

Project Title : Public Transport Optimization

Phase 1 : Problem Definition And Design Thinking

Problem Definition:

The project involves integrating Internet of Things(IoT) sensors into public transportation vehicles to monitor ridership, track locations, and predict arrival times. The goal is to provide real-time transit information to the public through a public platform, enhancing the efficiency and quality of public transportation services. This project includes defining objectives, designing the IoT sensor system, developing the real-time transit information platform, and integrating them using IoT technology and Python.

Design Thinking:

- **Project Objectives:** Define objectives such as real-time transit information, arrival time prediction, ridership monitoring, and enhanced public transport services.
- **IoT Sensor Design:** Plan the deployment of IoT sensors (e.g., GPS, passenger counters) in public transportation vehicles.
- **Real-Time Transit Information Platform:** Design a web-based platform to display realtime transit information to passengers
- **Integration Approach:** Determine how sensors will send data to the real-time transit information platform.

Project Objectives:

1 . Real time transit Information: It aims to provide immediate and current data about public transportation services to improve passenger experiences, reduce delays, enhance efficiency, and support data-driven decision-making for transit authorities and passengers alike.

2.Arrival time Prediction: In this ,public transport offer passengers real-time estimates of when vehicles like buses or trains will arrive at their stops, helping them plan their journeys more effectively.

3. Ridership Monitoring:In public transport optimization focuses on using real-time and historical data to make immediate adjustments to routes, schedules, and resources to meet passenger demand, improve efficiency, and enhance the overall transit experience.

4.Enhanced public transport services: Frequent Schedules , more frequent bus or train services during peak hours to reduce waiting times and Improved Punctuality, better adherence to schedules to minimize delays.

IoT Sensor Design:

- **Sensor Selection:** Choose the appropriate sensor type for the specific data you want to collect. Different sensors are designed for various purposes, such as temperature, humidity, motion, or environmental pollutants. The selection should align with your IoT project's objectives.

- **Power Management:** Efficient power management is crucial for IoT sensors, as they often run on battery power. Design the sensor to consume as little energy as possible when collecting and transmitting data, and implement sleep modes to prolong battery life.

Real Time Transit Information Platform:

- **Data Integration:** Quickly integrating data sources like GPS, sensors, and scheduling systems to provide real-time updates on vehicle locations and schedules.
- **Passenger Access:** Making real-time information accessible to passengers through mobile apps, websites, and digital displays at stops to improve their immediate transit experience.

Integration Approach:

Integrating software systems for route planning, scheduling, and passenger information to streamline operations and enhance efficiency.