International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 04 Issue: 04 | Apr -2017 www.irjet.net p-ISSN: 2395-0072

# INTELLIGENT BUS SYSTEM USING RFID, ZIGBEE AND GPRS

**Sheetal Dhende[1], Vedanti Kaotekwar[2], Varsharani Kokane[3],Prof.V.S.Karambelkar[4]**

*[1,2,3] BE Student, Dept. Of E&TC, BVCOEW, Pune, India*
*[4]Assistant Professor, Dept. Of E&TC, BVCOEW, Pune, India*

---

**Abstract -** *While travelling by the public transportation, time and patience are required. In other words, many people using public transport buses have experienced time loss because of waiting at the bus stops and even after getting bus because of too many passengers in the bus in countries like India . In this paper, we proposed smart bus tracking system that any passenger can access on webpage on their device. This paper innovatively utilizes the embedded technology and RFID technology. Anyone can access these webpage and can know the expected bus arrival times for the interested buses and number of passengers present in that bus. We used MQ3 alcohol sensor which will estimate if driver is drunk for ignoring the accidents. This system is based on IoT, zigbee and GPRS (Global Packet Radio Service) used for display services, respectively.*

***Key Words***: **GPRS, keypad, MQ3 , RFID, Smart bus, Webpage, Zigbee**

## 1.INTRODUCTION

Nowadays many people travels by public transport. Most people reach from homes to workplace or school using public transportation. People can lose time in transportation because of unwanted waiting and even though they get a bus because of too many passengers in the bus they don't get a comfortable journey. Also, people have the right to know where the bus is now and how long time it takes bus to reach bus stop. All transport systems must provide services like route and schedule and basic information like stop locations. These types of information are delivered in a variety of ways: a. via printed maps and schedule cards b. And this data can also be viewed on Internet so that users can either view it at home or in their office. c. this can also be done by using smartphone applications [1].

In this paper, we proposed an intelligent bus system which gives exact position of bus whuch is derived from RFID , and other information of bus as how many passengers are present in the bus as passenger press the key when he enters or exit from the bus for comfortable journey and bus number, route number, etc. The system also monitors if the driver has consumed alcohol with the help of MQ3 sensor, to avoid accidents. All this data can be viewed on the internet webpage.

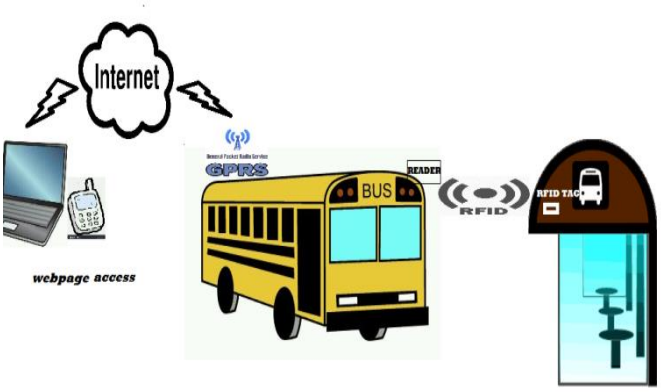


**Fig - 1:** RFID information flow

### 1.1 SYSTEM ARCHITECTURE

The components and architecture of the proposed system consists of two sections as shown in Fig. 2. These are (i) first section is transmitter section which consists of LPC2148 arm controller, keypad, RFID, LCD, Buzzer, Zigbee transmitter and motor, (ii) receiver section which has LPC2148, zigbee receiver, MQ3 sensor, GPRS and LCD, (iii) RFID tags placed at bus stops, and (iv) showing the information on webpage on any device which has internet service

### 1.2 Usage of RFID in the system

RFID is Radio Frequency Identification, basically have tag and reader. RFID operates at frequency 125 KHz and can be connected to any microcontroller directly or with RS232 converter. the range of RFID varies from centimeters to kilometers.

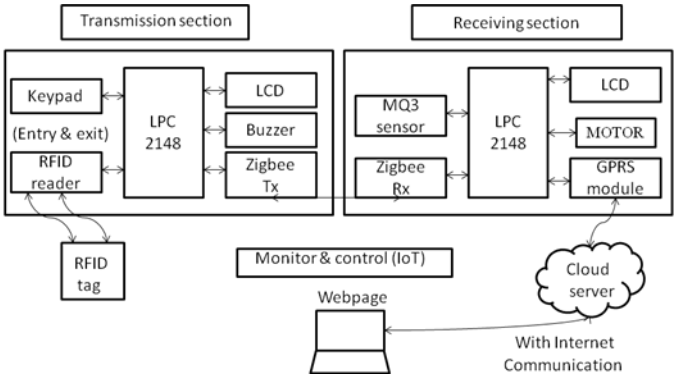


**Fig – 2**: Block diagram

The card/tag number is unique and is stored in database which has particular bus stop name. Whenever bus passes by the bus stop RFID reader detects the tag placed at bus stops and the taken information is sent to the receiver section by Zigbee transmitter. Zigbee receiver receives the information and through GPRS it goes to the database and can be viewed on the webpage.

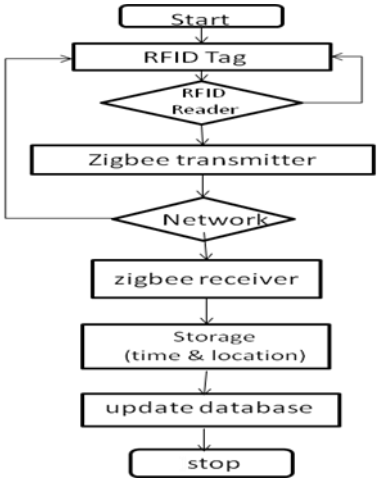


**Fig – 3:** flowchart of RFID tag detection operation

## 1.2. MQ3 SENSOR

Main role of the MQ3 sensor is to check whether the driver has consumed alcohol or not and it shown on LCD. Its operating voltage is 5v AC or DC. It has lower conductivity in clean air and conductivity is higher as the alcohol contents are rising in air. The sensing switch of the sensor is connected to controller. Whenever it detects alcohol contents in the air, it conductivity changes and this signals are given to the ARM controller. If driver has consumed alcohol then the motor will stop.

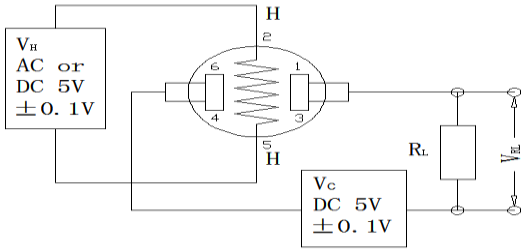


**Fig – 4:** MQ3 test circuit

## 1.3GPRS AND WEBPAGE:

As shown in fig.2 the information obtained from the transmitter section that is the location of the bus and number of passengers in the bus which is derived by pressing keypad (whenever they enter or exits from the bus), GPRS transmits this data in the form of packets which can be viewed on the webpage on the following link:

http://intelligent_bus_system

## 1.4 : USER INTERFACE AND SERVICES

Flow of the system is as follows:

• MQ3 Alcohol sensor senses the alcohol gas in the air around driver, if gas is present, it .


**Fig – 5:** Result of MQ3 sensor

• As seen in Fig. 5&6, the black markers represent buses, the red markers represent bus stops. Users can zoom in for better view.

• If users are registered then they are informed by SMSs or emails.


**Fig -6.** RFID Tag detected at Balaji Nagar

**Fig - 7:** Current Location at Balaji Nagar

## 3. CONCLUSIONS

In this paper, we have presented an intelligent bus tracking system. It is based on GPRS, zigbee, RFID and webpage technologies. The proposed system, basically tracks the position of busses, estimates the passengers present in the bus and informs the users through webpage to avoid unnecessarily wait at bus stops and travel comfortably.

In the future, we plan to enhance the system with some other tools and statistical analysis. Moreover, since the system is developed with open standards and open sources, it is easily extended with future technologies according to users.

## REFERENCES

[1] Suleyman Eken, Ahmet Sayar, "A Smart Bus Tracking System Based On Location -Aware Service and QR codes", IEEE,978-1-4799-3020-3/14,2014

[2] M. A. HANNAN, A. M. MUSTAPHA, A. HUSSAIN and H.BASRI, "Intelligent Bus Monitoring and Management System" ,WCECS 2012, October 24-26, 2012, San Francisco, USA

[3] M. Bhuvaneswari, S.Sukhumar, N. Vidya, S.Kalpanadevi, N.Suthanthira Vanitha, "Embedded System Based Automatic Ticket Vending Machine for Modern Transport System", International Journal Of Advanced Research In Computer and Communication Engineering, vol.2,Issue 11,Nov.2013

[4] Paul Hamilton, Suresh Sankaranarayanan, "Intelligent Agent Based RFID System For on Demand Bus Scheduling and Ticketing", International Journal Of Future Computer and Communication,vol.2,no.5,Oct.2013

[5] Mrs. Swati Chandurkar, Sneha Mugade, Sanjana Sinha, Megharani Misal, Pooja Borekar, "Implementation Of Real Time Bus Monitoring and Passenger Information System", International Journal Of Scientific and Research Publications, vol.3,Issue 5,May 2013

[6] Komal Agarwal, Kranti Dive, "RFID Based Intelligent Bus Management and Monitoring System", International Journal Of Engineering Research and Technology(IJERT), vol.3, issue 7,July2014

[7] Shao Jie*, Tang Qian-jin, Cheng Cheng, Li Zhen-yu, Wu Yi-xuan, "Remote Detection of Alcohol Concentration in Vehicle Based on TDLAS", 978-1-4244-4964-4/10,2010 IEEE