

Train Tracking System Using RFID & IOT

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Abstract:

Now a day's India is the country which having world's largest railway network. Over hundreds of railways running on track every day. We need improvement in the present system of Indian railways i.e. how they allot platform to the train arriving at a station. In This Project, Reader Section Is Fixed On Train. When train arrival at station, reader read that RFID tag which is place at each station, at that time station name will announce through speaker. Same Time Train Arrival On "Xxx Station" will display on LCD. Using IOT module, train status will be shown on webpage /mobile app. all information display on LCD. Railway tracking system in which system provide easy navigation to passenger. We can implement it successfully for real time systems.

Keywords: Automatic railway gate opening, RFID, IOT, ARM7 etc.

INTRODUCTION:

Train transport is important mode of transport in India as well as over the land. India has large network of railways throughout the country. About 7800 trains carry near about 11 billion of passengers every day.

Many times rail accidents take place due to wrong signaling, excessive speed, drivers' errors, track faults etc. In such accidents many people have to lose their lives. The recent examples of such rail accidents due to

wrong signaling are as below: On 15 October 2009 Rajdhani express collides with Sswaraj express due to signaling error at Jammu station. On 19 July 2010 Uttar banga express collides with Vanachal express as it was leaving platform at Sainthia station in west Bengal. In this accident 66 people died and 165 were reported injured.

Such accidents can be stopped if we add automation in our railway systems. One of the easiest and cheaper automation systems in railways is by using RFID and IOT module. In this system a unique RFID code is given to each train. Every train is identified by this RFID code. When train enters platform this code gets scanned and according to scanned data name of station will announce through speaker & same time display on LCD. Communication of train will be update using IOT modules.

MOTIVATION

Now a day's India is the country which having world's largest railway network. We need improvement in the present system of Indian railways i.e. how they allot platform to the train arriving at a station.

So this is mainly the goal of our project. Just because of lack of coordination between train's driver and server and sometimes negligence of authority's results in very terrible incident. So, our project is motivated from such kind of incidents such incident which took

place in India. This accident left a deep impact on our mind.

Thus we want to build a system that can ensure the safety of people inside the train. No, we had our own idea for the problem and our work is not inherited from others. The system which we have designed is more reliable, accurate and stand-alone. To provide safety in travelling, as system announce name of stations. To Design System Which Give voice Announcement According to railway station To Passenger for Easy Navigation. And to update information on webpage using IOT.

LITERATUREREVIEW:

1. An in-depot realtime train tracking system using RFID and wireless mesh networks (IEEE 2014) Authors :- Zongjian He ; Yigui Luo ; Junhao Zheng
Knowing the real-time position of moving trains is essential for public transportation safety. to get the period of time train position, signal based, video and sensor based solutions are projected. However, those solutions area unit either too costly or solely applicable for traditional driving situation. during this paper, we have a tendency to propose a real-time tracking solution for light railway trains within the depot to avoid potential collisions. The system utilizes RFID technology to localize trains' current position and sends the position data to manage center using wireless mesh networks.

2. RFID ZIGBEE Based Interplatform Train Tracking System (IEEE 2013) Authors :- Anand Bansal ; Ankit Aneja ; Janender Bansal ; Sachin Sharma ; Raghav Ankur

This project aims to supply advancing technologies for overall development of the terminal. Allotment of platform to range of trains in less time interval is kind of tough with the token system as a result of this can be done simply on guess that isn't that abundant economical and what is more, a minor mistake in estimation might result in associate accident which can bring lots of lives into danger.

3. GPS and Ethernet based real time train tracking system (IEEE 2013) Authors :- R. Immanuel Rajkumar ; P. E. Sankaranarayanan ; G. Sundari

The system proposed permits human action the important time data concerning the train position and additionally its health conditions supported few sensors attached/integrated. The projected system would additionally give with the entire data concerning the various trains running, within the video terminal of the controller, exploitation the offered net facilities and therefore the Google mapping ideas. This projected system uses a Arduino - A Electronic open source hardware that provides the entire computation capability for this work.

4. Automatic railway gate control and track switching with automated train

Author: - Mrs. Swati Rane¹, Mayuri Pendhari², Pooja Patil³, Prakash Sakari⁴, Yashmith Shetty⁵

This project is designed to automatically control the railway gate at the level crossing, to automatically control the railway track switching mechanism and to automatically control the movement of the train (i.e.,)to start and stop the train automatically. As the number of accidents related to railway is increasing day by day, the above automations will reduce these accidents to a much greater extent. Project employs two pair of Infrared (IR) sensors, one pair of IR sensor is used to control the railway gate and the other pair of IR sensor is used to automatically switch the railway track. These IR sensors are used to sense the arrival and departure of the train.

SYSTEM ARCHITECTURE:

The railway is using so many new systems to improve its working. Here RFID fixed on railway engine and RFID tags allocated on track between some distances. RFID reader consists of main coil with a power supply and RFID tag consist coil too, RFID tag is like a small chip mainly RAM of 12 bit unique code. RFID works apart from physical connection between reader and tags. When RFID reader going from area of tags that time waves of reader fall on RFID tag that time coil

inside the tags induce the magnetic field. The tag captures power from it and send it to circuit in the tag. Then tag pass information encoded in the tags memory. The RFID tag consists of The chip of silicon that contains data, The coil and chip is installed on the plastic cover and tshe chip is joined to an antenna due to which code is transmitted. IOT module updates the status of train on webpage.

PURPOSED SYSTEM

The module outside the train consists of RFID reader interfaced with ARM 7 Microcontroller. At every station RFID tag get placed, when Reader placed on Train come in contact with Tag Unique ID send to microcontroller unit. Microcontroller receive that tag no and match it with database if match name related to that database get announce by speaker using voice IC. Same time station name get display on LCD (16*2).

On webpage data get update & display data in graphical way update with the help of IOT module.

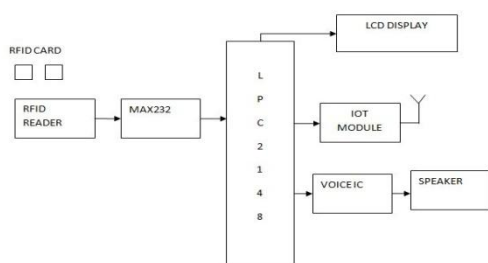


Fig.1 Block diagram

In This Project, Reader Section Is Fixed On Train. When train arrival at station, reader read that RFID tag which is place at each station, at that time station name will announce through speaker. Same Time Train Arrival On “Xxx Station” will display on LCD. Using IOT module, train status will be shown on webpage /mobile app. all information display on LCD.

COMPONENT DETAILS:

4.1 LPC2148 CONTROLLER

Founded in November 1990, it is spun out of Acorn Computers, it Designs the ARM range of RISC

processor cores. Licenses ARM core designs to semiconductor partners who fabricate and sell to their customers. ARM does not fabricate silicon itself, it also develop technologies to assist with the design-in of the ARM architecture. Software tools, boards, debug hardware, application software, bus architectures, peripherals etc.

4.2 LIQUID CRYSTAL DISPLAY:

LCD stands for Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons: The declining prices of LCDs, The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters. Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data. Ease of programming for characters and graphics.

4.3 IOT MODULE:

Internet Of Things- Internet is helping people to communicate each other using different applications. Internet of things helps the things to communicate each other using IoT module. Internet of things helps the things to communicate each other using IoT module. The Internet of Things (IOT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.

DIFFERENT MODULES- ESP8266 (ESPRESSIF), ESP8089, ESP6203.

4.4 Max232

The MAX232 is an integrated circuit first created in 1987 by Maxim Integrated Products that converts signals from a TIA-232 (RS-232) serial port to signals suitable for use in TTL-compatible digital logic circuits. The MAX232 is a dual transmitter / dual receiver that typically is used to convert the RX, TX, CTS, RTS signals.

4.5 ACTIVE / PASSIVE RFID TAGS

Passive RFID tags: Passive tags only backscatter magnetic or electromagnetic waves coming from the interrogator. That is the only way they can communicate with the interrogator. In other words, they do not have any RF emitters on board so they cannot create their own RF signals. Batteryless passive tags use the incoming signal from the interrogator to supply the embedded chip. But batteryless and passive are two different characteristics of the tag and are unfortunately often confused.

4.6 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 objects. Radio waves are used to transfer data from the tag to a reader.

ADVANTAGES AND APPLICATIONS:

ADVANTAGES

- Automatic identification of location
- Advertisement based on location
- Voice based advertisement
- Location coordinates displayed continuously on LCD

APPLICATIONS

- Transport companies
- Public trains
- Private travels
- Government travels

CONCLUSION AND FUTURE SCOPE:

Railway tracking system in which system provide easy navigation to passenger .we successfully implement first module. We will proceed for next module in step wise manner.

In middle stage we design system which read RFID tag place at every station and display that station name on display announce it by using speaker. In final stage we use IOT module for data updating. In future we add door open / close system in this project. As station

come system automatically open / close door. We find track fault using image processing & giving signal to microcontroller unit. We can add movable platform system in this project.

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