SMART CAR PARKING IN BUSY CITY ENVIRONMENT

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Abstract: This project proposes a Smart Parking system which provides an optimal solution for parking problem in metropolitan cities. Due to rapid increase in vehicle density especially during the peak hours of the day, it is a difficult task for the drivers to find a parking space to park their vehicles. The aim of the paper is to resolve the above mentioned issue which provides the Smart Parking system. This system uses cloud computing and Internet of Things (IOT) technology. A suitable shortest path algorithm is used to find the minimum distance between the user and each car park in the system. Thus, the waiting time of the user is minimized. The paper also introduces the usage of android application using smart phone for the interaction between the Smart Parking system and the user.
Keywords: Internet of Things, IR Sensor, Ipv6, Parking Management System.

I. INTRODUCTION

Present day's getting a parking space in urban areas is very difficult in peak hours due to lack of parking spaces. Due to this driver stuck in traffic or looking for parking spaces around the location makes traffic congestion. This causes waste of money and time. So if we have parking space information, we can plan for advance booking based on requirement, for that we developed a prototype of car parking management system using Internet of things. Parking spaces are large in size for airport or multiplexes, so it's difficult to maintain system manually. The major issue with car parking is that improper parking and damages others cars while parking the car. Hence the damaged car parking owners unhappy with parking management and get frustrated.

II. RELATED WORK

A. Purpose of the document
This project is to design and develop the car parking using IOT supportable hardwares Bluetooth and obstacle sensor.

B. Scope of the project
The system works with obstacle sensor which detects the vehicle coming to the parking slot and says that the slot is busy

III. REQUIREMENTS AND SPECIFICATIONS

A. Functional Requirements:
INPUT: User, checks weather slots are available, Register.
BLUETOOTH :which indicates the vehicle within 100mtrs and sends the message to the customer.
OBSTACLE SENSOR: which senses the coming vehicle and sends the message to the lcd display that the system lane was busy.
OUTPUT: Displays a message if a user has available slot otherwise checks for available slot ,registered successfully.

B. Non-Functional Requirements
Usability: It involves the use of low cost sensors , real-time data and applications that allows users to monitor available and non-available parking spots.
Ability : The ability to connect , analyze and automate data gathered from devices , powered by and described by IOT.
Reliability : Airports , Universities , Shopping centers and city garages are just a few entities that have begun to realize the significant benefits of automated parking technology.
Time consuming : The main intention to decrease time spent manually searching for the optimal parking floor , spot and even lot.
Scalability : A system whose performance improves after adding hardware proportionally to the capacity added , user to monitor available parking spots.

C.Software Requirements
Operating system: Windows XP
Technology used: Android 2.2
IDE   : Eclipse Indigo
Database   : MySQL.
D. Hardware Requirements
Processor : Pentium P4
Motherboard : Genuine Intel
RAM   : Min 1GB
Hard Disk :   80 GB

IV. PROPOSED SYSTEM

The proposed system is the combination of smart parking and the Slot allocation with the Android application. In the existing system, a dynamic algorithm is carried out, which is a random allocation method. It randomly allocates parking lot to the users

V. IMPLEMENTATION

1.IR Module
In this proposed system, we were used IR module as sensing node, IR sensors are motion detectors which detects the presence of the vehicle at the parking slot. Infrared transmitter is one type of LED which emits infrared rays. Similarly, IR receiver is used to receive the IR rays transmitted by the IR transmitter.
2. Obstacle sensor
By using obstacle sensor will sense the position of the vehicle and entry gate will open. Whenever a car wants to take exit then it will go to exit gate again the Obstacle sensor will sensor the position of car and send an amplified signal to controller and gate will open and again LCD will display the fare of parking duration.

3. LCD

Display devices are needed to show the conditions of parking slots. There are many display devices such as LED display board, LED matrix, Graphic LCD 16x2 LCD display and 4x20 LCD display. In these prototype design, 4x20 LCD display is chosen to be interfaced with the microcontrollers which are placed at the parking levels and entrance gate.
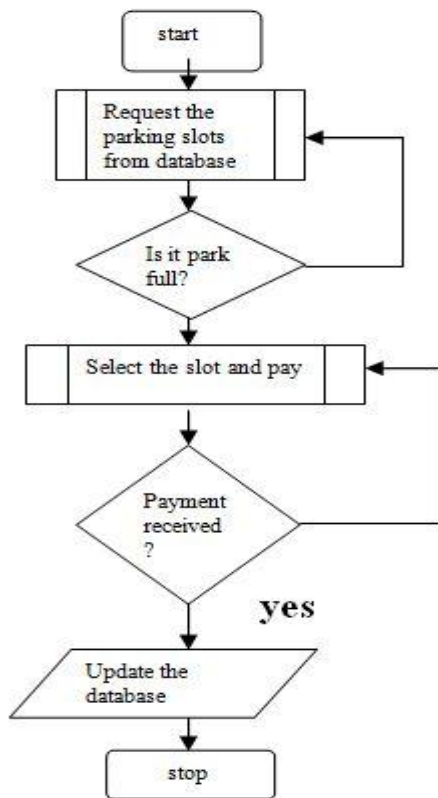
4. Software design

Implementing the smart parking system is done in C which is the easiest programming language.

5.Vibration sensor

Vibration sensors are sensors for measuring , displaying , analyzing linear velocity , displacement and proximity.

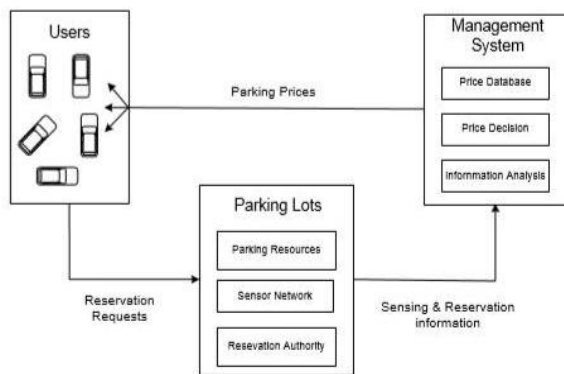*Flowchart*

VI. ARCHITECTURE DESIGN
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Fig. 1. System architecture

VII. RESULTING

VIII. CONCLUSION

In this project, the implementation of cloud based smart parking system using Internet of Things is discussed. The average waiting time of users for parking their vehicles is effectively reduced in this system. The optimal solution is provided by the proposed system, where most of the vehicles find a free parking space successfully. This smart parking system provides better performance, low cost and efficient large scale parking system. Security measure to ensure that the users do not misuse the parking system can be implemented.

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