FoodExpress

Mobile Food Delivery Application

Project Report

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Course	Mobile Programming
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1. Project Overview

The FoodExpress is an all-in-one mobile application developed in Flutter for front-end and Node.js with MongoDB for back-end. The application provides a seamless experience for users to browse restaurants, order food, and track deliveries in real-time.

Additionally, a dedicated delivery dashboard allows administrators to manage and monitor all active orders efficiently.

2. Technology Stack

Frontend (Mobile Application)

The Flutter framework is a cross-platform mobile development framework that allows developers to write an app once and run it on both Android and iOS. The state management of the application will use the provider pattern to manage the flutter app cart and provide real-time updates to the UI components that interact with the cart. The app allows users to authenticate themselves, browse restaurants, view menu items, add menu items to their carts, place orders, and track orders.

Backend (Server & Database)

Server: Node.js with Express.js framework providing RESTful API endpoints for all client-server communications. **Database:** MongoDB Atlas (cloud database) storing users, restaurants, menu items, and orders with proper relationships and indexing. **API Architecture:** RESTful design with endpoints for authentication, restaurant management, menu retrieval, order processing, and status updates.

Delivery Dashboard

Technology: HTML, CSS (Tailwind CSS), and vanilla JavaScript for a responsive web interface. **Real-time Updates:** Auto-refresh every 30 seconds to display active deliveries, completed orders, and delivery statistics. **Features:** Live order tracking, time elapsed/remaining calculations, order status management, and delivery confirmation.

3. Core Features & Functionality

User Authentication System

Users can register with email, password, phone number, and delivery address. The system validates credentials and maintains session persistence using Shared Preferences, allowing automatic login on app restart. All passwords are securely stored in the database.

Restaurant & Menu Management

The application displays a curated list of restaurants with ratings, estimated delivery times, and cuisine categories. Each restaurant has a detailed menu with item names, descriptions, prices, and images. Users can easily browse and select items to add to their cart.

Smart Shopping Cart

With the shopping cart, the Provider state management allows for an item to be added from only one restaurant at any given point. The users can add and remove items as well as modify the quantities, and will always see updated totals in real-time. Additionally, the shopping cart is maintained throughout all pages of the application, ensuring a smooth checkout process with delivery address and phone number verification.

Order Processing & Tracking

Once an order is placed, it is stored in MongoDB with status tracking (Pending, Preparing, On the Way, Delivered). Users can view their complete order history with details including items ordered, total amount, delivery address, and current status. Orders are timestamped and sorted chronologically.

Delivery Dashboard (Admin Panel)

The dashboard provides a comprehensive view of all orders with key statistics (active deliveries, delivered today, total orders). It displays time elapsed since order placement, estimated delivery time (30 minutes from order), and time remaining. Delivery personnel can mark orders as delivered with a single click, automatically updating the database and user's order history.

4. Database Architecture

The MongoDB database consists of five main collections: **Users** (storing authentication credentials, contact information, and delivery addresses), **Restaurants** (containing restaurant details, ratings, and operating information), **Menu Items** (linked to restaurants with descriptions, prices, and images), **Orders** (tracking user orders with populated restaurant and user data, order items, timestamps, and delivery status), and **Tasks** (for additional administrative functionality).

All collections use MongoDB's Object Id for unique identification, and relationships are established through references. The database is hosted on MongoDB Atlas, providing cloud-based reliability, automatic backups, and scalability.

5. Project Achievements

This project successfully demonstrates a production-ready food delivery system with both customer-facing mobile application and administrative delivery management. The implementation showcases modern mobile development practices including state management, API integration, responsive UI design, and real-time data synchronization. The system handles concurrent orders, maintains data integrity, and provides an intuitive user experience comparable to industry-leading food delivery platforms.

6. Conclusion

FoodExpress represents a complete end-to-end solution for food delivery services, built with scalable technologies and best practices. The project demonstrates proficiency in cross-platform mobile development, backend API design, database management, and

full-stack integration. Future enhancements could include payment gateway integration, push notifications, and advanced analytics for restaurants and delivery optimization.