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**SMART PARKING USING IOT**

**PHASE 2 SUBMISSION REPORT**

**BLOCK DIAGRAM OVERVIEW:**

Parking Area

Ultrasonic Sensor 1

ESP 8266

Entry Gate

IR Sensor

Gate Barrier

Display

Cloud

Fire Base

Mobile APP

Ultrasonic Sensor 2

Ultrasonic Sensor 3

**DESCRIPTION**:

This documentation outlines the components and architecture of a Parking Slot Monitoring System, which utilizes Arduino, ESP8266, Ultrasonic Sensors, an LCD Display, and Firebase to provide real-time parking slot information to a mobile app.

**COMPONENTS**:

1. Arduino:The central microcontroller that controls the system. It connects to multiple Ultrasonic Sensors, an ESP8266 module, and an LCD Display.

2. ESP8266: An IoT module that enables the Arduino to connect to the internet and communicate with the Firebase platform.

3. Ultrasonic Sensors: Multiple Ultrasonic sensors are deployed in parking slots to detect the presence of vehicles. They measure the distance between the sensor and the vehicle, determining if a slot is occupied or vacant.

4. LCD Display:An LCD screen connected to the Arduino to visually indicate parking slot availability to users in real-time.

5. Firebase Platform: A cloud-based database and server platform that stores and manages parking slot status data.

6. Mobile App: An Android or iOS app that allows users to access real-time parking slot information, displaying available and occupied slots.

**WORKING PRINCIPLE:**

1. Ultrasonic Sensors continuously measure the distance to the ground or a vehicle in each parking slot.

2. Arduino processes sensor data and determines the occupancy status of each slot.

3. Arduino communicates with ESP8266 to send the parking slot status data to Firebase.

4. Firebase stores the data in real-time, making it accessible to authorized users through the mobile app.

5. The LCD Display connected to Arduino visually indicates the parking slot availability status to users.

6. Users can also access the mobile app to view the current parking slot availability status and find vacant slots easily.