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Automated Parking Facility

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Abstract: *Over the years, there has been lot of changes that has taken place which affects human life. Due to increase in the number of the vehicles in cities have led to major problems such as traffic, pollution, etc. One such problem that is the reason for traffic and disturbance is the parking problem. People usually park their vehicle in an indiscipline manner which leads to informality. Also people usually waste their time and efforts for searching proper space to park their vehicle. The aim of this paper is to resolve this issue related to parking. IoT based system named Automated Parking is implemented which involves sensors for detection of free spaces and LCD's for display purpose. RFID tag for payment purpose. This system allows the user to get the nearest free slot for parking which avoids the wastage of the time and also avoids traffic.*

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I. Introduction

Nowadays, parking of vehicles has become a major issue. The problem created by the vehicles includes traffic,airpollution,noisepollution,etc.People usually park their vehicles in manual way which usually are unplanned and lacks discipline and leads to informality. Here is a solution for such problems by implementing the prototype system called Automated Parking system that allows vehicle drivers to find the efficient and nearest free parking places.Automated parking involves technologies such as IoT to efficiently manage the existing parking problems. It has become popular in recent times due to its low-cost,lowpower sensor technology and its connectivity for efficient data transfer.Internet of thing(IoT) sends the data through network without invloving human interactions. Automated Parking system is designed to minimise the user's time and also gets the nearest free parking slot. It also helps in avoiding traffic in the parking slots.It will also be useful as the automated parking system helps drivers to find a vacant spot using sensors that detect the presence of vehicle and finally direct the drivers to the available locations. Motivation: The motivation of the work is, we want to digitize our daily life as well as our country.

Objectives: To introduce automated parking facility in India and get advantages from it. To compare manual parking facility with the automated parking facility. To increase the economic of our country by implementing this method.

II. Related Research

Having a rapid growing economy [1], the number of people using vehicles has increased exponentially raising to the need of more parking space. In this paper,the aim is to propose an IoT based Smart parking system that integrates with mobile Application. Features like providing a reserved parking space, authenticating the user, finding the nearest slot based on the vehicle size has been provided. To identify free slots IR sensors are used. [2] In today's dominated economy [2] In the fast growing urban area the parking space problem can be turned into a new opportunity brought by the recent trends to meet the world's connected perpetuity. This paper makes it easy for the user to automatically find a free space at a lower cost without consuming much time and fuel. Thandee system is based on WIFI network.The author has [3] presented the design, principle and implementation of smart parking which is based on wireless sensor networks, allowing the vehicle driver to find vacant parking spot. The scheme is based on WSN, Embedded Server, Central Server and

Mobile application. The driver will be able detect whether the parking slot is free or not, by using mobile devices. The sensor node in the parking slots detects the state and reports it to embedded webserver. Finally, the information is sent to central webserver by using WIFI network. [4]This paper will help to monitor parking area by informing the drivers about availability of slots and also provides the direction to the available slots. It is based on Wireless Sensor Node,RFID, ZigBee technology.

WHAT'STHEPROBLEM

In present day's people are facing many problems with the manual car parking facility. As there will be no discipline and this creates a big problem. Most of the time this will create a huge traffic jam. The Manual parking system has many disadvantages such as improper usage of land, traffic jams, human intervention etc. The other constraint in the manual parking system is billing to which another queue has to be formed and once the person is done with his work and comes back to get the vehicle, there is a possibility of not finding his vehicle quickly because of large number of vehicles parked.

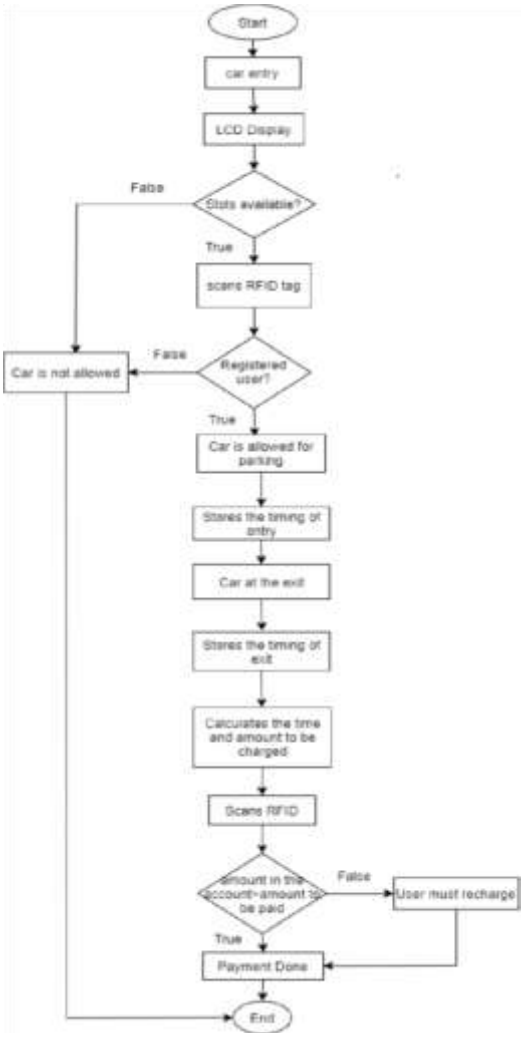
THE SOLUTION IS

The proposed automated parking facility consists of sensors to monitor the availability of slots and condition of allowance for the cars to park. A LCD is placed at the entrance of the parking slot that allows only registered user and also to check if the slot is availability or not. The proposed system also solves the problem of finding the vehicle, when there are large number of vehicles parked. Automated parking facility discusses the working of the system in the form of prototype. It also projects the recharged billing system where the user is recharged with the specific amount. During the authentication, the amount is deducted with respect to the parking time during the vehicle retrieving period. The parking slot is divided into specified slots which decreases informal way of parking.

SYSTEM FLOW

This flow chart will give a brief description of the work.

1.Firstly, car enters the parking area.2.At the entrance, LCD display is placed which will give the information about availability of slots.3.If slots are available, then the user must scan RFID tag.4. the time at which car parked and exit of the car will be stores to get the duration and accordingly amount will get deducted from the RFID tag, if sufficient amount is not there then user should recharge.



SYSTEM IMPLEMENTATION

Considering, there are n slots in the parking lot, n+2 infrared sensors and n ultrasonic sensors are used. Each parking slot is equipped with one ultrasonic and one infrared sensor. Entry gate and exit gate are also equipped with infrared sensor.

At the entrance:

On the arrival of car at the entrance gate, first it will check the vacancy of slots if slots are not available then car will not be allowed to enter. If slots are available then user will be asked to scan the RFID card. Each RFID card will have a unique 12 character array. When the rfid card is scanned, this 12 digit character array is read. Only registered RFID card will be allowed to enter. With the help of timer entry time will be stored.

Assignment of slots:

Parking slots will be assigned to the user in ascending order. i.e. nearest available slot will be assigned. The assigned slot number will be sent to user's mobile number so that user can find their car easily without wasting time.

At the exit:

On the arrival of car at the exit gate, user will be asked to scan the RFID card. With the help of timer, time for the parking will be stored and accordingly amount charged for the user and the amount will be displayed on the LCD. In the RFID card, if balance is sufficient then amount will be debited automatically and exit gate will be opened. If balance is not sufficient, then a text message will be sent to user's mobile number stating "please update your balance". To recharge their card, user should send a text message to the administrator with their RFID card number and amount to be recharged. On successful sending of the message, balance will get updated and exit gate will get open.

III. Result And Discussion

As parking vehicles is a big issue automated parking allows user to get access about the availability of parking slot. This helps drivers to reduce the effort searching free slots and time. Major advantage is that there will be no car theft without RFID card. It also projects the recharged billing system where the user is recharged with the specific amount. During the authentication, the amount is deducted with respect to the parking time during the vehicle retrieving period

Test Case Number	**Testing Scenario**	**Expected result**	**Result**
TC-1	RFID tag is not registered	Invalid card	Pass
TC-2	No slots available	Displays "Parking slots are full" and entry gate should not open	Pass
TC-3	Balanace not sufficient in RFID tag to make payment	An SMS should be sent to the user phone number and exit gate should not open.	Pass

IV. Conclusion And Future Work

In this work, IoT based automated car parking integrates many devices and sensors to find the availability of vacant parking slots. The proposed system will reduce the driver's effort and time for finding the free slots and even with the use of RFID card they can make payment automatically. This prototype can be extended by allowing multiple user registering for single RFID card. To adopt this automated car parking system with android application which benefits the user in such a way that availability of slots will be displayed on their smart phone application and allowing users to reserve a slot online before reaching the parking area.

References

[1]. J . Cynthia, C.BharathiPriya, & P. A. Gopinath (November 2018) . IOT based Smart Parking Management System. International Journal of Recent Technology and Engineering.
[2]. JayaksheiDadajiBachhav, &Prof.Mechkul M. A. Smart Car Parking system (IRJET) 2019.
[3]. Yang, J., Portilla, J., &Riesgo, T. (2012, October). Smart parking service based on wireless sensor networks. In IECON 2012-38th Annual Conference on IEEE Industrial Electronics.
[4]. Patil, M., &Bhonge, V. N. (2013). Wireless sensor network and RFID for smart parking system. International Journal of Emerging Technology and Advanced Engineering, 3(4),188-192.
[5]. https://www.circuitstoday.com
[6]. https://www.electronicsforu.com

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