

# CERTAIN INVESTIGATION OF MONITORING SYSTEM IN TRANSPORTS USING IOT

Dr.P.Ramesh kumar,M.Tech,Ph.D<sup>1</sup>, Brindha G<sup>2</sup>,Priyadharshini K<sup>3</sup>,Yuvarani M<sup>4</sup>

1(ECE, Sengunthar Engineering College(Autonomous), Tiruchengode  
Email: dean.research@scteng.co.in)

2 (ECE, Sengunthar Engineering College(Autonomous), Tiruchengode  
Email: brindha2001g@gmail.com)

3 (ECE, Sengunthar Engineering College(Autonomous), Tiruchengode  
Email: kumarpriya172001@gmail.com )

4 (ECE, Sengunthar Engineering College(Autonomous), Tiruchengode  
Email: yuvaranim0@gmail.com)

## Abstract:

Innovations and technology will make our life became much easier now a days. We are working on developing a college bus monitoring system using RFID (Radio Frequency Identification technology). Our project is about controller and RFID based displaying and updating bus management system based on IoT and embedded system, to achieve automatically display and manage the bus database details with bus name or number, entry and exit time of the specific vehicle alongside date without the need for manual operation. It is part of intelligent transportation, at the same time the use of auto data base management, to reduce the work load of the bus management system, microcontroller was used to receive and send the data, then the data is communicated to the IoT module. For every vehicle RFID tag will be given. In gate the RFID readers are located. Using reader tag, information is retrieved. The serial number of each tag is associated with each transport's database. With the help of the system RFID and the Internet of Things, the transports monitoring will be easy to access; through the accuracy and reliability of the data, the system gives accurate information to the administrator of transports. The proposed system can inform in charge of transports whether the bus is arriving on time, early or late.

**Keywords** — RFID Technology, IoT, Transport Monitoring.

## I INTRODUCTION

Nowadays, travel time information of transports becomes a major component of Advanced Traveler Information System (ATIS). These travel time of transports depending on external parameters such as accidents, stuck in traffic. Most bus station follows fixed schedules, and don't use intelligent systems for vehicle tracking and control. Many supervisors are deployed at the station to control the entrance and the exit of buses and prepare the trip sheets containing the schedules manually which is time consuming and inaccurate. Manual control can be used in offices, laboratories and libraries where it is essential to keep a record of the people entering and exiting. At present every work should be done manually and because of this performance is degraded. This problem can be solved by using latest technologies like Radio Frequency Identification (RFID). RFID is the wireless non-contact frequency electromagnetic fields to transfer data, for the purposes of

automatically identifying and tracking tags attached to objects. In this system the individual RFID tags and readers are viably utilized for observing transports. There is a feature provided in this system to generate daily reports monitoring of transports can be done automatically. In addition, Arduino UNO and Esp8266 (NODEMCU) are utilized in this task. These both communicate with one another and the information's are spread through WIFI - Device NODEMCU to the cloud. Whenever transport entered into the organization the RFID reader peruses the transport number, transport entry timing will be captured. With the assistance of Esp8266 (NODEMCU) all the subtleties are sent to the college transport office through the cloud with the assistance of Esp8266. These subtleties if not matches with the predefined boarded database of the bus, then use MQTT (Message Queuing Telemetry Transport) server module will send the message to the person who is in charge of transportation system of college. Then the monitoring of transport reports can be done easily to the administrator without human force.

## **II LITERATURE SURVEY**

Radio Frequency Identification (RFID) is introducing, and it's bringing a streamlined revolution in this world. When dealing with the tracking device, Radio Frequency Identification (RFID) is the latest phase in the decades that can be used as an efficient tracker. Radio Frequency Identification (RFID) Technology used to develop tracking system is quite new but something that promising. This is used to gives solution RFID technique for monitoring entry and exit of employees with their official assets (E.g., laptops). This system is actually based on external database system that will provide the pre-recorded information about the reader. Since the reader detected by the database, then the tracking system will process the data and will show the result of subject tracking. [1]

In the era of embedded systems efficiency and time are the matter of priority. RFID (Radio Frequency Identification) one of the converging technologies and transportation plays an important role in urbanization, RFID is one of the key catalysts playing a significant role in it. RFID plays major role in auto ID applications like RFID contact fewer smart cards used by bus riders, in Super market, Textiles and logistics chain management. This is mainly focused to understand the benefits of RFID technology and possibilities to reduce the accidents on Indian roads. The GSM (Global System for Mobile Communications) has been a great success to providing both voice and low speed data services. In GSM one of the major evolutionary steps to serve real-time high-speed data services is to Enhanced Circuit Switched Data (ECSD). [2]

The basic concept of connectivity is IoT can be integrated into traditional communication network to reduce many problems. Vehicle-to-Infrastructure (V2I) technology is one of the aspect of IoT enabling intelligent transport systems. In V2I Vehicular monitoring is part which to helps minimize the problem caused by vehicles in the city, like traffic violation and road accidents, congestion. In this system observed an instance of Vehicle-to-infrastructure communication model realizing data transmission between traffic light and vehicle is to be regulated. A On-Board Units (OBU) prototype and Road Side Units (RSU) prototypes are developed. Vehicles send Identity, speed and location messages to the traffic controller fully based on Zigbee wireless technology. The message is analyzed to check speed violation. From the RSU information related to user's driving is transmitted to a monitoring server to charge the offender of traffic rules.

Therefore, the modules based on Controller Area Network (CAN) bus for in- vehicle communication, OBU details for Over speeding in highways, RSU information for Real time data collection and E-mail notification service based on violation rules are developed [3]

The lifecycle for industrial applications is becoming shorter, the application complexity increases, performance is too low, fault tolerance is required, reuse of components is desired, and the developer require strong verification tools to cut down the verification phase. These problems are increases with based on longer development time and requirements of higher quality from the customer, its more important to examine flexible and scalable parallel processing for complex real-time systems. This is the motivation forerunning the research project SARA (Scalable Architecture for Real-Time Applications). The first SARA system is now running with vision system connected to an industrial robot (ABB Robot). The system-busses are important resources in computer-system. Today there are no methods to monitor busload during runtime; in this project discuss a simple method of how to do this.[4]

In this work present to integrate RFID (Radio Frequency Identification) in WSN (Wireless sensor network). It is used to support Radio Frequency identification process by the read range of an RFID system extended. Besides, we can monitor the environment of an object and optimize RFID reader's performance and energy by the use of wireless sensor networks. Then the methodology to integrate RFID technology, WSN forms an intelligent bus tracking application is studied. The proposed system can monitoring bus traffic inside spacious bus stations and used to inform the administrators to whether the bus is arriving on time, early or late. This information is then displayed on the different wireless displays inside and outside the bus station. [5]

## **III EXISTING SYSTEM**

In existing method, have to monitor the transports related data by the use of manual system to get a information in institution. No automatic system was implemented to get information automatically which will lead work load and manual errors may occur in that system.it is a long process to monitoring and maintaining the database by the use ledger, it may give error to database of the transports. There is no storing method to handle the real time daily databases in previous method. Overcoming this method, we can choose RFID methodologies to store and give the daily databases of the transports in all organizations.

## IV PROPOSED SYSTEM

### BLOCK DIAGRAM

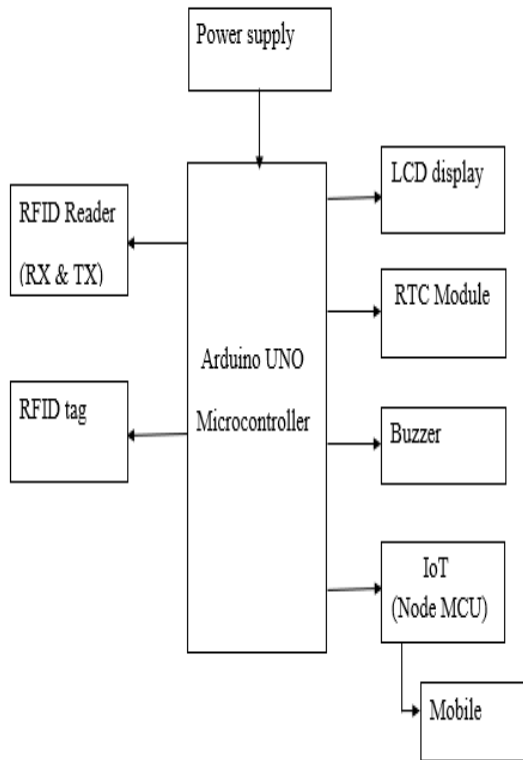


Fig.1 Block Diagram for RFID Based Transport Monitoring System

This project proposes a system for tracking college bus using advance techniques which are capable to deliver results and the information in a rapid and efficient way. In this system will propose the bus database monitoring on Android Application which is used MQTT server. It will modifies the advance and latest techniques for the existing System. The system will replace IOT, the traditional way of monitoring the bus by using IOT system. The data will give the exact timing of bus in and out and co-ordinates of the Bus. The RFID will be connected to the microcontroller. The Arduino Uno has web connectivity using IOT module. The RFID is placed in a bus. The software will also stores the daily information monitoring of Bus like, details of Bus, identity number, etc. In and out gate time which will be shown on an LCD display and as well as stored in software if it is exceeded in the predefined time of institution then the message will automatically send to the administrator who is in charge of the transportation.

This proposed method mainly focused on the RFID technology which will overcoming the existing method of monitoring the database these technologies will give better solution to monitoring the database automatically.

Radio-frequency identification (RFID) - It is a programmed identification technique; this will be depending on Storing the data and recovering information remotely by using RFID labels or transponders.

**RFID Reader:** It will send the electromagnetic waves which

is carrying a signal to identify objects. This will ensure that finally the reader receives the information returned back by these kinds of objects.

**RFID tag:** Unique identity tag will attach to the objects; it will react to receiving the signal from a RFID reader and sent the required database in order to forwarding to it the requested information.

**Computer/database:** It will be used to storing and processing the information collected by the RFID reader.

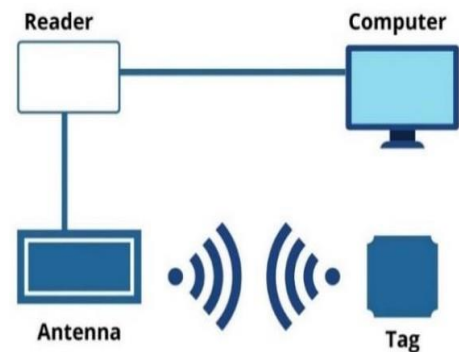


Fig.2 RFID Technology

### A. ARDUINO UNO MICROCONTROLLER

In this system using Arduino uno controller. It is a main part of this system because it internally stores the all-transport related database programmed inside it by the use of embedded programming. It is used to get information from the RFID reader and send it to the WIFI gadget (Node mcu). LCD is likewise associated with it so as to see the passage entry and leave time status, bus number along with date.

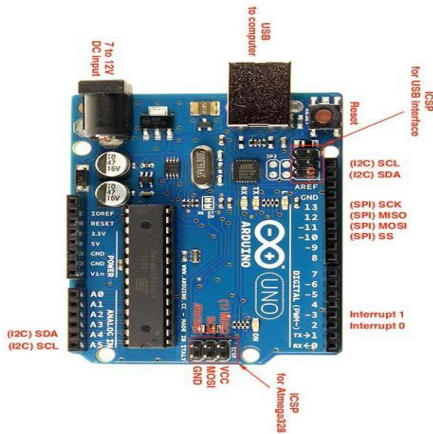


Fig.3 Arduino UNO

## B. RTC MODULE

RTC means Real Time Clock. RTC modules are simply TIME and DATE remembering systems which contains battery setup in the absence of external power keeps the module running. In this system Entry and exit time of the buses are generated by using RTC and the Arrival time is noted and displayed in LCD.

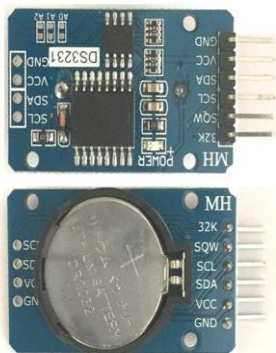


Fig.4 RTC Module



Fig.5 NODE MCU (ESP2866)

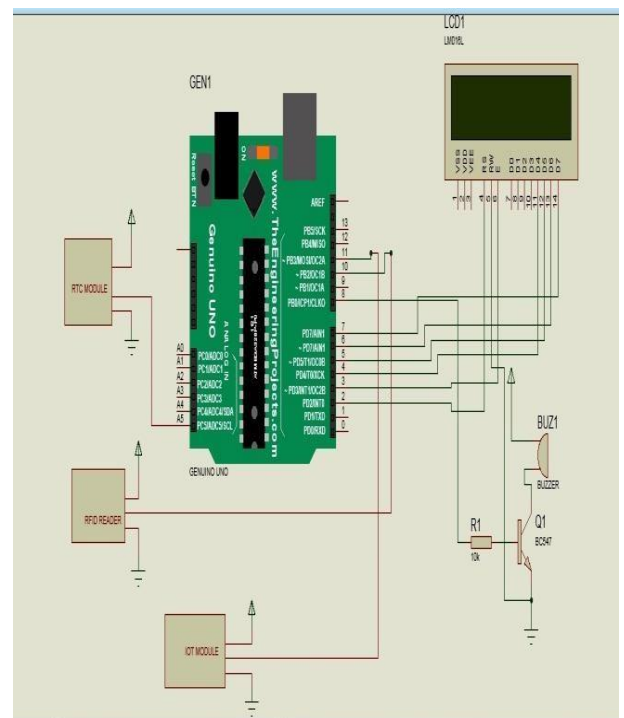


Fig 6. Circuit diagram for Transport Monitoring using IoT

## C. NODE MCU

Node Microcontroller Unit is simply called as NODE MCU it is a open-source software and hardware development environment built around an inexpensive System-on-a-Chip (SoC) called the ESP8266. WIFI gadget utilized for sending the subtleties caught to the cloud (MQTT client).It cooperates with Arduino Uno and gets the subtleties from it and sends to cloud. Node red represents the buses updated on entry in real time database cloud with the help of NODEMCU. If the predefined database will not match the subtleties then the SMS notification and buzzer indication send through it.

## V WORKING PRINCIPLE

There are two sections in this project one is transmitter section which contains a RFID tag and it is placed on the bus and another section is receiver section which contains a RFID reader placed on college gate. Bus is consistently monitoring by the use of RFID Technologies. The Reader continuously producing a radio waves. These waves are used to passively identified tagged object by the use of passive RFID tags. The Radio frequency ranges are different in frequencies. These frequency ranges mostly give the RF ranges of the tags from low frequency tag ranges

from 3m to 5m, middle frequency tag ranges from 5m to 17m and high frequency tag ranges from 5ft to 90ft. When bus comes in the range of the college gate, with the help of wireless networks. This can constantly maintain the bus data base with the help of controller. Finally the database will store inside the software called node red and the data will be monitored by the authority of transport remotely.

punctual to the transport schedules that have been established, resulting in a more efficient transport circulation system in the institution. Generating reports with the help of internet browsers is convenient and flexible for printing the History of SMS and Time-in-time-out. In future expect that the system will inspire the designers and developers to develop transport monitoring with enhancement of features in future.

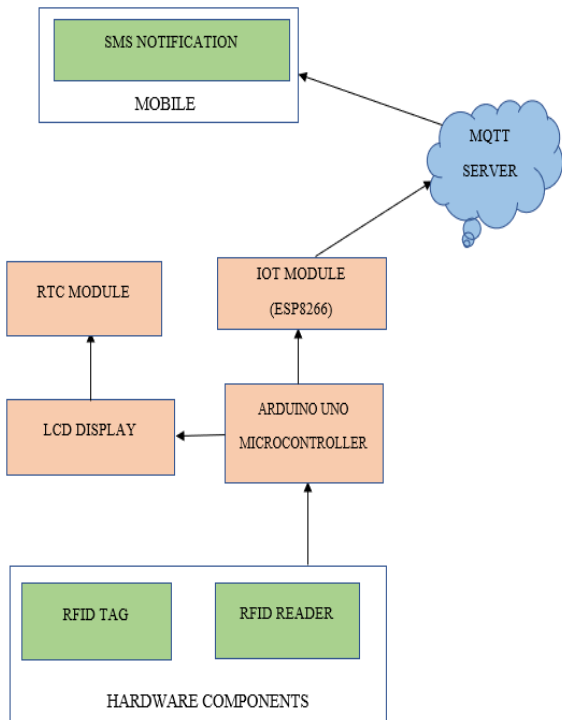
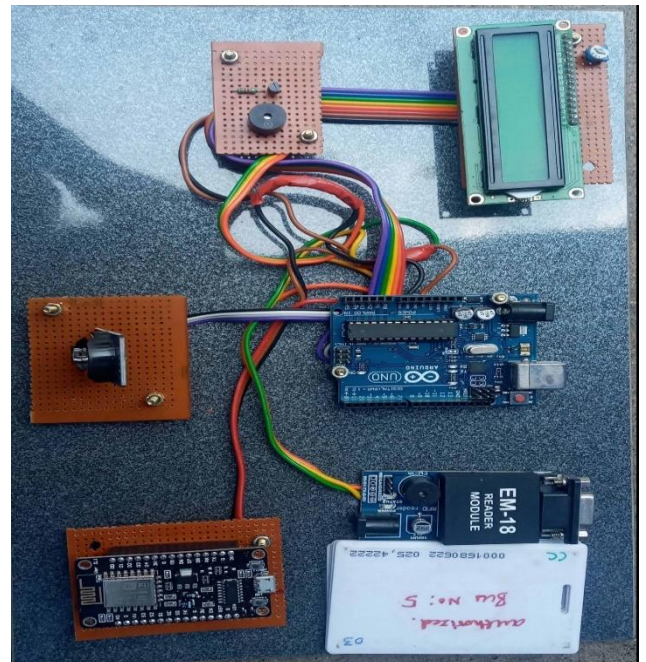


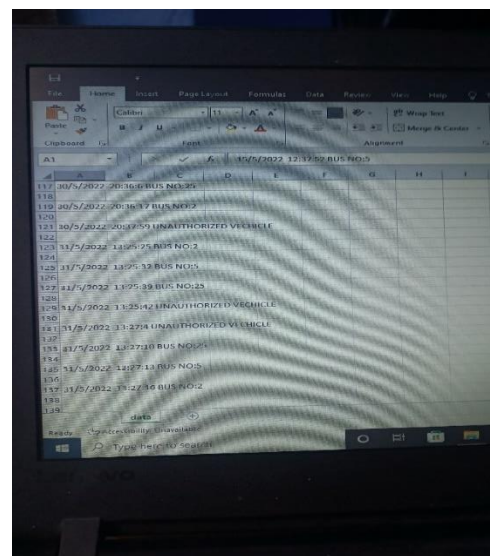
Fig.7 Architecture diagram

## VI RESULTS AND CONCLUSION

As the RFID technology evolves, various sophisticated applications will use the capability of RFID to send, receive, store and forward the data to a remotely to the sink source. Each area needs to be exclusively programmed. Maintenance is bit costly than traditional system. 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. This framework can be stretched out for full-time monitoring and college transports that will be useful for Transport organization at least expense. This system gives time saving, easy control and reliability and also reduces manpower. Bus drivers will ensure to be more



## VII SYSTEM OUTCOMES



## VIII REFERENCES

- [1] Ran Hee Jeong, and Laurence R. Rilett (2004) "The Prediction of Bus Arrival Time Using AVL Data", Transportation Research Board 83rd Annual Meeting, Washington D.C.
- [2] H. Isredza Rahmi, Comparative study on RFID, hotspot and car plate scanning method : for intelligent parking management system. masters thesis, University Technology MARA. 2005.
- [3] Urachada Ketprom, Chaichana Mitrpant, Puchapan Lowjun, "Closing Digital Gap on RFID Usage for Better Farm Management", PICMET 2007, 5-9 August 07.
- [4] QIN, K., XING, J., CHEN, G., WANG, L., QIN, J. "The design of Intelligent Bus Movement Monitoring and Station Reporting System", In Proceedings of the IEEE International Conference on Automation and Logistics, Qingdao, China, September 2008, p. 2822-2827.
- [5] Longer O. (2009), "Implementation of Student Attendance System using RFID Technology", B. Tech Project Report, Ladoke Akintola University of Technology, Ogbomosho, Nigeria.
- [6] Mohamed A.B, Abdel-Hamid A and Mohammed K.Y.,(2009), "Implementation of an Improved secure system detection for E passport by using EPC RFID tags", World Academy of Science.
- [7] Ben Ammar Hatem, Hamam Habib, "Bus Management System Using RFID in WSN", European and Mediterranean Conference on Information Systems. [2010].
- [8] A. HANNAN, A. M. MUSTAPHA, A. HUSSAIN and H. BASRI, "Intelligent Bus Monitoring and Management System", CECS 2012, October 24-26, 2012, San Francisco, USA.
- [9] Kumar, Chaturvedula. U.P, M.Tech, Embedded Systems, RFID Based Embedded System for Vehicle Tracking and Prevention of Road Accidents ,International Journal of Engineering Research & Technology (IJERT) Vol. 1 Issue 6, August-2012.
- [10] Anwar Al-Lawati, Shaikha Al-Jahdami, Asia Al-Belushi, Dalal Al-Adawi, Medhat Awadalla and Dawood Al-Abri. "RFID-based System for School Children Transportation Safety Enhancement". [2015].
- [11] Akshay S. Kyatam, P. A. M. M. A. A. K. [2015]. "Tracking and Scheduling of State Transport Bus using RFID". International Journal of Engineering and Computer Science, 4(05). Retrieved from <http://www.ijecs.in/index.php/ijecs/article/view/3599>.
- [12] International Journal of computer Application (0975-8887) Volume 168-No.3, June 2017 Intelligent Bus Monitoring System Neha Shinde & Saniya Ansari.
- [13] M. K. Sangole and Sakshi S. Kedar and Pallavi B Phad and Sanket V Salunke. "RFID BASED TRANSPORT MONITERING SYSTEMS: A Technical Review", [2018].
- [14] PRARTHANA. S, NIVETHA.R, K. POORNIMATHI. [2020]. "IoT Based Bus Entry Monitoring System Using RFID". International Journal of Computer Science and Mobile Computing - IJCSMC (Vol.9, No. 5).

