IoT Based Smart Vehicle System

Sumalatha Pitchuka[1], D.V.Sridhar[2], Alekhya Kalapatapu [1], Maheswara Rao Chithiri[1], Chandana Matta[1]

U.G. Student, Department of Electronics and Communication Engineering, Sri Vasavi Institute of Engineering & Technology, Nandamuru, Pedana Mandal, Andhra Pradesh, India[1]

Assistant Professor, Department of Electronics and Communication Engineering, Sri Vasavi Institute of Engineering& Technology, Nandamuru, Pedana Mandal, Andhra Pradesh, India[2]

ABSTRACT: In our country due to more population, the vehicle details like Registration Certificate (RC), pollution Certificate (PUC), Vehicle Insurance and License of individual Vehicles are checking by Traffic police is more difficult and takes more time, sometimes it causes traffic jam. This paper describes our project entitled IoT Based Smart Vehicle System which helps the Traffic Police Personnel's to checking the vehicle details without delay by read one smart card by RF Reader which is carried by vehicle owner,it has all vehicle details and helps Vehicle owner to avoid carrying All documents just by carry only one smart card. We are going to store all the details of the individual vehicle in this RFID CARD. Whenever police read the Smart Card by RF Reader if there is any document details are missed, the system sends e-Challan Link to the Vehicle owner's registered mobile number.Using that link Vehicle owner Pay the challan. This process reduces the number of documents and waiting time. The things required for implementation are at low cost.

KEYWORDS: Raspberry Pi3; RFID Reader; RFID Tag; IoT; LCD.

I. INTRODUCTION

In this paper, we focus on a smart vehicle system based on Radio Frequency Identification (RFID) technology, which has not been well- studied in the past. In such a system, all vehicle documents are attached with an RFID tag, so that they can be tracked by authorized government individual or traffic police equipped with an RFID reader. Intuitively this brings the following benefits

1) All the information present in documents that are linked with vehicles are entered into theRFID card. As a result, users do not need to wait in long queues while the authority is checking the documents

2) Whenever the RTA officials scans the RFID card or enters the vehicle number in the official webpage then the data will be uploaded to the cloud server and get updated when there is a new entry.

II. LITERATURE SURVEY

In the present system people are waiting in a queue for the documents verification of the vehicle. This is a time taking process. This makes people inconvenient as well as the man power is very high. The official should always check the documents by using man power.

III. PROPOSED METHODOLOGY AND DISCUSSION

To overcome the drawbacks in the existing system, a RFID tag with all the vehicle information inscribed in it is provided to each user at the time of vehicle registration. Government official should be equipped with the RFID reader to scan the details present in the tag. The details of the vehicle are also entered into the server. So, After each scan and vehicle number search the data will be updated in the server. This RFID tag consists of information like license, RC, Pollution certificate and Insurance etc. So, after placing tag near the reader the details of the vehicle will be displayed on the LCD screen present in the reader and vehicle information is known to the official from anywhere using IoT.

International Journal of Innovative Research in Computer and Communication Engineering
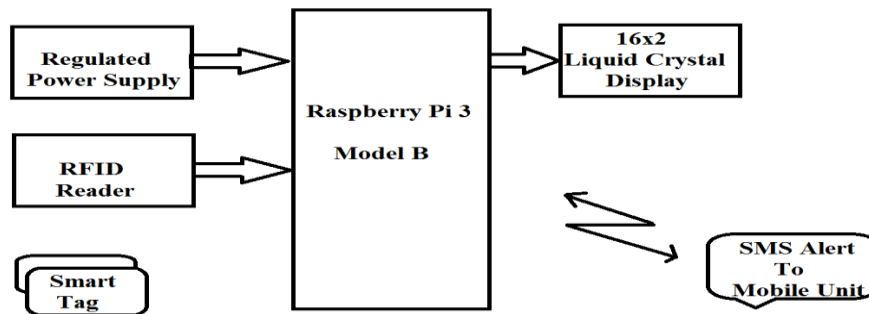
III A.*Block Diagram*

Fig. 1. Block Diagram of the Project

III B.*Flowchart of the System*
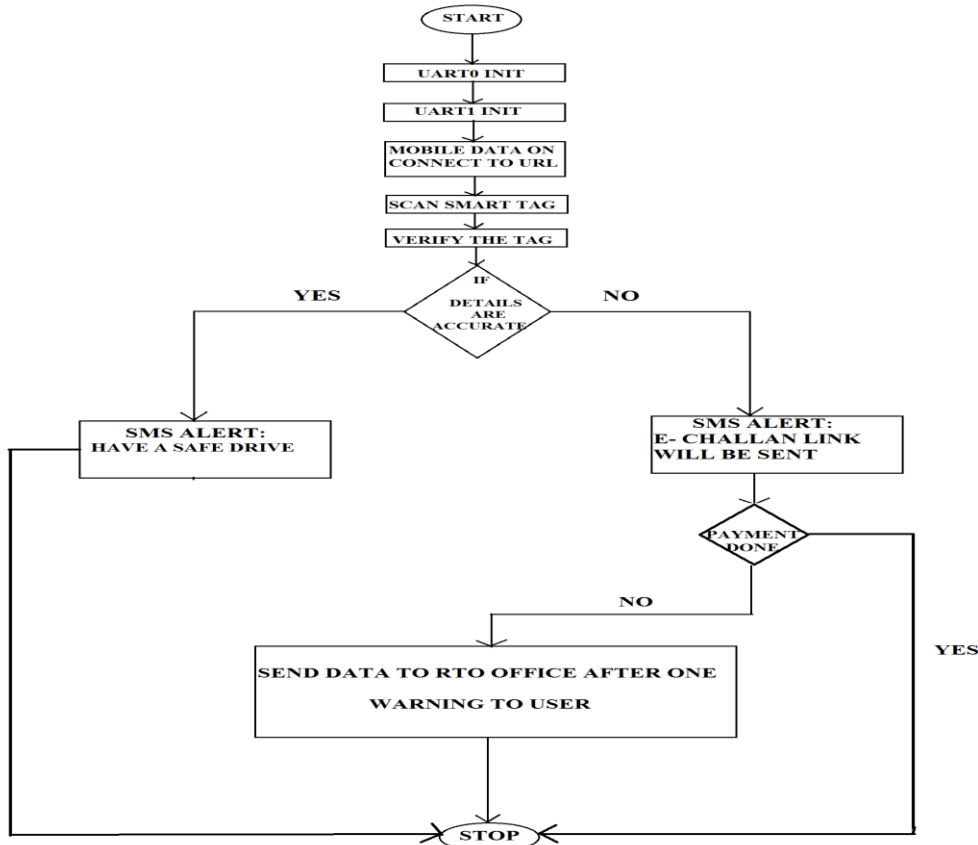
Fig. 2. Flowchart of the Project

III C: *Overview of the Project*

The components used in the project are Raspberry Pi3, RFID Reader, RFID Tags and LCD. These RFID Reader and LCD are interfaced with Raspberry Pi.The RFID Tag placenear the Reader After the RFID tags gets into themagnetic field of RFID reader, the RFID tag will receive the RF signals emitted by RFID reader.By the energy of induced current, the RFID tag will send out vehicle information stored in the tag chip (it is passive tags).RFID Reader will receive the signal and read decode the information sent to the central information system for the data processing.

III. C. 1:**Raspberrypi3**

Raspberry pi is a series of small single-board computers (SBC is a complete computer built on a single circuit board, with microprocessors, memory, input/output and other features required of a functional computer) developed by the Raspberry Pi foundation.Released date of Raspberry pi 3 model B is 29 February 2016.It has on-board Wi-Fi, Bluetooth and USB boot capabilities.All models feature a Broadcom system on chip (SoC) with an integrated ARM compatible CPU and on-chip graphics processing unit (GPU). The foundation provides Raspbian (OS for Raspberry pi) based Linux distribution for download, as well as third-party windows10 IoT core, RISC OS, and specialized media center distributions. It promotes Python and Scratch as the main programming languages.

Fig. 3. Raspberry pi3

III. C. 3: *RFID Reader*

A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual vehicle documents. Radio waves are used to transfer data from the tag to a reader.The RFID tag does not have to be scanned directly, nor does it require line-of-sight to a reader. The RFID tag must be within the range of an RFID reader, which ranges from 3 to 300 feet, in order to be read. RFID technology allows several items to be quickly scanned and enables fast identification of a particular vehicle information.

Fig. 4. RFID Reader

III. C. 4: *RFIDTag*

RFID is a common term employed to describe a device which is employed in transferring data with the help of radio waves. RFID tags comprise of a RFID transceiver for transferring data from one system to another. There are two kinds of RFID tags- Active tags & Passive tags. Passive tags comprise 3 key components, namely, an in-built chip, a substrate and an antenna.

Passive RFID tags can comprise of various kinds of micro-chips depending on the structural design of a particular tag. These chips can be MO (read only) or WORM (write once chip other than read many) or RW (read write) chip. A general RFID chip is competent of accumulating 96 bits of data but some other chips have a capacity of storing 1000- 2000 bits.

Fig. 5. RFID Tags

III. C. 5: *Liquid Crystal Display*

A liquid crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome.
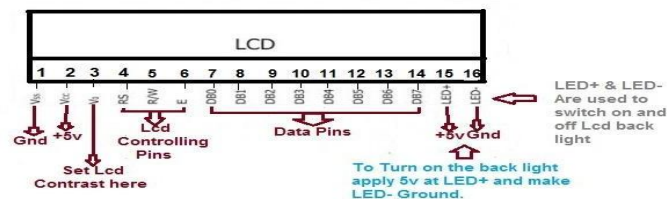

Fig. 6. Liquid Crystal Display

IV. **EXPERIMENTALRESULTS**

The IoT Based Smart Vehicle System experimental setup shown in Fig. 1. Wwhenever the traffic police stops the vehicle, the vehicle owner shows the smart card at the RF Reader which was shown in the Fig.2. If the vehicle owner doesn't have valid documents like license, PUC, Insurance, Registration Certificate, the IoT System automatically sends the e-Challan link to registered mobile number of vehicle owner for paying the fine, that shown in the Fig.3.

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)
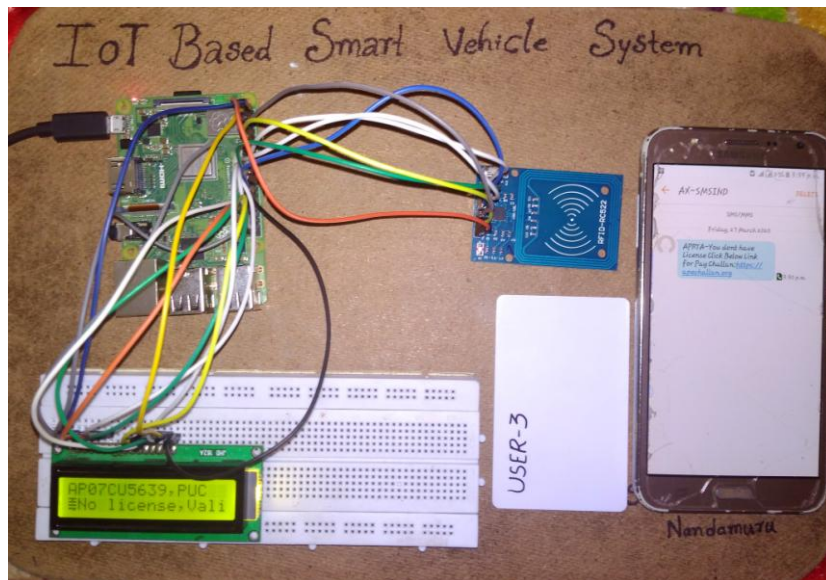
Website: www.ijircce.com

Vol. 8, Issue 2, February 2020
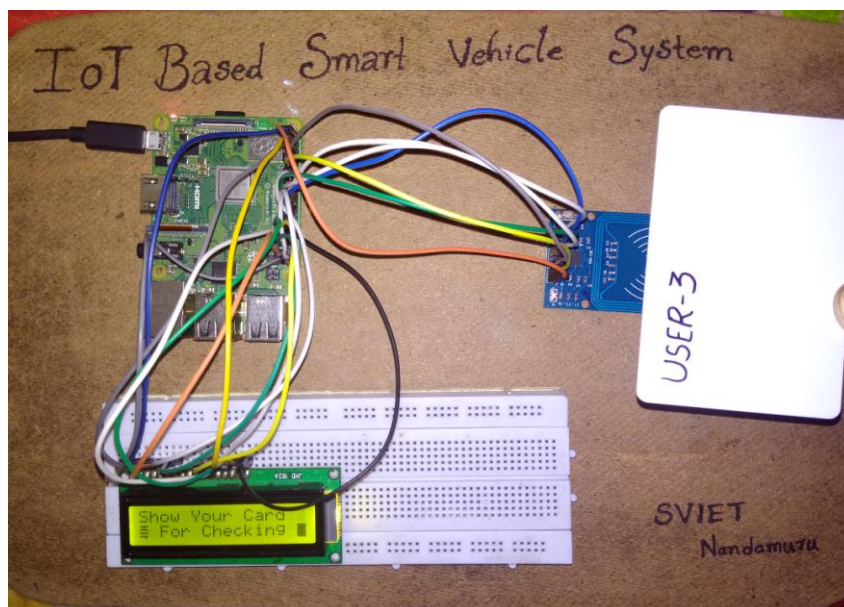

Fig.1 Final View of the Proposed Project

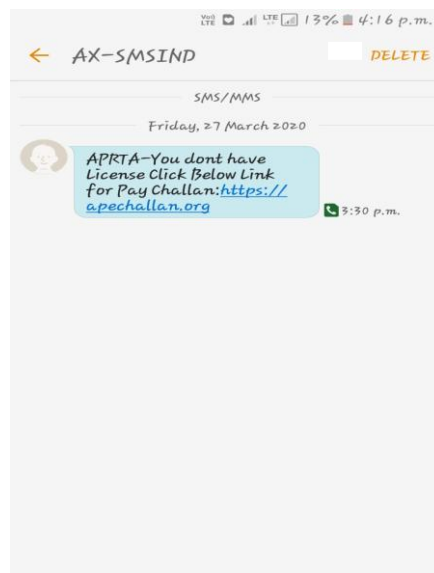
Fig.2 Vehicle Owner Shows SMART CARD

Fig.3. E-Challan Link sent to Vehicle Owner

V.CONCLUSION

At present everybody needs comfortable and easy drive, because people are very busy with their works. Here is an idea for this which is helpful for both users and government authorities called an IoT based smart vehicle system using RFID & IoT technology.By using this system time is saved as well as people will feel comfortable. So, automatically user interface will be increased and a greater number of checking's per day can be increased.

REFERENCES

1.T. Shanmugapriyan, "smart cart to recognize objects based on user intention", International Journal of Advanced Research in Computer and Communication Engineering, vol. 2, no. 5, 2013.
2.R.Kumar, K.Gopalakrishna, and K. Ramesha. "Intelligent Shopping cart", International Journal of Engineering Science and Innovative Technology, vol. 2, no. 4, pp. 499-507, 2013.
3.M. R. Sawant, K. Krishnan, S. Bhokre, and P. Bhosale, "The RFID based smart shopping cart", International Journal of Engineering Research and General Science, vol. 3, no. 2, pp. 275-280,2015.
4.Martin C. Brown, "The Complete Reference Python", published by McGraw Hill Education on 20 March 2018.
5.Martin C. Brown, "The Complete Reference Python", published by McGraw Hill Education on 20 March 2018.
6.R. Nageswara Rao, "Core Python Programming", published by Dreamtech Press on 1 Jan 2018.

BIOGRAPHY

Sumalatha Pitchuka is pursuing B. Tech in the faculty of Electronics and Communication Engineering from Sri Vasavi Institute of Engineering and Technology, Nandamuru, Pedana Mandal, Krishna District, Andhra Pradesh, India. Her area of research is Embedded Systems.

D.V.Sridhar is currently working as Assistant Professor in Sri Vasavi Institute of Engineering and Technology. He has 9 years of working experience in Teaching and Embedded design projects. He received his B. Tech degree from Jawaharlal Nehru Technological University, Hyderebad and M. Tech degree from Jawaharlal Nehru Technological University, Kakinada. He is a member of ISTE and IAENG. His research areas include Embedded System and IoT.

Alekhyakalapatapu is pursuing B. Tech in the faculty of Electronics and Communication Engineering from Sri Vasavi Institute of Engineering and Technology, Nandamuru, Pedana Mandal, Krishna District, Andhra Pradesh, India. Her area of research is Embedded Systems.

Maheswara Rao Chithiriis pursuing B. Tech in the faculty of Electronics and Communication Engineering from Sri Vasavi Institute of Engineering and Technology, Nandamuru, Pedana Mandal, Krishna District, Andhra Pradesh, India. His area of research is Embedded Systems.

Chandana Mattais pursuing B. Tech in the faculty of Electronics and Communication Engineering from Sri Vasavi Institute of Engineering and Technology, Nandamuru, Pedana Mandal, Krishna District, Andhra Pradesh, India. Her area of research is Embedded Systems.