METRO TICKETING SYSTEM

Technical Documentation

Version 1.0

Saturday 12th April, 2025

Department of Computer Science

Contents

Chapter 1

Project Application Idea

1.1 Introduction

The Metro Management System is designed to automate and streamline the processes involved in managing metro services. This includes user registration, ticketing, route management, and complaint handling. The system ensures efficient and reliable operation of metro services, providing a user-friendly interface for both administrators and commuters.

1.2 Problem Statement

The goal of this project is to make online the process of day-to-day operations such as shopping, bill paying, easy availability of things and calculating the bill. Using Structured & Modular Techniques and a Menu-Oriented Interface, make it as simple as feasible.

1.3 Objective

The objective of this project is to develop a Metro Management System that:

- Automates the ticketing process
- Manages metro routes and schedules
- Handles user complaints efficiently
- Provides a user-friendly interface for administrators and commuters

1.4 Scope

The system will cover the following functionalities:

- User registration and authentication
- Ticket purchasing and validation
- Route management, including stations and pricing
- Complaint management for users to lodge and track complaints

1.5 Background

With the growing population and urbanization, metro systems have become a critical part of public transportation. Automating metro management processes is essential to handle the increasing demand and ensure smooth operations. This project aims to leverage modern web technologies to build a comprehensive system for metro management.

Chapter 2

Requirement Specification

2.1 Software Requirements

- Operating System: Windows 10 or higher, macOS
- Development Tools: Visual Studio Code, Node.js, MongoDB, React

2.2 Hardware Requirements

- Processor: Intel Core i5 or higher
- RAM: 8 GB or more
- Storage: 500 GB SSD or higher
- Network: Stable internet connection

Chapter 3

Project Management

3.1 Project Planning and Scheduling

Project planning involves defining the scope, objectives, and tasks required to complete the project. A Gantt chart will be used to plan and track progress.

3.2 Project Plan

Task Name	Duration
Planning	7 Days
Documentation	3 Days
Delivery	10 Days

Chapter 4

System Design

4.1 Introduction

The system design phase involves creating detailed technical specifications that will be used to develop the system. This includes database schemas, user interfaces, and interaction models.

4.2 Physical Design

The physical design includes the database schema that depict the relationships between different entities in the system.

4.2.1 Database Schema

- **users** table:
  - id (int)
  - username (varchar)
  - email (varchar)
  - password (varchar)
  - gender (varchar)
  - ticket_history (varchar)
  - created_at (timestamp)
  - updated_at (timestamp)
- **tickets** table:
  - id (int)
  - user_id (int)
  - route_id (varchar)
  - purchase_time (timestamp)
  - valid_until (timestamp)
  - created_at (timestamp)
  - updated_at (timestamp)
- **complaints** table:
  - id (int)
  - user_id (int)

  - subject (varchar)
  - complaint_details (varchar)
  - created_at (timestamp)
  - updated_at (timestamp)

- **routes** table:
  - id (int)
  - route_id (varchar)
  - price (float)
  - stations (varchar array)

Chapter 5

Functional Requirements

5.1 Registration Process

- **User Registration**: Users can sign up with their details and create an account
- **User Authentication**: Users log in using their credentials

5.2 Ticket Management

- **Ticket Purchase**: Users can buy tickets for specific routes
- **Ticket Validation**: The system validates the tickets based on purchase time and route

5.3 Route Management

- **Route Creation**: Admins can create new routes with specific stations and prices
- **Route Update**: Admins can update route details and pricing

5.4 Complaint Management

- **Complaint Filing**: Users can file complaints regarding metro services
- **Complaint Tracking**: Users and admins can track the status of complaints

Chapter 6

Conclusion

The Metro Management System aims to enhance the efficiency and reliability of metro operations through automation and streamlined processes. By addressing the needs of commuters and administrators, the system will contribute to a more effective public transportation system.