# WALCHAND COLLEGE OF ENGINEERING, SANGLI

## (Government-Aided Autonomous Institute)

## Department of Electronics Engineering

## Third Year B. Tech. Project Synopsis

## *"IOT Based Smart Parking System"*

### Submitted By

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# 1. Introduction

Now a days, main problem in malls, function halls and etc., is parking. It is due to the lack of sufficient parking space. Now a days the vehicles in a family are greater than the head count of the family members, and due to this the vehicles are also increased in the country, which leads to the parking scenario which is unhappily falling short to the current requirements in the country. Due to this parking is difficult and it also increases the time needed to park the vehicle with increase in the fuel consumption of the vehicle. And during the working days the companies and offices are facing the problem of the parking in urban areas. Now a days vehicles are most affordable to the low-income group families also and the vehicles especially the cars are taking lot of space. Due to the increase in vehicles the parking space is also not sufficient in these congested cities. Whether at a shopping malls, stations and airport, problems with parking is a big issue. Most of the time people spend their time on searching parking, to park their vehicles. Thus, lot of congestion occurs in the traffic which leads to a tedious job to find the parking space to park their vehicle. The most traffic occurs only because of vehicle congestion in the urban areas thus people are wasting time in searching the parking area abnormally to park their vehicles. And one more issue is also added to this is pollution, which effects the entire environment due to this increase in vehicles.

# 2. Literature Survey

1. Proposed a model to save the time, effort and obviously fuel using IOT while searching for parking. The system consists of hardware components like master Arduino, infrared (IR) sensor.

2. Suggested a system in which an ultrasonic sensor is used to sense the occupancy of slot. For ultrasonic sensor a specific distance value is set as threshold for non-occupied status. When the slot is occupied, the distance calculated by sound waves will always be less than the set threshold. All distance values below the set threshold classifies the slot as occupied. The Parking slot status is sent to Arduino board.

# 3. Proposed Work

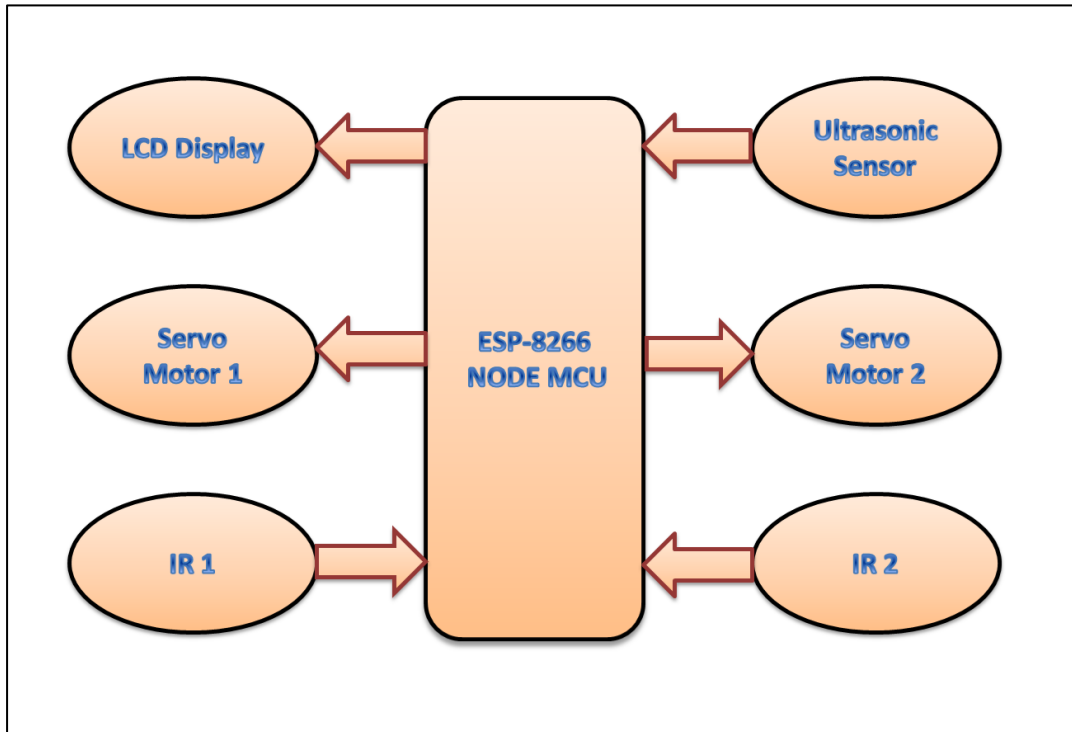## 1. Block diagram of IOT Based Smart Parking System:



*Fig..Block Diagram*

In this IOT Smart Parking System, we will send data to webserver for looking up the availability of space for vehicle parking. Here we are using firebase as IOT database to get the parking availability data. For this we need to find the Firebase host address and the secret key for authorization. It involves two IR sensor, two servo motors, one ultrasonic sensor and one 16x2 LCD. Here the ESP8266 will control the complete process and also send the parking availability information to Google Firebase so that it can be monitored from anywhere in the world over the internet. Two IR Sensors are used at entry and exit gate to detect the presence of car and automatically open or close the gate.
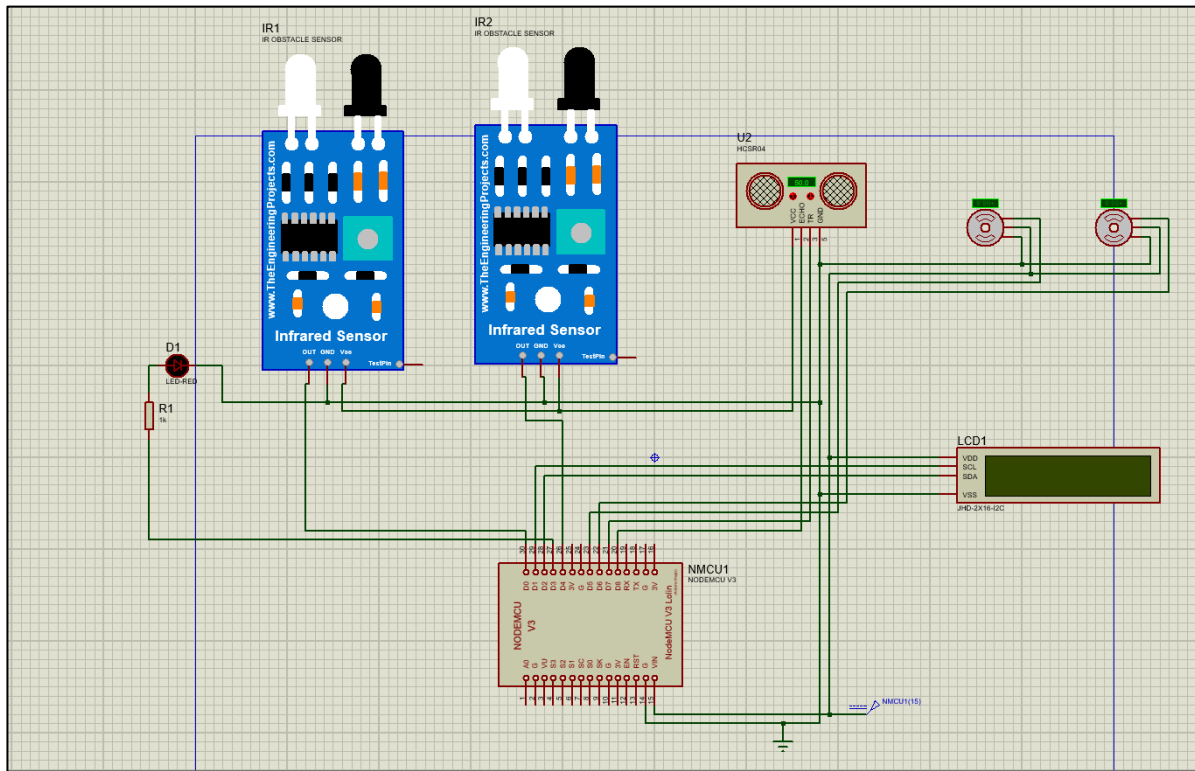
## 2.Circuit Diagram



*Fig..Circuit Diagram*

## 3. Objectives

1. The main objective of this system is to improve the quality of life and convenience in the public Parking.
2. To provide greater Parking security.
3. To design an automated system that will have ability to be controlled and monitored Parking status.
4. Stimulating smart, understandable and accessible solutions and services for public environment.
5. To make smart and intelligent usage of Space in smartparking system.

## 4. Methodology

Smart parking system describes a system of networked, controllable device that work together to make your parking more comfortable, customized, efficient and secure. In this device there are five main parts Node MCU, IR sensor, Servo Motor, Ultrasonic sensor and Database.

1. Firstly, analyze all the information required for this system from reference book, journals, websites.
2. Then select the components and assemble the circuit as per the circuit diagram.
3. Create a code program for this system.
4. Create a Database from where we can see the status of parking.
5. When powering up this system, the Nodemcu board connects to the Database through the internet.
6. At that point, the sensors begin to receive values. Then, those values are sentby the Nodemcu board to the Database.
7. In this way, the parking system get automatically controlled and monitered anywhere in the world.

# 5. Expected Outcomes

Based on the results of analysis of all data obtained by testing the smart parking with the Internet of Things based NodeMCU module, the following outcomes can be drawn:

1. Smart parking with Internet of Things (IoT) based NodeMCU Module can be designed with various components hardware and software support so that it can be arranged controlled into a smart parking system that is automatically according to sensor data.

2. The Smart parking with this Internet of Things (IoT) based NodeMCU Modulecan be implemented to control some of the electronics performance including status of parking area, Gates opening and closing.

3. we can send data to webserver for looking up the availability of space for vehicle parking. Here we are using firebase as Iot database to get the parking availability data.

# 6. References

### Books:
1. I.V.VAIBHAV, A.Ramya, A Review onSmart Parking Management System Using Vehicle Authentication, IJAREEIE 2016NodeMCU Features and Pinout. A Brief Tutorial on the Introduction toNodeMCU V3.
2. Mohit Patil, R. S. (2014). Smart Parking System Based On Reservation . International Journal of Scientific Engineering and Research (IJSER) , 6.

### Websites:
1. https://www.iotforall.com/how-to-use-iot-for-smart-parking-solution-development.
2. https://mobidev.biz/blog/iot-based-smart-parking-system.

# 7. List of Components

| SR.NO | COMPONENT | QUANTITY |
|-------|-----------|----------|
| 1. | ESP8266 | 01 |
| 2. | Ultrasonic Sensor | 01 |
| 3. | DC Servo motor | 02 |
| 4. | IR Sensor | 03 |
| 5. | 16x2 LCD Display | 01 |
| 6. | Battery (9V) | 01 |
| 7. | Connecting Wires | - |
| 8. | PCB | 01 |
| 9. | Male Header | - |
| 10. | Female Header | - |

## 8. Proposed Work Plan

| Sr. No. | Work/ Activity | Month |
|---------|----------------|-------|
| 1. | Group Formation. | January |
| 2. | Discussion on Various Project Topic. | February |
| 3. | Project Topic Finalization. | February |
| 4. | Information Collection and Components selection for Project. | March |
| 5. | Preparation of synopsis and submission | March |