Bus Reservation System

Mini Project Synopsis

Academic Year: 2025-26

Abstract

- This project implements a full-featured Bus Reservation System with search, seat availability, booking, tracking, and admin dashboard using MERN + Supabase.

Problem Statement

- Traditional bus booking lacks unified platforms and efficient management. A secure, modern, and user-friendly reservation system is needed.

Objectives

- - Unified platform for search & booking
- - Support for multiple operators
- - Interactive seat selection
- - Live tracking
- - Admin dashboard
- - Secure authentication
- - Responsive UI

Scope

- - User auth
- - Bus search with filters
- - Seat selection & booking
- - Ratings & amenities
- - Admin module
- - Ticket printing
- Out of Scope: Payments, SMS gateway, MFA

Proposed System & Features

- - JWT auth, bcrypt

- - Real-time seat availability

- - Live tracking

- - Multi-operator support

- - Admin CRUD

- - Ticket export

System Architecture

- Frontend: React
- Backend: Node.js/Express
- DB: Supabase PostgreSQL
- Maps: Leaflet
- Data Flow: User → UI → API → DB

Module Description

- - Auth

- - Bus Search

- - Bus Listing

- - Seat Selection & Booking

- - Tracking

- - Admin Module

- - Ticketing

Database Design

- Tables: users, buses, bookings
- Includes RLS for secure access.

Technology Stack

- React, Node.js, Express, Supabase, Leaflet, Bootstrap

Requirements

- Hardware: 8GB RAM PC
- Software: Node.js, npm
- Services: Supabase

Methodology

- Agile-like development
- Modular MERN architecture
- REST APIs
- React hooks

Security Measures

- - JWT auth
- - Bcrypt passwords
- - Env secrets
- - RLS policies
- - Input validation

Testing Strategy

- Unit + integration tests
- Manual verification
- Edge cases handling

Project Plan

- Weeks 1–6: Architecture → Auth → Booking → Tracking → Admin → Finalization

Expected Outcomes

- Functional end-to-end booking system with secure storage and responsive UI.

Future Enhancements

- Payments, notifications, operator portal, analytics, PWA

Conclusion

- A scalable, secure, and modern bus reservation system suitable for academic and real-world application.