



IOT CAR PARKING SYSTEM

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ABSTRACT

In this fast-growing economy, the number of vehicle users increases exponentially demanding more parking space. Pervasive presence of smart phone encourages users to prefer mobile application based solutions. Growth of IOT has paved way for integration of mobile devices, wireless communication technologies and mobile Applications. This paper proposes an IOT based Smart parking system that integrates with mobile Application. It provides a comprehensive parking solution both for the user and owner of the parking space. Features are provided for reserving a parking space, authenticating a reserved user, identifying nearest free space depending on the size of the vehicle, navigating to the parking slot and computes accounts information on daily, weekly and monthly basis. IR sensors are used to identify if a parking spot is free. Availability of a free slot with its location information is transmitted using WIFI module technology, microcontroller and wireless communication technology to the server and is retrieved through a mobile application. A scheduling algorithm is used to identify the nearest free slot based on the size of a vehicle. The owner of the parking space can get the analytics of the number of free and available slots for a given period, the occupancy rate on week days and weekend and the amount collected for a given period and can use it for fixing variable parking fees. The mobile application is designed to provide rich customer experience.

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

1 INTRODUCTION

The Concept of Internet of Things (IOT) started with things with identity communication devices. The devices could be tracked, controlled or monitored using remote computers connected through Internet. IoT extends the use of Internet providing the communication, and thus inter-network of the devices and physical objects, or 'Things'.

Internet means a vast global network of connected servers, computers, tablets and mobiles using the internationally used protocols and connecting systems. Internet enables sending, receiving, or communicating of information. Thing in English has number of uses and meanings. Dictionary meaning of 'Thing' is a term

used to reference to a physical object, an action or idea, situation or activity, in case when we do not wish to be precise. IoT, in general consists of inter-network of the devices and physical objects, number of objects can gather the data at remote locations and communicate to units managing, acquiring, organizing and analyzing the data in the processes and services. It provides a vision where things (wearable, watch, alarm clock, home devices, surrounding objects with) become smart and behave alive through sensing, computing and communicating by embedded small devices which interact with remote objects or persons through connectivity.

The scalable and robust nature of Cloud computing is allowing developers to create and host their applications on it. Cloud acts as a perfect partner for IoT as it acts as a platform where all the sensor data can be stored and accessed from remote locations. These factors gave rise to the amalgamation of both technologies thus leading to the formation of a new technology called Cloud of Things (CoT). In CoT the things (nodes) could be accessed, monitored and controlled from any remote location through the cloud. Due to high scalability in cloud any number of node could be added or Removed from the IoT system real time basis simple terms IoT can be explained in form of an equation stating:

Physical Object + Controller, Sensor and Actuators + Internet = Internet

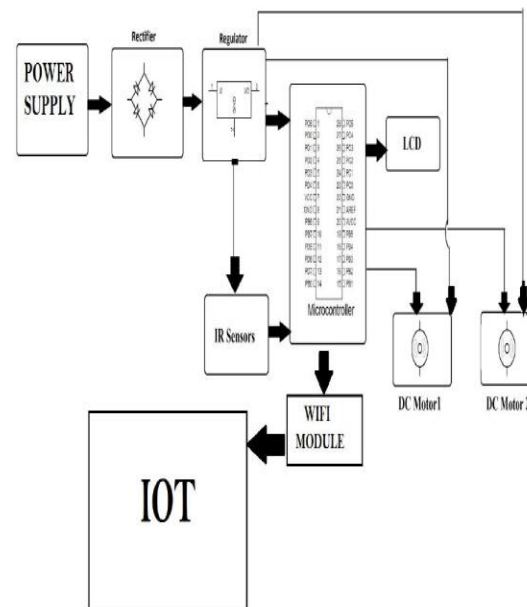
The idea of creating a Smart City is now becoming possible. With the emergence of the Internet of Things. One of the key issues that smart cities relate to is car parking facilities and traffic management systems. In present day cities finding an available parking spot is always difficult for drivers, and it tends to become harder with ever increasing number of private car users. This situation

can be seen as an opportunity for smart cities to undertake actions in order enhance the efficiency their parking resources thus leading to reduction in searching times, traffic congestion and road accidents. Problems pertaining to parking and traffic congestion can be solved if the drivers can be informed in advance about the availability of parking spaces at and around their intended destination. Recent advances in creating low-cost, low-power embedded systems are helping developers to build new applications for Internet of Things. Followed by the developments in sensor technology,

many modern cities have opted for deploying various IoT based systems in and around the cities for the purpose of monitoring. A recent survey performed by the International Parking Institute reflects an increase in number of innovative ideas related to parking systems. At present there are certain parking systems that claim to citizens of delivering real time information about, available parking spaces. Such systems require efficient sensors to be deployed in the parking areas for monitoring the occupancy as well as quick data processing units in order to gain practical insights from data collected over various source.

METHODOLOGY

BLOCK DIAGRAM:



PROPOSED SYSTEM

Car parking is a major issues in modern congested cities of today. There simply are too many vehicles on the road and not enough parking space. This has led to the need for efficient parking management systems. Thus we demonstrate the use of



IOT based parking management system that allows for efficient parking space utilization using IOT technology. To demonstrate the concept we use IR sensors for sensing parking slot occupancy along with a dc motors to simulate as gate opener motors. We now use a wifi modem for internet connectivity and an ATMEGA microcontroller for operating the system. The system detects if parking slots are occupied using IR sensors. Also it uses IR technology to sense if a vehicle has arrived on gate for automated gate opening. The system reads the number of parking slots available and updates data with the cloud server to allow for checking parking slot availability online. This allows users to check for available parking spaces online from anywhere and avail hassle free parking. Thus the system solves the parking issue for cities and get users an efficient IOT based parking management system

PROJECT IMPLIMENTATION:

- Power supply connected to the Arduino 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 ip adress cloud
- After giving ip adress click on the connect button

- After connecting it shows the slots are empty or filled in the led screen as well as mobile

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2.3 APPLICATIONS

- The smart car parking system can be implemented in Shopping malls
- Restaurents
- Theaters
- It can be used in open spaces as well as in
- It can be used in Smart Cities.

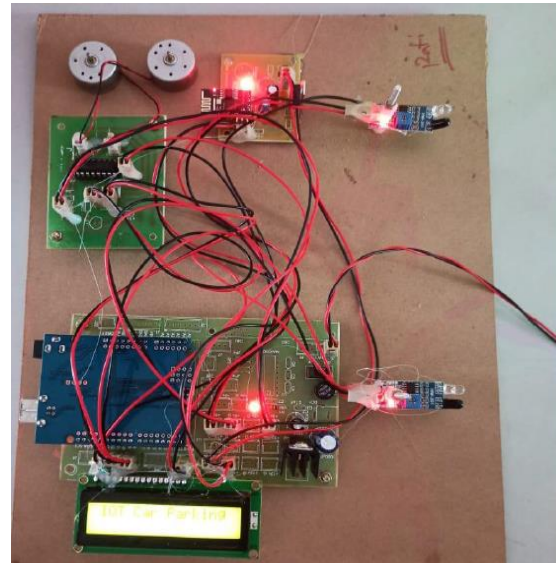
2.4 ADVANTAGES

- Shorter waiting time at parking space.
- It saves money, space and time.
- Reduced traffic
- Reduced pollution

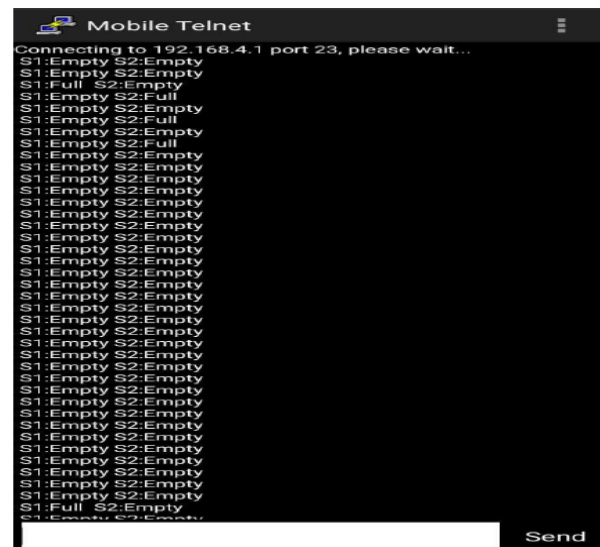
- Enhanced User Experience.
- Increased Safety.
- Real-Time Data and Trend Insight.
- Decreased Management Costs.

2.5 DISADVANTAGES

- The high cost of construction or installation.
- Regular maintenance.
- Operation.
- Breakdown.
- Uncertainty in the building structure.
- The problem of a higher cost of construction and installation.
- Problem of operation.
- Issues relating to regular maintanances.



Results:



CONCLUSION:

The concept of Smart Cities have always been a dream for humanity. Since the past couple of years large advancements have been made in making smart cities a reality. The growth of Internet of Things and Cloud technologies have given rise to new possibilities in terms of smart cities. Smart parking facilities and traffic management systems have always been at the core of constructing smart cities. In this paper, we



address the issue of parking and present an IoT based Cloud integrated smart parking system. The system that we propose provides real time information regarding availability of parking slots in a parking area. The sensor sensors used detect the vehicle are the essential components. The efforts made in this paper are intended to improve the parking facilities of a city and thereby aiming to enhance the quality of life of its people.

FUTURE SCOPE:

The Smart parking system based on Slot booking is implemented, using the Android application. Using the slot allocation method we can book our own cheapest parking slot. It is an efficient one for solving parking problems, which overcomes the traffic congestion also provides automated billing process. This work could be further extended as a fully automated system using multilayer parking method. Safety measures such as tracing the vehicle number face recognition of the drivers so as to avoid theft & automatic billing process can also be designed. We plan to expand the tests on the real time environment where the users can have the "Smart Parking" system in their handheld devices.

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