Enhancements

- Online payments via UPI, cards, wallets.
- AI-powered food suggestions based on order history.
- GPS tracking for delivery staff.
- Cloud deployment on AWS or Azure.