IR Sensor Based Automatic Car Parking System

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ABSTRACT: *One of the challenging problems for man vehicle owners in big metropolitan cities is where to park their vehicles. In this paper we would like to propose an RFID based parking slot allocation system wherein an intended user is informed about the parking slot availability at a particular parking location via Short Messaging Service. The slot availability details are collected using an RFID system and are updated periodically into a web server via internet for a registered user. If needed, the user can reserve his parking slot via SMS. 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.*

Keywords: RFID middle ware,vehicle, database

I.INTRODUCTION

The main objective of this paper is to recommend a simple, and an efficient technology to bring down parking waiting time. This may save lot of fuel wastage of waiting vehicles at parking stations. The cost of RFID tags and readers are tumbling down due to large scale deployment in industry. In this paper, we use RFID technology for parking slot allocation. Using the proposed method, an end user can know about the availability of free parking slot through his mobile device. If necessary he can also reserve a slot using his mobile device in order to save his precious time. Every vehicle to be parked is fitted with a passive RFID tag. At the parking stations there should be at least two RFID readers. These two readers are connected to a central computer which in turn is connected with a web server via internet. Through GPRS connectivity, the relevant parking slot details are disseminated to the end user's mobile device as a service. Thus a registered user will be informed about parking slot availability, periodically using push technology.

II.WORKING

In the proposed model, it is assumed that each and every vehicle in need of parking space is assumed to be fitted with an appropriate RFID tag, preferably a passive RFID tag as it is inexpensive. Two RFID readers preferably operating at high frequencies whose sensing range is about 10 meters are used, one at the entry point and the other at the exit point of the parking area. These two RFID readers are connected to a computer via serial communication. We developed a middle ware running at this computer using Visual C#.NET. This middle ware was connected with a back end database created using SQL Server 2000 for storing necessary vehicle related information as show
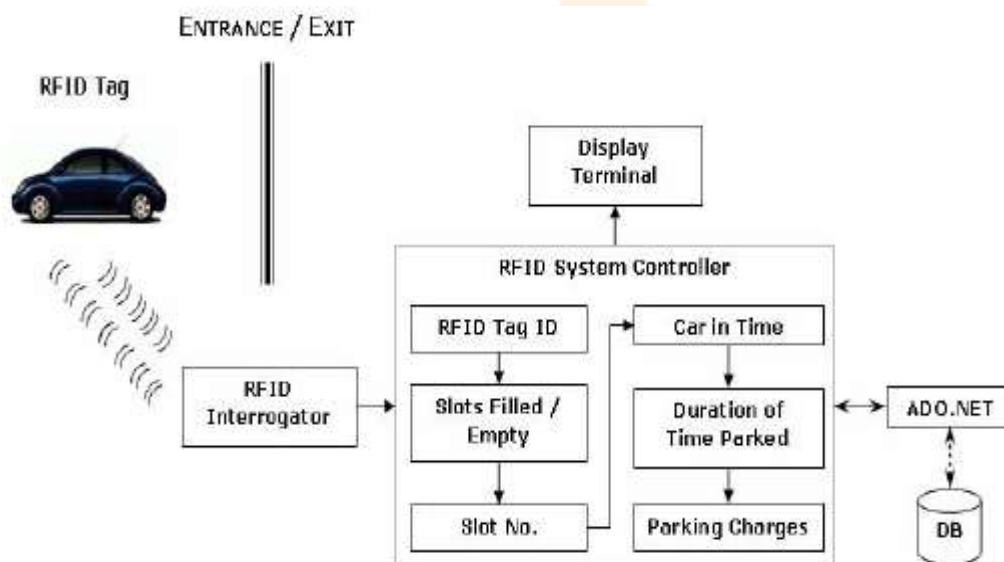

Figure 1 :- Block Diagram Of Automatic Car Parking Slot Allocation

Whenever a vehicle enters at the entry point, the corresponding Electronic Product Code is recognized by the RFID reader and it is communicated to the middle ware (developed by us) via serial communication. Using an appropriate triggering mechanism, the middle ware queries the database and finds the available free slots. If the slots are available, one of the free slots is chosen and it is assigned to the incoming vehicle. This slot allotment information is stored in the database along with the time stamp. The updated free slot availability status is passed to the appropriate display system. These display systems are useful for the drivers to know the slot availability at a distance.

This slot availability information is also updated periodically (say every 2 minutes) to a web server through TCP/IP connectivity available in the computing system. If an authorized end user has registered with this web server, he will be informed about the parking slot

availability through Short   Messaging Service periodically. Hence a user can know about the free slots in advance, if necessary, the parking slot can be booked in advance by disseminating our mobile number (a web server can retrieve the Electronic Product code of the vehicle from its database by searching the incoming mobile number) to the web server, which in turn can communicate with the relevant middle ware and reserve the parking slot. When a reserved user enters into the parking area, his vehicle RFID is verified first against the reserved slot, if it matches with the reserved one then his slot is confirmed. Otherwise a new slot is allocated, if available.

Whenever an end user drives through the exit point the RFID reader (located at the exit point) senses the Electronic Product Code from the RFID tag and passes the same to the middle ware via serial communication. Now using another triggering mechanism, the necessary parking charges are calculated for the concerned vehicle by subtracting the vehicle check-in time from the vehicle check-out time. Necessary charges are credited/collected from the end user. The slot availability status is updated by deallocating the released slot. The proposed system is cost effective and also easy to implement and there is no time limit for its operation. It can work through out a day and it can be deployed at any location without distributing the existing system.
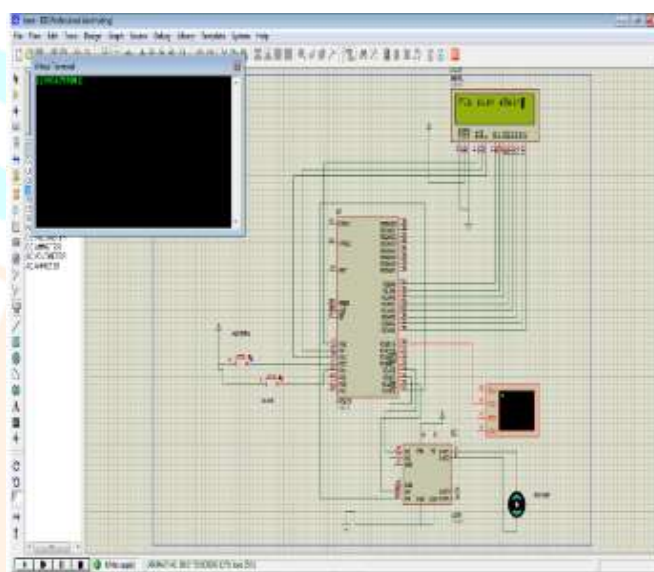
III.SIMULATION RESULTS
The simulation provides the output in the following order such as:
1. Display of the number of parking left
2. .Matching the ID card
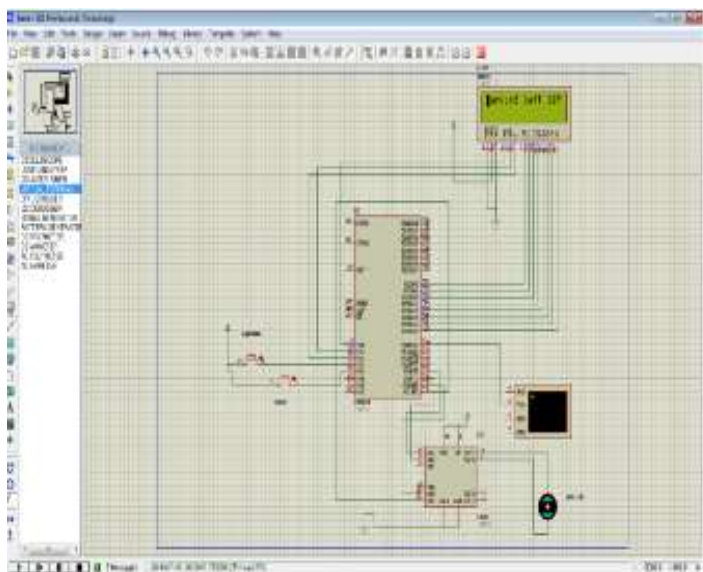
1.Display of the Number Of Parking   **2. Matching the ID card**

IV.CONCLUSION
This research work has been carried out to study and give a beneficial solution to traffic parking difficulties. The model can be used at all places starting from domestic to the industrial system helps it to be used by a large number of people as people with less knowledge of hardware can also use it without facing any problem. Lastly it is concluded that RFID technology is one of the best solution which provide automatic car parking system for social benefit.

V. APPLICATION
RFID Technology solves Tracking and monitoring assets . These wireless systems allow for non-contact reading and are effective in manufacturing and other hostile environments where bar code labels could not survive. RFID has been used in a wide range of applications such as inventory control system, baggage tracking in airports, cargo container tracking, library management system, automated vehicle identification (AVI) systems, because of its ability to track moving objects. Some other applications are as follows:
       1. Automatic Vehicle identification
       2. Inventory Management
       3. Work-in-Process
       4. Container/ Yard Management

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