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RFID Based Automatic Car Parking System

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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 vehicles which requires more space to park. This also leads to burn millions of fuels that makes air pollution. In this paper, we are proposing that automatic real time vehicle parking system, which is based on Internet of things. 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. The display board is used to display the Vehicle details. 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. This paper makes easy for the user to find automatically a free space at the low cost and without consuming time and fuel. The whole system is based on Wi-Fi network. The android application in mobile is also provided to the user to check the availability of free space for parking that slot accordingly.

KEYWORDS: Vehicles, Smart parking, IOT, Node MCU, Internet

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. The RFID card is given to each registered user which stores various details such as Vehicle details. The LCD is used to show vehicle number and details. Node MCU has inbuilt IOT module that can used internet. Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify, and track tags attached to objects. LED for showing the status of the parking lot. 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. 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. The IoT has a big influence on our lifestyles, from how we react to how we behave. In this document, an IoT-based smart parking system is implemented for users. An Android application is implemented which provides security and flexibility where users can reserve their parking spaces and park their vehicles. This system helps reduce work and reduce time consumption. The main objective of this methodology is to provide an application that enables RFID technology for the parking system. By using RFID readers and tags in a centralized parking system, all parking spaces can be managed quickly and easily.

We are implementing a parking system which is based on IoT. There are few scenarios that we want to be fulfilled. Just example we want to pay on cash in parking's. But we are planning to be make it smarter than others. Therefore, we are using a firebase as database to store the information of a user. Authentication of a user is also required. This can be e e done with the help of RFID module. We have use Node MCU esp8266 as a microcontroller which can handle all the things of the project. The is nothing but IoT device which can help to process our data as well as send the data to the database. The Node MCU give us the flexibility to connect Wi-Fi every microcontroller needs programming. The parking system proposed in provides an energy efficient model that helps in reducing parking time by providing the



information of nearest parking availability enabling easy and quick parking. It also has an add-on feature that turns the parking lights on as soon as any car comes in motion in the parking lot.

II. METHODOLOGY

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. The RFID card is given to each registered user which stores various details such as Vehicle details. The LCD is used to show vehicle number and details. Node MCU has inbuilt IOT module that can used internet. Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify, and track tags attached to objects. LED for showing the status of the parking lot. 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. 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.

We are implementing a parking system which is based on IoT. There are few scenarios that we want to be fulfilled. Just example we want to pay on cash in parking’s. But we are planning to be make it smarter than others. Therefore, we are using a firebase as database to store the information of a user. Authentication of a user is also required. This can be e e done with the help of RFID module. We have use Node MCU esp8266 as a microcontroller which can handle all the things of the project. The is nothing but IoT device which can help to process our data as well as send the data to the database. The Node MCU give us the flexibility to connect Wi-Fi every microcontroller needs programming.

• **BLOCK DIAGRAM:**

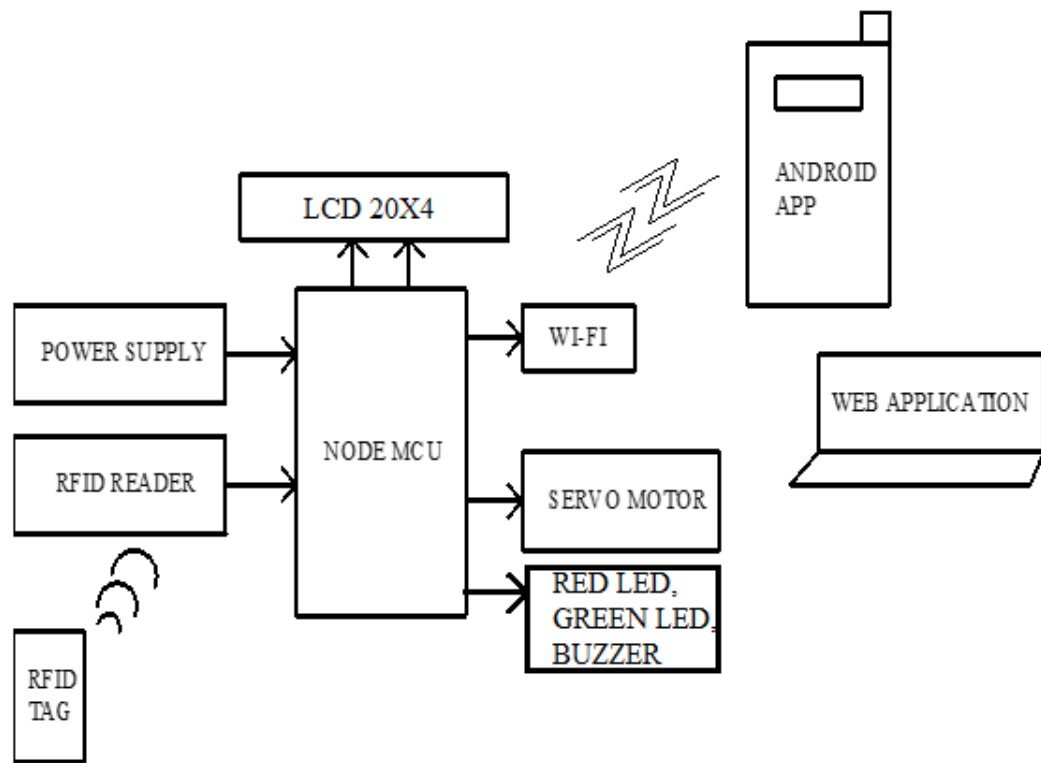


Fig 1: Block diagram



The above figure shows the block diagram of the smart parking system. This is consisting of the Node MCU, servo motor, LCD display, RFID Module. We are designed a smart parking system which is based on IOT. As per the above block diagram the firebase is main part of our system which is used as a database in our project. The Node MCU is the controller or we can call it as the IOT device which is used to process the data. The smart parking system needs the user authentication. This can do with help of RFID module. It has the RFID cards which can have unique values read by the RFID module. To display the all operation, we are used LCD display. When the parking is full, the red LED is ON. The servo motor is employed for gate open and close. We are implementing a parking system which is based on IOT. The Node MCU give us the flexibility to connect Wi-Fi every microcontroller needs programming and d it supports c and embedded c language. In this way we can implement our smart parking system.

III. CONCLUSION

In this work, IOT based smart parking system has been proposed which integrates several physical devices to check the parking slot availability. Here the RFID tag referred is assumed to have a modified version than present-day RFID tags on vehicles because it stores all the information required for this module to work. LED for showing the status of the parking lot. 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.

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