IOT BASED VEHICLE PARKING MANAGER

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Abstract: Population of India is very huge. Each person in the country has his own vehicle. In the 21st century, parking issue of vehicle in public place is very high such as malls, multiplex etc. Answer of this problem is IOT Internet of Things. Our Proposed system is connected with server and system updated time to time, so person knows about availability of parking slots on mobile application. Our System is more useful and efficient to address the problem of vehicle parking. Our system aims to reduce the human intervention to the minimal by automating the process of car parking.

Keywords: IOT, Android, QRcode, Parking.

I.   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'. The two prominent words in IoT are "internet" and "things". Most of the times we need to traverse through multiple parking slots to find a free space for parking. The problem becomes more tedious if the parking are multi-stored. Thus the problem is time consuming [1]. This situation calls for the need for an automated parking system that not only regulates parking in a given area but also keeps the manual intervention to a minimum. Our proposed system presents an Autonomous car parking that regulates the number of cars that can be parked in a given space at any given time based on the parking space availability [2]. According to a report, Smart Parking system could benefit in saving 2, 20,000 gallons of gas till 2030 and 3, 00,000 gallons of gas by 2050, if it is executed perfectly. In order to alleviate this condition, many smart parking facilities evolved but failed to bring relief to all. They could only give the parking information but didn't prove to "smart" enough. Thus this system proves to be useful for the purpose of the car parking automation and thereby helps reduce the car driver's time, as the searching of the free parking space is handled by the Parking Control Unit [3]. There is a lot of fuel and time wasted by countless commuters to find for a place for parking. This became our main motivation to develop a system were commuters can get parking information on finger tips, because time saved is time earned.

II.   LITERATURE SURVEY

Various methods are prevalent for development of autonomous or intelligent parking systems. Study of these systems shows that these require a little or more human intervention for the functioning. One of the intelligent systems for car parking has been proposed by making use of Image processing [5]. In this system, a brown rounded image on the parking slot is captured and processed to detect the free parking slot. The information about the currently available parking slots is displayed on the 7-segment display. Initially, the image of parking slots with brown-rounded image is taken. The image is segmented to create binary images. The noise is removed from this image and the object boundaries are traced. The image detection module determines which objects are round, by estimating each object"s area and perimeter. Accordingly, the free parking space is allocated. A vision based car parking system [6] is developed which uses two types of images (positive and negative) to detect free parking slot. In this method, the object classifier detects the required object within the input. Positive images contain the images of cars from various angles. Negative images do not contain any cars in them. The co-ordinates of parking lots specified are used as input to detect the presence of cars in the region. Haar-like features are used for feature detection. However, limitations may occur with this system with respect to the type of camera used. Also, the co-ordinate system used selects specific parking locations and thus camera has to be at a fixed location. Limited set of positive and negative images may impose limitations on the system. Number Plate Recognition technique [7] for developing autonomous car parking system uses image processing basis to process the number plates of the vehicles. In this system, the image of the license number plate of the vehicle is acquired. It is further segmented to obtain individual characters in the number plate. Ultrasonic sensors are used to detect free parking slots. Then the images of number plate are taken and analyzed. Simultaneously, the current timing is noted so as to calculate the parking fees. The LCD displays „FULL" sign to indicate that a parking lot is not available. However some limitations with the system include background colour being compulsorily black and character colour white. Also, analysis is limited to number plates with just one row. Smart Parking system [8] designed proposed a mechanical model with an image processing facility. The car would be parked with the use of lift at multiple levels. Also, image processing is used to capture the number plate and store in database for comparison to avoid illegal car entry. Thus, we aim to propose a car parking system that represents a fully automated model with minimum human intervention and overcome the limitations of existing systems.

III.   EXISTING METHOD

In earlier systems presence of a system was necessary for management of parking slots i.e for checking available parking slots, occupied parking slots, allotment of slots for new coming vehicles etc. As this is done manually this may sometimes be erroneous and time consuming Page 27 process. There are many problems faced by the customers. Some of them had to wait for a long time for the allotment of slots, when parking traffic increases manifold. This may increase outside traffic as well. The other problem is no proper charges. Details of number of vehicles entering and leaving the parking place may or may not be available with the parking staff. This causes inconvenience to the customers as well as staff managing the system.

IV.   PROPOSED WORK

 The system will require a Raspberry Pi with various IR sensors attached to it. The IR sensors will determine the parking status. The operating system of the raspberry Pi is Raspbian and to see the status of the parking in the parking lot we use the display unit for monitoring and remote server page. The parking lot setup (Raspberry Pi and IR sensor) will be accessible to the server over Internet of things. The server webpage will be used by users to check the parking status on their cell phones, and hence it will be the User interface of our project. The Raspberry Pi is interfaced with the IR sensors to determine the parking status will be the hardware setup of the project. Hence the raspberry pi becomes the hardware module of the system
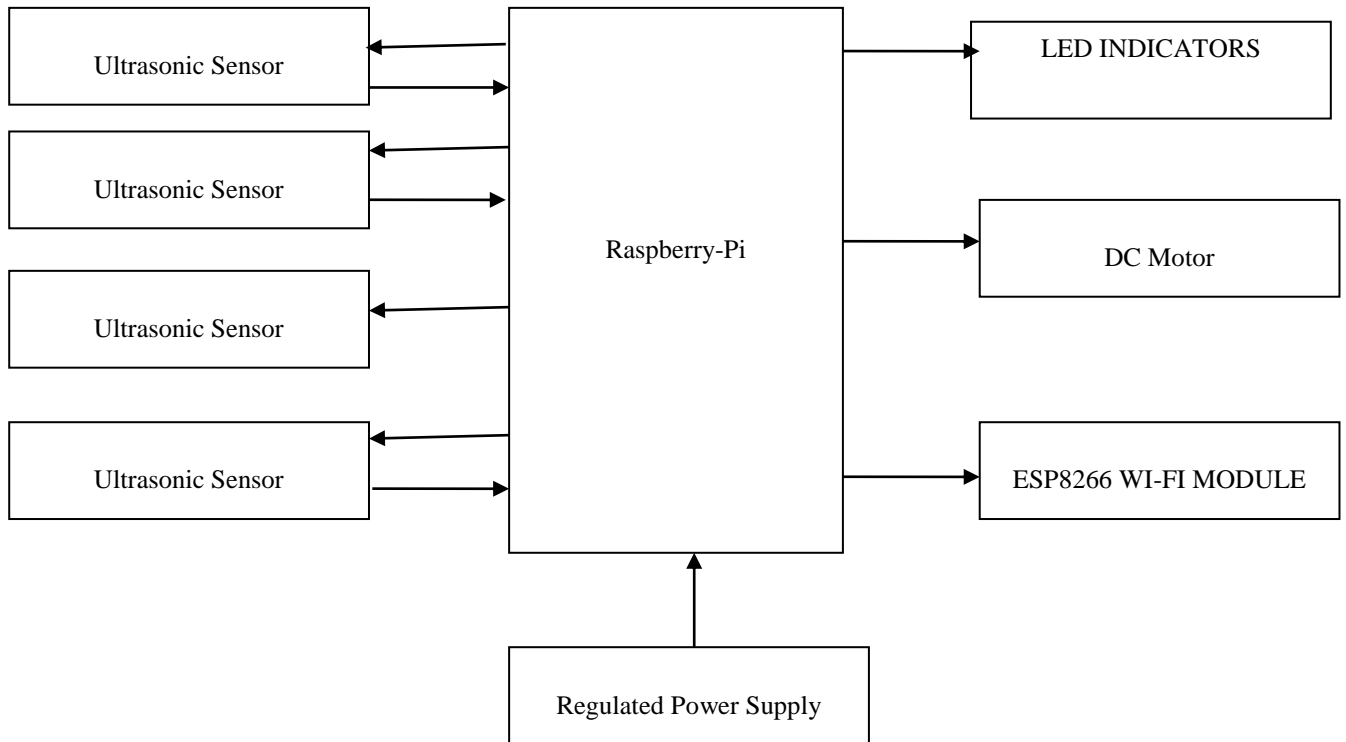
Fig. 1: IOT based Smart Vehicle Parking Manger

GOALS AND OBJECTIVES

_ To minimize the effects of on street parking upon road safety and congestion.

_ Enhance the security with simplifying parking system.

_ Smart system that parks a number of vehicle with latest space possible to create the garage efficient by using efficient management.

CONCLUSION

Internet of Things stands out to be the indispensable technology implemented along with Cloud Computing. To be a smart city, Smart Parking facility is an essential service. Previous technologies were exploited which proved to be either not efficient or too expensive. The sensors used to detect the vehicle are the essential components. This will make the management of the parking spaces efficiently, by eliminating need of manual labour work.

FUTURE WORK

We infer that our future work would facilitate parking issues and decrease traffic congestion and pollution created by the search for parking. System can be extended to multi-level and multiple parking areas by making potential changes in the hardware setup. SMS sent through Android Application can be made secure by applying encryption algorithms. Also, for security purpose, Login facility can be provided to the users.

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