ENHANCING DIGITAL GOVERNMENT AND ECONOMY

Digital Skills for Students

Final Project

Dhaka Metro Rail Ticketing System

Submitted By

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1. Project Overview

The Dhaka Metro Rail Digital Ticketing System is a web-based solution designed to enhance the efficiency, transparency, and accessibility of urban transit services in Dhaka. Supporting the goals of the "Digital Bangladesh" initiative, the system digitizes ticketing operations to reduce paper waste, streamline passenger flow, and improve service reliability. The platform features two primary interfaces: the Passenger Portal and the Admin Dashboard. The Passenger Portal allows users to purchase tickets online, view fare details, access journey history, and receive service notifications. It is optimized for both mobile and desktop use, ensuring ease of access for a wide range of users. The Admin Dashboard offers metro authorities tools for real-time system monitoring, financial tracking, and user management. It includes detailed analytics, operational reports, and system health metrics to support informed decision-making. Security features such as access controls and encrypted data handling help maintain integrity and compliance. Together, these interfaces provide a scalable and user-centric approach to modern urban mobility in Dhaka.

The system comprises two main interfaces:

- **Passenger Portal:** Enables users to purchase tickets, view journey history, and access real-time service updates.

- **Admin Dashboard:** Allows transit authorities to manage operations, resolve complaints, and monitor system health.

2. Project Objective

The primary goal is to enhance public transport accessibility and transparency while promoting paperless operations. This system enables:

- Fast and secure digital ticketing

- Reduced operational costs and paper waste

- Increased accountability and user satisfaction

3. Features

Passenger Portal:

- **Online Ticket Purchase:** Purchase single or multiple tickets via web.
- **Fare Calculator:** Computes fares based on origin, destination, and passenger category.
- **Journey History:** Logs past trips for user tracking.
- **QR Code Ticketing:** Generates scannable digital passes.
- **Digital Wallet Integration:** Supports bKash, Nagad, Rocket, etc.
- **Multilingual UI:** Supports Bangla and English.
- **Accessibility Features:** High-contrast modes and screen reader support.
- **Complaint System & Lost & Found:** Enables service issue reporting and item recovery.

Admin Dashboard:

- **Real-Time Monitoring:** View live ticket sales and passenger stats.
- **Revenue Analytics:** Track usage and financial reports.
- **User Management:** Admin roles and permissions.
- **Complaint Panel & Lost Items Tracking:** Resolve issues and manage lost property.
- **System Health Monitor:** Alerts on downtime and performance.
- **Security & Logs:** Maintain integrity through audit trails.

4. Technical Details

Development Tools:

- **XAMPP Stack:** Apache, MariaDB, PHP for backend development.
- **MySQL:** Structured database with optimized indexing and stored procedures.
- **Bootstrap 5:** Responsive frontend framework with mobile-first design.

Key Implementations:

- **Normalized Database Schema:** Ensures relational integrity.
- **Query Optimization:** Indexing, caching, and materialized views for performance.
- **Modular Frontend Components:** Ensures UI consistency and accessibility.

5. Future Improvements

- **AI-based Predictive Fare Suggestions**
- **Offline Ticketing Kiosks with Solar Power**
- **Expanded Language Options**
- **Open APIs for Third-party Integration**
- **Gamification for User Engagement**

6. Conclusion

The **Dhaka Metro Rail Digital Ticketing System** sets a new standard for public transportation in Bangladesh. By digitizing essential services and integrating modern tools, it not only improves daily commute efficiency but also contributes to national digital transformation. The system's scalability, accessibility, and sustainability make it a model for future smart city solutions.

This project demonstrates the application of modern development tools and sustainable engineering practices, ensuring a secure, inclusive, and future-proof transport infrastructure.