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INTERNET-OPERATED PARKING SYSTEM

THOTA SRAVANTI SHANKAR MOHAMMED MUJEEBULLAH,
P NANDA KUMAR

ABSTRACT

The rapid growth of the economy has necessitated the building of more parking spaces to accommodate the growing number of automotive users. Customers are more likely to prefer mobile application-based solutions than conventional ones due to the widespread usage of smart phones. As the Internet of Things (IoT) continues to gain popularity, mobile devices, wireless communication technologies, and mobile applications are becoming more intertwined. With the help of the Internet of Things and Bluetooth, this study proposes the creation of a Smart Parking System. The complete parking solution it offers is beneficial to both property owners and visitors. For example, users may reserve space, confirm a reserved user's identity, search for nearby free spaces depending on vehicle size, go to the designated parking spot, and calculate account data on a daily, weekly and monthly basis, among other options. Infrared sensors are used to determine whether or not a parking space is available. Wi-Fi module technology, microcontrollers, and wireless communication technology are used to interact with a server to gather information about the availability of a free slot and its location. The most convenient available space in the schedule is determined by a scheduling algorithm depending on the size of the vehicle being carried. It is possible that the owner of a parking place may utilise data such as the number of free and available slots, weekday and weekend occupancy rates and the amount of money received over a certain period to determine variable parking costs for the parking space. In order to provide a positive customer experience, an app for mobile devices has been created.

Keywords— Internet of Things; Smart Parking; Smart City; Cloud of Things.

1 INTRODUCTION

When the Internet of Things (IoT) was first proposed, it was envisioned as a network of objects that could interact with one another. For real-time tracking, control, and monitoring, remote computers connected to the Internet may be utilised to control and monitor the devices in question. Known as the Internet of Objects (IoT), it allows for the expansion of Internet use by facilitating communication and, as a consequence, the connectivity of devices and physical things, referred to as 'Things,' on a global scale. It is a large international network of connected servers, laptops, tablets, and mobile devices that use standards-based protocols and connecting systems that are widely used all over the globe, and which is referred to as the "internet." Transmission, receipt, and exchange of information are all made possible by the Internet.

M.Tech Associate Professor, sravanti815@gmail.com
, M.Tech Assistant Professor, shankardvk48@gmail.com
M.Tech Assistant Professor,m.mujeebullah117@gmail.com
M.Tech Assistant Professor, nandha.iarevlsi@gmail.com
Department-ECE
Pallavi Engineering College Hyderabad, Telangana 501505

Thing is a word that may be used in a number of situations and has a range of meanings in the English language. "Thing," according to the dictionary, is a term that may refer to a physical thing, an action or notion, a scenario or activity when we do not want to be precise about what we are describing. In general, the Internet of Things (IoT) is constituted of a network of devices and physical items that are all linked to one another. In the course of business operations and services, a vast number of objects may collect data from distant places and connect with units that manage, acquire, organise, and analyse the data gathered. The use of this technology allows us to imagine a world in which things (such as wearable technology such as a watch or alarm clock) become smart and behave alive as a result of sensing, computing, and communicating by embedded small devices that interact with distant objects or people through connectivity.

In order to take use of Cloud computing's scalability and resilience, developers are able to build and host their applications on the platform. In addition, the cloud is an excellent partner for the Internet of Things since it serves as a platform on which all sensor data can be stored and made available from a number of locations. As a result of these factors, these technologies were integrated to create a new technology known as cloud computing, which was eventually nicknamed "the Internet of Things" as a result of its widespread adoption (CoT). Through the use of cloud computing infrastructure, the objects (nodes) in CoT may be accessed, monitored, and controlled from any location in the world. Because of the immense scalability of the cloud, a huge number of nodes may be added to or deleted from the IoTsyStemon on a real-time basis.to put it in layman's terms The Internet of Things may be stated mathematically in the form of the following equation:

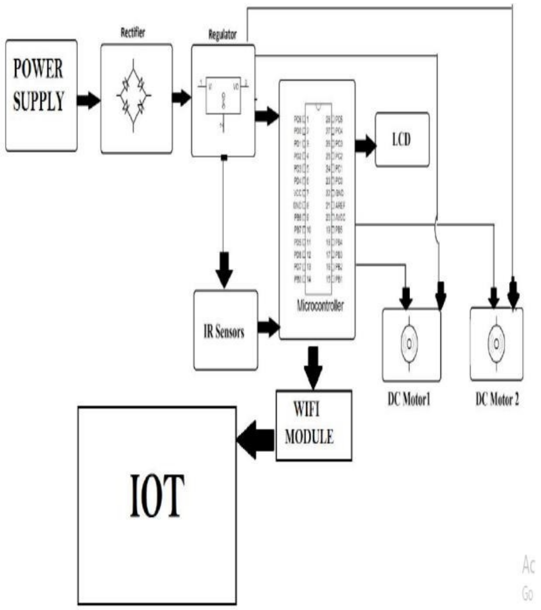
The internet is comprised of a controller, sensor, and actuator, as well as a physical item and the internet.

The notion of establishing a Smart City is becoming more and more viable with each passing day. This is especially true with the introduction of the Internet of Things. Car parking facilities and traffic management systems are two of the most pressing issues that smart cities must address in order to thrive. The issue of finding a parking space in today's cities is always a challenging one for drivers, and the process is growing more onerous as the number of private car users continues to climb. The situation is as follows.

As a consequence, smart cities should take advantage of the opportunity to increase the efficiency of their parking resources, which will minimise the amount of time people spend looking for parking places, as well as traffic congestion and road accidents. This will assist to relieve parking and traffic congestion issues by informing drivers in advance of the availability of parking places at or near their intended destination. In recent years, advances in the manufacture of low-cost, low-power embedded systems have made it easier for developers to create new applications for the Internet of Things (Internet of Things). Many modern municipalities have opted to adopt a range of Internet of Things (IoT) based devices in and around their cities for the purpose of monitoring as a result of technological developments in sensor technology. Several recent studies, including one undertaken by the International Parking Institute, have shown that there has been an increase in the number of novel parking system designs introduced. In the present condition of the parking system business, there are a number of parking systems on the market that offer to give customers with real-time information about parking spaces that are available. When designing a parking lot occupancy monitoring system, it is essential to consider the placement of effective sensors in the parking lot for occupancy monitoring purposes, as well as the use of fast data processing units in order to derive useful insights from data collected from multiple sources.

Methodology

BLOCK DIAGRAM:



PROPOSED SYSTEM

Car parking is a major issue in today's congested cities, and this is particularly true in the present day. We just have an excessive number of vehicles on the road, and there isn't nearly enough parking space to accommodate them all. Effective parking management solutions are essential in order to cope with this situation. This is shown by the implementation of an Internet of Things-based parking management system, which, as previously said, allows for more efficient parking space use via the use of IoT technology. Using infrared sensors to detect when parking spaces are occupied, as well as dc motors to simulate gate opening motors, the notion is shown to demonstrate the concept. A wifi modem offers internet connection, while an ATMEGA microcontroller oversees the overall functioning of the system and the allocation of available resources. The technology uses infrared sensors to assess whether or not parking spots are being utilised by customers. Besides that, it makes use of infrared technology to assess whether or not a vehicle has arrived at the gate, enabling it to open automatically. Reading the number of available parking spots and synchronising the data with the cloud server enables for online verification of parking slot availability. From any location, users will be able to search for available parking places online and take advantage of the convenience of hassle-free parking services. It is as a consequence of this that cities are able to handle their parking problems while also offering users with an effective Internet of Things-based parking management system.

PROJECT IMPLIMENTATION:

- ➢ Power suppy connected to the Ardunio uno board
- ➢ We use IR Sensors for Senseing parking slot occupy along with gate opeing motors
- ➢ In this car parking system mainly use the telnet app.
- ➢ By using the telnet app we know the how many slots are empty and how many slots are filled
- ➢ It shows on the led
- ➢ First connect wifi module to the phone
- ➢ The wifi module name is org6547
- ➢ After connecting the wifi module open the telnet app
- ➢ In telnet app go to the telnet settings. In that give the ipadress cloud
- ➢ After giving ipadress click on the connect button
- ➢ After connecting it shows the slots are empty or filled in the led screen as well as mobile

First and foremost, the Arduniuno board was connected to the power source. Voltage of the power supply is 5 volts. An ESP8266 coupled to a microcontroller might calculate what ESP8266 means in terms of WI FI hotspot. We employ infrared sensors to detect when a parking space is used, in conjunction with gate opening motors. A wifi modem provides internet access, while an ATMEGA microcontroller manages the system's operation and management of resources. IR sensors are used to determine whether or not parking spaces are occupied by the system. Additionally, it makes use of infrared technology to determine whether or not a vehicle has arrived at the gate, allowing for automatic gate opening. The telnet application is mostly used in this auto parking system. Through the use of the telnet application, we can determine how many spaces are vacant and how many slots are occupied. It is shown on the led. First, connect the wifi module to the phone using a USB cable. The org6547 is the name of the wifi module. After connecting the wifi module, use the telnet app on your smartphone. Navigate to the telnet settings in the telnet application. In such case, provide the cloud's IP address. After you have entered your IP address, click on the connect button. Following the connection, the slots on the led screen and on the mobile device are either empty or full.

2.3 APPLICATIONS

- The smart automobile parking system may be deployed at Shoping malls \s
- Restaurents\s
- Theaters
- It may be utilised in open places as well as in

- It may be utilised in Smart Cities.

2.4 ADVANTAGES

Shorter waiting times at parking lots; it saves money, space, and time; and it reduces traffic congestion.

- Pollution has been reduced.

- A better overall user experience.

- An increase in security.

The ability to get real-time data and trend insight

- A reduction in management costs.

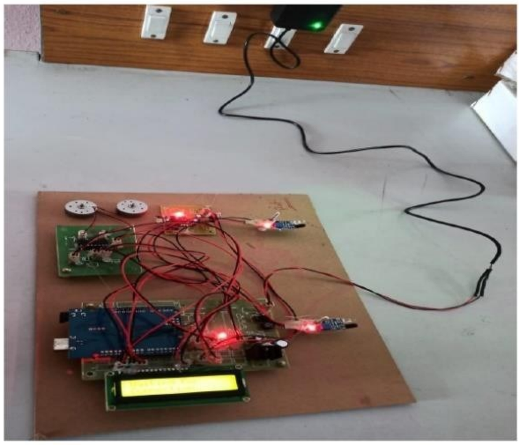
2.5 DISADVANTAGES

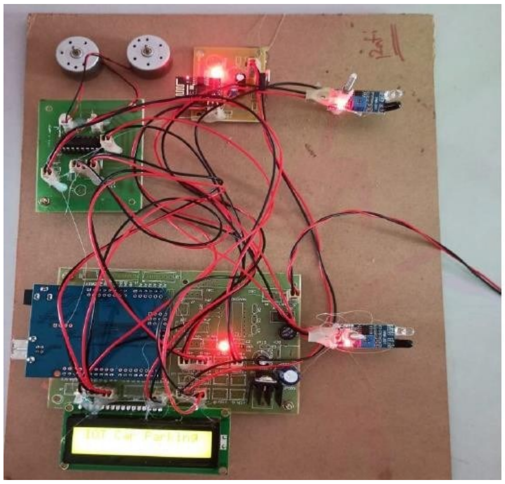
- The high expense of building or installing a new system or system component.
- Maintenance on a regular basis; • Operation.
- There is a breakdown.
- Uncertainty about the structural integrity of the building.

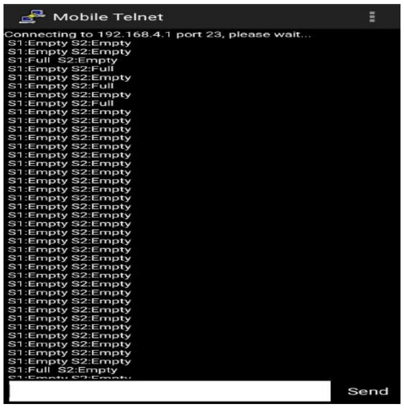
It is necessary to address the issue of greater building and installation costs.

- There is a problem with the operation.
- Issues connected to frequent maintenance visits and visits by outside contractors.

Results:







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Connecting to 192.168.4.1 port 23, please wait...
 S1:Empty S2:Empty
 S1:Empty S2:Empty
 S1:Full  S2:Empty
 S1:Empty S2:Full
 S1:Empty S2:Empty
 S1:Empty S2:Full
 S1:Empty S2:Empty
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 S1:Empty S2:Empty
 S1:Full  S2:Empty
```

CONCLUSION:

The notion of Smart Cities has long been a pipe dream for the whole human race. In the last few of years, significant strides have been made toward the realisation of smart cities in the United States. In the context of smart cities, the development of the Internet of Things and cloud computing technologies has opened up new opportunities. In order to build smart cities, intelligent parking facilities and traffic management systems have always been at the forefront of the design process. Here, we address the problem of parking and provide an Internet of Things (IoT) based Cloud integrated smart parking system (Smart Parking System). In a parking lot, the system that we propose offers real-time information on the availability of parking spaces. The sensor sensors that are utilised to detect the vehicle are critical components of the system. All of the efforts made in this article are directed at improving the parking facilities of a city and, as a result, improving the overall quality of life for its residents.

FUTURE SCOPE:

The Android application is used to implement the Smart Parking System, which is based on Slot Reservations. Using the slot allocation approach, we may reserve the cheapest parking space available for us. It is an effective method of resolving parking issues, since it reduces traffic congestion and also allows for the automation of the charging process. In the future, this work might be expanded to include a completely automated system that uses a layered parking mechanism. Various safety features, such as tracking the vehicle's licence plate number and facial recognition of the drivers to prevent theft, as well as an automated paying procedure, may be implemented. We want to broaden the scope of the testing to include a real-time environment in which users may use the "Smart Parking" system via their portable devices.

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