RFID BASED TRANSPORT MONITERING SYSTEMS:
A Technical Review

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Abstract: **Our life became much easier now a days because of innovations and technology. We are working on developing a bus management system. The AVR302 based Bus Module consisting mainly of a GSM modem and RFID Readers on the entry and exit gates. This paper summarizes our work on design and implementation of RFID based system.**

Keywords: **RFID Tag, RFID Reader, GSM module, Visual Basis.**

I.INTRODUCTION

Here, we used AVR microcontroller which controls all the working of our system. It will give signal to all the other hardware we used. RFID tag and RFID reader are the second most important component in this system. **Radio-frequency identification** (**RFID**) is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects [1].

RFID is connected to the bus which contains the information such as bus number, registration number, time date etc. RFID reader is connected to the gate. Whenever bus enters into the gate, it will detect RFID number connected to the bus. RFID reader will check the time when bus enters from the gate. This time if not matches with the predefined boarded time of the bus, then GSM module will work on it. GSM module will send the message to the person who is in charge of transportation system of college.

RFID
A RFID system uses three components:
a) An Antenna
b) A transceiver (include decoder)
c) A transponder (RF passive)

Electronically programmed with unique information. There are different types of RFID components out in the market. Their categorization can be done with respect to frequency power. Some of the most commonly used RFID kits are as follows:
1) Low-frequency (30 KHz - 500 KHz)
2) Mid-Frequency (900 KHz - 1500MHz)
3) High Frequency (2.4GHz - 2.5GHz)

These frequency ranges mostly tell the RF ranges of the tags from low frequency tag ranging from about 3m to 5m, mid frequency ranging from 5m to 17m and high frequency ranging from 5ft to 90ft [2].

II.SYSTEM LITERATURE SURVEY

Swapnil Bhosale, Abhishek Aru,Tushar Jashav,Vikas Kalokhe,Santosh Sambare publish a research paper on Bus tracking system. The proposed system architecture for the bus monitoring and management system is shown in Figure 2. A black box containing RFID reader, GSM modem is equipped in the moving bus. As the bus approaches a bus station with an RFID tag, the distance between the reader and the tag decreases and causes them to interact with each other. This network communication results in data and the data obtained is sent to the Super station via GSM[1]

Komal Satish Agarwal, Kranti Dive published a paper on RFID Based Intelligent Bus Management and Monitoring System which describe work on the design and implementation of RFID-based system for tracking the location of buses provided for public transportation.[2]

G. kiran kumar , Dr. Mallikarjuna Prasad published a paper on Public Transportation Management Services using GPS-GSM which describe Transportation management service includes vehicle tracking & security system bt embedding of an electronic device in a vehicle with purpose-design computer software to enable the owner or a third party to track the vehicle's location, collecting data in process. This project works on and implement a solution for enhancing public transportation management services based on GPS and GSM.[3]

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C . Matheswaran ,V. Senthilkumaran worked on Bus Monitoring System based on RFID Technology with GSM Communication.[4]

Neha Shinde and saniya Ansari introduce a system named as Intelligent Bus Monitoring Sytem. Here they design and implementation of smart public transport system for smart cities is proposed. A detailed survey concluded for implementation of various features to the system prototype. Feature like smart application for user friendly use, GPS/GSM system interface, emergency & bus fail switch etc.[5]

III. METHODOLOGIES AND ALGORITHMS

Radio Frequency Identification (RFID) is a generic term for technologies that use radio waves to automatically identify and track product, animal, or person by means of using RFID tags that are applied or incorporated on them. An RFID system consists of a tag, basically a microchip with an antenna and an interrogator or reader with an antenna. Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal. The reader sends out electromagnetic waves. The tag antenna is tuned to receive these waves. A passive RFID tag draws power from field created by the reader and uses it to power the microchip's circuits. The chip then modulates the waves that the tag sends back to the reader and the reader converts the new waves into digital data [3].

The purpose of bus identification, the tags are attached to bus .this tags consist of information such as bus number ,registration number ,bus route, capacity of the bus. When the tag is tapped on the receiver it will first identify the card number from the database and it will transfer the information which is present in that row. In addition to that system is connected to the real time clock (RTC), it will give the exact entry and exit time of the bus. The time is represented in 24 hours format to avoid the confusion created by 12 hour format. Because of this system can be easily useful in different countries. With the help of visual basics system can present this data on the computer. By this way system will have proper record of the bus which is to be managed.

Hardware specification

➢ **RFId Reader**

Fig.1:- Reader Module

It is used to read unique ID from FRID tags. Whenever RFID tags comes in range, RFID readers reads its unique ID and transmits it serially to the microcontroller or PC. RFID reader has transreceiver and an antenna mounted on it. It is mostly fixed on stationary position. Basically, RFID systems categorised as active and passive based on how they are powered and their range.

➢ RFID Card

RFID small electronic devices that consist of a small chip and an antenna. The stands for Radio-Frequency Identification. The acronym refers to chip typically is capable of carrying 2,000 bytes of data or less. . The RFID device serves the same purpose as a bar code or a This is a plug and play GSM Modem with a simple to interface magnetic strip on the back of a credit card or ATM card; it

Fig.2:- RFID Card

provides a unique identifier for that object. And, just as a bar code or magnetic strip must be scanned to get the information, the RFID device must be scanned to retrieve the identifying information. RFID methods utilize radio waves to accomplish this. At a simple level, RFID systems consist of three components: an RFID tag or smart label, an RFID reader, and an antenna. RFID tags contain an integrated circuit and an antenna, which are used to transmit data to the RFID reader.

➢ GSM Module

Fig.3:- GSM Module

serial interface. Use it to send SMS, make and receive calls, and do other GSM operations by controlling it through simple AT commands from micro controllers and computers. It uses the highly popular SIM800 module for all its operations. It comes with a standard RS232 interface which can be used to easily interface the modem to micro controllers and computers. The modem consists of all the required external circuitry required to start experimenting with the SIM300 module like the power regulation, external antenna, SIM Holder, etc.

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➢ Electronic Buzzer

These high reliability electromagnetic buzzers are applicable to automobile equipment. Compact, pin terminal type electromagnetic buzzer with 2048Hz output. Pin type terminal construction enables direct mounting onto printed circuit boards.

Fig.4:-Buzzer

These are thin-type electromagnetic buzzers with a height of only 7mm. They provide output over a relatively wide band, making them suitable for music. Pin type terminal construction enables direct mounting onto printed circuit boards.
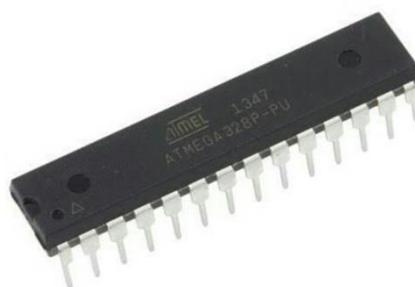
➢ At mega 328

Fig.5:-At mega 328

The AT mega 328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the AT mega 328P achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

➢   LCD

Fig.6:-LCD

LCD (Liquid Crystal Display) is a 16*2 electronics display usedfor wide range application. LCD 16*2 display used in various application such as display some information in the form of alphabets and digits. 16*2 LCD display means it shows 16 character in 2 lines. i.e. per character it display 5*7 pixel matrix. Display circuitry contain two register command and data. Command instruction is used to store the instruction which is given to LCD display. Data register is used to store data which is to be displayed on the LCD 16*2 screen. The data is in the form of ASCII value of the character to be displayed on the LCD.

➢   Block Diagram

IV.DETECTION AND ALGORITHM
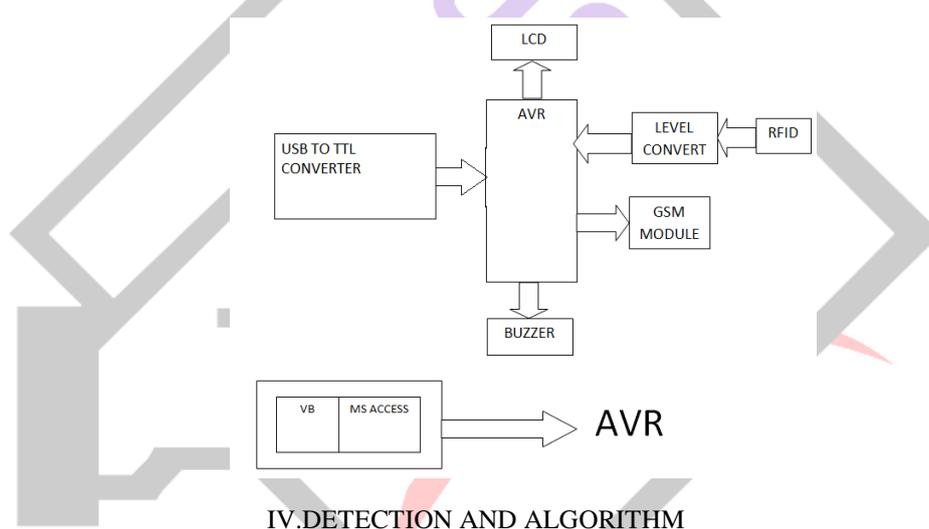
As the tag is read by the reader it will give relevant information to the system. The reader will accept the card if the tag information is already stored in the database. At the end of day the information will transfer to initial memory and the reader will reset for the next day

REFERENCES

[1]. RFID Based bus tracking system Swapnil Bhosale, Abhishek   Aru, Tushar Jashav, Vikas Kalokhe, Santosh Sambare Computer Engineering Department. Pimpri Chinchwad College of Engineering. Nigdi, Pune, India
sswapnil.1993@gmail.com,aruabhishek@gmail.com,   jadhavtv@gmail.com,vkalokhe70@gmail.com, sambare_santosh@pccoe.org
[2]. International Journal of Engineering Research & Technology (IJERT) IJERTIJERT ISSN: 2278-0181 www.ije Komal Satish Agarwal Computer Department MIT College Of Engineering, Pune Pune, India Kranti Dive Computer Department MIT College of Engineering, Pune Pune, Indiart.org Vol. 3 Issue 7, July – 2014
[3].IJRCCT, ISSN-2278-5841,Vol-1,Issue-3,Aug-2012 G.Kiran Kumar, Dr. A.Mallikarjunna Prasad Department of ECE,JNTU Kakinada ,AP ,India. Kirankumar.205@gmail.com , a_malli65@yahoo.com
[4]Matheswaran ,V. Senthilkumaran worked on Bus Monitoring System based on RFID Technology with GSM Communication.
[5].International Journal of computer Application(0975-8887)Volume 168-No.3,June2017 Intelligent Bus Monitoring System Neha Shinde & Saniya Ansari