ABSTRACT:

Efficient and smart way to automate the management of parking system that allocates an efficient parking space using internet of things technology.

The IoT provides a wireless access to the system and the user can keep atrack of the availability of the parking area. With increase in the population of the vehicles in metropolitan cities, road congestion is the major problem that is being faced.

The aim of this paper Is to resolve this issue. The user usually wastes his time and efforts in search of the availability of the free space in a specified parking area.

The parking information is sent to the user via notification. Thus, the waiting time for the user in search of parking space is minimised.RFID technology is being used to avoid car theft.

Keyword: RFID, Arduino, GSM Module, IR Sensor, cloud

A Smart Parking System is an advanced solution designed to optimize the process of finding , reserving, and managing parking spaces , leveraging modern technologies such as IoT, AI, and cloud computing. Here's an abstraction o f its key components and functionality: reserving, and managing parking spaces, leveraging modern technologies such as IoT

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INTRODUCTION

Internet of thing (IoT) has the ability to transfer data the through network without involving human interactions . IoT allows user to use affordable wireless technology and also help s the user to transfer the data into the cloud.

IoT helps the user to maintain transparency. The idea of IoT started with the identity of things for connecting various devices. These devices can be controlled or monitored through computers over internet.

IoT contains two prominent words "Internet" and "Things", where Internet is a vast network for connecting servers with devices [1]. Internet enables the information to be sent , receive or even communicate with the devices. The parking problem causes air pollution and traffic congestion

[4]. In today's scenario, parking space is hard to search in a day to day life for the people. According to the rection a survey, there will be a rapid increase in the vehicle's population of over 1.C billion around 2035

[7]. Around one million barrels of world's oil is being burnt everyday [4]. Thus , smart parking system is the key solution to reduce the waste stage of the fuel. The solution for the problems that is being raised.

The smart parking can be a solution to minimise user's time and efficiency as well as the overall cost of the fue l burnt in search of the parking space. In this, the data is collected from the sensor and through analysing and processing, the output is obtained.

Methodology and Methods

1] The sensors used in IoT based smart parking systemstores 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

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

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

4] 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.

RELATED WORKING OF SMART PARKING SYSTEM

[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).

[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

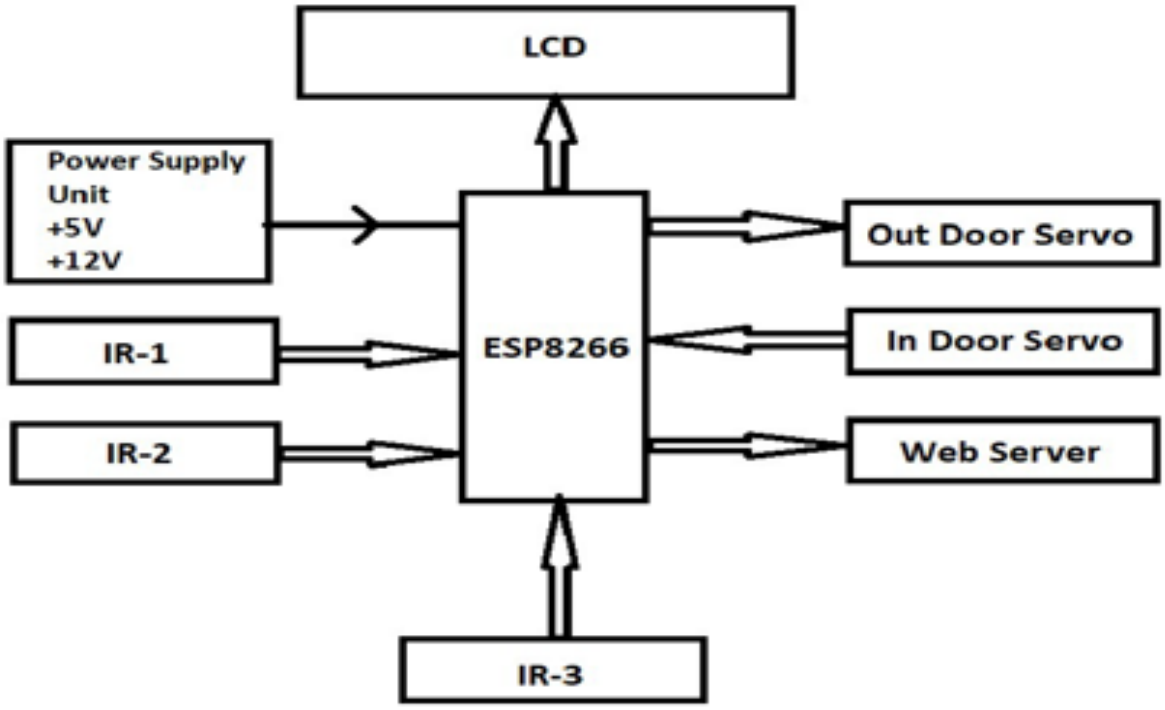
[3] A wireless sensor node along with smart phone application is being used to find the parking space.Since, wireless technology is used here the system has high accuracy and efficiency.

[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

[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.

SYSTEM ARCHITECTURE

A. Proposed System; It consists of three sections: first section is the parking area which includes Arduino devices along with IR sensor. The user interacts with the parking area with the help of these devices. The user cannot enter the parking area without the help of RFID card. The second section contains the cloudbased web services which acts a mediator between the user and parking area. The cloud is updated depending upon the availability of the parking area. The admin administers the cloud services and it can also be viewed by the user for checking the availability. The third section is the user side. The user gets notification on the basis of the availability via



DETAILS OF THE MODULE

A] **GSM Module; The GSM module is a circuit which is used to setup communication between mobile phones and microcontroller. It is used to send SMS, MMS and voice messages through mobile network. GPRS extension in GSM allows high data transmission. GSM uses time division multiple access GSM Module approach for transmission.**

Fig. 4. GSM Module

B. **IR Sensor ;An infrared sensor is basically an electronic device which is used to detect the presence of objects. Infrared light is emitted by this device. If this device does not detect any IR light reflected back that means there is no object present. If the light is detected by the sensor there is an object present.**

Fig. 5. IR Sensor

Servo Motor; **It is a rotator device that allows the control of angular as well as linear motion. A servo motor is used for the opening and closing of the gate. Servo drivetransmits electrical signals to the servo motor for producing motion**

Fig. 8. Servo Motor

Arduino Nano ; **It is a compact board which can be used in various devices and various field. It has overall 22 input/output pins out of which 14 pins are digital pins. It has a flash memory of about 32 kb. These pins can control the operations of digital pins as well as analogy pins. This module is a breadboardfriendly boarT**

Fig. 9. Arduino

IMPLEMENTATION

This section contains the implementation of the proposed system. Every user who enters the parking slot contains a RFID card which contains the details of the user.When the RFID card is scanned by the reader module, the details of the user aretransferred into the module. Now the IR sensor checks whether the parking space if free .If, there is no

space available the parking barrier gate will not open.Amessage is sent to the user with the help of a GSM module which sends a registered message depending upon the availability and unavailability of the parking space. The WIFI module supports the system by storing all the data in the cloud. It connects the devices with the cloud server

Message Received by User

Here, the user scans the RFID card provided to the user. If space is available, the user receives a message "Welcome username" the barrier gate will open and the user can park the car. When the user exits the parking space the user again has to scan the RFID and a message will be received by the user "thanks for using smart parking username". The database about the user's activity in the parking space will

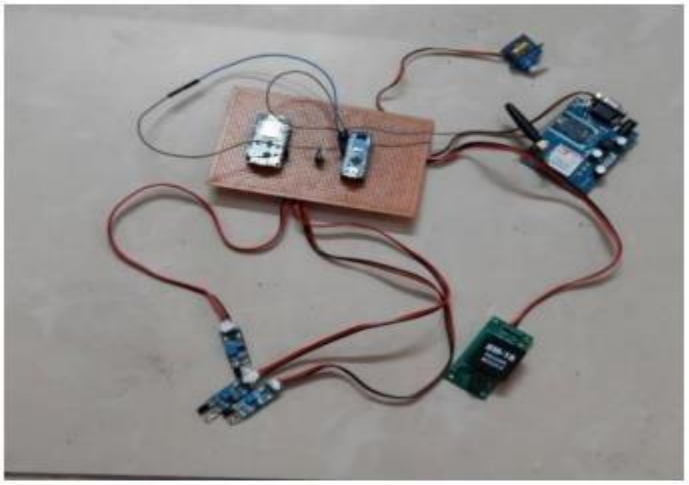


Fig. 12.Model

RESULT s DISCUSSION

The demand of smart parking system is increasing significantly. This allows user to involve real time access of the availability of the parking space. The existing system in today's world doesn't contains the facilities of parking reservation and parking slot availability checker. The existing system was vision-based monitoring system [7] which estimates the number of the parking slots available in the area by counting the number of incoming and outing cars which consumes lot of time and efforts. The next existing system was sensor-based system which uses ultrasonic sound waves for detecting the presence of vehicles and then two-tier parking came into existence which used the concept of parking cars one above another. The result of the paper is to make the parking area connected with the world as well as reduces time and can be cost effective for the user. The result of this paper is to reduce car theft. This paper reduces overall fuel energy

CONCLUSION sFUTURE WORK

The concepts of smart cities have always been a dream. There have been advancements made from the past couple of years to make smart city dream to reality. The advancement of internet of things and cloud technologies cities. Smart parking facilities have always been the core of constructing smart cities. The system provides a real time process and information of the parking slots. This paper enhances the performance of saving users time to locate an appropriate parking space. It helps to resolve the growing problem of traffic congestion. As for the future work the users can book a parking space from a remote location.GPS,

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