K.RAMAKRISHNAN COLLEGE OF TECHNOLOGY
(Autonomous)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PROPOSAL

FOR

TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

STUDENT PROJECTS SCHEME

2024-2025

BATCH MEMBERS

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Automated Bus Scheduling and Route Management System

INTRODUCTION

Creating an Automated Bus Scheduling and Route Management System for the Tamil Nadu State Transport Corporation Transport Corporation (TNSTC) involves several key components and considerations to ensure efficiency, reliability, and adaptability. Here's a comprehensive outline to guide the development of such a system.

PROBLEM STATEMENT

Automated Bus Scheduling and Route Management System for the Tamil Nadu State Transport Corporation Transport Corporation (TNSTC)

- ➢ Inefficiency in Scheduling:
- ➢ Limited Real-Time Information
- ➢ Higher Risk of Errors:
- ➢ Difficulty in Scaling:

PROPOSED SYSTEM

To overcome the problems mentioned above, the optimal solution is achieved by our proposed system with the following features,

1. Automated Scheduling:

- **Dynamic Timetabling:** Use real-time data to adjust bus schedules based on demand, traffic conditions, and operational issues.
- **Predictive Analytics:** Forecast passenger demand to optimize frequency and capacity of buses.
- **Integration with Shift Management:** Coordinate bus schedules with driver shifts and maintenance schedules.

2. Route Management:

- **Optimal Routing:** Use algorithms to determine the most efficient routes based on traffic patterns, road conditions, and passenger demand.
- **Dynamic Re-Routing:** Automatically adjust routes in response to traffic congestion, road closures, or other disruptions.

C. Real-Time Tracking and Monitoring:

- **GPS Tracking:** Real-time location tracking of buses to provide accurate ETAs and track performance.
- **Passenger Information Systems:** Provide real-time updates and notifications to passengers about bus arrival times, delays, and route changes.

D. Data Analytics and Reporting:

- **Performance Metrics:** Analyse data on bus performance, passenger load, and route efficiency to identify areas for improvement.
- **Historical Data Analysis:** Use historical data to inform scheduling decisions and route planning.

E. User Interface:

- **Driver Interface:** Provide drivers with a user-friendly interface for real-time updates, navigation, and communication with the control centre.
- **Passenger App:** Develop a mobile app for passengers to access real-time information, plan journeys, and provide feedback.

OBJECTIVES

The system aims to optimize bus scheduling and route management, improving service efficiency, reducing operational costs, and enhancing passenger satisfaction.

DETAILED DESCRIPTION OF THIS PROJECT

A. Pilot Testing:

- **Initial Rollout:** Start with a pilot project on selected routes to test the system's functionality and gather feedback.
- **Evaluation and Adjustment:** Analyse pilot results to make necessary adjustments before a full-scale rollout.

B. Full-Scale Deployment:

- **Phased Approach:** Gradually expand the system to cover all routes and services.
- **Training:** Provide training for drivers, operational staff, and administrative personnel.

C. Maintenance and Support:

- **On-going Monitoring:** Continuously monitor system performance and address any issues.
- **Updates and Upgrades:** Regularly update the system with new features and improvements based on user feedback and technological advancements

BLOCK DIAGRAM

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┌─────────────────┐                    ┌─────────────────┐
│  Passenger App  │                    │                 │
│ (Real-time info,│ ◄────────────────► │ User interface  │
│ Schedule, Routes)│                    │                 │
└─────────────────┘                    └─────────────────┘
         │                                      │
         ▼                                      ▼
┌─────────────────┐                    ┌─────────────────┐
│ Data Collection │                    │                 │
│(Sensors,GPS,RFID,..)│                │ Data Processing │
└─────────────────┘                    └─────────────────┘
         │                                      │
         ▼                                      ▼
┌─────────────────┐                    ┌─────────────────┐
│                 │                    │  Analytics and  │
│  Data Storage   │                    │   Reporting     │
└─────────────────┘                    └─────────────────┘
         │                                      │
         ▼                                      ▼
┌─────────────────┐                    ┌─────────────────┐
│                 │                    │Traffic Management│
│ Real time Update│                    │  and Routing    │
└─────────────────┘                    └─────────────────┘
         │                                      │
         ▼                                      ▼
┌─────────────────┐                    ┌─────────────────┐
│                 │                    │System Control and│
│ Driver Interface│                    │   Monitoring    │
└─────────────────┘                    └─────────────────┘
```
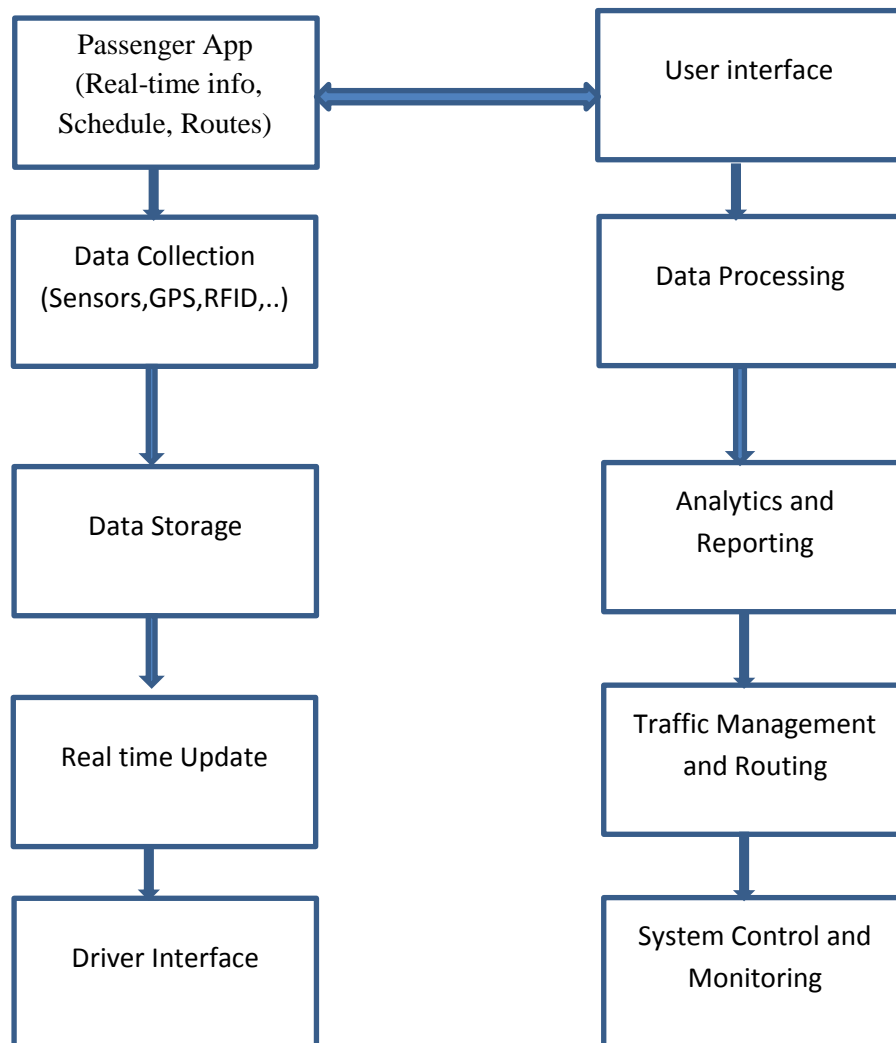
WORK PLAN

Sep 1-3: Literature review

Sep 5-9: Software simulation

Sep 12-16: Apparatus purchasing

Sep 19-30: Hardware arranging,

Oct 3-7: Hardware and software interfacing

Oct 8-20: Verifying the hardware system in real time application.

BUDGET PLAN

Description	Estimated cost (Rs)
Passenger Mobile App	5000
Driver Interface	1500
Control Center Dashboard	1000
Traffic Management and Route Optimization Engine	1000
Backend Server	1000
Data Integration and IoT Management	1500
Total	**Rs. 11000**

CONCLUSION

This proposed work the Automated Bus Scheduling and Route Management System for the Tamil Nadu State Transport Corporation Transport Corporation (TNSTC) represents a significant leap forward in the modernization of public transport. By leveraging advanced technologies and data-driven strategies, the system aims to deliver a more efficient, reliable, and user-friendly transportation experience for the people.