

# INTELLIGENT AUTOMATED SMART VEHICLE PARKING SYSTEM USING IOT

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**ABSTRACT:** The quickly developing urban world of India is creating various problems for the urban areas. Vehicle parking being one in every of the most important issues faced nearly a day. The amount of vehicles is additionally increasing daily adding to the parking at public places during this paper, we have a tendency to gift an IoT primarily based cloud integrated sensible parking system. The projected sensible parking system consists of an on-the-scene readying of an IoT module that's wont to monitor and signalize the state of accessibility of every single car parking zone. A mobile application is additionally given that permits an user to see the provision of car parking zone and book a parking slot consequently.

**Keywords—** Internet of Things; Cloud Computing; Smart Parking; Smart City; Cloud of Things

## I INTRODUCTION

The Internet-of-Things technology (IOT) has created a revolution in several fields in life additionally as in smart-parking system technology. Parking is restricted in virtually each huge town within the world– resulting in pollution, holdup, and driver frustration. Our motivation is to fill the close to term parking demand mistreatment the web of Things(IOT).The contributions of our system include: 1) Reduce time 2) increasing area utilization ,3) Improving drivers expertise ,and "what's a lot of, besides", clever management. 4) Saving fuel from the motivation behind customers read, keen town parking system that is Associate in Nursing intelligent and secure parking service. Here we have a tendency to aiming to see directions to reduce the stopping issue and to try to secured stopping utilizing the savvy stopping underneath Slot Allocation technique with the assistance of automaton application. RFID application is employed for debit the total for stopping charges through the RFID tag .The principle commitment of our planned systems is to search out standing of the parking lot and supply secured parking. In CoT the things(nodes) may be accessed, monitored and controlled from any remote location through the cloud. because of high measurability in cloud any range of node may be superimposed or off from the IoT system on a true time basis. In straightforward terms IoT is explained in kind of Associate in nursing equation stating.

## II. NEED FOR IOT-CLOUD INTEGRATION

Cloud computing and IoT have witnessed large evolution. Both the technologies have their advantages, however several mutual advantages can be foreseen from their integration. On one hand, IoT can address its ethnological constraints such as storage, processing and energy by leveraging the unlimited capabilities and resources of cloud[4]. On the other hand, Cloud can also extend its reach to deal with real world entities in a more is tribute and dynamic fashion by the use of IoT. Basically, the Cloud acts as an intermediate between things and applications, in order to hide all the complexities and functionalities necessary for running the application. Below are some of the factors that led to the amalgamation of Cloud and IoT.

## III. RELATED WORK

Abhirup Khanna.et al. [1] proposed IoT based Smart Parking System. This paper provided a 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 give 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.

Luca Mainetti.et al. [2] presented a Smart Parking System Based on IoT Protocols and Emerging Enabling Technologies. In this project, authers presented a novel IoT-aware Smart Parking System able to reduce the traffic congestion and improve the citizens' quality of life. By exploiting the jointly use of different, yet complementary, technologies and standards, the proposed system is able to collect, in real time, both environmental parameters and information about the occupancy state of parking spaces, and to provide advanced service.

Mahendra B M.et al.[3] presented a IoT Based Sensor Enabled Smart Car Parking for Advanced Driver Assistance System. This project put work proposed in this system addresses an issue of parking in smart cities. The system is implemented using low cost IR sensors, Raspberry pi model 3b for real time data processing, E-parking mobile application and Geared DC motor.

Juan Rico.et al. [4] presented parking easier by using context information of a Smart City. This paper presents the integration of different technologies into a single application increase the functionalities served and help to dynamically update the application so as to be more accurate than existing solutions.

Pampa Sadhukhan.et al. [5] presented an IoT-based E-Parking System for Smart Cities. This paper presents the prototype of an E-parking system that provides novel parking management solution for various parking facility areas throughout the city. The proposed E-parking system enables the drivers to obtain information on availability of parking space and to reserve some parking lot via a suitable GUI that means reservation based parking management facility.

Muftah Fraifer.et al. [6] Proposed smart car parking System Prototype Utilizing CCTV Nodes. Although much work has been done on smart parking, the work reported in this paper is almost exclusively based upon IoT cams. We propose a novel architecture for low cost and flexible smart parking using CCTV and smart phones.

Felix Jesus.et al. [7] presented a Crowd sensing Smart City Parking Monitoring. In this paper we introduce an ongoing work concerning the feasibility of the use of magne to meter sensors, embedded in the user mobile phones, as a scanner of available parking spaces.

Pampa Sadhukhan.et al. [8] presented an IoT-based E-Parking System for Smart Cities. This paper presents the prototype of an E-parking system that provides novel parking management solution for various parking facility areas throughout the city. The proposed E-parking system enables the drivers to obtain information on availability of parking space and to reserve some parking lot via a suitable GUI that means reservation based parking management facility.

IlhanAydin.et al. [9] presented a Navigation and Reservation Based Smart Parking Platform Using Genetic Optimization for Smart Cities. In this paper, a new optimal navigated reservation based approach has been proposed to find the free parking slot in smart cities. The aim of the proposed method is to find the minimum distance to the free parking slot. For this purpose, the problem is formulated as an optimization uses a genetic algorithm to find the nearest free parking space.

JiongShi.et al. [10] proposed a Smart Parking System Based on NB-IoT and Third-party Payment Platform. This paper has presented a smart parking system based on NB-IoT and third-party payment platform, which lowers the deployment cost and improves the user payment experience. Sensor node module, cloud server module, application for mobile device and the third-party payment platform are explained in detail.

#### IV.PROPOSED SYSTEM

The proposed framework is the blend of shrewd stopping and the slot designation with the Android application. In the current framework, a dynamic calculation is completed, which is an irregular allotment strategy. It arbitrarily distributes parking area to the clients.

##### *Block Diagram of System and Description:-*

#### 4.1 MICROCONTROLLER UNIT

The ARM7TDMI-S could be a general purpose 32-bit silicon chip, that offers high performance and really low power consumption. The ARM® design relies on Reduced Instruction Set pc (RISC) principles, and therefore the instruction set and connected rewrite mechanism square measure a lot of easier than those of small programmed complicated Instruction Set Computers. This simplicity leads to a high instruction output and spectacular period interrupt response from alittle and efficient processor core .Pipeline techniques square measure used so all elements of the process and memory systems will operate ceaselessly

#### 4.2 RFID

Radio-frequency identification (RFID) uses magnetism fields to mechanically determine and track tags hooked up to things. The tags contain electronically-stored info. Passive tags collect energy from a close-by RFID reader's interrogating radio waves. Active tags have a neighborhood power supply (such as a battery) and will operate many meters from the RFID reader.

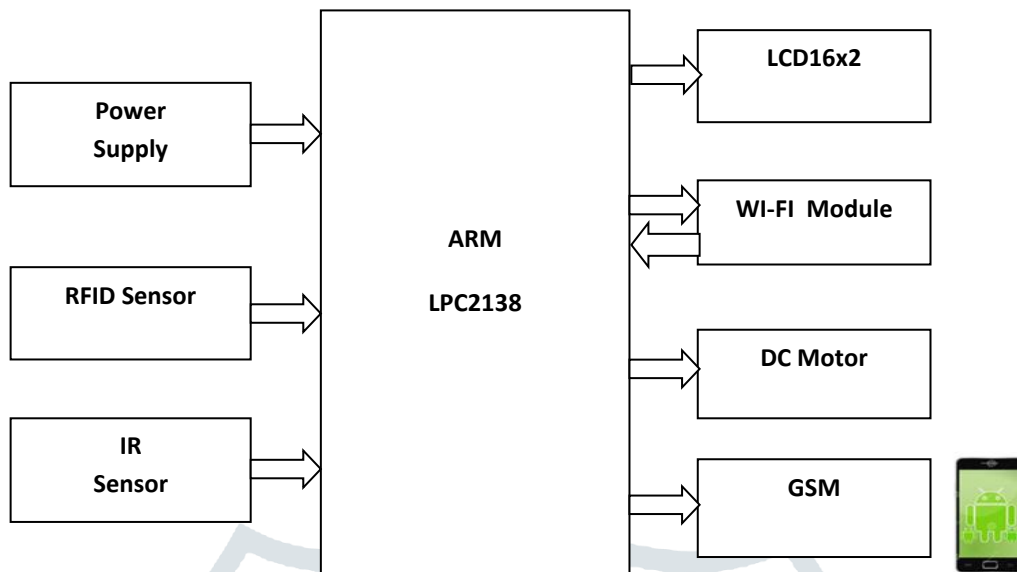


Fig.:- Block diagram of system

#### 4.3 WI-FI MODULE

The ESP8266 Wi-Fi Module could be a self-contained SOC with integrated TCP/IP protocol stack which will offer any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting associate degree application or offloading all Wi-Fi networking functions from another application processor. every ESP8266 module comes preprogrammed with associate degree AT command set code. The ESP8266 module is a particularly value effective board with an enormous, and ever growing, community.

#### 4.4 LCD

LCD is used as an area of a venture to imagine the yield of the appliance. we've used sixteenx2 LCD that demonstrates 16 segments and a couple of lines. Thus, we will compose sixteen characters in each line, during this method, add up to thirty two characters we will show on 16x2 LCD. LCD will likewise use in a very venture to visualize the yield of varied modules interfaced with the microcontroller. on these lines LCD assumes a necessary half in a very venture to examine the yield and to research the framework module shrewd if there ought to be an incident of framework disappointment keeping in mind the tip goal to amend the problem.

#### 4.5 IR sensor

An IR detector may be a device that detects IR radiation falling on that. Proximity sensors (used in reality screen phones and edge avoiding robots), distinction sensors (used in line following robots) and obstruction counters/sensors (used for numeration product and in stealer alarms) are some applications involving IR sensors.

#### 4.6 DC Motor Drive

DC motors area unit compact and show high output, and their speed is straightforward to manage. they'll be driven by battery or the other power offer and area unit so conjointly simple to use. A DC motor may be a automatically commutated motor powered from electricity (DC). this can be however the relative angle between the stator coil and rotor magnetic flux is maintained close to ninety degrees, that generates the most torsion.

#### 4.7 GSM

(**Global System for Mobile communications**) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation digital cellular networks used by mobile devices such as tablets Global system for.

### V. SOFTWARE (ALGORITHM &FLOWCHART)

#### 5.1 ALGORITHM

- Step 1: Start.
- Step 2: Read status of IR receiver.
- Step 3: If car requires parking requires yes go to step 4 otherwise step 2.
- Step 4: Check the vacant parking space if yes go to step 5 otherwise display No parking space and go to step 2.

- Step 5: Get the status of cash.
- Step 6: If cash received through e-wallet then open the gate otherwise go to step 5.
- Step 7: Open the gate and wait for vehicle to go inside for car parking.
- Step 8: Closed gate and go to step 2.

5.2 FLOWCHART

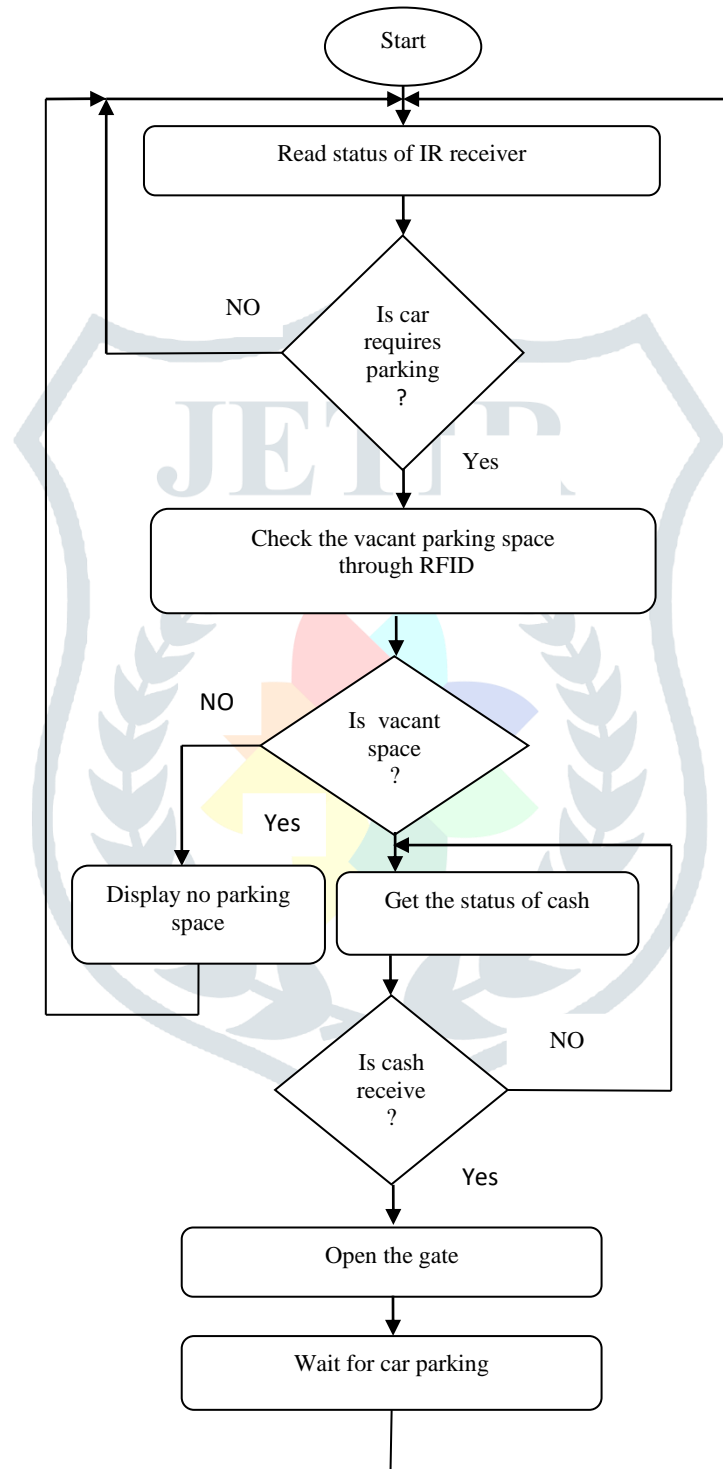


Fig:- Flowchart

## VI RESULTS:



Fig.LCD display for different messages

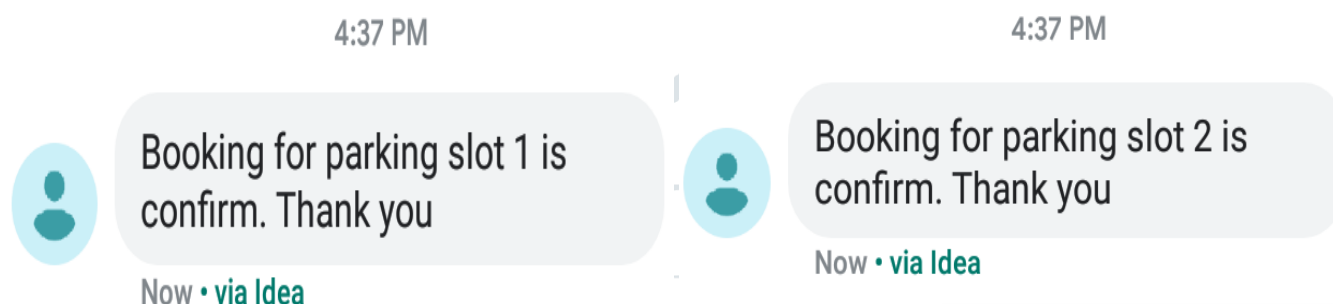


Fig. Message received

**Traffic staff Interface-** This interface allows traffic operators to manage current and historical information from environmental sensors, visualize and eventually change the data about parking lots state and users' payments. Traffic cops can interact remotely with the system by using the "IoT", allows traffic cops equipped with an RFID-enabled to check the notifications related to the detection of an unauthorized use of a reserved space, directly reading the information stored in the RFID tag placed on a machine, and to issue a fines.

**Driver Interface-** This interface allows drivers to visualize information about the occupancy state of parking lots and the executed payments. Specifically, users can use a IoT, to find the parking spaces available in a given area, get the right directions to the selected parking spot, pay the parking fee, check the remaining parking time and receive notifications when the purchased time is expiring.

## VII CONCLUSION

The ideas of sensible cities have continually been a dream for humanity. Since the past number of years massive advancements are created in creating sensible cities a reality. the expansion of net of Things and Cloud technologies have given rise to new potentialities in terms of sensible cities. sensible parking facilities and traffic management systems have continually been at the core of constructing sensible cities. during this project, we tend to address the problem of parking associate in Nursingd gift an IoT based mostly Cloud integrated sensible parking system. The system that we tend to propose can provides real time data relating to handiness of parking slots during a lot. Users from remote locations may book a parking slot for them by the employment of our mobile application. The efforts created during this project to enhance the parking facilities during a town and thereby progressing to enhance the standard of lifetime of its individuals.

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