Informing Passangers About The Arrival Of The Train On The Previous Station Through GSM And RFID

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Abstract- *The GSM technology which has been used in many applications for traking an object can be used along with RFID. RFID has components like RFID tag and RFID reader which make it more simplified because of distribution of tasks. The microcontroller which accesses the output of the RFID reader takes the necessary steps to inform the GSM module to send messages on the cellphones of the travellers who are waiting for the train on the next to the following station. Because of the cheap cost and quick mechanism, the proposed system can be an alternative to the existing systems that use GSM which is ultimately dependent on the satellite.*

Keywords- RFID tag, RFID reader, RFID, GSM, microcontroller, IoT.

I. INTRODUCTION

IOT   RFID

Figure 1.

Internet of Things is an emerging trend that focuses on making smart applications and minimizing the intervention of human beings. IoT also throws light upon the use of embedded systems that are the combinations of hardware and software. The real time systems such as tracking of railways constitute both hardware components and the relevant software components. To track any object, may it be a simple object like a watch or may it be a complex object like satellite, GSM or GPS technology have to be used.

The RFID technology can be assimilated with GSM for better tracking results. As far as real time objects like railways are concerned, the RFID tag can be mounted on each station and RFID reader can be mounted on the railway engine itself.

According to the applications, the position of RFID tag and RFID sensors vary. In the station identification process, the RFID tag has to be mounted on each station and the reader has to be placed under the railway engine. So that, when both of them come in contact the reader can 'read' the tag and the microcontroller can identify it.

II. LITERATURE REVIEW

Anand.kr.Gupta et.al proposed A RFID based railway track system. The system implanted RFID Readers on the track and RFID tags at the bottom surface of the train for detection and transmission. This paper also considers determining the correct path of the train. The train is allowed to move only in correct path [1]. K. Siva Rama Krishna and K. Veerraju Chowdary in their research paper propsed the GPS based train tracking system utilizing mobile network to support public transport and demonstrated the need of satellite based GPS system for tracking [2].

N. K. Das et.al adopted GPS –GPRS based train monitoring system. Track number is assigned to track the position of the train. The state of the train is linked to the web server to curtail the accidents. [3].

K.Vidyasagar, P.Sekhar Babu, R. Ram Prasad proposed train tracking and signalling system using Infrared and radio frequency technology.They considered the secured level crossing Signaling system and Train tracking system . An Atmel micro controller was used to regulate the entire process to meet the desired state of the work [4].

Rajkumar et.al presents train tracking system using Global positioning system (GPS) and communication link provided using Ethernet concepts. A unique IP address provided to track the trains. This paper also focused to monitor

the status of the alcohol dunked state of the driver and the speed of the train also. [5]

III.   OVERALL SYSTEM VIEW

1.   HARDWARE COMPONENTS:

1.   Atmega328P   :

Figure 2.

ATmega328P is commonly used in many projects and autonomous systems where a simple, low-powered, low-cost micro-controller is needed.

2.   RFID Tag

Figure 3.

RFID tag can be either active or passive. For our proposed system, we are using passive RFID tag.
It will be mounted below the railway track on the station.

3.   RFID Reader

Figure 4.

The reader will be mounted beneath the engine of the railway. When the train will move on the track, it will detect the tag and the read value will be sent to the Atmega328P.

2.   SOFTWARE COMPONENTS

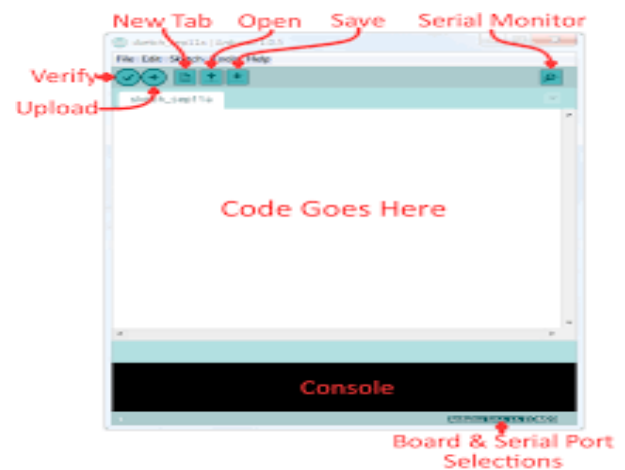### 1.   Arduino IDE

Figure 5.

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board.

2.   Embedded C language

As, Embedded C is generally an extension of the C language, they are more or less similar. However, some differences do exist, such as: C is generally used for desktop computers, while Embedded C is for microcontroller based applications.
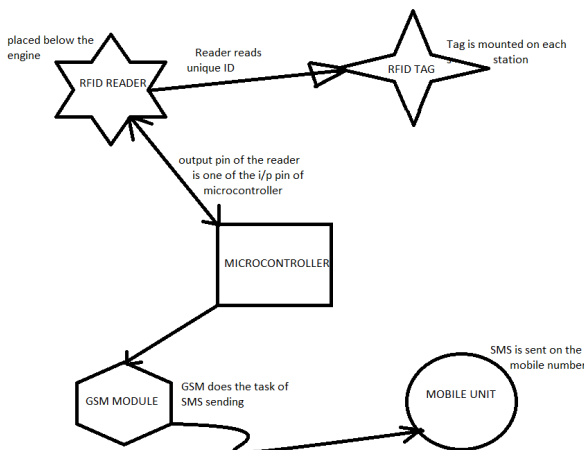
3.   PROPOSED SYSTEM WORKING

Figure 6.

Dig 1.1 The proposed working of the station tracking system

In this proposed system, we will be using ATMEGA328P microcontroller. The RFID Tag will be mounted on each station.

For example, suppose we have a train from Pune to Mumbai city in India. And the route consists of 4 stations Pune cerntral, Lonavla, Dombivali, Mumbai CST.

When the train arrives at Pune, our aim is to inform the Lonavla ,Dombivali and Mumbai passengers that train has just arrived at Pune central.

The first step would be to read the RFID tag ID by the reader. The microcontroller will do the process of matching each tag ID with the already determined values. After matching the ID value, the controller will decide the cellphone numbers to whome the SMS should be sent through GSM technology.
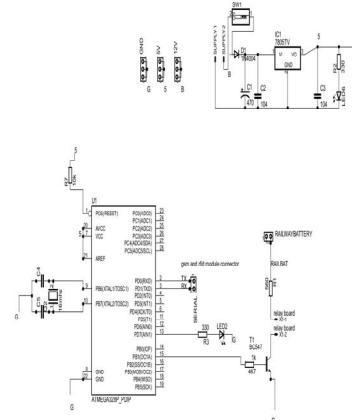

Figure 7.

Dig 3.1 The proposed connections between the ATMEGA328P and other modules.

IV.   ALGORITHM

1. Create character arrays to store the predetermined Tag IDs.
2. Create a variable to store the tag match status.
3. Check the serial data that is output of the RFID reader with each character array byte by byte.
4. If for a character array of Tag ID, the reader value matches then the variable for match value will be equal to 1.Else it is 0.
5. Make input to GSM high and send the cellphone number to GSM board.
6. Send SMS.

V.   CONCLUSION

Thus the combination of RFID and GSM can bring the cost effective system. It can also lower down the need of manual enquiry by the passengers. The current scenario is of that type where the passenger on his own has to enquire about the status of his or her respective train and thus SMS charges are applicable. But because of the automated system of informing the passenger, the passenger can become tension free as far as arrival of the train is concerned. The Arduino IDE is an open-ource platform that makes the coding in embedded C more easier. The practical application of the station identification and informing can become possible with low cost.The future scope of this system can be to include the

automation of more complex system including many trains at railway junction.

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