Smart Car Parking System

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ABSTRACT

There has been a considerable amount of reduction in transaction costs and decrease in stock shortage with the use of Radio Frequency Identification (RFID) technology in automation. Most of the RFID networks include a wide range of automation technologies. These technologies are RFID readers, RFID writers, RFID barcode scanners, and RFID controllers. In this study, a solution has been provided for the problems encountered in parking-lot management systems via RFID technology. RFID readers, RFID labels, computers, barriers and software are used as for the main components of the RFID technology. The software has been handled for the management, controlling, and operation tasks for parking lots. The parking-lots will be under control with RFID readers, labels and barriers (gate).

Keywords: Car Parking, RFID reader, ESP8266.

ARTICLE INFO

I. INTRODUCTION

By The increasing number of cars and the ever-decreasing amount of free space makes searching for parking place very difficult, especially in metropolitan areas. People rely on their car for transportation and need a practical and convenient place to park. This does not just apply to cities, urban areas and business parks, but also to office buildings, airports, train and subway stations, trade centers and hotels. Parking is increasingly becoming the deciding factor for companies who are looking to re-locate or build to suit.

There are over 550 million cars on the road worldwide, and this number is increasing at a rate of more than 5% annually. As the number of drivers grows, so does the demand for convenient and safe parking. Automated parking, a method of automatically parking and retrieving cars, solves these and many other parking problems.

- Smart parking system is an integrated system to organize cars in public parks.
- The system will be used for every slot in park.

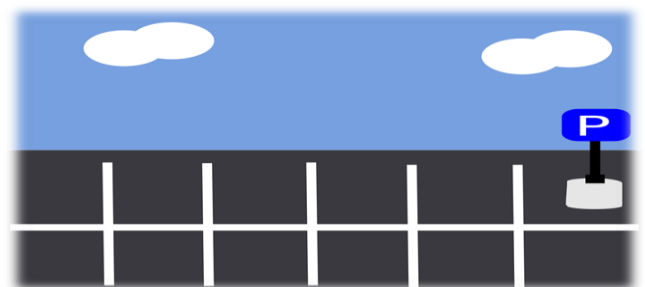- The motivation of this project is to help drivers. And park the car easier way.

Fig 1. Simple structure

II. LITERATURE SURVEY

[1]The sensors used in IoT based smart parking system stores and accesses data from remote locations with the help of the cloud these factors give raise to cloud of things (COT). The nodes could be monitored and controlled from any location the system that we propose provides information regarding the availability of the parking slots

with the help of the mobile application the users from the remote location can book the parking slots.

[2] An algorithm is used to increase efficiency of cloud-based parking system and network architecture technology is used. This algorithm is used to find the lowest cost parking space. Considering the number of parking space available and also considering the distance of the parking space from the user. The user can directly access the cloud-based server and find the information on the parking space. The user can also install an application in their mobile phones to access this information. With the help of this algorithm, waiting time of the user to find a parking space can be minimised. Security aspects are not included in this paper.

[3] A wireless sensor node along with smart phone application is being used to find the parking space.Since, wireless technology is used here the system has high accuracy and efficiency. In this system, onboard units are used to communicate with other vehicles. The user parks his vehicle in any one of the several bays available a mechanical lift lifts the vehicle out. A ticket key and id are given to the user and it is only known to the user which is used to retrieve the vehicle. The user need not carry any paper ticket since anRfid card is given to the user. The technology used here is economical. Security features must be improved to protect the user's privacy.

[4] The author of smart parking system the survey has divided detector system and vehicle sensors into two math categories as intrusive sensors and non - intrusive sensors. Intrusive sensors are installed in holes on the road surface by tunnelling under the road. Non-intrusive sensors do not affect the surface of the road and it can be easily installed and maintained. Smart parking system helps us to resolve the grounding problems of the traffic congestion and it also reduces the emission from a car.

[5] A paper proposes efficient way to unfold the issue of parking availability in the real time scenario and to reduce the time consumption. In this, the data is sent locally with devices which filters the data. This signal is transmitted over the cloud for the process as well as for evaluation which uses machine learning algorithms. This paper uses mobile phone application that connects the user with the real time traffic status via Google API. Thus ,avoiding traffic congestion. This paper does not provide the reservation facility for the car parking.
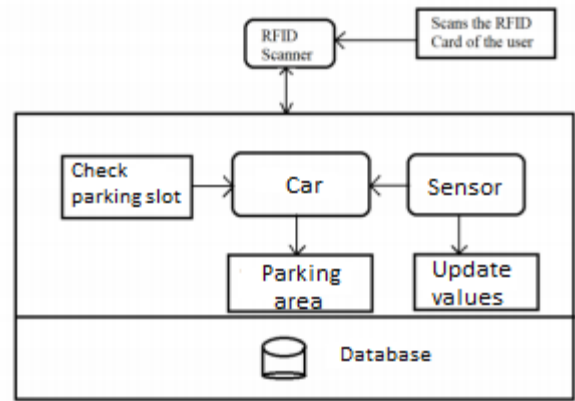
III. PROPOSED SYSTEM

Fig 2. System architecture

A. System Flow

This system consists of car parking management (Fig.1). We designed the RFID based technology to detect the car when enter the parking lot once access granted the gate is open and park the car.

Hardware Component:

1. **ESP8266**

Fig 2. Wi-Fi model

Feature:

- Voltage:3.3V.
- Wi-Fi Direct (P2P), soft-AP.
- Current consumption: 10uA~170mA.
- Flash memory attachable: 16MB max (512K normal).
- Integrated TCP/IP protocol stack.
- Processor: Tensilica L106 32-bit.
- Processor speed: 80~160MHz.
- RAM: 32K + 80K. • GPIOs: 17 (multiplexed with other functions).
- Analog to Digital: 1 input with 1024 step resolution.

2. **RFID Reader**

Fig 3. EM-18 Reader

Feature:

- Voltage: 5VDC
- Current: <50mA
- Operating Frequency: 125Khz

- Read Distance: 10cm
- Size: 32mm(length) * 32mm(width) * 8mm(height)

3. RFID Tag

Fig 4. RFID card

Feature:

- Highly efficient
- Stringently tested for their quality
- Highly reliable

IV. CONCLUSION

Our smart parking system project is planned to be integrated with another software application to help drivers to find the empty spot in parking lot more easily with less time.

Also our project implements most of the functionalities needed in a parking lot.

V. FUTURE SCOPE

We can add a GPS module to store the location for every unit.

Adding other ultrasonic sensor would be more efficient.

And to make our project more useful in our countries, we could integrate our system with the ordinary way of payment.

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