A Review Paper: Smart Train System Using IOT

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Abstract

This project describes the design, implementation and deployment of wireless train crowd and resource management system. The proposed solution can provide further energy efficient automated appliances to conserve energy. This is beneficial for commuter in the developing cities where there is mass population. The Internet of Things (IOT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

Keywords: IOT, Web server formatting smart system

INTRODUCTION

Millions of people have their lives dependent on the Mumbai suburban railways. Urban rail (local, metro, mono) is an important and major mode of transport for people in big cities such as Mumbai, Delhi, Chennai. It is an effective way to save energy, counter crowded traffic problems and reduce pollution at the same time. Striding forward towards the next 20 years, mass public transportation in cities will faced growing problems in both human congestion and stressed social behavior due to the rapidly growing city population.

The implementation of smart train system into the urban trains offers a lot convenient and comfortable journey for passengers. Today industries like SIEMENS are working on ensuring the desirability of decisive factors like speed, reliability and convenience of modern mass-transit railways. Crowd monitoring and distribution (In addition to the resource automation and security alarms) is considered as one of the very tricky issue to resolve. During peak hours, picking the wrong carriage will mean having to wait for the next train in order to board. The idea of smart train system using IOT will inform passengers using a mobile application which carriage should they board on so that they encounter minimum crowd. IOT is one of the emerging technologies. It is next step in artificial intelligence (AI). This technology will be telling both people and machines what they need to know and need to do.

Researches by several organisations examined lack of safety requirements for signalling of train. It was found that, more safety requirements, controls and infrastructure are needed. Also there were lot of problems faced while travelling via train especially when trains are overcrowded.

This system will solve the unpleasant scenario when a commuter chooses to board a carriage which turns out to be crowded by uploading the data to cloud for easy access by authority and commuters. A mobile application will give information about occupancy status of the carriage. Also the alert system will give alerts if the emergency alarm of trains goes on. The resources like lights, fans will be automated so that managing system will turn them off when not needed to save electricity.
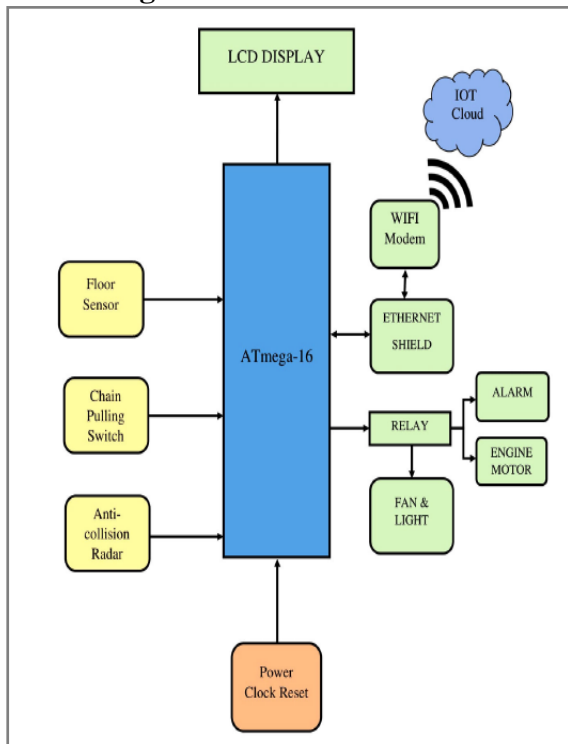
SYSTEM DESIGN
Block Diagram:

Fig:1 Block Diagram

COMPONENTS
Arduino Ethernet Shield : The Arduino Ethernet Shield connects your Arduino to the internet in mere minutes. Whose connection speed is 10-100 Mbps.

Floor Switch: This is a small switch inside the controller connected to the full on power and full off brake. It gives positive contact and eliminates the resistor from the circuit. It is a very efficient way

of handling power even in the newer electronic controllers.

PIR sensor: PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out.

Cloud server: This is the most important component that is supposed to manage the entire system. The server will consist of the database

EXPLANATION
The basic working of the system with the help of components is explained as per the flow control. Commuter checks the seat occupancy status with the application available in the mobile phone. So that passengers get general idea about vacant spaces before boarding the train.

for safety assurance instead of keeping only a chain for emergency, there is a panel of four switches in each compartment with acknowledgement indicator and different condition labels like:-(1) Unknown Object 2) Fire Bracket 3) Medical Emergency 4) Theft Attempt This will help traveler and train management both to make quick and informed decision through wireless communication. Automation is also used inside each compartment for efficient use of energy. Fans and lights of each compartment will be automatically switched on or off depending on output of floor sensors.

This system also takes care of train accidents. To avoid accidents such as landslide, head on collision there are anti-collision sensors. Information such as vacant spaces in a compartment, medical emergency, theft, unoccupied or vacant seats, train accidents etc. will be transmitted to the IOT cloud and this information is made available on mobile

phones through mobile application as well as on computers at stations which are continuously monitored.
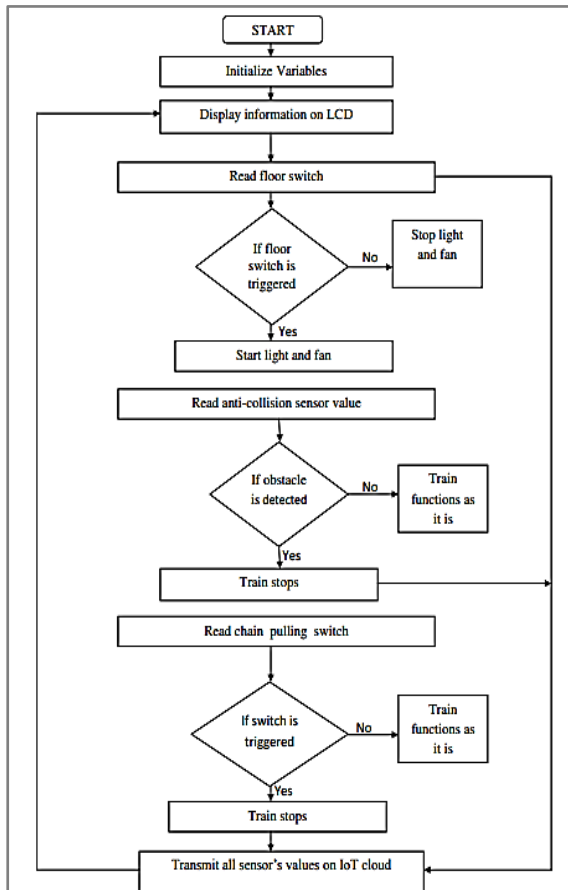
FLOW CHART

Fig.2 flow chart

CONCLUSION

The model of this project reduces the existing faults in the presently Train System. This project is useful for practical use and it can be implementable in Developed as well as Developing Countries. The project deals with the condition monitoring of both the infrastructure and trains. This model if implemented in day to day life will be beneficial to avoid overcrowding in trains, accidents, collision etc. Overall this system serves a social cause and has a monetary potential to be extracted which is ultimately the main goal behind any innovation.

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