

A PROJECT REPORT ON

# AUTOMATED CAR PARKING SYSTEM



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## **ABSTRACT**

Population of the world is increasing at a very high rate and so is the number of vehicles on the road. It becomes very difficult to find places where you can park your vehicle and keep it safely. In recent times the concept of smart cities have gained great popularity. Thanks to the evolution of Internet of things the idea of smart city now seems to be achievable. Problems such as, traffic congestion, limited car parking facilities and road safety are being addressed by IoT. Here through this project we present a automated car parking system. This system consists of an on-site deployment module that is used to monitor and signalize the state of availability of each single parking space. In this module we have used a Arduino, 4 Ultrasonic sensors for checking the availability of slots, 2 IR sensor with 2 servo motor for controlling the barricades and all the related data are send to the sever using Nodemcu i.e. 8266 module. We have made a website which allows the end user to check the availability of parking space anywhere he wants to go and book a parking slot accordingly. The report also describes a view of the system architecture. Towards the end, the paper discusses the working of the system in form of a use case that proves the correctness of the proposed model.



## **INTRODUCTION**

Over the last few decades our country has developed significantly, now we are in this state that we have a well-established network of roads and transportation, commercial parks and exponentially increasing number of automobiles but one problem still prevails, Parking. While other countries have adopted automated and supervision free parking method India seems far away from even introducing the same, we still use manual and rigid parking procedures. Which in most of the cases is unplanned and lacks discipline and due to this people park their cars anywhere they think it will fit which creates a mess as they do not follow the particular cue as observed in most scenarios. It also causes economical loss to commercial places like shopping malls and amusement parks as people are more likely not to visit these places due to this parking hazard. Here we are going to solve this problem by introducing Automated Car Parking System. This system will be low cost so that even smallest of the commercial buildings can purchase and apply this system in their parking lot which eliminates the first problem as to why such systems are not adapted by India yet. While being cheap it will be efficient and smooth enough to be used by huge shopping complexes and MNCs. This system will also have complete internet support so it can be monitored from anywhere in the world and booking your parking slot can be done with so much ease now. The proposed system is described in further parts of this report in detail.

## **PROBLEM STATEMENT**

The “Automated Car Parking System” provides a remote facility to users to find a parking slot for their vehicle. Finding a parking slot in most of the metro cities is a tedious job which consumes a lot of time and wastage of fuel.

## **LITERATURE REVIEW**

### **Definition:**

The system which facilitates users in parking their vehicles by assisting them in managing the parking area in order to reduce congestion. The system is currently used in multiple places which suffer from the problem of overcrowding. The system we are trying to develop will also be able to calculate the price to be paid by the owner after parking their vehicle for a certain period of time.

Almost all big towns and cities are experiencing parking troubles, not sufficient parking breathing space propose potential customers pollution side effects or anything else, the amount concerning parking improvement is incredibly excessive. Smart Parking can be a parking garage/system that will function several technological know-hows to help properly regulate that car port. That instant direction with parking lots just by adequate overseeing together with giving you product to the clients together with managers is usually offered by these awakening solutions. An inexpensive resolution for the following product will be provided by Wi-fi sensor communities which often comprises the plethora of sensor positioned in the market and with active parking lots without the need of investing in innovative, costly cables together with which can handle fine-tuning along with the low-cost together with abundant detectors. E-parking utilizes sophisticated technological know-how to mix with reduced costs of parking booking together with charge solutions. Making use of this process, some taxi driver may well consult regarding the amount, arrange to get a parking breathing space for a offered spot, together with pay for as soon as departing.

Standard sensors are essential to help discover getting nearby vehicles. Nevertheless, the machine ought to be ready to discover clients and their vehicles producing booking together which enables the entry to arranged breathing space. That id approach in the parking lot may well use confirmation code access that site visitor gets with a mobile phone

### Research Area and Methodology:

The Area of the research is chosen to be the possibility of automation in the field of parking so as to reduce human intervention and develop a system which assists and adapts such that it manages the congestion better than the existing systems. Smart cities in future will have to be free from the trouble of chaotic parking which causes congestion and trouble not only for daily commutes but also for the tourists for this our team has proposed a smart parking system.

### Features of Smart Parking Systems:

- Enables the driver to collect ticket upon entrance: Car Parking system should be able to allow the driver to get his ticket after he press the button of the gate barrier.
- The system should allow the gate to open whenever a driver has pressed the button and take his ticket.
- Allow the drivers to make payment: if it's of commercial use, the system should enable the drivers to make payment of their charges before exiting.
- Allow the driver to exit: if the driver has paid his charges and require exiting, the system should open the gate to allow him exiting.

### Sensor solutions:

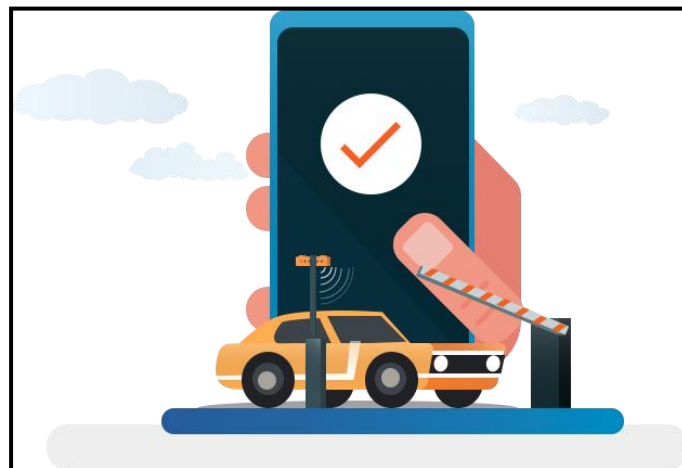
It was observed that the most used sensors are ultrasonic, whereas cameras and smartphones (accelerometer, gyroscope and magnetometer) are also used but not as much as ultrasonic sensors. This can be attributed to the fact that ultrasonic sensors can detect with greater precision the depth and thickness of surfaces in addition to working at high frequency, having high sensitivity and high power.

## APPLICATION

1. It can be applied in public places such as malls, stations etc. To accurately sense and predict spot/vehicle occupancy in real-time. This helps in decreasing the traffic at a large extent and hence decreasing the pollution caused as well.



2. Guides residents and visitors to available parking spot and can be used to decrease the chaos caused in the societies especially in those where there is no allotted parking.
3. Simplifies the parking experience and adds value for Parking stakeholders, such as merchants and drivers.
4. Enables intelligent decisions using data, including real-time status applications and historical analytics reports.





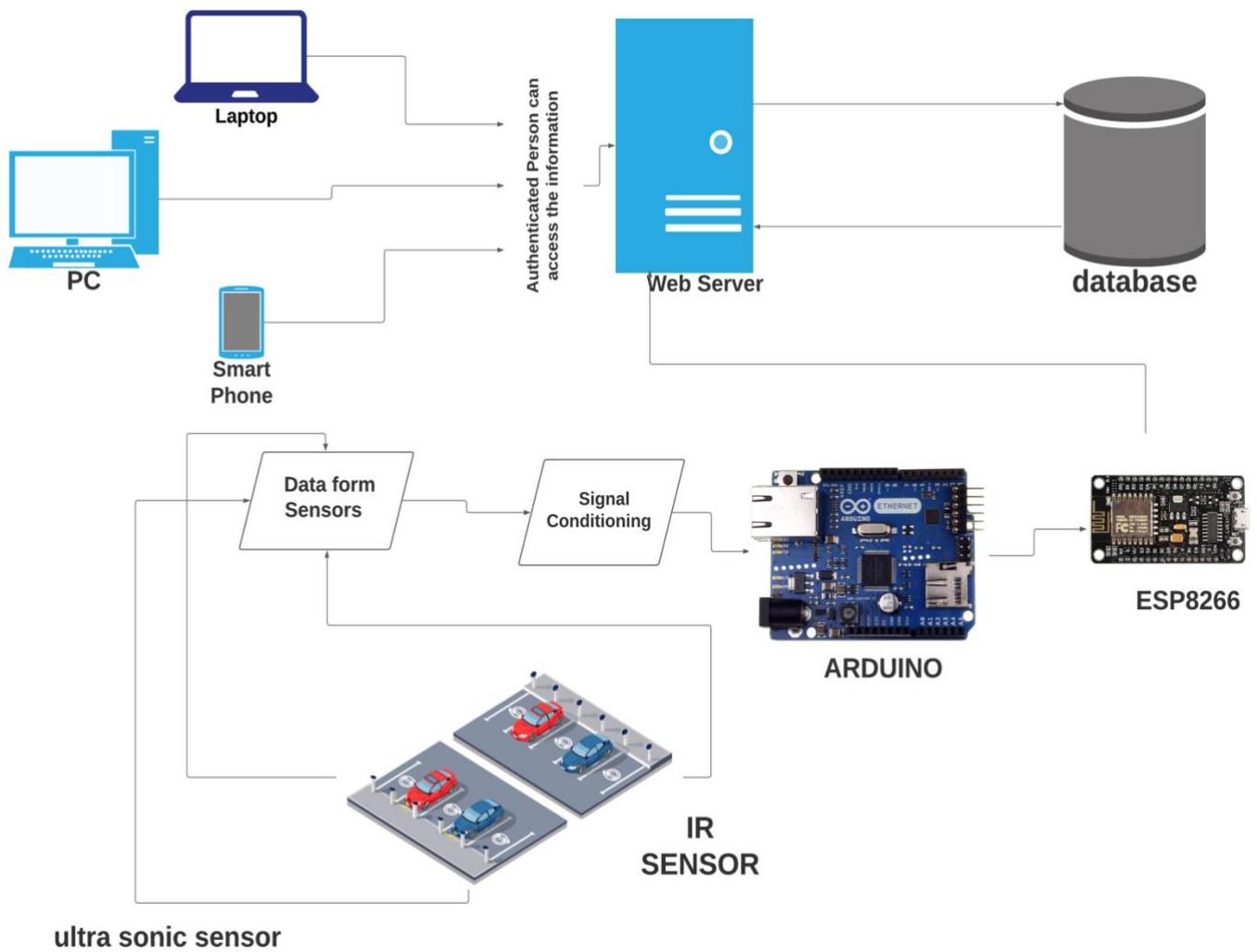
5. As discussed earlier Smart Parking plays an important role in creating better urban environment by reducing the emission of CO<sub>2</sub> and other pollutants.



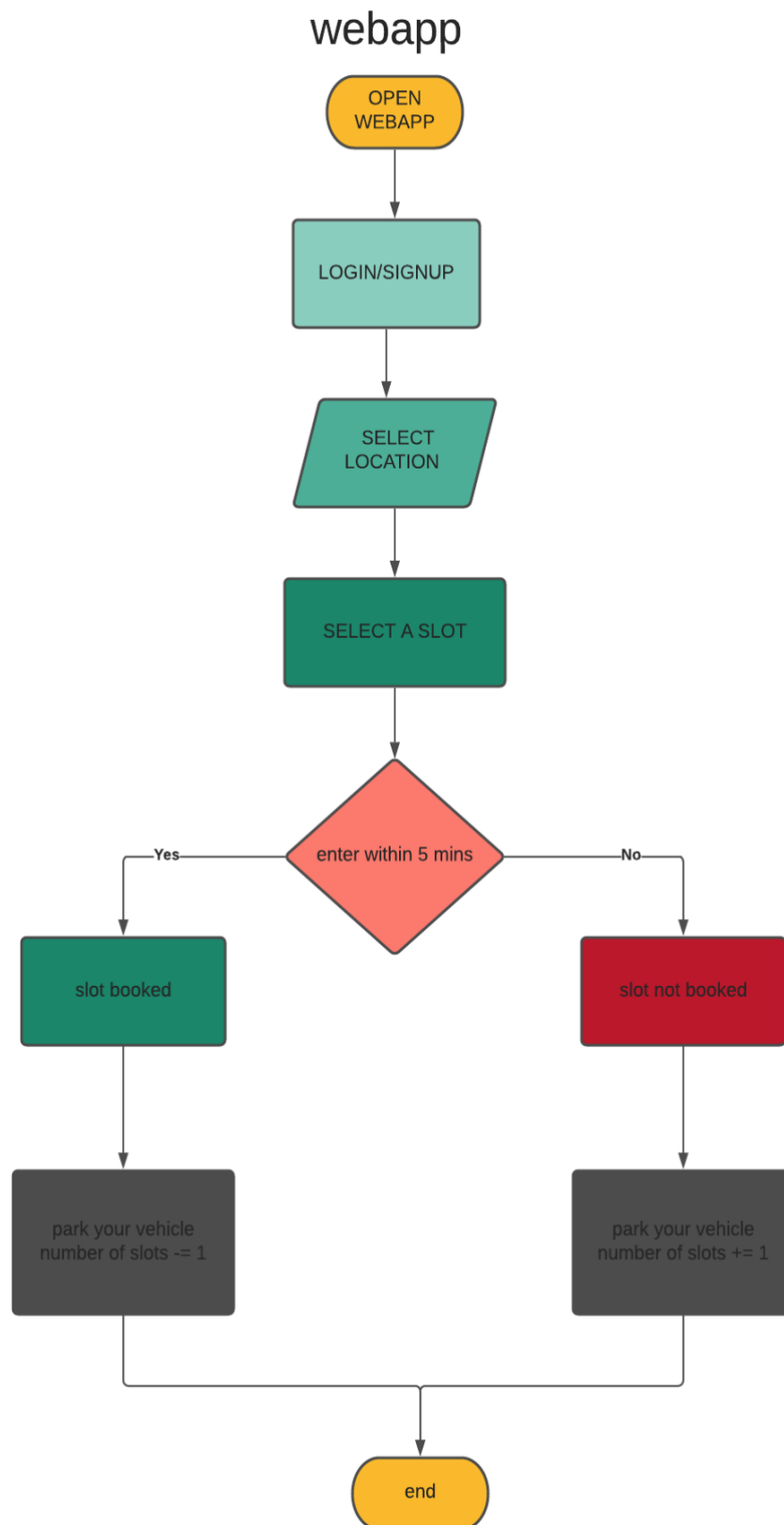
6. Smart Parking enables better and real time Monitoring and managing of available parking space which Results in significant revenue generation. Provides tools to optimize workforce management.



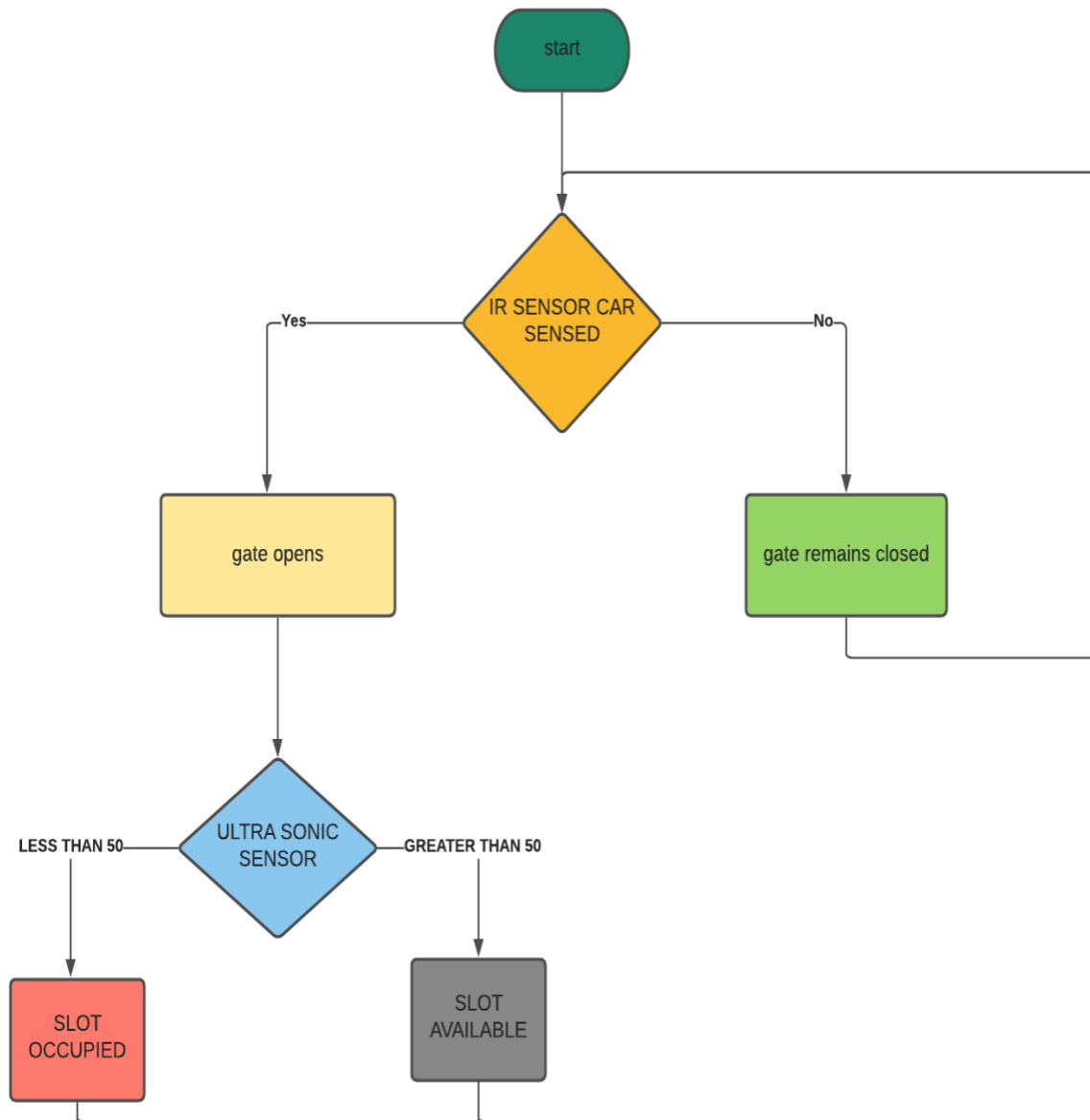
# BLOCK DIAGRAM



# FLOW CHART



## hardware



## **ESTIMATED COST OF HARDWARE**

Sensor and Microcontroller	Number of sensors used	Cost (in rupees)
Arduino Uno	1	350
Node MCU	1	300
Ultrasonic Sensors	4	320
IR Sensor	2	70
Total Cost(in Rupees): 1040		

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