

# Smart Car Parking System Using IOT

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## ABSTRACT

*In generation we are living, we all had faced on problem while parking vehicles. It is a big problem in cities. Parking vehicles becomes problem due to continuous increasing number of vehicles in which parking vehicles such as car which requires more space to park. This also leads to burn millions of fuel that makes air pollution.*

*In this paper, we are proposing that automatic real time car parking system, which is based on Internet of things. Through IOT we are able to connect to internet, for exchanging of information or data between internet and physical device. It is used for construct the devices and interact with objects that will sense and control equipment easily. In this system we employed Node-mcu which will control the devices or component that are connected via wire or with internet. When user uses this system, they will save their time in search of free space to keep the vehicle in parking slot.*

*Here, in IOT based smart car parking system infrared sensor is used to that can be able to calculate the number of vehicles entered or exit. Depending upon the number of vehicles entered this system will show the vacant space if available. As this system is connected with internet through IOT so it will help the user to reserve the parking slot in advance via website. Here every user will get user id and password when the user registers on the website so that each user can be distinguished.*

**Keywords**—Parking, IOT, website, ATMEGA 328p, RFID

## I. INTRODUCTION

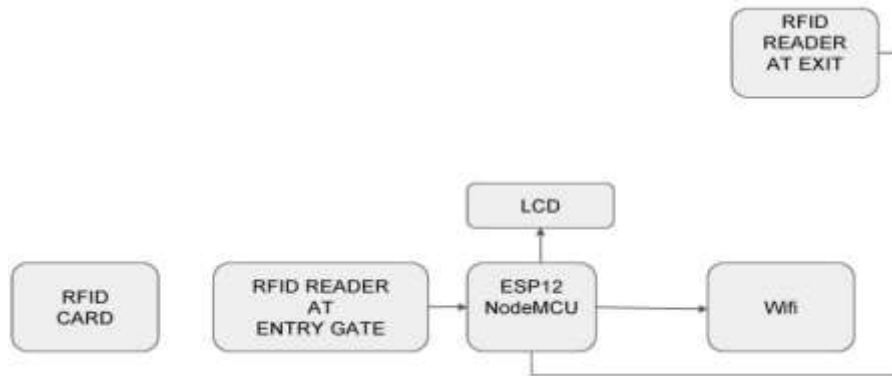
Internet of things plays an important role in our daily life. It reduces human efforts, time and error with the development of modern technology. An IOT based smart car parking system to help to provide parking also help to manage collision of vehicles when the vehicles arrive at the same time. In this system it helps user to find free parking space which will save their time as well as fuel.

Nowadays, it helps to find parking space in an area where the people try to search parking space to park their vehicles. People waste their time and fuel in searching for parking slots. Smart parking system gives information about parking space. An infrared sensor is used to count the number of vehicles entered and exit so this exactly tells the number of slots available. The information about the free space and used slot sends over web pages through IOT due to continuous raise or fall in the number of vehicles [1,2]. To overcome the parking problem we are implementing the automated this system. So website will tell the space is available or not, if the space is available then the vehicle can be able to park otherwise you will suggested to check nearby parking zone, this makes convenient to user[3,4].

In metropolitan cities, it is the major issue to search vehicle parking. Normally, it takes few minutes to find vehicle parking slot so why we increase wastage of time and fuel in search. To control these bound smart car parking based on website using Internet of things.

## II. METHODOLOGY

The main constituents of the system architecture are ESP12 Node MCU, RFID card reader, RFID tags/cards, I2C module and a LCD. The ESP12 Node MCU board is employed as a micro controller which is the brain of the whole system.



**Figure 1:** Block diagram of IOT based smart car parking system

The RFID card is given to each registered user which stores various details such as car number; the vehicle belongs to, registered contact number to communicate and amount available in the card. The card reader system extracts the details stored in the card as car enters and exits. The LCD is used to show messages to user. ESP12 Node MCU has inbuilt IOT module that can be used to interface with the website. IOT module is used to tell continuous real time that are to be reflected on to the website. The LCD display is used to display the number of slot available.

## III. IMPLEMENTATION

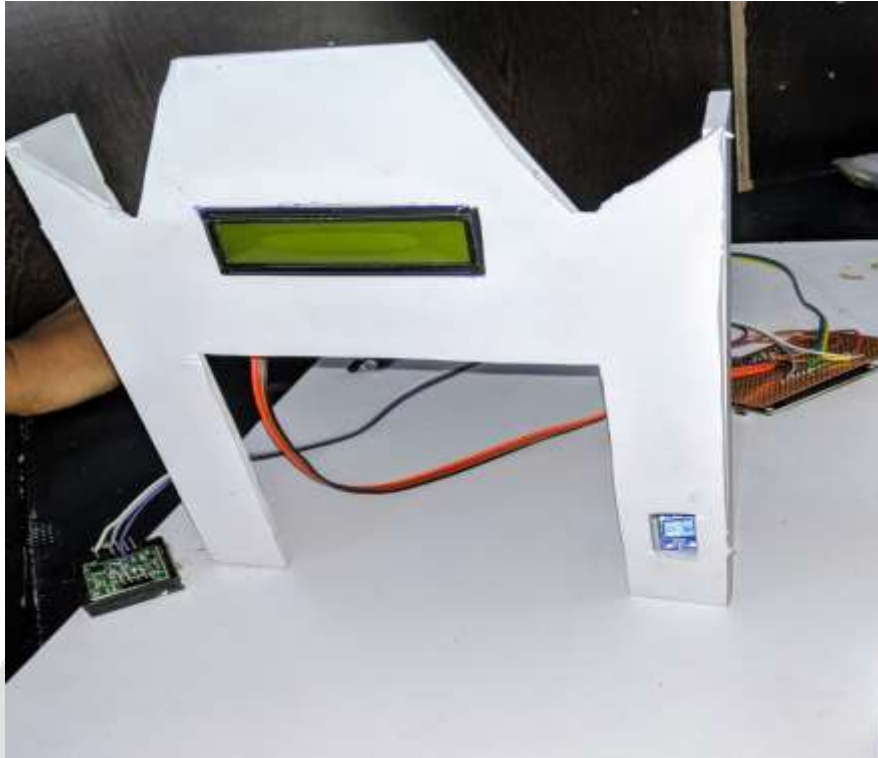
Various individual modules are explained as follow:

### A. Entry in the Parking Slot:

As the car comes in the parking zone, the RFID card is scanned through the RFID card reader at the gate in which each user had different ID. The RFID reader will take out the car's registration number. The system then checks whether the owner of the car has any particular parking space or not. At the same time the count of available slot will be decremented by one. The most beneficial parking space available is distributed to the car and the same is shown on an LCD panel. This will be reflected on to the website so that another user can be able to see how many slots are available. Time of entry is reflected into the system. Before coming to the parking zone the user can be able to book the parking slot in advance using website with their own user id and password and the booking amount will be deducted from the owner's balance.

### B. Exit from Parking Slot:

When the vehicle exits, as the user needs to the card is scanned again. Exiting time the count of the available slot increases by one and depending upon the time vehicle parked on the basis amount will be deducted from the user account. The parking cost is shown on the LCD panel after the RFID card is scanned again while exiting. Cost is deducted from the car owner's balance and will be reflected on the website. The website will also reflect about the amount deducted and the remaining balance in the card. System then shows as available parking slot in the parking space.



**Figure 2:** Working model depicting various sections

#### IV. CONCLUSION

In this way, a smart car parking system based on IOT benefits of avoiding the needless searching of empty slots in the parking area. It also enables cities to develop advanced and transportation system for easy access to the parking. Developing smart car parking system within a city requires IOT module and website for acting as an interface between parking slots and display; IR sensors are used in order to know the status of the parking slots, display board is used to display the total available. This system is automated and does not need any human at the parking area, which results in the reduction of the human efforts and does not need any man power.

#### V. REFERENCES

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