A Review Article of Parking System for smart City using Internet of Things

[1]Monika Bijore, [2]Monika Raghuwanshi

[1]M-Tech Student, [2]Assistant Professor, [1,2]Computer Science Engineering, RKDF College of Engineering, Bhopal, India. [1]bijore.monika@gmail.com, [2]monipriya21@gmail.com

Abstract **– Now-a-days parking has become a severe issue and even degrade, because of the growing number of automobiles universally. In this paper we propose an IoT based guidance for user as well as Upcoming self-driving vehicles to search parking space for the vehicle. it also helps user to choose the right vehicles to travel according to the parking spaces available to the destination point. it provides an intelligent guidance to the user, user can choose their travelling vehicle as two wheelers, four wheelers or public transport according to the traffic density. It aims to develop an intelligent parking guidance system. which reduces difficulty in conventional parking system. Device monitor the state of each parking slot by installing a sensor node on the slot. Accordingly, sensor senses the state of parking area and send state to central node server controller. The main processing unit collect the data from all sensor node and upload to the server using http protocol where user can check the parking status from anywhere using internet and any browser. The system can also integrate with the artificial intelligence network like google assistance and self-driving car. Google assistance assist user to choose right vehicle according to the traffic density and parking space available at the destination point. User can simply see the space available by clicking in google map of their destination building or social parking.**

Keywords **– : Ethernet Modem, Node MCU, Sensor node, Wi-Fi, IR, Sensor.**

I. INTRODUCTION

In these days, main problem in market, marriage garden, malls and may more palace where peoples gather with their personal vehicles has parking issues. It is because of the insufficient parking space. Now a day the vehicles in a family are greater than the head count of the family members, and due to this the vehicles are also increased in the city, which leads to the parking situation which is discontentedly falling short to the present requirements in the city. Due to this parking is difficult and it also increases the time needed to park the vehicle with increase in the fuel consumption of the vehicle. And during the working days the companies and offices are facing the problem of the parking in urban areas. Now a day's vehicles price is low, due to these four wheelers are most affordable to the low income group families, also the vehicles especially the four wheelers are occupying lot of space. Due to the growth in automobiles the parking space is not enough in this overfilled cities, whether at a shopping malls, railway stations and airport, problems with parking is a giant issue. Most of the time persons spend their time on searching parking, to park their automobiles. Thus, a heavy crowding occurs in the city due to which it is a tedious job to find the parking space for their vehicle. The most road traffic occurs only because of vehicle cramming in the city areas thus public are wasting time in searching the parking area abnormally for parking their vehicles. And one more issue is also added to this is pollution, which effects the whole environment due to this increase in vehicles.

Possible Solutions to opt type of vehicle

Our proposed system allow user to select there travelling vehicle according to the parking available at the destination place. Suppose user has to go at market for their shopping or has to go in a mega mall than first of all user has to visit our site and search the destination place which is shown in google map in our site than select the marker or click on marker of the building showing on map. After clicking on marker add user can see the live status of parking available at the destination place. And according to the parking space availability user can select there the vehicle either 4-wheeler, 2-wheelers of public transport. User can easy monitor the nearby parking arability. No need to physically present on the parking location and see the status. If any nearby parking is available, no need to go here and there user can directly go and park their vehicle, it reduces the extra time for searching parking space and wastage of extra fuel. It also reduces pollution in the city and traffic.

Our Goal.

1. Save time on looking for parking.

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2. Decrease in time and fuel spent by road user to search parking place.
3. Less traffic consecution as drivers will be guided to parking areas.
4. Correct selection of vehicle allowing to the availability of parking space.
5. Online parking results in higher revenues and profitability for parking facilities.
6. Reduces air pollution and sound pollution in the city.

II. The Internet of Things

The idea of Internet of Things (IoT) started with things and identity talking devices. The devices can be traced, controlled or watched using distant computers linked through Internet.

The internet of things has many definitions. In Short it is demarcated as the things present in the physical world or in an atmosphere are attached with devices or with any embedded systems and made linked to network via wired or wireless connections. These associated devices are named as smart devices or smart objects. And it contains of smart machines, which interconnect, interact with other machineries, environment, objects etc. And these can be processing by using some computers such as network processor, hybrid computer MCU/MPU etc. And the devices are linked by using some wireless machineries called GPS, Wi-Fi, BT/BTLE, RFID etc.

Internet of things was first presented in 1999 at auto-ID centre and first used by Kevin ashton. This latest skill promises to connect all our nearby things to a network and communicating with each other with less human involvement. Still internet of things is in beginning stage and there is no common architecture exist still today.

III. Related Work

Some of the recent studies demonstrate about the parking management and the parking slot management. It also gives the information about booking based parking system.

J. Cynthia, C. Bharathi Priya [1]: - In this work, Mobile app allows the user to locate and reserve a parking slot in online, navigation from entrance gate to available parking slot is also. the proposed system reduces the driver's effort and time to search parking space. Prototype is built for single storage parking slot, but this model can be extended for multi storage parking space.

Supriya Shinde1, Ankita Patil [2]: - With the advancement in new technologies in embedded system like introduction of various microcontrollers and evolution of new domain 'Internet of Things', it is feasible to have a system which can resolve the problem of parking of two wheelers or four wheelers in crowded areas. With this system, user will come to know about the parking availability by using our android application. The users across the globe can take the benefit from this

system. Hence, this system will overcome the problems of time consumption, wastage of fuel etc

Hemant Chaudhary, PrateekBansa. [3]: - The project is Based on RF-ID. Once the user with valid card punch on RFID reader, if a slot is available and he is authorized then gate will be opened and he will park his vehicle in the available slot. If he is authorized but free slot is not available, then the gate will not be opened and he is not allowed to park. If the user is not authorized, then gate will not open and doesn't allow him to park.

Prof. Yashomati R. Dhumal1, Harshala A. Waghmare2 [5]: - In this paper, the development of reservation for parking slots commanded by android application, number plate recognition, parking slot status and electronic billing system is implemented. The proposed system reduces the driver's effort and time to search parking space. Also the payment transaction is handled online which makes the system less human dependent.

Faiz Ibrahim Shaikh, Pratik NirnayJadhav [6]: - in private parking lots. Researchers have acquired the systems which dynamically arrange the scheme for different drivers as per their requirement, based on the real-time parking information. Thus, this concludes that the paper simplifies the context for the researchers for innovating various techniques to administrate and solve the problems faced by drivers on day to day basis.

RicardGarra, Santi Martinez [7]: - Privacy-preserving pay-by-phone parking system has been presented. From the driver's point of view, the system is composed of two components: an RFID and NFC enabled on-board device which is placed in the car, and an app which is installed in the mobile phone. The app manages an electronic wallet which is loaded with e-coins. When the driver parks her car in a regulated area, the mobile app starts making periodic e-coin payments for short time intervals until the car is removed from the parking spot. The system has been proven to provide privacy by not allowing the creation of profiles about drivers' parking habits. The system is also secure against e-coin forgery and double spending and permits a driver who has been fined unfairly to prove, by providing cryptographic evidences, that a payment had really been made.

Amir O. Kotb, Yao-chunShen [8]: - PGI systems utilize on roadway or off roadway sensors, controllers and transmitters to provide drivers with information about parking availability, in addition to pricing and navigation information in some cases. PGI systems are vast improvement over conventional parking, however, PGI systems tend to increase the competition of drivers over

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monitored parking spaces. This competition behavior may increase the parking problems. Building on PGI systems, reservations (PRS systems) are possible to guarantee parking spaces for drivers and avoid the competition on parking spaces. PRS systems could be based solely on pricing policies and bidding mechanism or could be more intelligent by taking into account both the objectives of the drivers and parking managers. PRS systems may increase the parking resource utilization and parking revenue and reduce traffic congestion.

IV. CONCLUSION

In this paper, we address the issue of parking and present a survey report on internet of things based web application smart parking system. The growth of Internet of Things have given rise to New possibilities in terms of smart cities. Smart parking Facilities and traffic management systems have always been at the core of constructing smart cities. The system that we propose provides real time information regarding availability of parking slots in a parking area. Users from any locations could book a parking slot for them by the use of our web application. The efforts made in this paper are indented to improve the parking facilities of a city and thereby aiming to enhance the quality of life of its people.

In our system user can search and view the real view of parking area of any register buildings, mall, hospitals, colleges and may more public parking areas. Due to this user has a choice that in what transport system he should use to visit that place.

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