International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 07 | July -2020 ISSN: 2582-3930

An analysis report of implementation of Smart Parking System using Internet of Things

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Abstract *–The numbers of vehicles are increasing day by day and it is very difficult for the driver to search a parking space among few. Smart parking space systems are proved to help drivers to find and park their vehicle in cost effective manner. Smart Parking System (SPS) are enable the user to search the nearest parking area and gives availability of parking space in that respective parking zone. And it primarily focus on reducing the time consumption and fuel consumption for searching the parking spaces and also it removes the unnecessary travelling through filled parking spaces in a parking zone. Thus it reduces the fuel consumption which in turn reduces carbon footprints in an environment. Our system is based on Internet of things (IOT). IOT is a concept used to connect all our surrounding things to a network and communicating with each other. It is broadly classified into three categories sensing, processing and connectivity. This paper gives review about the various smart parking systems, which uses cloud database, RFID, wireless sensor nodes, optical sensors, microcontrollers and filtering algorithms like collaborative filtering algorithm.*

Keyword: -Internet of things (IOT), RFID, wireless sensor nodes, optical sensors

I. INTRODUCTION

Smart parking space is a tool and technique that provides the available parking space for any updated parking slot at any given time. With the increasing number of vehicles, finding a parking spot is becoming difficult and consumes more time. Traditional parking system involves a manual procedure which entails the user to find a free spot by his own expertise. In recent times there have been a number of smart parking system that intimates the user with the number of parking spaces which are available. These systems reduce the time and cost taken for parking. With the usage of the smart parking system the user will be able to obtain the live details of the parking and allows the user to reserve for a spot. Specifically IoT can be described in the form of an equation which is shown below:-

Object(physical) + Controller, Sensor and Actuators + Internet = Internet of Things(IoT).

Internet of Things (IoT) can be stated as anything which could be attached or connected to internet gives the results into "Internet of Things". IoT is a concept used to connect all our surrounding things to a network and communicating with each other. It is broadly classified into three categories sensing, processing and connectivity. The Internet-of- Things technology (IoT) has created a revolution in many ways in life as well as in smart parking system (SPS) technology. As parking becomes a very essential need of our day to day life. Therefore, this system looks forward to plan and acquire a smart parking system before heading out towards our destination in order to reduce the hassle of driving around looking for a parking spot during peak hours. Nowadays in cities, finding an available parking spot is more difficult for drivers, and it tends to become harder with ever increasing number of vehicle users day by day. This circumstance can be seen as an opportunity for smart cities to undertake the actions in order to increase the efficiency of their parking resources, thus tends to reduce in searching times, traffic congestion and road accidents. Recent advances in creating low-cost; low- power embedded systems are helping developers to build new applications for the Internet of Things. As the number of population increased in the metropolitan cities, the need of vehicles also got increased. Ultimately, it causes problems in parking which leads to traffic congestion, driver frustration, and air pollution. When we visit the different public places like Shopping malls, multiplex cinema hall & hotels during the festival time or weekends it creates a lot of the parking problem. According to the recent research found that a driver takes nearly 8 minutes to park his vehicle because he spend more time in searching he parking slot. This searching leads to 30 to 40% of traffic congestion. Here we are going to observe how to reduce the problem of parking and to do secured parking using by the smart parking system.

II. LITERATURE REVIEW

S.no	Title	Author	Findings	Remarks
1	Smart Parking : Green IoT for Smart City	Ayushi Shrivastava and R.Harshitha June 2017	the data compression techniques used in the WSN model as well as in the central	energy reduction and probability of deployment of WSN at remotely areas is a

			data base so as to reduce the energy exploitation and achieve the goal of green IoT	long path and huge area for achieving the environmental goals
2	Automatic Smart Parking System using Internet of Things (IOT)	Dr Y Raghavender Rao May 2017	searching for available parking lots has been completely eliminated security feature of the system is enhanced with the password	the status of parking slots can be known from anywhere in the users webpage. This is achieved using Wi-Fi communication.
3	Automated Parking System using IOT	Sarang Joshi et.al. May 2017	simple, economic and provides effective solution to reduce carbon footprints in the atmosphere to access and map the status of parking slots from any remote location through web browser	optical sensor (Phototransistor) , depending upon the ambient light will help in determining whether the parking space is vacant
4	IoT Based Smart Parking System Using RFID	Prof.S.S.Thorat et.al. January 2017	maximizing their venue generation for the parking facility owners to booking of parking lots over a period of time from advance	mobile application can be extended up on other operating systems such as iOS, Windows ,etc. In the server , services can even be enhanced to the security measures like as fire, theft, etc.
5	Parking Availability for cars using IOT Technology	Varun Dilip Changede et.al. January 2017	Android application will be created that will empower a client to send data like his span of remain for parking space over the system without giving out individual data to the stopping office server	reduces the traffic congestion, need of manpower, usage of paper system can be further be extended for booking parking slots for vehicles for some time period from advance

III. METHODOLOGY

The main objective of this paper is to reduce the traffic jam that occurs in the urban areas which are caused by vehicles searching for parking. The system looks forward to plan and acquire a smart parking system before heading out towards our destination in order to reduce the hassle of driving around looking for a parking spot during peak hours. Nowadays in urban areas, finding an available parking spot is too difficult for drivers, and it tends to become hardest with ever-enhancing number of vehicle users. This condition can be seen as an opportunity for smart cities to undertake the actions in order to enhance the efficiency of the parking resources, thus leading to reduction in searching times, less fuel consumption, traffic congestion and road accidents. Recent advances in creating low-cost; low- power embedded systems are helping developers to build new applications for the Internet of Things.

IV. ANALYSIS

Thus, I have referred five different types of Smart parking mechanisms.In Automatic Smart Parking system, the user has to be connected to the Wi-Fi network of that particular parking area through which he is given access to the webpage and can know about the exact status of the parking spot.The state of empty slots of parking space can be known from anywhere in the users webpage. This is achieved using Wi-Fi communication. IoT Based Smart Parking System Using RFID, RFID readers are present on the parking area which captures the RFID information of each user. Before generating ofthe parking bill, IR sensors and RFID tags work together to know which vehicle is being parked and depending on the time period and the amount the corresponding bill is generated. The bike is detected on the parking area with the help of IR sensors. IR sensors are responsible to detect if a particular slot contains bike or not. This system minimizes the parking waiting time in a large- sized parking facility. This also helps in maximizing their venue generation for the parking facility owners. This would also help to reduce the necessity for man-power in the parking facility which would hugely reduce the cost and faults in the process.

V. CONCLUSION AND FUTURE SCOPE

In this paper, smart parking solution is presented as IoT application in the smart city, most types of sensor nodes for sensing of vehicle is used out of many sensors magnetic and smart eye.The hassle in finding for available parking slots has been fully avoided by reserving the slots via IOT system. The security feature of the system is enhanced with the password requirements upon entrance to the parking slot. The designed system could be applied anywhere because of its easy to use and effectiveness. In this research we have found slots of smart parking systems, sometimes the user may face difficulty in using a system, chances are less for user to like all the smart parking systems. This reduces the risk of searching the parking slots in any parking zone and this also avoids unnecessary travelling of vehicles across the non-empty parking slots in a city. The smart parking system is simple, economic and provides effective solution to reduce carbon footprints in the environment. This is well managed to access and map the status of parking slots from any remote area via web browser.This method would reduce the paper usage which ensuring a green system. In future we can work to construct system which allows the user in finding a parking slot effortless, reserve park space, navigation to reach car park and also the facility to monitor his car in the car park. It isa projectwhich can be extended by adding an application of reserving the parking spot before reaching the destination. It can be achieved by using GSM and RFID communication. It can be further extended to booking of parking lots over a period of time from advance. The mobile application can be enhanced up on another operating systems such as iOS, Windows, etc. In the server, services can be incremented to the security measures such as fire, theft, etc.

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