Smart Parking Applications Using RFID

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Abstract - **The proposed Smart parking system consist of an onsite deployment of an IOT module that is used to monitor and signalize the state of availability of parking space. This project introduces an IOT based efficient and easy way of parking the vehicles by checking the availability of slots.**

Present day car parking has become major issue in urban area with lack of parking facilities. It's very difficult and frustrating to find a parking space in most metropolitan areas ,especially during the rush hours. To solve this problem the proposed application, provide an easy way for reservation of parking slot.

There has been a considerable amount of reduction in transaction costs and decrease in stock shortage with the use of Radio Frequency Identification (RFID) technology in automation. Most of the RFID networks include a wide range of automation technologies. These technologies are RFID readers, RFID writers, RFID barcode scanners, RFID smart sensors and RFID controllers. In this study, a solution has been provided for the problems encountered in parking-lot management systems via RFID technology. RFID readers, RFID labels, computers, barriers and software are used as for the main components of the RFID technology.

Index Terms - **RFID, Automation, Parking Lot, Intelligent Sensor, Database, Control System.**

INTRODUCTION

Smart Parking is a parking strategy that combines technology and human innovation in an effort to use as few resources as possible such as fuel, time and space to achieve faster, easier and denser parking of vehicles for the majority of time they remain idle. An IoT based smart parking system, also known as a connected parking system, is a centralized management system that allows drivers to use a smartphone app to search for and reserve a parking spot. Apart from helping users in day-to-day life, IoT has made considerable advances in the smart city and business sectors. Today Internet of Things application has become an elementary domain for data streams and big data analysis. IoT has allowed making a secure connection between people and devices at any point in time and every sector possible. The applications further help in real time management, disaster management, automated work management, effective asset utilization, and smoother logistics. Mere IoT does not work; it further requires provisions with ubiquity, reliability, efficiency, and high performance. IoT's application in parking is mainly based on an automated system capable of providing a real-time database for the proper management of traffic congestion. The huge increment in the number of vehicles in urban areas along with mismanagement and congestion has become a significant cause for the tremendous increase in parking related problems and its after-effects like road rages and conflicts between drivers and government officials or parking lot security [3]. All these problems urge for the need of an automated parking system that provides a platform to the drivers for selecting among available parking spaces in the nearby slots. This kind of system not only helps in tackling traffic-related problems but also helps in:

• Reduction of fuel consumption

• Saving time

• Improving drivers' experience

• Proper and organised use of parking spaces

• Reduction in air pollutions

A well and smartly managed car parking system leads to a reduction in fuel consumption, decreased vehicle's emissions, which help in reducing levels of pollution to a noticeable extent. As fuel consumption is directly proportional to vehicle miles travelled, it also attributes to vehicle travel being reduced. Smart parking system enables proper utilization of parking spaces along with guaranteed safety. With the smart parking apps and websites, drivers can easily track empty parking slots nearby, thus effectively managing vehicle travel time and cutting down search time. Illegal parking of vehicles along the roadside would also decrease. Moreover, the smart car parking system helps in predicting future most effective parking

patterns from the information gathered. It can also be made more cost-effective and user friendly based on the results of experimentation with car parking.
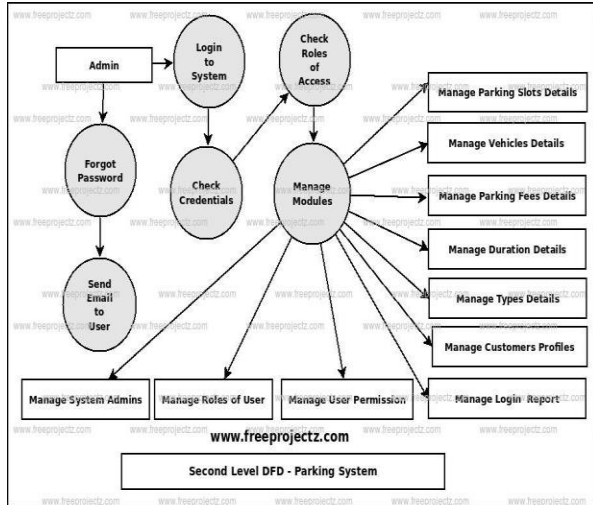
MODULE

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify, and track tags attached to objects.
The tags contain electronically stored information.
Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader.
Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method of automatic identification and data capture

FUTURE SCOPE

The Smart parking system based on Slot booking is implemented, using the Android application. Using the slot allocation method we can book our own cheapest parking slot. It is an efficient one for solving parking problems, which overcomes the traffic congestion also provides automated billing process.

CONCLUSION

This paper presents a prototype of a fully equipped RFID based Parking System that provides solutions to various parking problems. Here the RFID tag referred is assumed to have a modified version than present-day RFID tags on vehicles because it stores all the information required for this module to work. This module will enable the drivers to pre-book the parking spaces to prevent them from traffic congestion and irritation. Further, it will also reduce air pollution and provide an efficient system with no wastage of time and fuel in searching for vacant parking lots.

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