Intelligent Vehicle Monitoring and Recognition and Recommendation of Parking Places using RFID

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Abstract— With the wide use of vehicles there always occurs a problem for vehicle entry and parking. Time has always been a key factor in today's day to day world, in order to minimize time consumption here we introduce automated vehicle monitoring system based on RFIDs. In this project Cloud based methodology is be used and implemented to track details about parking places. The monitoring system includes an interactive application interface which provides various features Vehicle Entry, Entry data visualization, parking assistance, Admin Feature in need of emergency. Here the check-ins and check-outs is handled in a fast manner without having to stop the cars so that traffic jam problem is avoided during these processes. Vehicle owners will not have to make any payments at each check-out thus a faster traffic flow will be possible. Since there won't be any waiting during check-ins and check-outs the formation of emission gas because of such waiting will be avoided. A central parking-car tracking system is be developed and utilized. Instead of cars parking on streets, a more modern and a fast-operating parking-lot system is developed.

Keywords: Internet of Things; Smart Parking; Smart City; Cloud of Things

I. INTRODUCTION

The development of Smart Cities is one of the main topics in the agenda of our Indian Government and of several countries worldwide, aiming at creating an urban model that can guarantee a high quality of life for individuals and business alike. Enabling a sustainable urban mobility is one of the most challenging goals of the Smart Cities vision, and in such context, the optimal management of parking areas represents a key aspect. As highlighted in, in fact, it is estimated that 30% of the daily traffic congestion in urban areas is caused by vehicles cursing for parking spaces, and that a driver spends on average 7.8 min to find a vacant parking spot. This not only causes waste of time and fuel for drivers looking for parking but also increases air pollution and drivers' frustration. To improve parking's efficiency and achieve higher levels of customer satisfaction, the adoption of intelligent parking systems is advocated. They are able to guide the drivers towards the nearest vacant parking spots either by using information display panels located throughout the parking areas, or by means of customized smartphone applications. It is worth to observe that a key feature of such systems is the ability to automatically detect the occupancy state of parking spots.

A. Overview

Our Proposed System will provide an automated and a secured vehicle management system. With simple features which include on-time tracking of users to check their availability and overcoming the hassles of parking space finding the app dashboard can display the parking slots available irrespective of their location.

II. INTRODUCTION TO RFID

RADIO frequency identification (RFID) is a ubiquitous wireless technology which allows RFID tags to be identified automatically. RFID can be used in Electronic Toll Collection (ETC) centers at the entrance and exit of highways. Principle of RFID is continuously emitting radio frequency signals by reader. When RFID tag entered the sensing range, it can generate an induced current to obtain required power and can respond to sensor. Take a passive tag for example, before entering the sensing rage of sensor, tag is completely static which emits radio frequency electromagnetic waves to e Tag response messages to sensor. Sensor decodes messages and sent them to another application system for further processing.
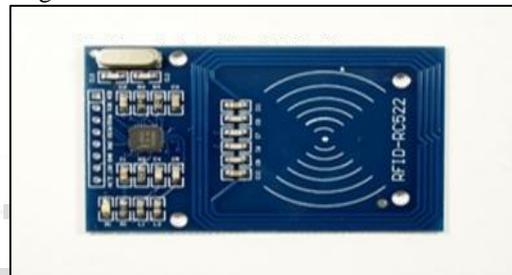

Fig. 1: RFID - RC522

III. PURPOSE OF OUR SYSTEM

In today's fast moving world, time is more important than money. Considerable amount of time is wasted during authentication and parking the vehicle. By introducing RFID technology in parking system we can eliminate this drawback. RFID technology is an automized vehicle identification system that is useful and requires no personnel. Vehicles are identified automatically via this system. The sole purpose of this this study to utilize such an important technology with an application. In this study, via RFID technology, some solutions are provided for the problem encountered in parking lot management systems to the present and some important results have been gathered.

IV. LITERATURE REVIEW

Improvised Iot Based Smart System for Recognition and Recommendation of parking Places: This system provides a unique algorithm which increases the capability of the current cloud based smart Parking system and it also develops a network architecture based on the Internet of Things technology.

V. SYSTEM AND SOFTWARE DESIGN

Before a starting for actual coding, it is highly important to understand what we are going to create and what it should look like? The requirement specification from first phase are

studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture. The system design specification serve as input for the next phase of the model.
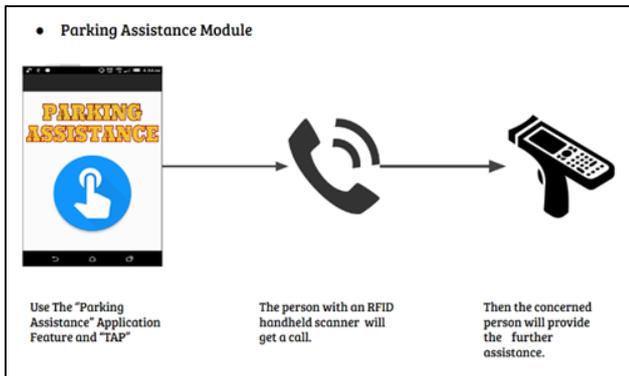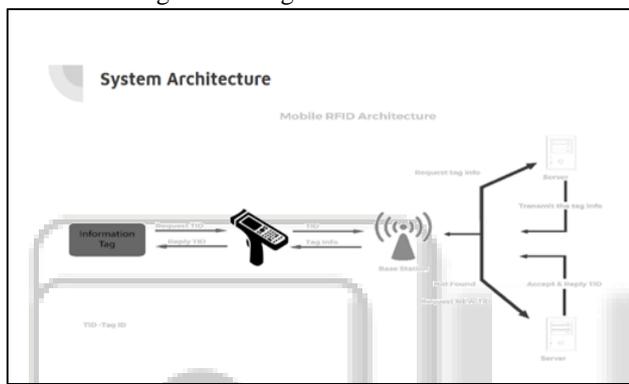

Fig. 2: Parking Assistance Module
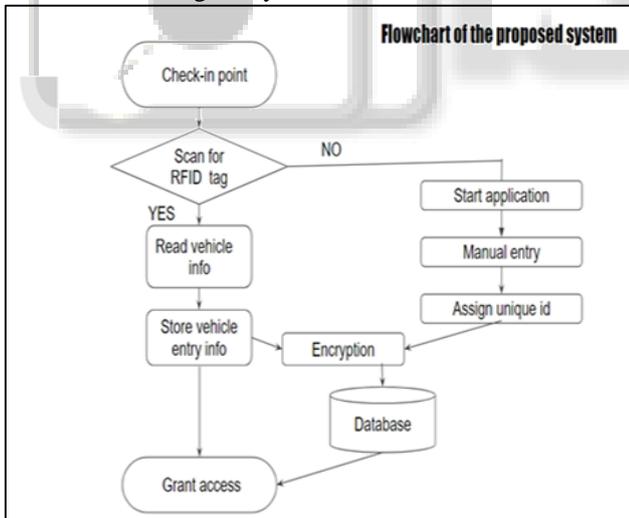

Fig. 3: System Architecture

Fig. 4: Flowchart of Proposed System

VI. MATHEMATICAL MODELLING

For selected problem statement:
S1={s, e, Y, F, Z} s=Initial state: Input data set and also the user interaction with app e= End State: successful authentication of vehicle Y= For user: Authentication of the vehicle For Admin: display data of user on mobile app F= Algorithm Function used in the program. Z= Output to the user

VII. MAJOR CONSTRAINTS

One of the major constraints is Internet where in if the server is down the will stop automatically. Here, usability is another constraint as the user or concerned authority may or may not be able to use an android application. Database should be updated and should not contain redundancy, backup of database should be maintained.

VIII. WORK FLOW OF PROPOSED SYSTEM
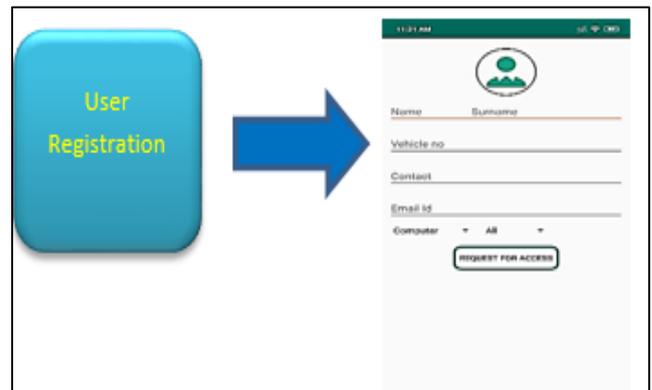
A. Step 1 (User Side)

Fig. 5: Screenshot of User Registration

B. Step-2 (Admin Side)

Fig. 6: Screenshot of Admin Login
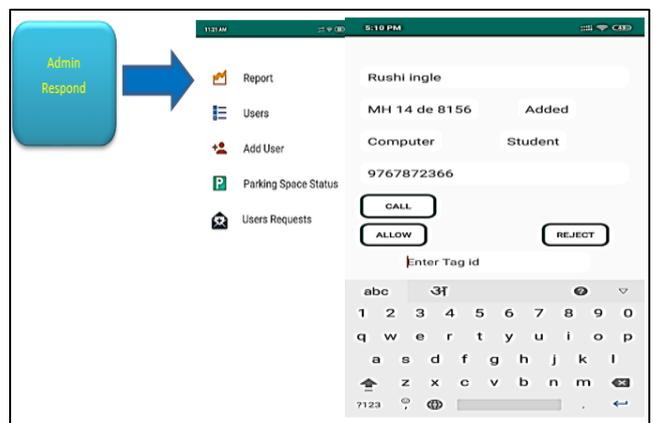
C. Step-3 (Admin Side)

Fig. 7: Screenshot of User Request
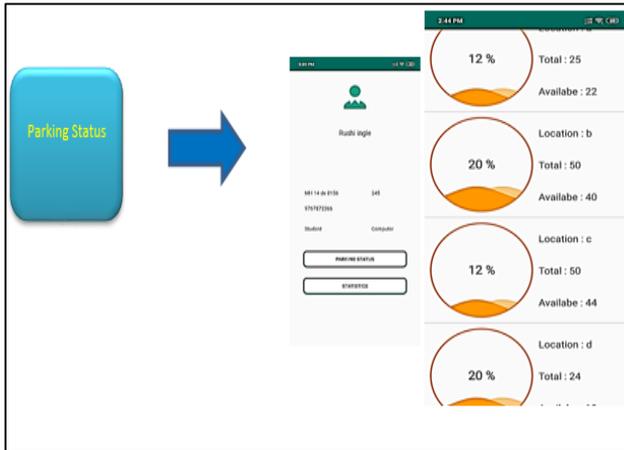
D. Step-4(User Side)

Fig. 8: Screenshot of Parking Status

IX. CONCLUSION

Our system minimizes the parking waiting time in a large-sized parking facility. It also helps in maximizing there venue generation for the parking facility owners. It would also help to reduce the need for man-power in the parking facility which would greatly reduce the cost and errors in the process. Also this method would minimize the usage of paper ensuring a green system. This work can be further extended to booking of parking lots over a period of time from advance. The mobile application will be helpful in fast operating of the system. In the server, services can even be extended to the safety measures.

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