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Smart Vehicle Parking Management System

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Abstract— The Project Title is Vehicle Parking Management System” Present by the AI&ML based smart parking system which provides an optimal solution for the parking problems in metropolitan cities and other public places. As a result, there are too many vehicles on the road & insufficient parking spaces. This allows users to check for available parking space online from anywhere for hassle free parking. Thus, the system solves the parking issue.

Keywords -Smart Parking, Internet of Things, Mobile Application, Show available parking lots as per location or registration, Time Duration, Online Payment.

I. INTRODUCTION

The Internet of Things (AI&ML) is the network of physical object devices, vehicles, buildings and other items-embedded with electronic, software, ultrasonic sensors and network connectivity that enables these objects to collect and exchange data. The AI & ML allows objects to be sensed and controlled remotely across existing network, infrastructure, creating opportunities for more direct integration, of the physical world into computer-based system and resulting in improved efficiency, accuracy and actuator. With the implementation of the smart parking system, patrons can easily locate and secure a vacant parking space at any car park deemed convenient to them. Vehicle ingress and egress are also made more convenient with the implementation of hassle free. To implement this mobile application will allow an end user to check the availability of parking space and look a particular lot accordingly. Each the user gets know to the availability / un-availability of the parking space prior to his/her entry into the parking place Implementation involves minimal human interaction and provides a seamless parking experience thereby reducing a lot of time wasted by the user in parking his/her vehicle. Ground sensors have been around for decades now and haven't changed much over the years. With the use of radar technology, ground sensors are installed into the concrete at each parking space or bay. When a car enters the space, the sensor below will identify an object above it and register that single

parking space as occupied. There are many ground sensor manufacturers worldwide - some big names being: Bosch, Smart Parking, Libelium and Nwave.

II. LITRATURE SURVEY

A. ADITYA BASU [1]-

B. He's says that Smart Parking system typically obtains information about parking spaces in a particular available position. It involves using low-cost sensors, real-time data collection and mobile phone enable automated payment system that allow people to reserve parking in advanced or very accurately predict where they will likely find a spot. The monitoring modules includes ultrasonic sensors/ ambient light sensor which identifies the free parking space and transmit the Information to control unit through Zig Bee.

Limitation: The limitation of this paper is that it does not include payment system, so it is not application for payable parking.

C. ANUSOOYA G & KUMAR KANNAN [2]-

D. Says that, the main objective is to avoid the cramming in the car parking area by implementation an efficient car parking system along with a user friendly application for an ease of use .Normally at public places such as multiplex theatres ,market areas, hospitals ,function-halls ,offices and shopping malls ,one experiences the discomfort in looking out for a vacant parking slot ,though it's a paid facility with an attendant /security guar d .The parking management system is proposed to demonstrate hazel free parking

Limitations: If card is lost, it can be misused by some unknown person

III. PROPOSED SYSTEM

The proposed system is used by the user to reserve the parking slot. Here the user can reserve the car parking slot. Once he enters the slot the time will get started later user

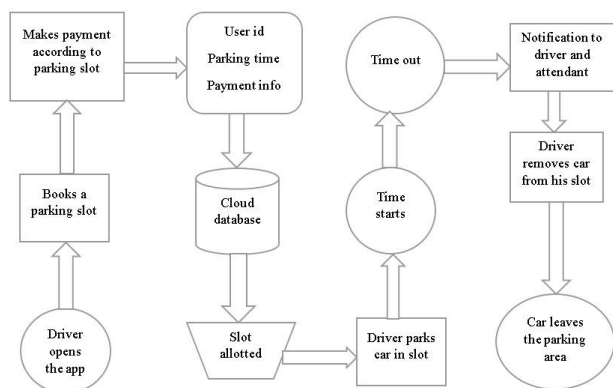
leave the slot, he needs to pay the amount for the period is placed his car in the slot area.

A. System Design -

The design of the system architecture describes the structure, behaviour and more views of the system and analysis. The goal of the design is to produce a module of the system which is used to build the system. In the proposed system. Initially once the user login into the application he can view the real time parking slots that are available to park. After once he views the slot based on FIFO method the parking will get allocated to the users so once he selects the parking slot by entering all the required information, he is able to reserve the parking area.

B. System Architecture -

The goal of design is to produce a module of the system which is used to build the system. Fig 1 shows the proposed system where:



1. The user will register to the application, later he gets login into the application by entering the username and password
2. Initially in the homepage he is able to view the real time slots that are available
3. By viewing the availability of the slots, he selects the slot area and enters the required information such as vehicle number, parking slot number, in time out time.
4. The data is sent into the cloud that slot gets allocated to the user.
5. Once the selected-out time is getting in into the finish, if the person did not receive back his car the alert message will be sent to the user.
6. Later the user leaves the parking slot area he gets in to paid to the respective period.
7. Later the availability of the slots will get updated in the homepage to view. B. Algorithms:

Algorithm can perform calculation, data processing, and automated reasoning tasks. As an effective method, an algorithm can be expressed within a fine amount of space and time in a well-defined formal language for calculating a function.

Algorithm 1: Algorithm of System Operations.

Step 1- Start

Step 2- If user not registered

User register into the system

Else

Login into the system

Step 3- User sends the request

Step 4- Staff will receive the request

Step 5-if parking space is not available

Staff will send the message that slot is not available (try another park! Unavailable space)

Go to step 3

Else

Staff will send the reserve parking slot number of the user

Step 6- user enter the car parking

Step 7-End

Algorithm 2:

Step 1- Start

Step 2- detects the vehicle using the ultrasonic sensor

Step3- Update the staff table

Step 4- if the vehicle is leaving

Update the staff table

Go to step 2

Else

Go to step 2

Step 5-End

After parking the car, the ultrasonic sensors detect the change in the signal. The system updates the state of each lot every 2-3 minutes to update the table case, the achieved by the setting of the system as shown in algorithm 2: The new message will be selected based on the reserved parking lot of the current vehicle

C. Working process of parking slot

When the ultrasonic sensors sense the presence of the vehicle it will send the signal to the Arduino. Then Arduino will transmit the signal to the relay .Relay is connected to the led bulbs .When it receive the signal sent by the Arduino , based on that signal it will on or off the bulb .Ultrasonic sensor work by emitting sound waves then wait for the sound to be reflected back .When the car enters the respective slot ,the sound waves sent by the ultrasonic sensor hit the car and reflected back and sense the presence of car .

IV APPLICATIONS

The importance of smart vehicle parking:

1. The system enables the user to reserve a particular parking space in advanced.
2. Accurately sense and predict spot /vehicle occupancy in real time.
3. Guides residents and visitor to available parking spot.
4. Availability information in specific parking district.
5. It also equipped with payment option.
6. Helps the free flow of traffic in the city leveraging AI&ML Technology.
7. Smart parking plays important role in creating better urban environment by reducing the emission of CO₂ and other pollutants.
8. End user function.
9. Highly scalable & Robust

smart phones' embedded sensors and short-range communication technologies.

V. CONCLUSION

In conclusion, car park user management issue raises huge concern for organization and park manager. The problem which arises while working with smart parking system as well as the solution has been described which gives a good platform for all the users. With the implementation of smart parking system, it assures the ease of life for individual who struggle in daily routines of their day-to-day life. The system that we propose provides real time information regarding availability of parking slots for them by this time from searching for parking slots.

VI. REFERENCES

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