SMART PARKING SYSTEM

SYNAPSIS:

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Overview:

A smart parking system using IoT aims to efficiently manage and monitor parking spaces, making it easier for drivers to find available spots and optimize parking space usage. This system uses sensors, microcontrollers, and a web or mobile application to provide real-time parking information.

Components Needed:

➤ **Ultrasonic Sensors:**

These sensors are placed at each parking space to detect the presence of a vehicle.

➤ **Microcontroller:**

Each sensor is connected to a microcontroller, which processes the sensor data.

➤ **Internet Connectivity:**

The microcontrollers are connected to the internet via Wi-Fi,
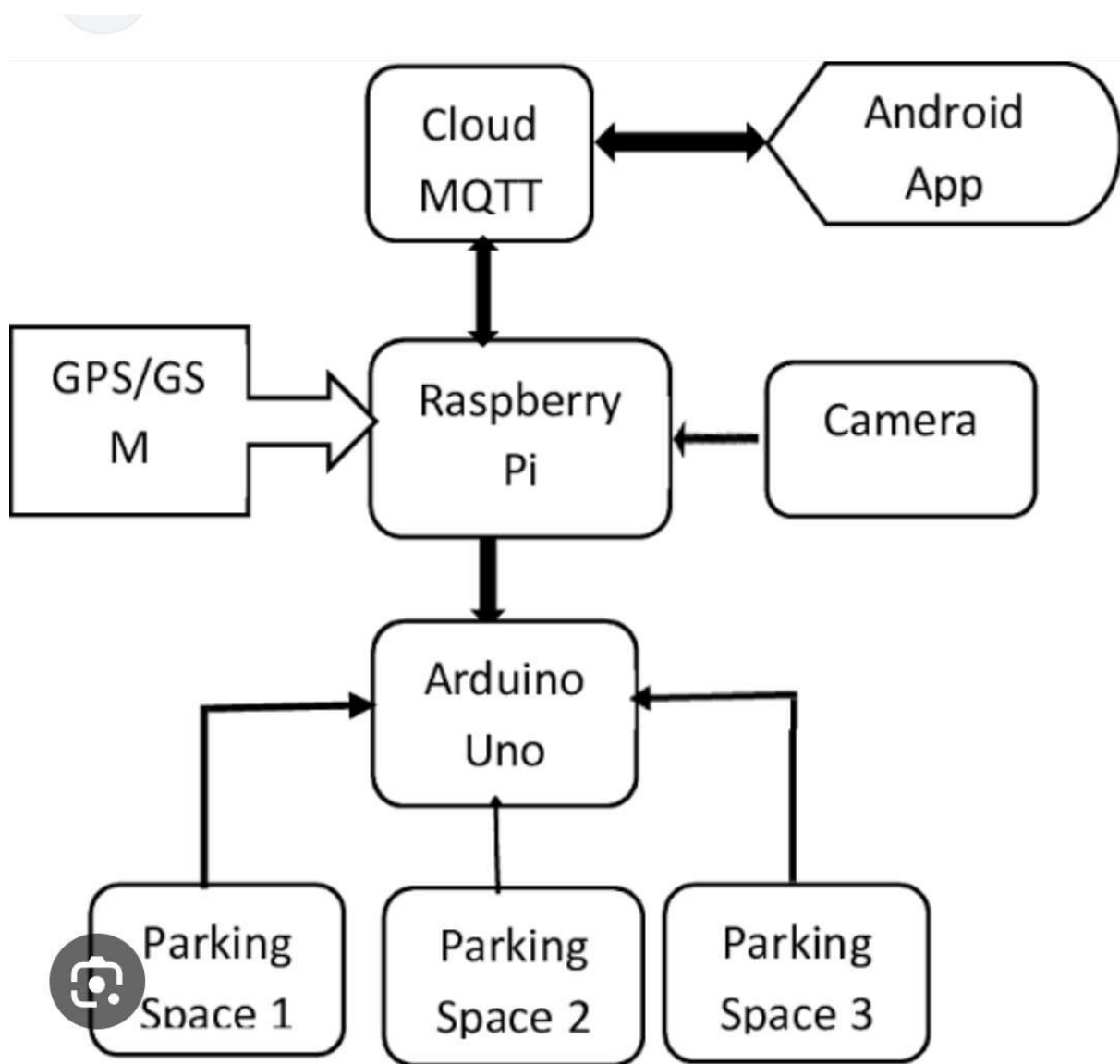
Ethernet, or cellular data.

➢ Server:

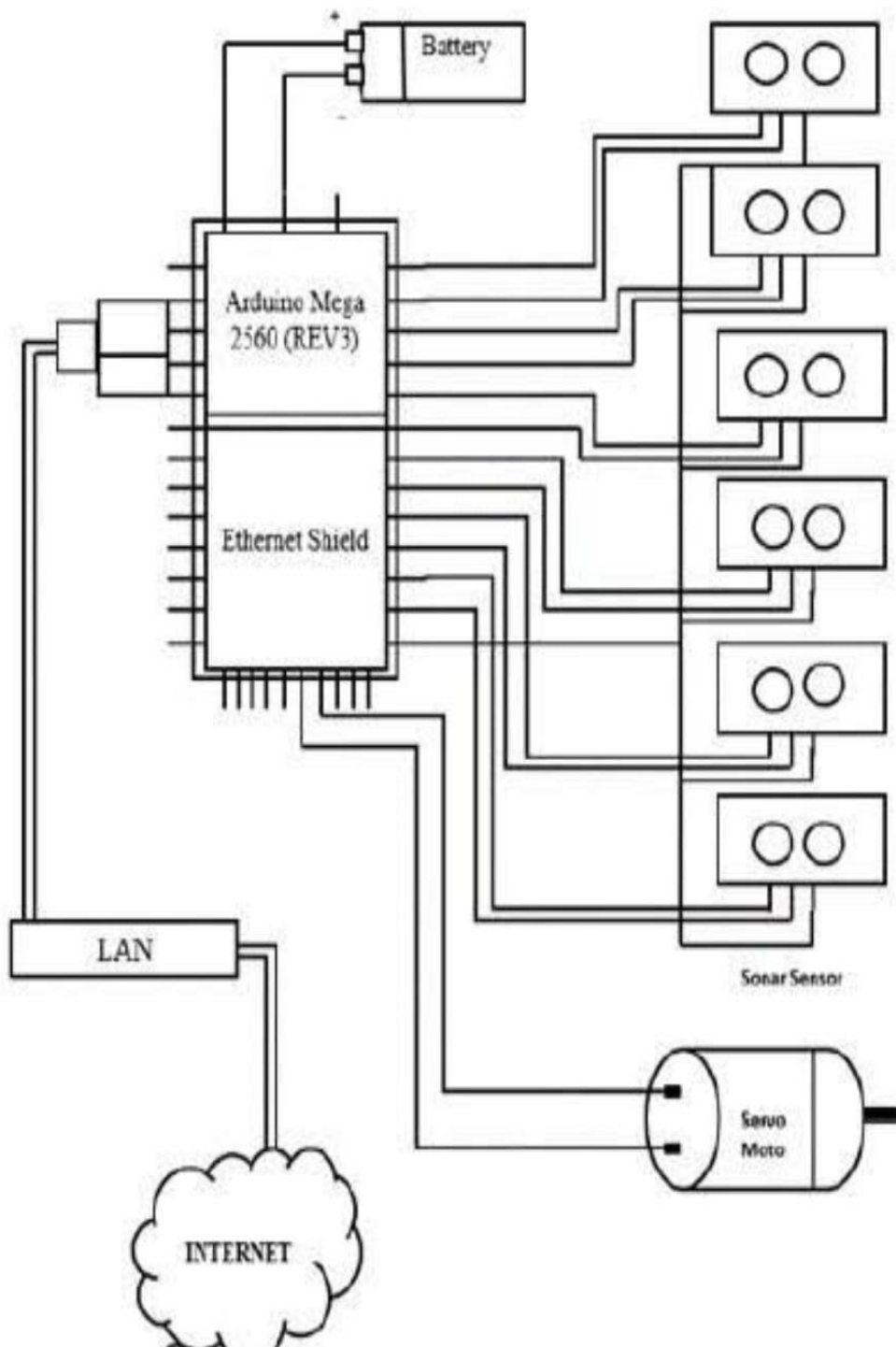A cloud-based server or a local server stores and processes the data form the microcontrollers.

➢ Web/Mobile App:

Users can access parking information through a web or mobile application.

Block Diagram:

Circuit Diagram:

Working steps:

➤ **Sensor Data Collection:**
Ultrasonic sensors detect the presence of a vehicle in each parking space. They send this data to the microcontroller.

➤ **Data Processing:**
The microcontroller processes the data and send it to the server via the internet.

➤ **Server Processing:**
The server receives and stores the data. It updates the parking status for each space in real-time.

➤ **User Interface:**
Users can access the parking information through a web or mobile app. They can see available parking spaces, reserve a spot, or receive navigation instructions to the nearest available space.

➤ **Notifications:**
The system can send notifications to users when their parking time is about to expire or when a reserved spot is about to be taken.

Benefits:

o Efficient parking space utilization.

o Reduced search time for available parking.

o Increased revenue for parking lot owners.

o Environmental benefits from reduced congestion and emissions.

Challenges:

o Cost of sensors and infrastructure.

o Maintenance of sensor and connectivity.

o Security and privacy concerns with user data.