

# Smart Parking

## TEAM MEMBERS

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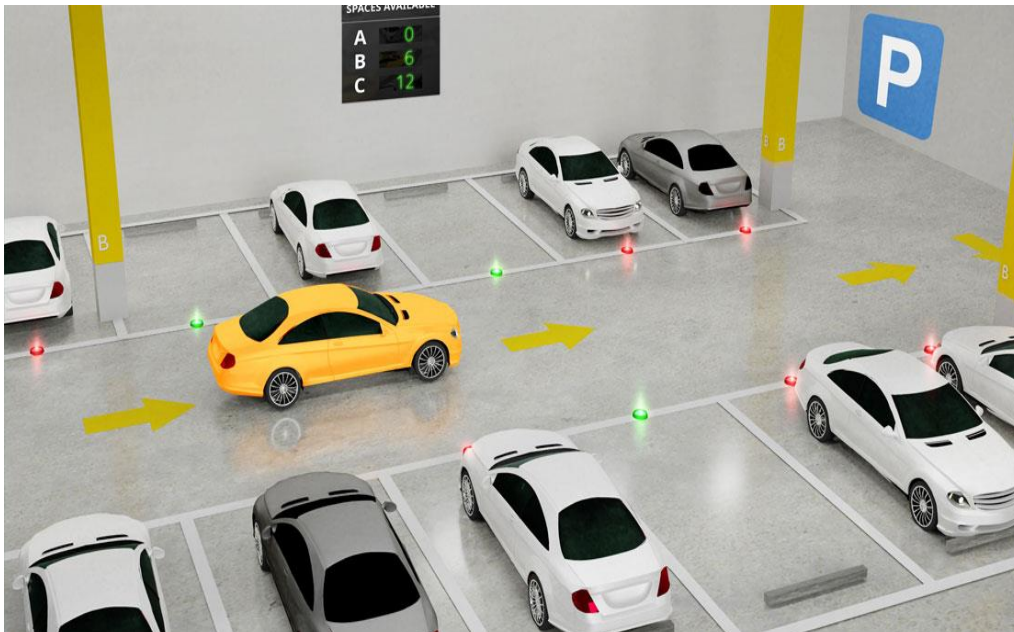
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### Phase-1 Document Submission

### Subject: **Smart Parking**



### Project Overview:

The project aims to integrate IoT sensors into public transportation vehicles to monitor ridership, track locations, and predict arrival times. The ultimate goal is to provide real-time transit information to the public via a user-friendly platform, thus enhancing the efficiency and quality of public transportation services. The project encompasses the following key components:

### Defining Objectives:

Establish specific objectives that include real-time parking space monitoring, mobile app integration, and efficient parking guidance.

## **IoT Sensor Design:**

Develop a comprehensive plan for the design and deployment of IoT sensors in parking spaces to accurately detect occupancy and availability.

## **Real-Time Transit Information Platform:**

Design an intuitive and user-friendly mobile app interface that displays real-time parking availability to users.

## **Integration Approach:**

Determine how Raspberry Pi devices will collect data from the sensors and update the mobile app with real-time transit information.

# **Design Thinking**

## **Project Objectives:**

### **Objective 1: Real-Time Parking Space Monitoring**

- Create a system for monitoring parking spaces in real-time.
- Gather data on the availability and occupancy of parking spaces.

### **Objective 2: Mobile App Integration**

- Develop a user-friendly mobile application for both Android and iOS platforms.
- Ensure seamless integration with IoT sensors and real-time transit data.

### **Objective 3: Efficient Parking Guidance**

- Utilize the real-time data to provide parking guidance to users, directing them to available parking spaces.
- Improve the overall efficiency of public transportation services.

## **IoT Sensor Design:**

### **1. Sensor Selection**

- Identify suitable IoT sensors capable of detecting occupancy and availability.
- Choose sensors that can communicate data effectively.

### **2. Sensor Placement**

- Strategically position sensors within parking spaces.
- Ensure a comprehensive coverage of all parking areas.

### **3. Data Transmission**

- Establish a reliable data transmission protocol to send sensor data to a central hub.

### **4. Data Processing**

- Implement data processing algorithms to convert sensor data into actionable information.

## **5. Power Management**

- Optimize power usage to extend the sensor's lifespan.
- Implement an efficient power management system.

## **Real-Time Transit Information Platform:**

### **1. User Interface Design**

- Design an intuitive and visually appealing mobile app interface.
- Prioritize user experience by making it easy to understand and navigate.

### **2. Real-Time Data Integration**

- Create a system to ingest data from IoT sensors and location trackers on public transportation vehicles.
- Ensure the data is processed in real-time.

### **3. Predictive Analysis**

- Implement algorithms to predict arrival times based on the real-time data.
- Enable users to plan their journeys effectively.

### **4. User Notifications**

- Set up a notification system to inform users about parking availability and transit updates.
- Push notifications for real-time alerts.

## **Integration Approach:**

### **1. Data Collection and Communication**

- Deploy Raspberry Pi devices to collect data from IoT sensors.
- Implement a secure and efficient communication protocol between sensors and Raspberry Pi.

### **2. Data Processing and Storage**

- Process data collected by Raspberry Pi for real-time updates.
- Store data in a secure database for historical analysis and reporting.

### **3. Mobile App Integration**

- Develop a mobile app capable of receiving data from the central hub.
- Ensure data is displayed in a user-friendly and real-time manner.

### **4. Continuous Improvement**

- Establish a mechanism for monitoring the system's performance.
- Plan for iterative improvements and updates based on user feedback and changing requirements.

## **Conclusion:**

In summary, this project focuses on improving public transportation services by integrating IoT sensors and creating a real-time transit information platform. It defines clear objectives, sensor design, and a user-friendly mobile app. The project's success promises to enhance efficiency and quality in public transportation, making it more accessible and convenient for the public. Continuous improvement will ensure its long-term effectiveness.