International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 04 | Apr 2019 www.irjet.net p-ISSN: 2395-0072

The Smart Parking System

Koushal U[1], Pramukh P [2], Preetham K R[3] ,B R Vatsala[4]

[1,2,3]Eight Semester, Dept. of Cse, The National Institute of Engineering, Mysore
[4]Assistant professor, Dept. of Cse, The National Institute of Engineering, Mysore

---

Abstract - The increasing variety of vehicles on the road beside the misdirection of obtainable parking zone results in the parking connected issues similarly as enlarged holdup in urban areas. so it's extremely needed to develop an automatic good parking management system that will facilitate the motive force to resolve some appropriate parking house for his/her vehicle terribly quickly. though ample quantity of analysis works on the event of good parking system exist in literature, however most of them haven't addressed the matter of time period detection of improper parking and automatic assortment of parking charges. during this paper, a example of internet-of-thing primarily based E-parking system is planned. The planned E-parking system uses associate integrated part referred to as timer to handle the above- mentioned problems similarly on offer good parking management throughout the town.

Key Words: Smart parking system (SPS), car parking zone, parking meter (PM), Internet-of-thing (IoT), E-parking.

1. INTRODUCTION

The huge proliferation within the range of vehicles on the road together with management of the on the market parking zone has created parking connected issues [1] additionally as enlarged the hold up in urban areas. Thus, it is needed to develop an automatic good parking management system [2] that wouldn't solely facilitate a driver to find an appropriate parking zone for his/her vehicle, however additionally it'd scale back fuel consumption additionally as pollution. it's been found that a driverjs look for an appropriate parking facility takes virtually quarter-hour that will increase the fuel consumption by the vehicle, hold up and pollution. A significant quantity of analysis works exist within the space of style and development of good parking system. numerous options of good parking system square measure listed below.

- Inquiry on handiness of parking zone and reservation of car parking zone
- Real-time parking navigation and route steering
- Vehicle occupancy detection and management of parking

Most of the sensible parking systems (SPS) planned in literature over the past few years provides answer to the look of parking convenience system, parking reservation system, occupancy detection and management of parking zone, period of time navigation among the parking facility etc. However, only a few works have paid attention to the real- time detection of improper parking and automatic assortment of parking charges. Thus, this paper presents AN internet-of- factor (IoT) primarily based E-parking system that employs AN integrated element referred to as timer (PM) to deal with the subsequent problems.

- Real-time detection of improper parking
- Estimation of every vehicles period of parking zone usage
- Automatic assortment of parking charges The E-parking system planned during this paper additionally provides city-wide sensible parking management answer via providing parking facility convenience data and parking zone reser- vation system and it's named as timer (PM) primarily based E-parking (PM-EP).

2. RELATED WORKS

Significant range of good parking systems supported various technologies like frequency identification (RFID), wireless detector network (WSN), Bluetooth, Wi-Fi, ZigBee etc. also as agent primarily based technologies and image process techniques are planned within the literature over the past few years. Among these, a image of RFID-based good sparking application that implements machine-driven arrival and check-out method of the vehicle from car parking zone space by mistreatment RFID reader is given in [3].

On the opposite hand, either the detector node or WSNs are utilised to style many SPSs [4, 5, 6, 7, 8]. Among these, a example of wireless detector network based mostly intelligent automobile parking system is given in [4]. The planned system deploys affordable detector node at every automobile parking space inside some parking field to sight and monitor the standing of every automobile parking space. The detected standing of varied parking heaps is sporadically according to a info via WSN entree deployed at the parking field. aside from observation the parking field, the system planned in [4] conjointly provides alternative services like auto-toll, security management etc. sensible parking (SPARK) management system planned in [6] conjointly uses wireless detector networks to perform numerous functionalities like remote observation of car park, reservation of automobile parking space, auto- mated steerage to the parking lot etc. The inaudible detector node based mostly SPS given in [6] provides numerous

practicality that embody vacant sparking house detection, detection of im- correct parking, show of accessible parking areas, payment facilities etc. The SPS and automobile parking management system planned in [7, 8] integrate WSNs and RFID technology.

A conveyance unintended network (VANET) based mostly sensible parking system for big square measurea|parking lot|car park|park|lot} is projected in and this projected parking theme provides the drivers 3 necessary services that are time period parking navigation, intelligent anti-theft protection and dissemination of friendly parking data. A reservation-based based mostly SPS projected in uses 802.15.4 low power wireless technology, Bluetooth and Wi-Fi to alter the motive force to search out and reserve the vacant parking areas. Associate in Nursing intelligent parking steering and infor- mation system that uses digital camera to notice free parking slot and provides SMS based mostly reservation service to the motive force is projected in . Image process technique is applied to style some intelligent parking system.

A smart and secure parking reservation system supported GSM technology is planned in . associate degree machine-controlled park- ing system that uses Bluetooth technology as a method of communication is planned in. The researchers in have bestowed associate degree intelligent parking negotiation and guidance device that uses mobile agents to form fast negotiation between the vehicle and parking facilities and additionally to scale back the quantity of knowledge to be transmitted over wireless networks. The cloud-based platform has been used as a service to style the SPS by the researchers in.

On the opposite hand, IoT primarily based automobile parking management system are projected. A location-centric IoT- cloud primarily based on-street automobile parking violation management system has been projected in. The projected parking violation management system assists the authoritative officers to find the vehicles improperly lay on street and conjointly recommends the officers some minimum price route to achieve those vehicles so as to scale back travel price in addition as average amount of parking violation detection.

An energy economical machine-controlled automotive parking system that allocates some free parking slot nearest to entrance of the lot so as to save lots of parking time yet as to utilize automobile parking space expeditiously, has been planned in. The planned system saves energy by shift the lights on only some automotive is in motion among the lot. a sensible automotive parking system supported economical resource allocation, reservation and valuation is planned in. The researchers in have tried to supply secure parking reservations with lower price and smaller looking out time for the drivers whereas higher revenues and resource utilization for the managers of the lot. The planned system utilizes mixed-integer applied math to fulfill its objective.

3. PROPOSED PARKING METER(PM) BASED E-PARKING

The E-parking system planned during this paper consists of the subsequent parts. These are timer, a native area network|WLAN|wireless fidelity|WiFi|local area network|LAN} or Wi-Fi integrated laptop/workstation referred to as local parking management server beside some Wi-Fi access points (APs) deployed among every parking facility and a central server for providing parking handiness info throughout town and receiving automobile parking space reservation request from the driving force of a vehicle. The specification of the planned e-parking system is shown in fig. 1.

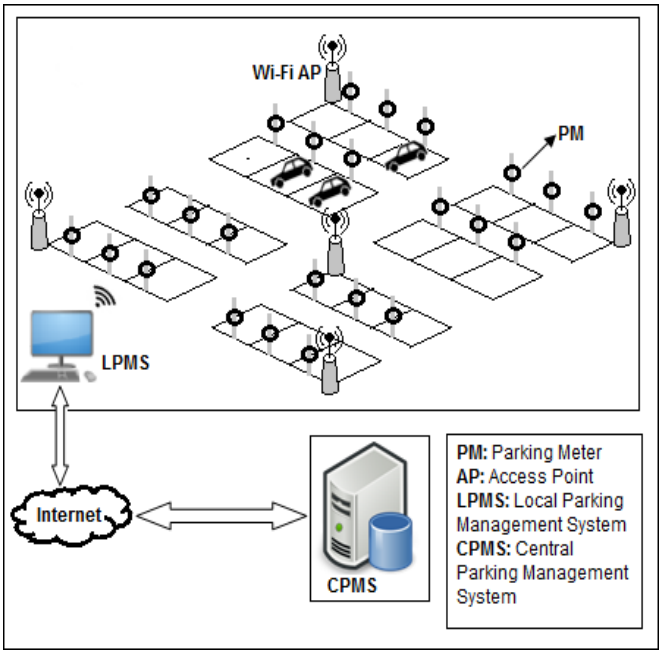

Fig-1: Network architecture of proposed E-Parking system

According to the planned PM-EP system, every parking heap is supplied with a PM that is positioned at the center of the rear finish of the parking zone as shown in fig. 1.

4. IMPLEMENTATION AND WORKING

In the previous section we tend to mentioned concerning the design and technical stack associated with the parking system. In this section we talk about the implementation and working of system in real world senario.

The complete method of checking a parking slot, parking a automotive in this slot and charges of parking is explained with the subsequent flow chart.

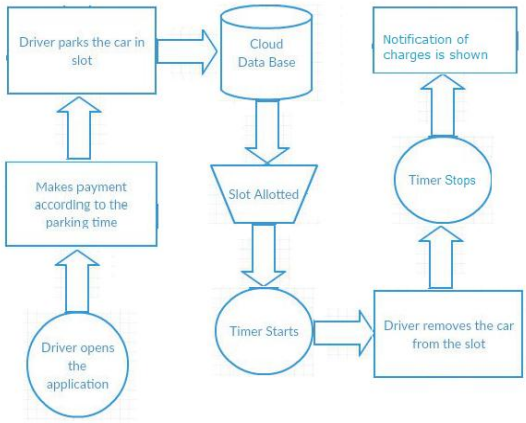

Fig-2: Flowchart of the system

The above mentioned flowchart for checking a slot and parking a car in the available slot and the charges for the time its parked is explained with the help of the following screenshots.

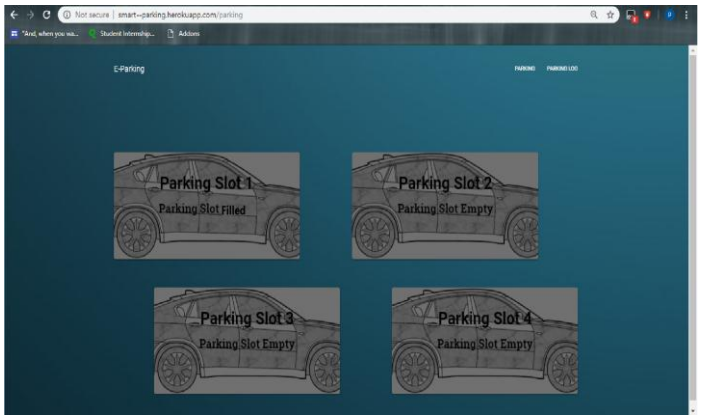

Fig-3: Parking slot availability

The above figure depicts the presence of vacant and occupied parking slots. In this case parking slots named slot2, slot3 and slot4 are vacant whereas slot1 is occupied.

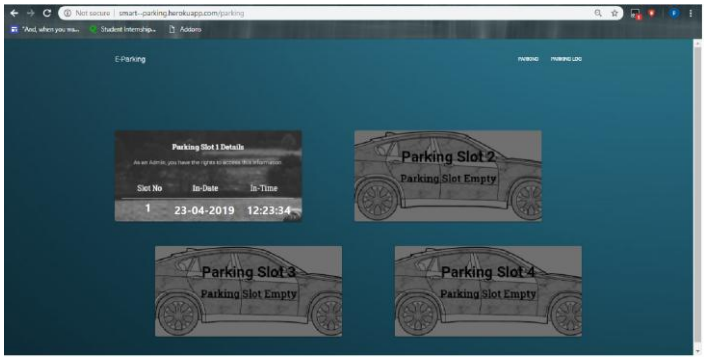

Fig-4: Detail of In-time of car parked in slot1

The above figure depicts the information of the in-time and in-date of the parked vehicle in slot1.

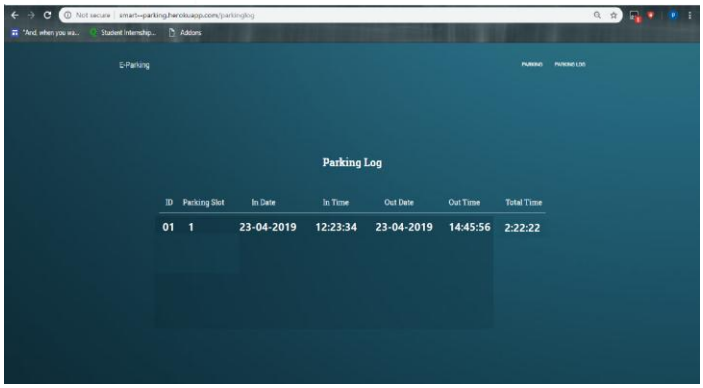

Fig-5: Parking details

Once the parked vehicle is left the out-time is noted and the charges as per the parking time is shown.

5. CONCLUSION

This paper presents the model of AN E-parking system that has novel parking management answer for numerous parking facility areas throughout the town. The projected E-parking system allows the drivers to get data on convenience of car parking zone and to reserve some automobile parking space via an appropriate GUI which means reservation primarily based parking management facility. This projected system will simply sight vehiclejs improper parking at intervals the heap|parking zone|automobile parking space|car parking zone} and estimate the period of the automobile parking spacejs occupancy by some vehicle by mistreatment an integrated part known as timer that's deployed at every parking lot. The projected system conjointly en- ables the automated assortment of parking charges by providing sensible payment choices to the driving force.

REFERENCES

[1] M. Y. Idna Idris, N. M. Noor and Z. Razak, *jj* Car Park System: A Review of Smart Parking System and Its Technology*jj* Information Technology Journal 8(2), pp. 101 113, 2009, ISSN 1812-5638.

[2] Faheem et al., *jj*A Survey of Intelligent Car Parking System,*jj* Journal of Applied Research and Technology, Volume 11, Issue 5, pp. 714-726.

[3] Z. Pala and N. Inanc, *jj*Smart Parking Applications Using RFID Technology,*jj* 2007 1st Annual RFID Eurasia, Istanbul, 2007, pp. 1-3. doi: 10.1109/RFIDEURASIA.2007.4368108.

[4] V. W. S. Tang, Y. Zheng, and J. Cao, "An Intelligent Car Park Management System based on Wireless Sensor Networks," Pervasive Comput. Appl. 2006 1st Int. Symp., pp. 6570, 2006

[5] S. V. Srikanth, P. P. J., D. K. P., T. S., M. U. Patil and S.C.N., "Design and Implementation of a Prototype Smart Parking (SPARK) System Using Wireless Sensor Networks," 2009 International Conference on Advanced Information Networking and Applications Workshops, Bradford, 2009, pp. 401-406. doi: 0.1109/WAINA.2009.53

[6] A. Kianpisheh et al., "Smart Parking System Architecture Using Ul- trasonic Detector," Intern'l Journal of Software Engineering and its Applications, Vol. 6, No. 3, July 2012, pp. 51-58.

[7] Patil, M., Bhonge, V. N, "Wireless sensor network and RFID for smart parking system," International Journal of Emerging Technology and Advanced Engineering, Vol. 3, No. 4, pp. 188-192.

[8] Karbab, E., Djenouri, D., Boulkaboul, S., Bagula, A. (2015, May). Car park management with networked wireless sensors and active RFID. In 2015 IEEE International Conference on Electro/Information Technology (EIT) (pp. 373-378). IEEE.