RESERVATION BASED VEHICLE PARKING SYSTEM USING GSM ANDRFID TECHNOLOGY

[1]Mrs. V. AMULYA, [2] R. KALPANA SREE, [3]J. RAGAVENDRA RAO,
[4]G. VYSHNAVI, [5]L. NIKITHA

[1] Professor, [2] student, [3]student, [4]student, [5]student
[1] DEPARTMENT OF ELECTRONICS AND COMMUNICATION,
[1]TEEGALA KRISHNA REDDY ENGINEERING COLLEGE, HYDERABAD, INDIA

Abstract: This paper is to develop a Reservation based vehicle parking reservation system to overcome the problem of unnecessary time consumption in finding parking spot in commercial parking areas. In this proposed system, we reserve the parking slot in shopping malls, theatres and offices by using short message service (SMS). User reserves the slot by sending a message to GSM modem placed at the parking end. GSM modem gives slot number and a password if the slots are available which is used to allow or deny access to the parking area at the entrance and exit. IR sensor is used for the indication of empty slot with a green LED. User can park the vehicle at the given zone, and this is valid up to a certain grace period only after that the priority will be given to next user. RFID technology is used for entering and exiting parking area and also used to debit the amount for parking charges through RFID tag. The main contribution is the system has more security .Thus users can just reserve the parking slots using the SMS.

Index Terms: ATMEGA 328P Controller, LCD Display, Power Supply, LED Display, GSM Modem, RFID Module, IR TX, IR RX, Keypad, Stepper Motor, ULN 2003, MAX 232.
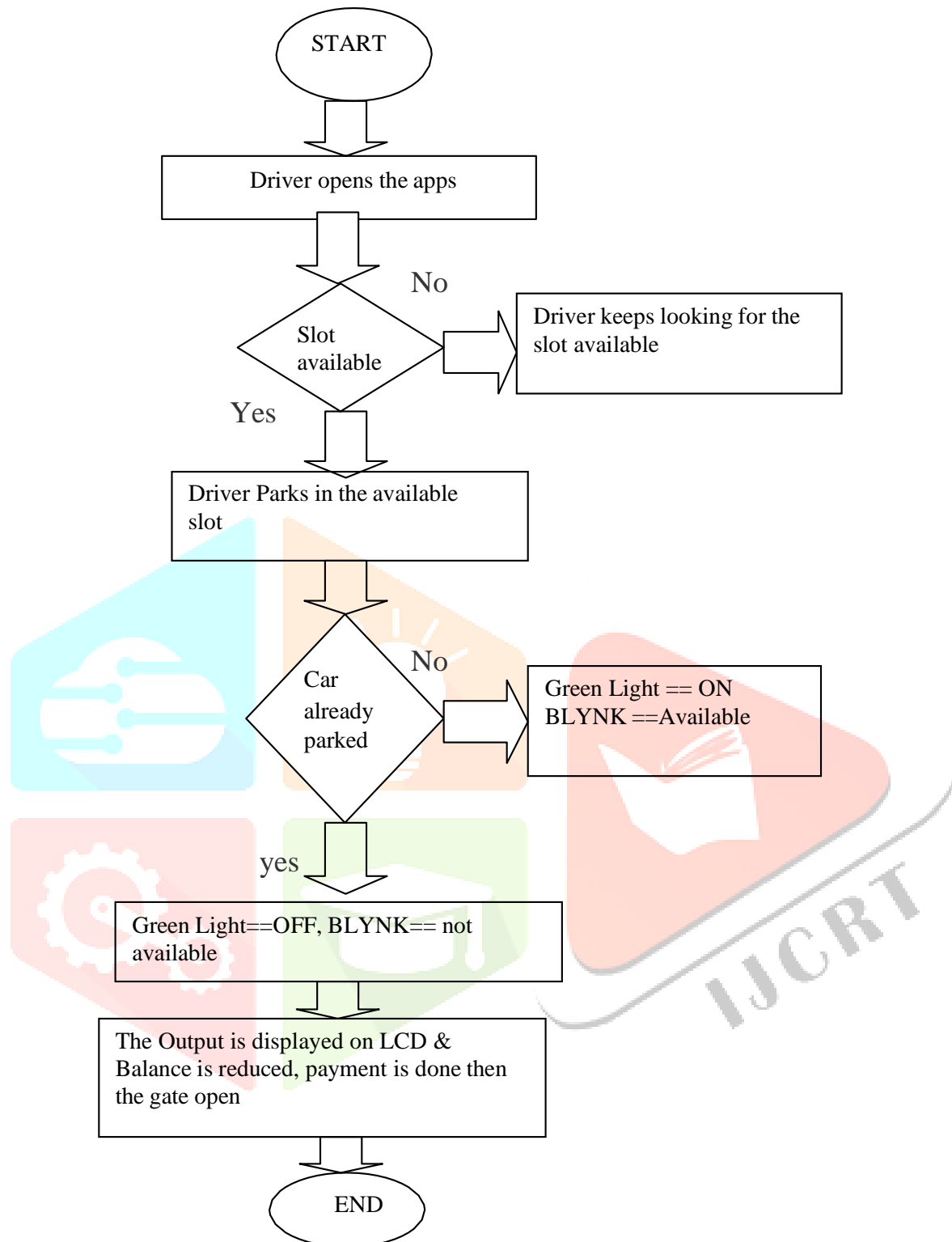
I. INTRODUCTION

In the existing parking system searching for parking space is always been a difficult process. In metropolitan cities it became a major issue due to space problem, no parking zones etc, hence comes the need of such a system which can automatically assists us to search the nearest available parking space in the surrounding area. Thus it will help us in saving time, petrol & money [1]. Most of them are manually managed and a little inefficient. All the work is done by staff of the parking slot. Drivers give the money to the staff directly. Many people are not satisfied with the current management of the parking system and the flexibility of finding empty space to park their vehicles.

Considering the present day car parking tedious job where not only the number of cars are increasing but also the parking space is very limited. Thus it is not only a cumbersome task to find out the available slot and this includes the car movement across the multiple slots and there by even wasting a considerable amount of fuel as well. The movement of the car along the parking slots may also damage the other cars which are parked and even resulting in the traffic slowdown and congestion. Considering the present day parking systems where the user don't even have an idea of the available parking Slots though there Some available slots as we they lack the monitoring system for the same. Thus the situation where a user faces the traffic congestion in parking areas is very much obvious.

Parking demand is routinely high at theaters, shopping malls and offices. The problem that always occurs at the vehicle parking is time being wasted in searching for the available parking spaces. Users will keep on circling the parking area until they found an empty parking spot. That is, people often "circle around" looking for a good parking space then a traffic jam may occur [2].Parking is an ever-growing challenge in cities and towns across the world. So the demand for Reservation based parking System is expected to grow rapidly in the near future to eliminator reduce this problem with parking facility by just reserving their parking slotusing the SMS without having to go online.

The main objective is to design a parking system with ATMEGA 328P microcontroller which can run on an embedded system. By using GSM and RFID technology the parking problem in big cities, especially the mega- cities, has become one of the keycauses of the city traffic congestion. The Reservation based Parking System is considered to be an effective way to improve parking situation

FLOW CHART:

START

Driver opens the apps

Slot available — No → Driver keeps looking for the slot available

Yes

Driver Parks in the available slot

Car already parked — No → Green Light == ON BLYNK ==Available

yes

Green Light==OFF, BLYNK== not available

The Output is displayed on LCD & Balance is reduced, payment is done then the gate open

END

WORKING PRINCIPLE:

First, the user sends a message to the GSM modem which is placed at the parking end. The GSM modem will send a confirmation message to the user if whether the slot is vacant or not. Then the GSM modem will send the password and the parking lot number to access the reserved parking lot. Once the confirmation message has been sent, the counter for there serving time will automatically start for sending message.

The equipments used for the system are a 12V relays for barrier gate, matrix keypad to key in the passwords as well as alphanumeric LCD for display is used. The user has to arrive at the parking area within the time limit or else the reservation process will be expired. The user will park the vehicle according to slot number, with the help of the LED indicator. The green LED indicates that the slot is vacant.

An IR sensor is positioned at the slot area to sense the presence of the vehicle. Just after the vehicle has parked in selected area, the green LED will be deactivated to indicate that the slot has been occupied. The user will need to use password provided upon confirmation of reservation to enter and exit through the barrier gate. The vehicle owner has to first register the vehicle with the parking owner and get the RFID tag. The tags contain electronically stored information like vehicle registration number, Name of the vehicle user & credit amount for example like petro card etc.., When the vehicle has to be parked, the RFID tag is placed near the RFID reader, which is installed near the entry and exit gate of the parking lot to authenticate only registered users.

RESULTS:
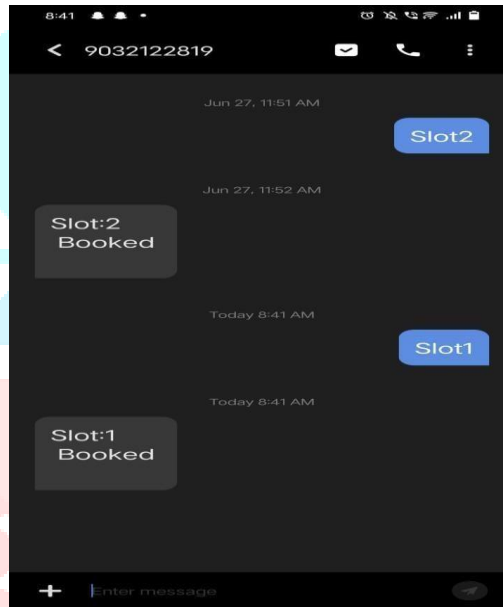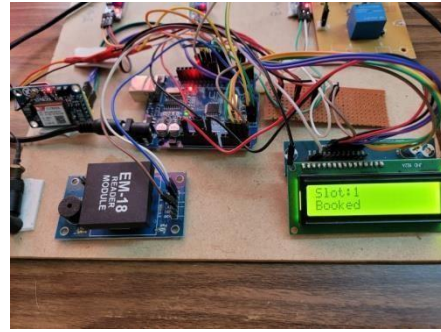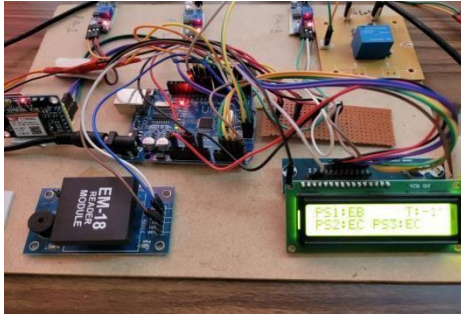
In above circuit all the components are connected correctly as per the block diagram and working of project. By using above module, we can easily detect the parking spaces for parking vehicles, using highly advanced IC have and with the help of growing technology the project has been successfully implemented.

ACKNOWLEDGEMENT :

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