IoT enabled smart bus for COVID-19

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Abstract
The main objective of this project is to ensure the safety precautions in public transportation. This project monitors and stores the database of number of allowed users with their respective temperature. The person’s identity is monitored with the help of radio frequency identification (RFID) tags. The sensors and RFID reader are interfaced with the Arduino. If the temperature is increased then the threshold level alert message is passed to the person mobile number through GSM. If any accident, fire occurs it can be detected by using fire sensor the message will send to the control room, with the help of the control room it sends an alert message or intimation to the nearest hospital and fire service. GSM (global system for mobile communication) used for sending an alert message. If any breakdown occurs message will send to the control room, the current location of bus is tracked with the help of GPS (global positioning system) The bus current location and routes on a map can also be easily found with the help IoT.

2 | LITERATURE REVIEW

IoT based Intelligent Bus Monitoring System (2018), Dr. N. Dhanasekar Chitra Valavan S. Soundarya. It sends instant notification with the relevant data from the college database server via internet. The parents can log into the Application and monitor the details of their Student and track the location of the bus. The admin can add stops, and generate an optimized route and can have a live tracking of the bus. Further this system can be enhanced by parking management system, having VANET for bus to bus communication.

IoT Based Bus Tracking And Monitoring System Using GPS And Raspberry Pi (2018), Juthuga Sri Jyothi Satya, Shaik Anwar. The software is equipped with components that make the bus journey safer, convenient, and accountable. Live video in the bus alerts the owner of the remote location in case of panic situations through an e-mail alert. By live video, reports can be analyzed like over speed, harsh breaking, vehicle ideal time, halt time, ignition on/off to closely monitor the security compliance and Driver’s behavior. Live tracking helps to identify the current location of the bus. Today, the use of GPS enabled bus tracking system

1 | INTRODUCTION

The traveling in public transportation during this COVID-19 period safety precautions are essential. Millions of people need to travel various places in their everyday life. In this more peoples were using public transports for moving one place to other place. For people’s obtaining a safe journey becomes a critical issue during COVID-19 positive cases are increasing day by day. In this paper IoT Enabled Smart Bus For COVID-19 has been proposed (Figure 1) that when a people entering in to the bus temperature can be monitored by the temperature sensor. If the temperature level is below the threshold (37 C) only the door gets open otherwise door does not get open. Finally, name of the people and their respective temperature is stored in IoT and displayed in LCD. If the person, having the temperature above the threshold message will send to the respective person mobile number through GSM. If any accident, fire occurs it can be detected by using fire sensor the message will send to the control room, with the help of the control room it sends an alert message or intimation to the nearest hospital and fire service. GSM (global system for mobile communication) used for sending an alert message. If any breakdown occurs message will send to the control room, the current location of bus is tracked with the help of GPS (global positioning system) The bus current location and routes on a map can also be easily found with the help IoT.
reduces the crime rates. By using GPS, improves the efficiency, profitability, and safety of most commercial bus transportation systems.

Smart bus tracking and management system using IoT (2017) Sridevi.K. The system will have latest technology and optimized algorithms with moderate cost. The android application gives the information about the college bus for students and staff. The proposed system is more user friendly than existing system. And it also gives greater performance. The system may focus on accurate arrival time prediction and real time position of bus. The system can be installed in android phones.

3 | EXISTING METHOD

On reviewing the past work of school bus following, observance and alerting system, there is a prospect to categorize varied methodologies and establish new trends.

One among them could be a challenge for vehicle chase, observation and alerting system. Several students realize themselves latched during a school bus within the bus automobile parking space once falling asleep on their thanks to school, miss the bus, or leave at the incorrect station.

This project makes use of the pertinence of oftenest identification (RFID) technology for chase and observation student throughout their trip to and from school on school busses. And it is the advantage of economical pursuit capabilities, low value, and straightforward maintenance.

The individual RFID tags square measure effective and it is used for chase and observation student. Fireplace sensing element is additionally utilized in this project to discover any fireplace accidents. Speed of the bus can also be calculated and send a message to control room through GSM.

The system consists of three main units, bus unit, parent unit, and faculty unit. The bus unit is employed to discover once a student enters/exits from the bus exploitation RFID card. This information is communicated to the parent unit and faculty unit that establish the presence of a student.

The system tracks the faculty bus by the IOT associate degree additionally gets an alert if the bus crosses the ordinance.

3.1 | Proposed system

The proposed system consists of IoT enabled sensors, GSM & GPS Module with LCD display (Figure 1). The main objective of this project envision the temperature before getting in the bus and knowledge square measure hold on in data base victimization IoT.

During this pandemic state of affairs variety of positive cases will increase once individuals pass bus so, it is necessary to confirm the temperature before getting in the bus and data square measure hold on within the information.

Temperature device observation the temperature level of the individuals and vibration device for observation the bus standing.

3.2 | Temperature sensor

Temperature sensor is used to measure the temperature before entering in to the bus and the temperature below the threshold is only door gets open. By this method of checking the temperature COVID-19 positive cases will decrease.

3.3 | LCD

A liquid crystal is a digital display alphanumeric display is created with either a passive matrix or a full of life matrix the temperature of the person in the LCD

3.4 | Vibration & fire sensor

Vibration sensors are used in a number of different projects, machines and applications. In this project vibration sensor is used to detect the speed of the bus and fire sensor is used to detect the fire if the bus met with an accident and fire it sends the information to the control room through GSM via control room it sends information to the nearby hospitals.

3.5 | Global positioning system

Global positioning system (GPS) used to monitor the current location of the bus. GPS devices are quite useful for the road transport sector. Some of the uses of GPS technology in road
transport include commercial fleet management, taxi services, monitoring of public transport services and passenger details, dispatch, and navigation etc. In this Project, the purpose of GPS is to track the location and also display grid. It is used to display to share the location of bus to the nearby hospitals and fire-services through the control room.

3.6 | **Global system for mobile communication**

GSM module is a chip or circuit that will be used to build communication between a mobile device or an information processing device and a GSM. The usage of GSM in this project is to share the message to the control room when the bus met with a fire accident and an accident or gets breakdown.

3.7 | **Output**

The hardware prototype is shown in Figure 2. The Hardware interfaced with all sensors and the test results can be controlled remotely with the help of IoT. It clearly gives the information regarding the sensor level, at what time the temperature of a person shown in Figure 3. The alert message got from vibration sensors shown in Figure 4.

4 | **CONCLUSION**

This proposed system aims at enhancing the safety of people’s during the daily transportation and crowded area RFID tags of the people’s, it sends instant notification with the relevant data from the RFID Reader database server via internet. The people can monitor the details of the bus by tracking the location of the bus. Further this system can be enhanced by temperature sensor to check the temperature level of each and every person’s, having vibration sensor to alert the breakdown of the bus. This system can be extended for full time monitoring during this COVID-19 period, that will be helpful for us.

**DATA AVAILABILITY STATEMENT**

Data sharing is not applicable to this article as no new data were created or analyzed in this study.
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