

Bus Management System

Project Presentation

Frontend Development Overview

Project Overview

- Comprehensive bus management solution
- Real-time route and schedule tracking
- User and admin management modules
- Interactive timetable management system
- RESTful API backend integration

Technology Stack

Frontend Framework: React 19.2.3

Routing: React Router DOM 7.13.0

HTTP Client: Axios 1.13.3

Styling: CSS3 with Responsive Design

Backend API: RESTful Web Services

Frontend Features

- Home Dashboard with Navigation
- Admin Module - System Administration
- Route Management - Route Planning & Tracking
- Timetable Management - Dynamic Schedule Updates
- User Module - Authentication & Profile Management
- Bus Management - Fleet Management Interface
- Schedule Management - Service Schedule Control
- Animated Background - Enhanced UX

Challenges Faced

1

Real-time Data Synchronization

Ensuring seamless data updates between frontend and backend without delays or inconsistencies

2

Complex State Management

Handling complex application state across multiple modules and components efficiently

3

API Integration Complexity

Integrating multiple API endpoints for different modules with proper error handling

Challenges Faced (Continued)

4

Responsive Design Implementation

Creating a responsive UI that works seamlessly across desktop, tablet, and mobile devices

5

Performance Optimization

Optimizing component rendering and API calls to ensure fast load times and smooth user interactions

6

User Authentication & Authorization

Implementing secure user authentication with role-based access control for different user types

Solutions Implemented

- ✓ Implemented Axios interceptors for API data consistency
- ✓ Used React Context API for efficient state management
- ✓ Structured modular components for better code organization
- ✓ Applied CSS media queries for responsive design
- ✓ Optimized component rendering with React.memo and useCallback
- ✓ Integrated JWT-based authentication with role-based routing

Project Output & Deliverables

Frontend Application

- 9 React Components
- Responsive UI Design
- Real-time Data Binding
- Dynamic Routing

Backend Integration

- RESTful API Endpoints
- Error Handling

Thank You!

Bus Management System - Frontend Development

Successfully delivered with challenges overcome and best practices implemented