IOT BASED SMART CAR PARKING SYSTEM

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Abstract :Nowadays parking facilities is a huge problem in modern society. Increasing the number of car and lack of free parking slots. Due to increase the populations, the number of cars also increased but without sufficient parking space many problems have been created. In This Paper search for the parking space is time consuming, process which not only effects the economy activity efficiency but also the effect the environment. This process sends the data in their real time to place the car at available position. It involves the real data collections using low cost sensors and display board display the vacant space regarding information to the user in particular real time. Currently used IOT will be effectively and efficiently used in daily environment to provide different services to different users. The device that we build will get the data of vacant parking slots. The growths of IOT have given the new possibilities *in terms of the parking slots.*

***Keywords*-- Wireless Sensor, Parking Slot, Intelligent Car Parking System, Internet of Things, Smart City, Arduino UNO.**

I. INTRODUCTION

Nowadays parking facilities is a huge problem in modern society. Due to increase in the populations, the number of cars also increased but without sufficient parking space many problems have been created. Sometimes when we want to go any particular place but parking slot is not vacant at that time we face thewastage of time and many more parking problems created. Sometimes when we want to go to any particular place but parking slot is not vacant at that time we face the wastage of space, wastage of time and many more parking problems created.

The main aim of this project is finds a solution to the traffic congestion and ease the way to get a parking slot. It eliminates the unnecessary travelling of vehicles across the filled parking slots in a city. Car parking systems are rarely available in the market and available systems are not good and effective, systems are costly too. The major scope of the system is to provide accurate location of the car. This system will help in the efficient management of parking in particular slots. It also improves theparking facilities of a parking area. The ideal 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 car parking facilities and traffic management systems.

The smart parking system that we propose is implemented The smart parking system is designed by making use of IOT supportable hardware's such as infrared sensors, Arduino board, Registers and LEDs. The system use IR sensors to detect the car. Sensors respond to the system to the availability of the car above the IR sensor. The sensors send data to the microcontroller, and microcontroller processes this data and transmits over display board. If the car is above the IR sensor, it will return the value 1 and the LED glows RED. If the car is not present above the IR sensor, it will return value 0 and the LED glows GREEN. This system will help in Time saving for particular area. It can be used in infrastructure like hospitals, malls, official area, etc...Developed Simple infrastructure design. Using this unique idea Probability of accidents is very less.

II. RELATED WORK

Increase in the populations and traffic congestion also increased but without sufficient parking space many problem havebeen created.Field but also from economic interests. Drivers can efficiently find parking spaces with smart parking services.main Methodologies used in the existing work and summarize their common goals and visions to solve current problem. The concept

There are prominent words in IOT are "internet" and "things". INTERNET means a global computer network providing a variety of information and communication facilities and connecting systems. Internet enables sending, receiving and communicating information. THINGS are used to refer to a physical object, an action or activity.[1] The smart parking system is designed by making use of some IOT supportable hardware's such as Arduino UNO, LCD display board(16*2), IR Sensors, Battery, Register, Capacitor, Crystal. The IOT based parking management system that allows for efficient parking space utilization using IOT technology. The automated parking system using IOT that we will develop can be implemented in basement. IOT module that is used to monitoring and checking the availability of the parking slots and

given output to the particular users using LCD display board.[2] Thus, the system solves the parking issue for basement and get users an efficient IOT based parking management system.

Fig 1 Iot Based Smart Car Parking

III. REQUIREMENT ANALYSIS

In this part, we discuss the requirement parts for designing our system. All the requirements can be fulfilled but we still need to look on the issues faced by the wireless sensor. In this section, we list the important requirements of parking system and then analyze the feasibility of the system. The main objective is to attract all the drivers and help to remove the traffic congestion. Thus the basic requirements are following.

A. Arduino UNO:

ArduinoUNO is used open source microcontroller board based on the microchip. The board contain with sets of digital and analog input/output pins that may be interface to various expansion board and others circuits.[3]Arduino is a Communication and programming of the sensor level components. Arduino is one type of software or machine which is operate as we want. The main thing in project is arduino which is connected to multiple IR sensors by the sensor we can get which place available for parking,[4] the data will be processed and output will be showed on the LCD display board.

B. IR Sensor:

IR stands for infrared. Sensors are the devices which sense the data from the physical world and transmit on the environment.The system use infrared sensor to detect the car. Sensors respond to the system to the availability of the car above the IR sensor.
It used IR technology to sense if a car has arrived on gate.[5] Some benefits of using IR sensor are low power requirement, simple circuitry and their portable features.Driver the parking slot allocated to him/her using IR sensors. When a car has already occupied a parking slot the LED will glow GREEN.

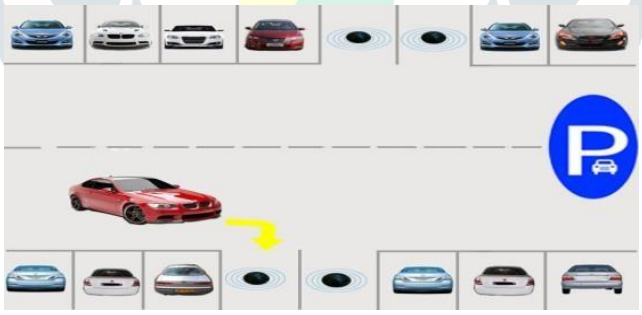

Fig 2 IR Sensor Detectthe Car

C. UltrasonicSensor:

The work of these sensors is sense the parking area and determine whether a parking slot is vacant or not. In this case we are using ultrasonic sensors to detect the presence of a car. The ultrasonic sensors are wirelessly connected.Ultrasonic Sensors are almost completely insensitive interfering factors.[6]

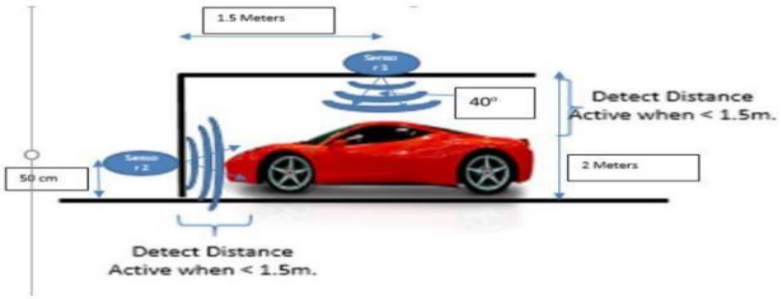

Fig 3 Ultrasonic sensor detect the car

Detection the car during the entry and exit. When The Car Enter The Parking Zone The first phase was to make the car detectable. Thus, two ultrasonicsensors were placed on the parking lot. The first sensor was placed above the car at a height of two meters from the ground, whereas the second was placed in front of the car with a fifty-centimeter ground clearance. The first phase was successful with the two sensors detecting the vehicle within proximity of less than 1.55 meters from each sensor.[7].Another way car is detected by number plate.

D. Led (Light Emitting Diode):

For every parking slot it will be given color and for occupied parking slots, it will be green color, this will provide a quick indication for the car owner to find and empty slots easily. LED is long life, Flexible dimming, low maintained LED lights enable you to create more supportable car park lighting while keeping visitors safe and comfortable.

E. 7 Segment display:

7-Segment display available in two configurations common cathode and common anode. all the 8 led terminal have their one end internally shorted and linked with the middle pins such that it serves as a common terminal (cathode or anode). 7 led are used to from the digits while the 8th one is for the dot which helps in identifying the correct orientation. It is widely used in digital clock, calculator, and various other Applications where numerical display is required. it can be used in place of dot matrix display. Which are more complex than seven segment display. 7-segment display can also also be used to display some alphabets. It is a group of light emitting diode (led) arrange in figure of 8 patterns. [8]

F. Servo Motor:

Servo motors around for a long time and is utilized in many applications. It is small in size but packs a big punch and is very energy-efficient. These features allow them to be used to operate remote- controlled or radio energy-efficient. These features allow them to be used to operate remote-controlled or radio controlled toy car and airplanes .it has an operating voltage of 5v.

IV. IMPLEMENTATION & WORKING

The parking system is designed in applicable for covered parks, open parks and street side Parking.IOT architecture for smart parking system which contains provides to store information about status of parking slots in a parking area and etc. The centralized server manages to store entire smart parking systems information such as number of slots,[9] availability of vehicles etc. And this information will be show in display board. This smart parking system which consists.

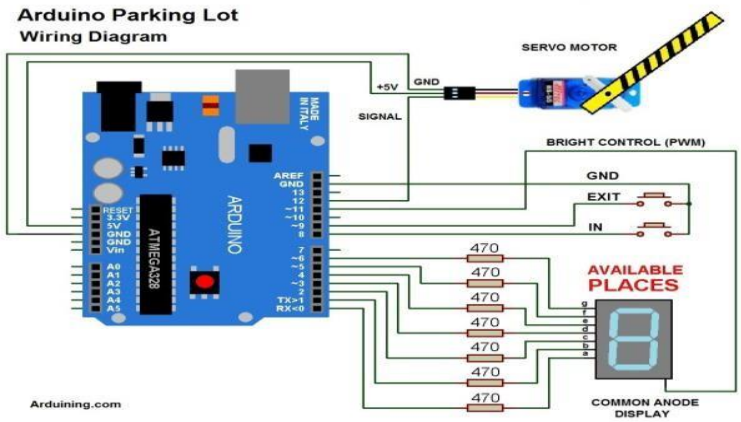

Fig 4 Circuit Diagram Of Arduino Parking Slot

In this paper we talk about the implantation and working of the system in a real world scenario. Parking system spaces are very important in nowadays. The smart parking system is designed by use of IOT supportable hardware's such as infrared sensors, Arduino board, 7 Segment display, Registers and LEDs, and Servo Motor.[10] The system use IR sensors to detect the car. When the car entered at the entrance we put barrier. With the help of IR Sensors car is detected and with the help of Servo motor Barrier will open at 90 degree then gate will be opened. We already set a timer so the barrier will open for 10 second and hold for 5 second until the car is entered and then barrier is automatically closed .[11]The another IR Sensor is used to open and close the gate. If all the parking slots are full then barrier will not be opened. Sensors respond to the system to the availability of the car above the IR sensor. If the car is present above the IR sensor, it will return the value is '1' and the LED glows RED. If the car is present above the IR sensor, it will return value '0' and the LED glows GREEN. The sensors send data to the microcontroller, the microcontroller will be programmed and processes this data and displayed slots [12]The seven segment display can used to track of the number of cars who have visited the Mall, and count number of cars passed and in Visited the Mall, and count number of cars passed and in parking slots to count and display number of cars inside the parking slot In particular real time.

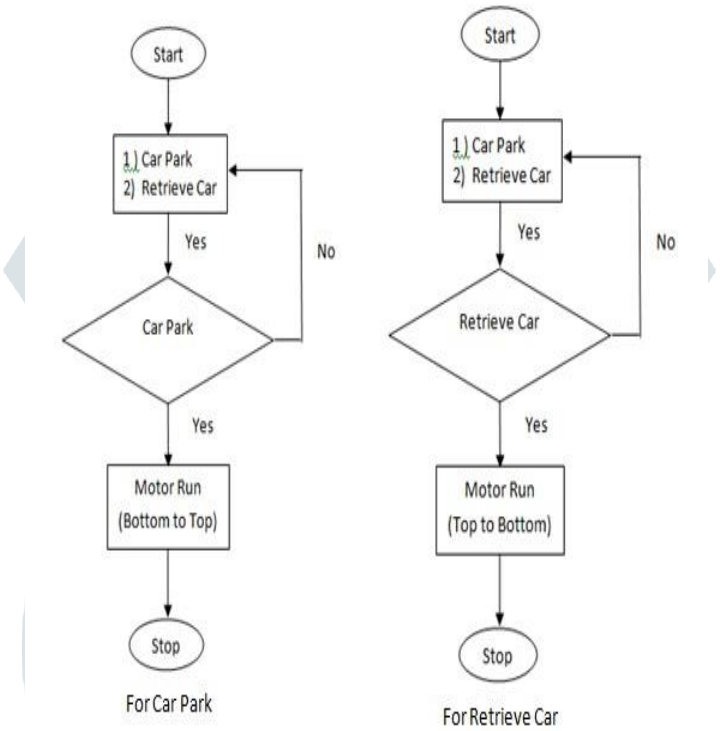

Fig 5 Flow Chart Of Car Parked And Exit

V.CONCLUSION

The smart car parking system has been implemented using various sensor circularity. It is an efficient system for car parking which prevails traffic congestion. Our project is aimed at making system cost effective and user friendly. And use can get information in particular real time and driver can find and park their vehicle with at most comfort while saving their time.

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