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Cloud Based Smart Vehicle Parking and Antitheft System Using IOT

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ABSTRACT: In recent times the number of vehicles are consistently rising and parking space is becoming a major issue in urban and semi urban cities so there is needs to design a parking system which will reduce manual work as well reduce the problem of vehicle parking on streets. In this work we propose the concept of smart vehicle parking system. As we see in the modern world everything is being atomized, here we will deploy an IOT based system which is used to sense the presence & movement of vehicle. Depending on the availability of space it allows parking and same is displayed on LCD panel. IR sensor is used to detect the presence of vehicle in parking slot. Using RFID card all details of vehicle i.e. vehicle number, vehicle owner name, time in and time out of vehicle parked is saved into database. RFID module will provide security as users who have authority can swipe the RFID cards and get entry. Web based availability of parking and booking system will be designed. Database will be created for checking of theft vehicle on cloud and communication will be made to authority regarding theft of vehicle.

KEYWORDS: IOT, Raspberry pi, RFID, IR Sensors

I. INTRODUCTION

Due to rapid increase in the vehicles there exists a problem for parking of vehicles. It leads to traffic congestion and also pollution. So we have a need to maintain the vehicle park management in order to reduce the wastage of time. If we see in the larger cities when we visit the shopping malls or tourist places or any other commercial areas there arises a problem for parking of our vehicle. We have so different methods of parking systems such as using Wireless Sensor Network method, etc. But the major drawback of those systems is they help us to find the available spaces for parking but not the exact location of those spaces. It can be overcome by using smart parking system.

II. OBJECTIVE

Objectives of the system are as follows:

- To design an algorithm to find the parking lots.
- To reduce time in finding parking lots.
- To avoid unnecessary travelling through occupied parking lots.
- To create database on cloud of vehicle number, owner name, time in and time out information.
- To provide a web based solution for parking system.
- To reduce fuel consumption this in turn reduces carbon footprints in atmosphere.
- To inform the authority if a theft vehicle is parked in parking lot.

III. MOTIVATION

People are facing many issues to find parking slots in minimum time and it is also difficult to know the status as theft vehicle which is parked in the parking lot. So Cloud based smart parking system using IOT will be designed which enables user to find the nearest parking area, To provide the information of availability of parking slots in parking area, To book the available slots well in advance.

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IV. LITERATURE REVIEW

Yuvaraju M, Monika. M: Vehicle parking place is one of the major problem in day to day life and it is indirectly leads to the traffic congestion. This paper presents the IOT based parking place detection using the mobile app. The user can able to check the nearest parking place availability and reserve the parking slot using mobile application. The mobile application will act as an interface between the end user and the system. Infrared sensor is placed at the parking slot along with the Arduino. Infrared sensor is used to detect whether the slot is occupied or empty and it is updated to the cloud using the GSM. Arduino is used to track the number of vehicles parked in the parking area. [1]

Ndayambaje Moses, Y. D. Chincholkar: Worldwide, vehicles have become a very significant means of transport in which results into a huge number of cars that are owned in various cities, in turn traffic congestion and pollution leads. At top of all, parking has become the sparking factor of the mentioned problems. This paper puts an eye on various techniques as far as the smart parking system (SPS) is concerned which are already implemented. In looking after this parking issue, big number of authors contributed a lot in monitoring SPS and management of SPS with the help of various technologies including wireless sensor network, Bluetooth, Zigbee, RFID, GSM, Cameras, Image processin.IoT accompanied by a number of software solutions based on mobile application. Following this survey will enhance researcher's thought on SPS which will result in a real solution of the technique and algorithms for ultimate SPS. [2]

ElMouatezbillah Karbab,Djamel Djenouri, Sahar Boulkaboul, Antoine Bagula:This paper considers automatic car park management, which becomes an inevitable option to rationalize traffic management in modern cities. Integration of networked sensor/actuator and radio frequency identification (RFID) technologies is explored to enable sophisticated services via the Internet in the emerging internet of things (IOT) context. Based on this integration, we propose a scalable and low-cost car parking framework (CPF). A preliminary prototype implementation and experimentation of some modules of the proposed CFP has been performed. The clustering of sensors (sensing boards) into a single mote using the standard I2C protocol has been explored in the prototype, and experimental results demonstrate considerable reduction in cost and energy consumption. [3]

Zhanlin Ji:This paper presents the generic concept of using cloud-based intelligent car parking services in smart cities, as an important application deployed on the Internet of Things (IOT). The corresponding IoT sub-system includes sensor layer, communication layer, and application layer. A high-level view of the system architecture is outlined. To demonstrate the provision of car parking services with the proposed platform, a cloud-based intelligent car parking system for use within a University campus is described along with details of its design and implementation. [4]

D.Sathya,S.Kumaresan:This paper presents a design and implementation of a smart and unique car parking system to support the modern day tedious car parking design using RFID reader and microcontroller. In the presented prototype model we describe and implement a parking tower with two floors and two slots per floor. The system designed with arduino controller automatically identifies the empty slot and parks the car at the corresponding slot. A group of Sensors, GSM and software are embedded together to work as a system to transport the car to its calculated parking slot. The System embedded with a RFID smart card helps us to calculate the time period during which the car is parked, thus helping an automatic e-commerce system to deduct the amount for the mentioned time period from the users account. The system has a GSM add-on module which will automatically respond's to the users SMS request by letting him the available slots at a given time. Temperature Sensors, CO2 sensor are used to indicating the security aspects in the overall parking system. [5]

Vatsala DaurPreeti Bhandari, Laxay Jain,Nalini N:IOT is a fast budding area. It allows us to connect dumb objects. Using this technology, we can greatly automatize our product by making hardware components to communicate. RFID is commonly used to trace items in near range. This radio communication uses readers and tags to exchange information. We have mainly used these two technologies which seem to have the potential to greatly automatize the manual systems and make them faster and error free. Our product, based on the idea of Internet of Things, aims at solving the chaos, confusion and long queues in parking spaces of public buildings like malls and business parks that is prevalent due to the increased use of automobiles. We aim to solve these problems and offer car drivers a hassle-free and swift car parking experience. [6]

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K.Sushma, P.Raveendra Babu, J.NageshwaraReddy: This paper is to develop a Reservation based vehicle parking reservation system to overcome the problem of unnecessary time consumption in finding parking spot in commercial parking areas. In this proposed system, we reserve the parking slot in shopping malls, theatres and offices by using short message service (SMS). User reserves the slot by sending a message to GSM modem placed at the parking end. GSM modem gives slot number and a password if the slots are available which is used to allow or deny access to the parking area at the entrance and exit. IR sensor is used for the indication of empty slot with a green LED. User can park the vehicle at the given zone, and this is valid up to a certain grace period only after that the priority will be given to next user. RFID technology is used for entering and exiting parking area and also used to debit the amount for parking charges through RFID tag. The main contribution is the system has more security. Thus users can just reserve the parking slots using the SMS. [7]

V. PROPOSED SYSTEM

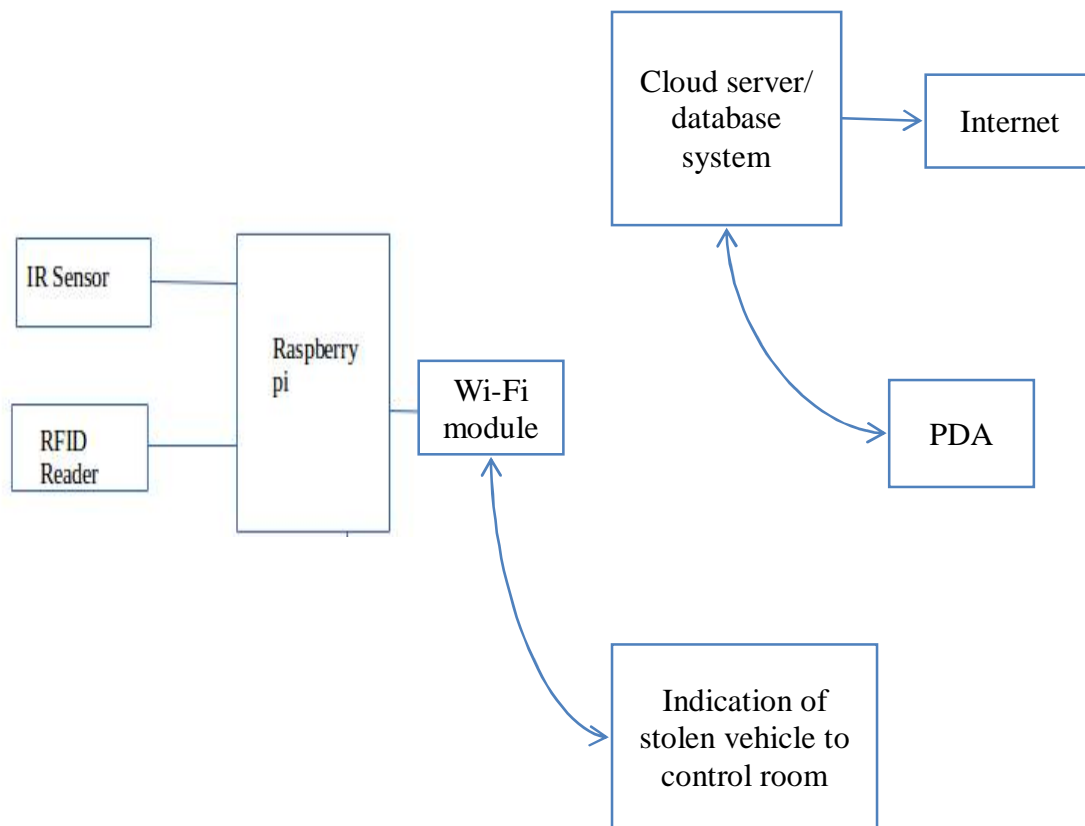


Fig.1 – Cloud based smart vehicle and anti-theft system using IOT

The above fig shows the block diagram for smart parking system. This system uses IR sensor to detect presence of vehicle on particular slot. IR sensor, RFID reader are connected to raspberry pi. The main workings of project is to sense vehicle presence, read vehicle's ID (i.e. RFID tag for each vehicle) and send the signal to the raspberry pi. After that raspberry pi take proper action i.e. whether to allow the vehicle in parking slot if IR detects it is empty or make a proper call to authorised person if it is stolen vehicle. LCD display will show the information about no of vehicle parked as well as available space for parking and RFID reader used to detect the details of vehicle i.e. car number,

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owner name, etc. It will show the no of busy parking slot, empty slot. The details of vehicle are stored on cloud. If all slot presented are full then it will show slot not empty.

VI. CONCLUSION

Automatic vehicle parking system is very important factor in the traffic areas. It can be automated without human being. It reduces the time consumption. So by implementing our smart parking system using IR Sensors and RFID we can manage our time and vehicles can be parked easily. The information related to number of current available parking lots in parking area will be available for user. Web server is best solution for providing information to availability of parking lots to the user. This will help to reduce the waiting time for the user to park the vehicles. Stolen vehicles can also be detected as the database can be made global due to IOT.

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