

HIGH ACCURACY IOT BASED SMART PARKING MANAGEMENT SYSTEM

E.Sanjan¹, M.Devendher²

^{1,2}Asst. Prof. Department of ECE, SVS Group of institutions, Bhemmaram, Warangal, Telangana

ABSTRACT:

The increasing number of cars is making it difficult to find a spot to park, particularly for cars. Congestion among site visitors is thus not caused directly. This is due to the fact that existing transportation infrastructure and parking lot facilities cannot handle the influx of a large number of vehicles onto the roads at once. Car parking, especially parking in the right place, is a key annoyance in daily life. Congestion on the site is an indirect result of this issue. This paper presents the straightforward idea of using server or cloud-based completely intelligent parking services in smart cities as a significant use of the IoT paradigm. Following government regulations, such as those pertaining to the management of outstanding parking sites within the city, this apparatus makes it possible to enhance parking device control. The purpose of this paper is to disseminate knowledge that can be used to alleviate the smart city problem, which includes lowering web site traffic on roads, reducing air pollution within the city, and freeing up parking spaces. Vehicles are identified with RFID tags, free parking slots are detected with IR sensors, and parking fees are calculated based on the amount of time a car spends in a certain spot with the use of a real-time clock.

Keywords: *IOT (Internet of things), IR sensor, Smart parking, RFID, tags, Online registration.*

1. INTRODUCTION

Worryingly, the world's traffic congestion problem has been growing at an exponential rate in

recent years. The fundamental cause of, and primary problem with, urban areas with limited parking spaces is

the bother of finding a place to park a car. Finding a parking spot is a common (and often frustrating) activity for people in cities all around the world. This industry consumes about a million barrels of oil each day. From anywhere in the world, a resident can use his mobile device or a laptop connected to the Internet to access the smart city application and learn more about where and when parking spots become available in the city. It enables novice car park administrators to efficiently manage their lots by locating parking spots from afar and quickly retrieving parked vehicles. The current car parking system relies on a reservation system, which has its limitations in terms of both time and space. Single parking control often aims at indoor parking lots, while multi-parking controls can be used to regulate both outdoor and indoor parking spots. Given the importance of the automobile in modern transportation, it is imperative that parking lots provide sufficient space

for consumers to leave their vehicles. The proliferation of a hip gadget can facilitate traffic control and reduce congestion on the streets. One of the new tools helps customers wait patiently as they find a parking spot. Incorporating specialised sensors like ultrasonic detectors, active and passive RFID readers, and other similar technologies is key to the Internet of Things concept.

2. RELATED STUDY

This helps people check the popularity/availability of parking areas before setting out on a trip. Here, the goal is to make better use of successful resources at the optimal level to cut down on travel time and traffic congestion within the city. Auridino, Raspberry Pi, and ARM 7 are all examples of embedded systems. facilitate the growth of IoT software. Some modern parking systems rely on sensors to compile data, but sensors, especially video sensors, may be costly, which is why we want to develop a system that does the same

job for less money. Urban areas have seen a rise in population and a corresponding rise in demand for cars. Ultimately, it leads to parking problems, which exacerbates traffic jams, angers police, and pollutes the air. During peak times (such as on weekends and holidays), visitors to one-of-a-kind destinations like malls, movie theatres, and hotels often face difficulties finding a parking spot. According to recent studies, it takes an average of 8 minutes for a police officer to park his car because of the time he spends looking for a spot. 30%-40% of all traffic congestion can be attributed to people gazing around. In this article, we'll look at a smart parking device that can help alleviate the parking shortage and make parking safer. Covered and open parks, in addition to parking along streets, can all make use of this parking gadget because of its flexible layout. Fig.1 depicts the cloud-primarily based, totally IOT structure for smart parking device, which consists of a cloud provider that provides a cloud

garage to keep records about the status of parking slots in a parking area and so on. Additionally, there is a central server that maintains all the data about the smart parking structures, such as the number of parking spots, the availability of vehicles, and so on. And these data may be accessed via the internet via a small number of protected entry points.

3. AN OVERVIEW OF PROPOSED SYSTEM

As we go toward the concept of the "smart city," "smart parking" serves as a prime illustration of how the Internet-of-Things (IoT) may be used effectively and accurately to provide individualised services to individuals. The proposed software is so user-friendly that even those with little to no technological knowledge can use it from their smartphones. Customers from any part of the world can use this service to locate a parking spot at no cost. The proposed system allows for efficient administration of parking spaces for a variety of vehicles by

allowing for their location to be determined remotely. The traditional method of reserving parking spots for cars is time-consuming and spatially inefficient. A proposed intelligent parking machine would efficiently offer the available parking spot, which would save drivers time and fuel while also lowering city pollution and traffic levels. Connecting, analysing, and automating data gathered from devices is made possible by an IoT-based new parking platform, making intelligent parking a reality. The term "cloud storage" refers to a subset of cloud computing in which data is kept on remote computers connected to the internet (the "cloud") [9]. A cloud storage provider is responsible for the upkeep, operation, and management of the storage space, which is housed on garage servers that make use of virtualization technology. Some computer owners have a hard time keeping up with the volume of data they get because they can't seem to find enough space to store it

all. Large hard drives are an investment for some people. Others favour CDs or flash drives as portable storage options. Computer users who are desperate to make room for new files may erase entire folders worth of historical files. However, there are many who have decided to rely on a new phenomenon: cloud computing. A Microcontroller is used as the system's central processing unit. The microcontroller can communicate with a Wi-Fi module and IR sensors. The Microcontroller receives input from infrared (IR) sensors. This information is processed by the microcontroller and sent to MOBILE through Wi-Fi. The controller is programmed with a programme in Embedded "C" to accomplish the task. To park a car, the user must log into the Wi-Fi network of the parking lot in question and enter the parking lot's unique password. The microcontroller processes the data received from the IR sensors. Using IoT, the microcontroller

communicates with the website to update the user on the slot's current state. In this method, the customer may quickly and easily locate a parking spot without dealing with any crowding or delays.



Fig.3.1. Working model.



Fig.3.2. RFID card using for Online registration.



Fig.3.3. Output results across Telnet app.

4. CONCLUSION

In a large parking lot, our device reduces the amount of time spent getting the car ready to park. It also helps parking lot owners maximise revenue at their venues. It could also aid in reducing the requirement for human labour in the parking facility, which would considerably minimise the cost and potential for error associated with the method. In addition, this method should cut down on paper use, making for a more environmentally friendly gadget. This depiction can be expanded to include the scheduling of parking spaces over a period of

time to accommodate expansion. The mobile app's functionality can be expanded to work with additional platforms, such as iOS, Windows, and others. Protection services, such as those against fire, theft, and so on, may also be made available on the server.

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