

# SMART CAR PARKING SYSTEM USING IOT

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**Abstract** - Internet of things (IoT) are being able to connect through billions of devices at any time, in any place through various application. In any country one of the daily tasks for the people are finding for the free parking slot. Searching for the parking slot people have been wasting a lot of their valuable time. By developing a system in which peoples are able to access the real time data about the presence of parking slot nearer to the user wherever they want is the main goal of this paper. Different sensors such as IR Sensor, RFID, NODE MCU etc. were used in this system. It can minimize the searching time, fuel consumption and reduce the pollution.

**Key Words:** IOT, Smart Parking, RFID (Radio frequency identification system), Parking slot, NODEMCU, etc.

## 1. INTRODUCTION

A huge problem is created day by day increasing vehicles leads to traffic. IoT is a broad area in which different sensors are being able to connect through the internet by some medium of data sharing protocols. The main goal of this parking system is easily to find, allocate the nearer parking and to find the available slots to park their vehicles.

From paper [1] stated that in 2006 a survey has been revealed an estimation in France, due to 700 million Euros were lost 70 hours has been spent in searching for a parking slot. In some countries a lot of work have been done on parking management system. In 1997 Guangdong AKE parking technology corporation ltd. Was founded, it was the first parking technology, in China it was the first company to develop and introduce parking guidance system (PGS) [2].

In this paper, if we have to know that how many slots are vacant at particular parking slot different sensors are activated at parking slots to detecting the vehicles and sent this data to the server. There are few steps involved in the process: To get the fastest route to the parking slot we have to check the availability of parking space.

## 1.1 Internet of Things

The Internet of things (IoT) describes the community of physical objects things which are embedded with sensors, software, and different technology for the reason of connecting and replacing information with different gadgets and structures over the Internet Things have advanced because of the convergence of more than one technology, real-time analytics, system learning, commodity sensors, and embedded structures. Traditional fields of embedded structures, wi-fi sensor networks, manipulate structures, automation (such as domestic and constructing automation), and others all make a contribution to permitting the Internet of things. In the purchaser market, IoT era is maximum synonymous with merchandise bearing on the idea of the "clever domestic", such as gadgets and appliances (together with lights fixtures, thermostats, domestic protection structures and cameras, and different domestic appliances) that help one or extra not unusual place ecosystems, and may be managed thru gadgets related to that ecosystem, together with smartphones and clever speakers. IoT also can be utilized in the healthcare of structures.

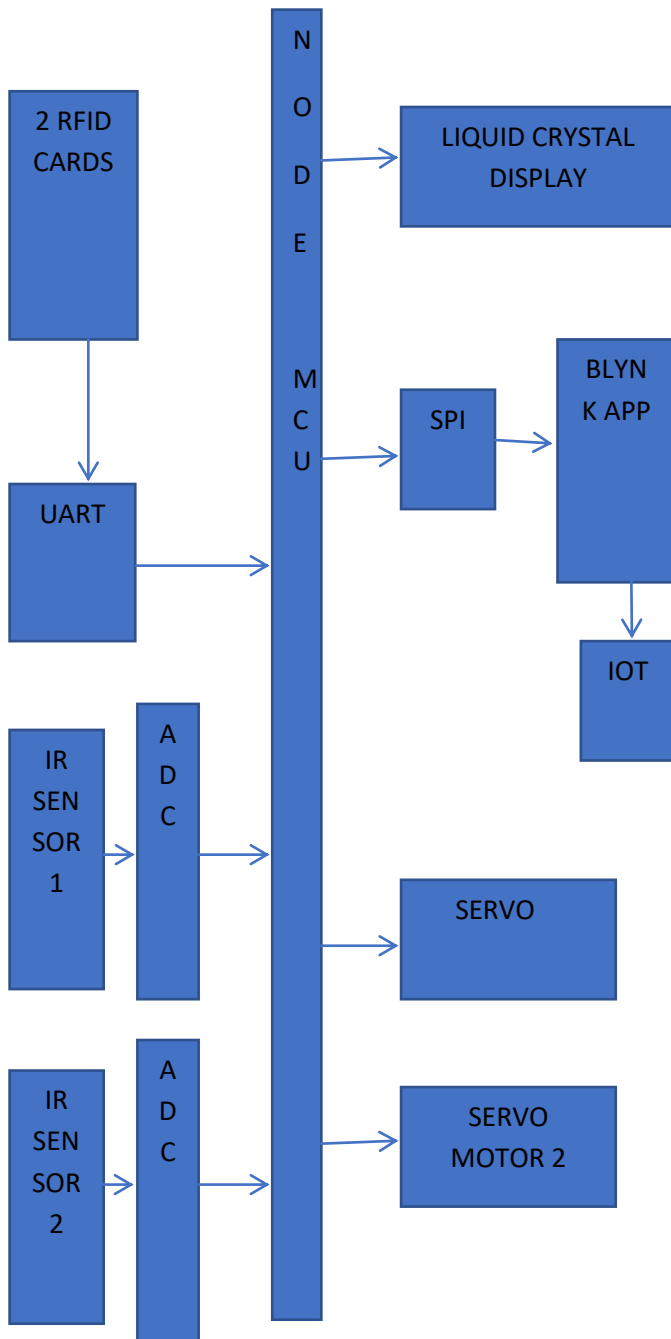
There are some of severe worries approximately risks withinside the boom of IoT, specially withinside the regions of privateness and security, and therefore enterprise and governmental movements to deal with those worries have started inclusive of the improvement of those which were worldwide standards.

## 1.2 RFID

☑ In the parking slot we have to get access through RFID Card and Token.

☑ Vehicle user scan their bar Code and the payment is automatically deducted through RFID Card and Token for the user to get access at the time of exit. User can use the bar Code for vehicle identification.

## 2. SYSTEM DESCRIPTION



## 3. HARDWARE COMPONENTS

- ❖ LCD 16\*2
- ❖ IR Sensor
- ❖ Servo motor

- ❖ RFID Module
- ❖ NodeMCU
- ❖ Jumping Cables
- ❖ Blynk app

### 3.1 IR Sensor

It is used to sense the automobiles present in the parking slot or not IR sensor was used.

It detects the presence of obstacle has been detected by IR sensor.

The heat of an object as well as motion can be measured by it.



### 3.2 NODE MCU

In NodeMCU open source prototyping board designs are available, which as an open -source firmware. The terms of "node" and "MCU" (micro\_controller unit) combines "NODEMCU". The term "NodeMCU" it rather associates the development kits it strictly speaking refers to the firmware.

In board designs both the firmware and prototyping are open\_source.



### 3.3 Servo Motor

It works on the principle of servomechanism to control the barrier for opening and closing for a specific desired angle. It was a simple dc motor.



### 3.4 RFID Module

It is used for applications like robotics, Navigation payment system etc. which was an acronym for “Radio Frequency identification” which typically detects and discover precise item as commanded.



### 3.5 LCD

It includes alphabets and numerics which is used to display atmost 32 characters.

### 3.6 UART

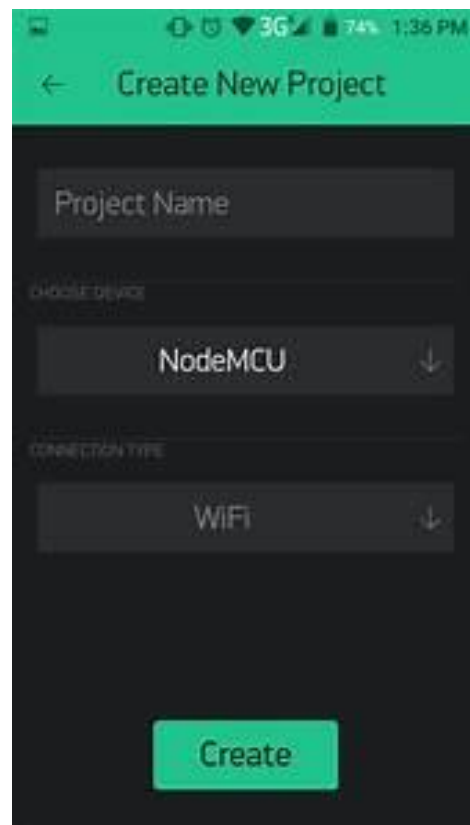
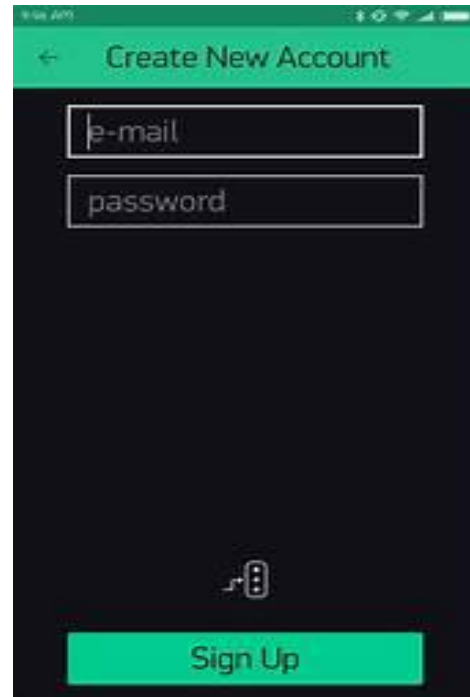
A universal asynchronous receiver/transmitter, abbreviated UART is a pc hardware tool that interprets facts among parallel and serial forms. UARTs are generally used at the side of communique requirements which include TIA. The familiar designation shows that the facts layout and transmission speeds are configurable. The electric powered signaling ranges and methods (which include differential signaling etc.). A UART is generally an individual (or a part of an) included circuit (IC) used for serial communications over a pc or peripheral tool serial port. UARTs are actually generally covered in microcontrollers.

### 3.7 BLYNK APP

Blynk is used to govern the Arduino, Raspberry Pi and the likes over the Internet which turned into a platform with IOS and Android apps. You can construct a photograph interface to your assignment with the aid of using clearly dragging and losing widgets with the aid of using the usage of the blynk app that is a virtual dashboard. Install the blynk app via google play store After downloading the app, create an account and log in or login together along with your actual e mail for higher connectivity

Click the “Create New Project” withinside the app to create a brand new Blynk app. Give it any name. Select the Hardware type. After this, pick connection type.

In this assignment we've got pick Wi-Fi connectivity.



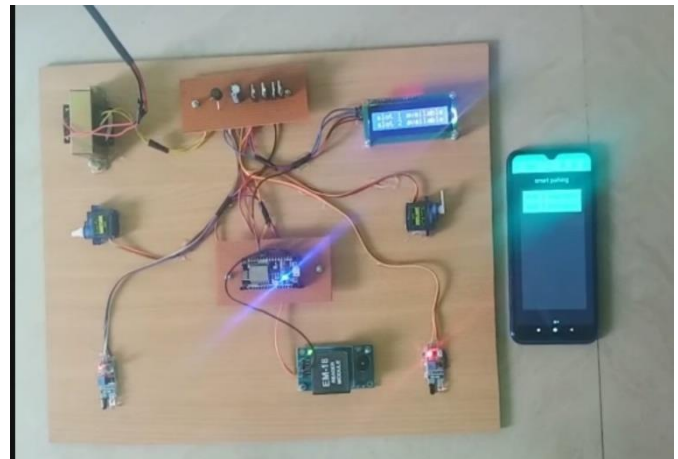
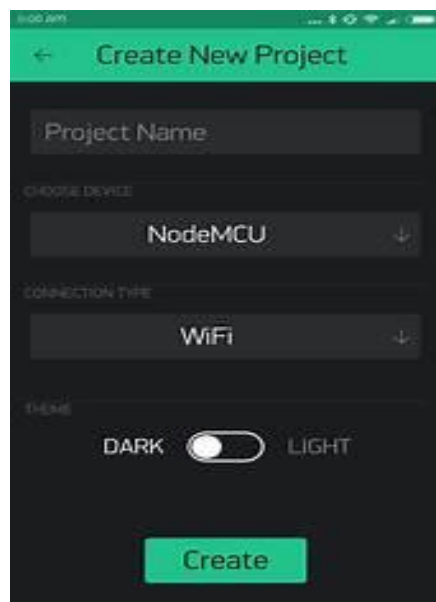


Fig: 1 Two slots are occupied

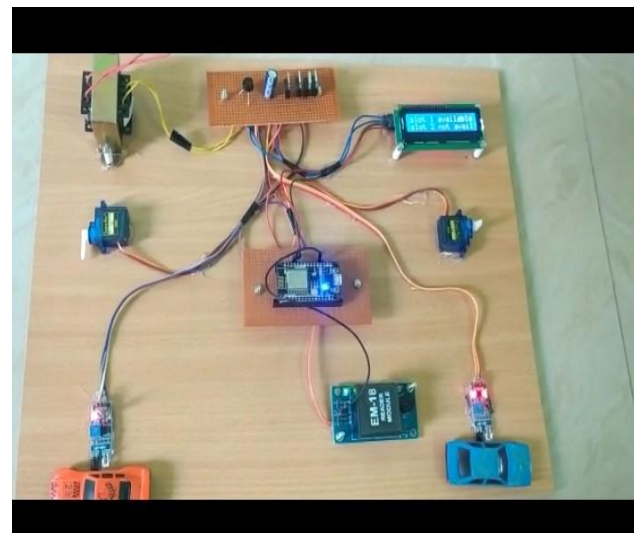


Fig:2 One slot is occupied

#### 4. RESULT & DISCUSSION

**ENTRANCE** -Each rfid card/token has a unique number get access through RFID card/token from Node MCU If RFID card access is granted then the entry and exit gates were open automatically.

Available slots are also visible on LCD

It can also show the available slots via Android using Blynk app.

#### 5. CONCLUSION

Smart Vehicle Parking the usage of IoT has been applied on this paper. The goal of this paper is to offer great technique to customers to decrease the time spent in looking of parking lot, saving gas intake and assist in lowering the site visitor's congestion and pollution. In this paper we've additionally offer navigated reservation, cloud primarily based totally method with IoT to discover the loose parking regions in city regions. It may be applied to finish the imaginative and prescient of creating clever cities. We have additionally offered the safety elements to the person for higher agree with and been achieved. It also can be upgraded for commercial enterprise functions with the aid of using offering renting of parking areas with the

aid of using neighborhood people. For making higher protection elements we also can improve protection characteristic with the aid of using including face reputation machine etc.

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