IOT Based Smart Parking System

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***Abstract*: The Internet of Things (IoT) is able to connect bil- lions of devices and services at any time in any place, with variousapplications. A modern urban city has over a million of cars on its roads but it does not have enough parking space. Following project tells about the development of IoT Based Smart Parking System.The majority of proposed solutions address the problem of finding unoccupied parking space and ignore issues such as information about the nearest car parking. This project proposes a smart car parking system that will assist users to solve the issue of finding a parking space and to minimize the time spent in searching for the nearest available car park.**

***Keywords:* IOT, Arduino, Smart city; Smart Parking, IR sensor.**

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 important words in IoT are "internet" and "things". Internet means a vast global network of connected servers, computers, tablets and mobiles using the internationally used protocols and connecting systems. Internet enables sending, receiving, or communicating of information. Thing in English has number of uses and meanings. Dictionary meaning of 'Thing' is a term used to reference to a physical object, an action or idea, situation or activity, in case when we do not wish to be precise. IoT, in general consists of inter-network of the devices and physical objects, number of objects can gather the data at remote locations and communicate to units managing, acquiring, organizing and analyzing the data in the processes and services

With the increasing number of vehicles, parking has become a major issue for the people. Today in many cities it has become almost impossible and quite expensive to build new parking areas for the vehicles as they have almost reached its full occupancy. Improper use of parking areas leads to congestion for drivers or those who are seeking the parking in that particular area. It has been observed around 28-45% of traffic congestion is because of unavailability of parking at an appropriate time. Increasing traffic in urban cities causes more pollution that even causes various body diseases. An effort is required to manage the parking facilities and resources so as to reduce the traffic congestion on roads and saving the time of people in search for parking and even reducing the pollution indirectly and thereby improvising the quality of life as well. Nowadays smart cities focus more on sustainability
by developing more resource managing technologies
like the internet of things. The majorities of proposed solutions address the problem of finding unoccupied parking space and ignore issues such as information about the car parking. This project proposes a smart car parking system that will assist users to solve the issue of finding a parking space and to minimize the time spent in searching for the nearest available car park.

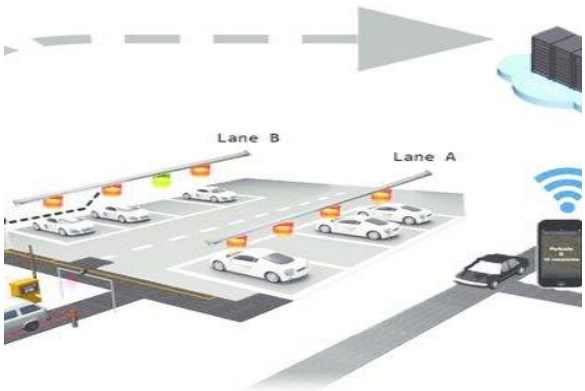


Fig: Smart parking system.

II LITERATURE REVIEW

From the research carried out by Bonde et. al. (2014), it was studied that how automation is pushed into the parking system with the used of IoT. Bonde specifically designed its model to maximize automation in the process of automatic parking system with the use of IoT. Bonde system of the automatically parking system was a little different from other systems as it was studying to make the system as a less human dependent [1]. Basavaraju S R(2015) developed a smart automation parking system at the low cost as per the study it was analyzed that video sensors could be very expensive which would ultimately make the automation parking

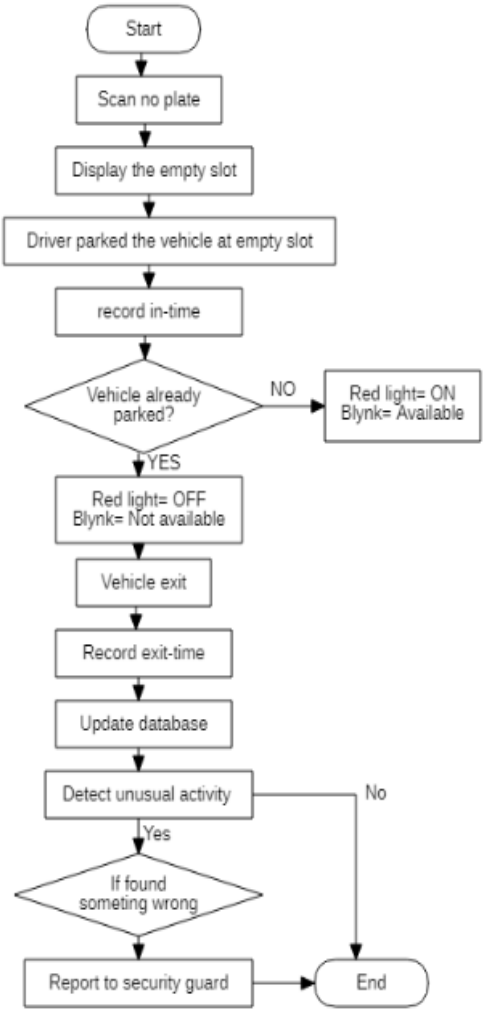
system more expensive and the main reason not adopted by many in cities so they used Raspberry Pi based parking sensors which would reduce the overall cost and helped in suggesting ways on how to automate this system more efficiently [2][3]. .Sachet Rajbhandari, Dr. Vikas Deep, Dr. Bhumika Thareja, Dr. Deepti Mehrotra proposed a smart parking system (IoT enabled) which continuously monitor and check for the available area for parking and engage the area in the particular place it is designed for. This would be the most efficient system designed for the smart cities which would definitely help in the betterment of the traffic conditions that people have been facing over a decade now, Thus the system is designed for optimum utilization of the parking spaces will save time and by these system traffic congestion would be reduced to a greater extent[4]. Kaivan Karimi(2013) in his research paper highlighted on how IoT is the next big thing in the coming era and he also simply defines that the ultimate pervasive device is the smartphone and how it can be used to control all the automation in your house or elsewhere[5] Rongxing Lu(2009) defined in his study on how to smartly secure and privacy-preserving parking spot
2018 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT)based on vehicular ad hoc networks which would be much more simple for cars to be parked in big spaces [6][7]. This model was developed employing parking lot RSUs to manage the whole parking lot through vehicular communications. Eleni I. Vlahogianni(2014) studied basically two different types of predictions namely the probabilitcy of a free space in subsequent time intervals, and prediction for short-term parking occupancy in particular regions [8].

EXISTING SYSTEM

Existing method may be considered as an issue since the raw data is sent promptly from distributed sensors to the parking area via cloud and then received back after it is processed. This is considered as an expensive technique in terms of the data transmission as well as the energy cost and consumption.

PROPOSED SYSTEM

When the vehicle will enter the parking zone , first of all camera will scan the number plate of the vehicle. After that the Car number will be gather from the captured image and number will be check, weather any car with same number is already parked or not in parking slot, whether the respective car owner is already has the membership of the parking area, if yes then check his membership is expired or not. If the respective user is member, then he will not be charged for parking. Then the system will record the in-time of vehicle and store the image of the vehicle. The database will store information of your vehicle. That information includes Vehicle owner name, Vehicle name, owner's details, membership detail and in-time of your vehicle. At the time of exit, the exit time and image of car will be recorded in database. This is how the in-time and exit-time will be updated in database. If vehicle is already parked then the red light is on and parking slot is available otherwise red light is off and parking slot is not available.
There is some time, when there are not so many security guards are available. In thus situation we need something to make sure everything is okay. So, we are creating a system which monitor the parking area, it will detect the unusual activities in parking area and report to the security guard in the cabin. So, guard can take actions according to situations.



IV CONCLUSION

This study has proposed a smart parking system that enhances the performance of saving users time to locate an appropriate parking space and reduces the general costs for moving to chosen parking space. Smart parking facilities and traffic management systems are two important aspects of building a smart city. Internet of Things has been playing a very essential role in the new digitized world, full of various technologies, offering us approaches to make our daily routine much easier and faster. This project proposes a smart car parking system that will assist users to solve the issue of finding a parking space and to minimize the time spent in searching for the nearest available car park.

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