

Smart Parking Management System

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Abstract- In recent times the concept of smart cities has gained great popularity. Thanks to the evolution of Internet of things for the idea of smart city now seems to be achievable. Consistent efforts are being made in the field of IoT in order to maximize the productivity and reliability of urban infrastructure. Problems such as, traffic congestion, limited car parking facilities and road safety are being addressed by IoT. In this project, we present an IoT based cloud integrated smart parking system. The proposed Smart Parking system consists of an on-site deployment of an IoT module that is used to monitor and signalize the state of availability of each single parking space. A mobile application is also provided that allows an end user to check the availability of parking space and book a parking slot accordingly. The paper also describes a high-level view of the system architecture. Towards the end, the paper discusses the working of the system in form of a use case that proves the correctness of the proposed model.

Indexed Terms —Internet of Things, Cloud Computing, Smart Parking, Smart City, Cloud of Things

I. INTRODUCTION

In the current scenario, due to increase in traffic, ample of drivers roam around in search of decent parking space. This not only creates traffic congestion but also wastes time. What if a driver has advance information of available parking space in the required destination spot. So, using IOT we can plan and provide the parking slot to the driver in advance. For places like malls and airport, parking spaces are so extremely large that it is impossible to manage it manually. In urban areas like Bangalore, Delhi, Chennai, car parking has become a critical subject with the steady increase in count of vehicles. Day by day Research survey shows 40% of vehicles including car and bike in this traffic congestion are mere searching for a decent parking area. Survey also adds that on an average seven and a half minutes' time is needed to

find a space for parking. A research says that 75% of devices in INDIA shall be connected to the internet by end of the year 2019. In this parking system, we set out IR sensors such a way that when a car is parked in a particular slot, an IR sensor will sense the presence of a vehicle in the slot and update the database. The server maintained here is of shared type. The data will be processed before sending to the database. People can easily book in advance the parking slot and accordingly, the shared database will be updated. Future of IOT can be seen where human interference is minimal, technology will take the control of everything. Current automobile burglary cannot be just simply ignored, it is increasing day by day.

II. METHODOLOGY

Prototype can be categorized into 4 parts:

- Book online
- Vehicle Entry
- Exit of the vehicle
- Parking Management

The Node MCU which will be our shared server. It is a low cost, smart card sized computing model that can be plugged into PC, laptop or TV. The entire coding is done in python and stored inside it. It uses an OS just like Linux and capable of performing any complex mathematical problem.

Book Online:

Since the drivers keep on roaming around seeking out for decent parking, using this feature they can book the space for car parking in advance. They just need to install the app and can select the vacant slot. For this feature, they don't have to pay anything in advance.

Once booking is done, the server will be updated accordingly.

Vehicle Entry:

On the entrance of the parking gate, we need to check whether the car entering is stolen or not. If it so, then using IPV6 protocol, we will send an alert message to the closest police station. Internet uses a protocol suite called TCP/IP protocol. The purpose of this protocol is to identify host using the logical address and to route data over network layer of OSI model.

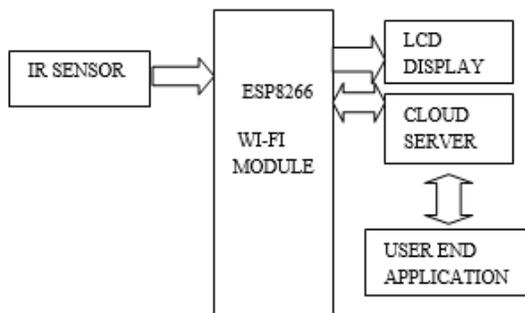
Exit of Vehicle:

Upon leaving the parking space, the driver is required to pay the fee which will be calculated on time basis. Upon successful payment, that particular slot will make vacant again and the database will be updated accordingly so that next user can use the same.

Parking Management:

Generally, driver or user ends up in dilemma and parks the vehicle in the wrong slot. Not only this, incompetent drivers may hit other cars as well which causes frustration among people.

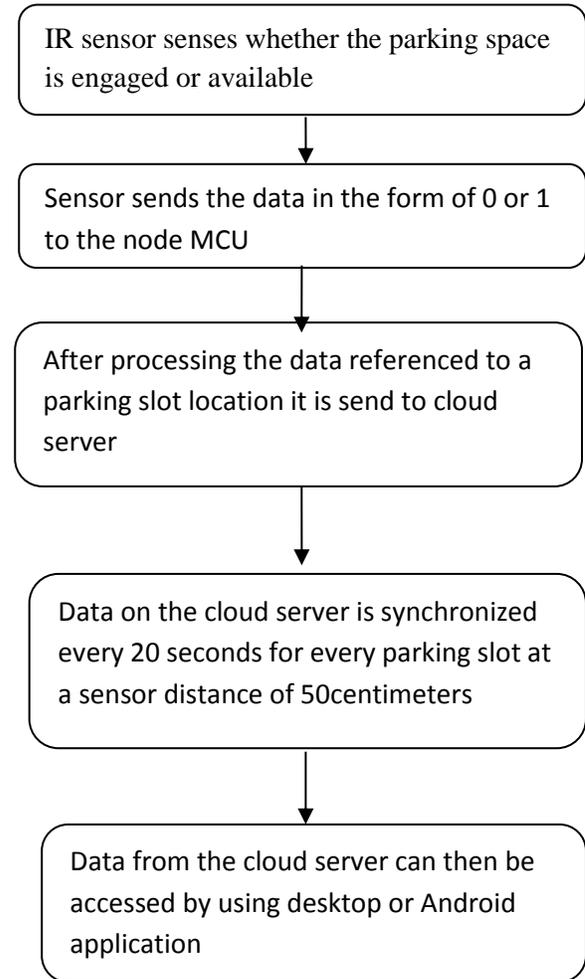
III. BLOCK DIAGRAM



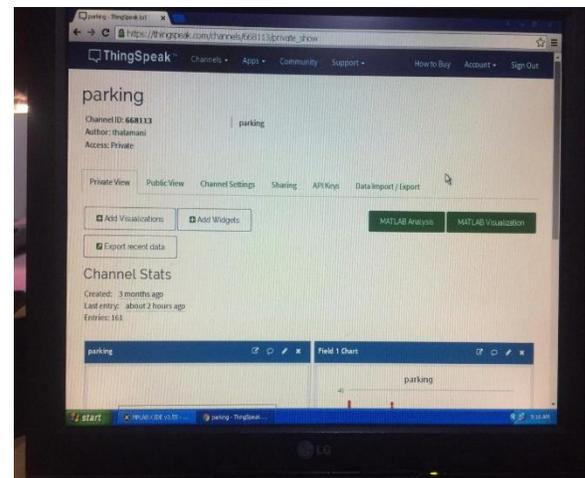
IV. FLOW OF PROPOSED SYSTEM

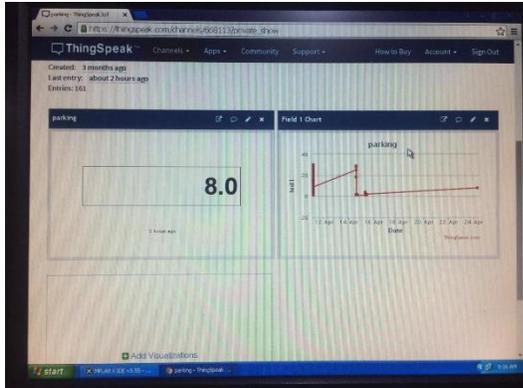
Proposed system used ESP8266-01 Wi-Fi Module to send data over the cloud. It consists of many network layers to establish a connection between software and hardware. Protocols used in each layer have a specific task as shown in Figure . Physical layer deals with the mechanical and electrical support to the system. Every

system has a unique MAC address This system dynamically assigns IP address to each node and users.



V. RESULTS AND DISCUSSION





VI. CONCLUSION

The concept of Smart Cities has 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 proposed work, we have addressed 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. Users from remote locations could book a parking slot for them by the use of our mobile application. The efforts made in this paper are indented to improve the parking facilities of a city and thereby aiming to enhance the quality of life of its people.

REFERENCES

- [1] Rico, J., Sancho, J., Cendol, B., & Camus, Parking easier by using context information of a smart city: Enabling fast search and management of parking resources.
- [2] Parking availability prediction for sensor-enabled car parks in smart cities. In Intelligent Sensors, Sensor Networks and Information Processing, IEEE Tenth International Conference on IEEE.
- [3] Bota, A., de Donato, W., Persico, V., & Pescape, A. On the Integration of Cloud Computing and Internet of Things. In Future Internet of Things and Cloud (, 2014

International Conference .

- [4] Ji, Z., Ganache, I., O'droma, M., & Zhang, X. A cloud based intelligent car parking services for smart cities. In General Assembly and Scientific Symposium.
- [5] A survey on applications of wireless sensor network using cloud computing. International Journal of Computer science & Engineering Technologies Kamburugamuve, S., & Hartman,