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IOT BASED TRANSPORTATION MANAGEMENT SYSTEM

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Abstract: Internet of Things (IOT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment and transfers data over a network without requiring human-to-human or human-to-computer interaction.

This paper presents a highly sensitive and more secure management system for bus transport with a help of PIC microcontroller and various sensors. The proposed system provides information regarding moving bus to the owner of bus who is located outside the bus based on IOT. Major aim is to transport information like number of non-ticket holders in a bus, accident occupant places, location of moving bus, fuel level in bus and running speed of bus, pressure level in tires to a bus owner who is outside the bus based on IOT.

Index Terms – Internet of Things, Transportation Management, GPS location tracking, GSM, ARM7.

I. INTRODUCTION

The Internet of Things (IoT) is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure. Typically, IoT offers advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is implemented in nearly all fields of automation enabling advanced applications like a Smart Grid. The term things in the IoT refers to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, or field operation devices that assist fire-fighters in search and rescue. Current market examples include thermostat systems and washer/dryers that utilize Wi-Fi for remote monitoring.

With an increase in population, there is an increase in the number of accidents that happen every minute. These road accidents are unpredictable. There are situations where most of the accidents could not be reported properly to nearby ambulances on time. In most of the cases, there is the unavailability of emergency services which lack in providing the first aid and timely service which can lead to loss of life by some minutes. Hence, there is a need to develop a system that caters to all these problems and can effectively function to overcome the delay time caused by the medical vehicles. The purpose of this paper is to introduce a framework using IoT, which helps in detecting car accidents and notifying them immediately. This can be achieved by integrating smart sensors with a microcontroller within the car that can trigger at the time of an accident. The other modules like GPS and GSM are integrated with the system to obtain the location coordinates of the accidents and sending it to registered numbers and nearby ambulance to notify them about the accident to obtain immediate help at the location.

With the increase in technology and motor vehicle production the number of road accident has increased. The survival rate after accident is very low as proper emergency facilities are not available. Our project would help in detecting an accident and determine its location and the location is dispatched to rescue team and emergency contacts of the rider. The existing models are not reliable as they use vehicle distance between two vehicles provided by certain sensors and does not show concern about speed. Very slow emergency facility can also be a drawback that can be solved by our model.

Currently, vehicle to vehicle communication is an important application and thrust area of research. In this paper the author highlighted the workings, executions, implementations and the application of the Internet of Things (IoT) in transport management and vehicle to vehicle communication systems. The main advantage of this Industry 4.0 based IoT technology is that it helps us to reduce road traffic and accidents. The limitations of GPS like accuracy, precision, effective analysis, etc. has led to the evolution of Mobile based V2V communication which is more effective, error proof, result oriented and smart. For proper analysis of traffic vehicle to vehicle communication is established. Random Data from vehicles taken by numerous sensors. Any car coming in its variety could effortlessly share the data by either of two cars nearby. With the help of vehicle-to-vehicle communication we can provide a path of emergency vehicles to reach the destination quickly

II. PROPOSE SYSTEM

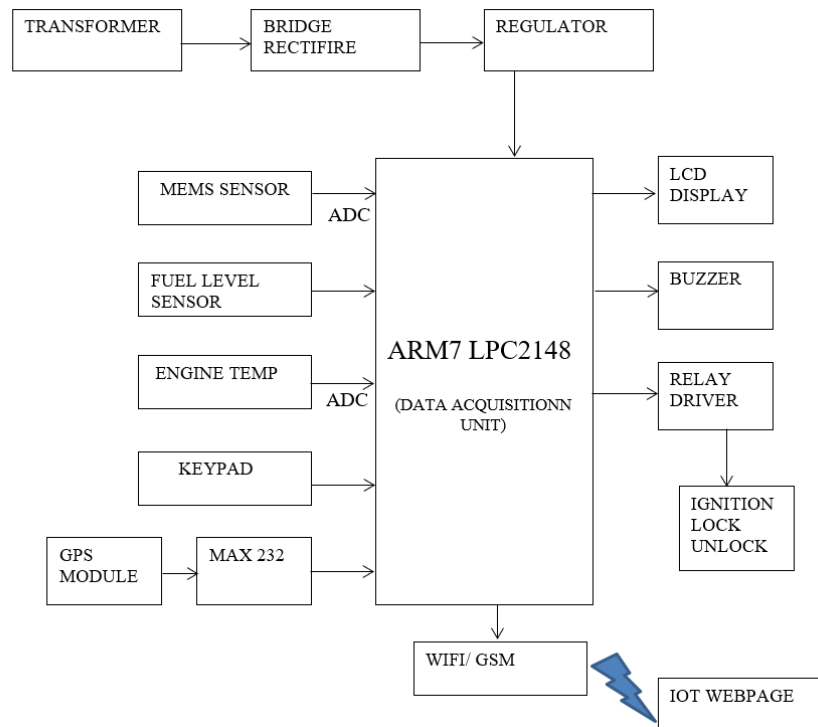


Fig -1: Block Diagram

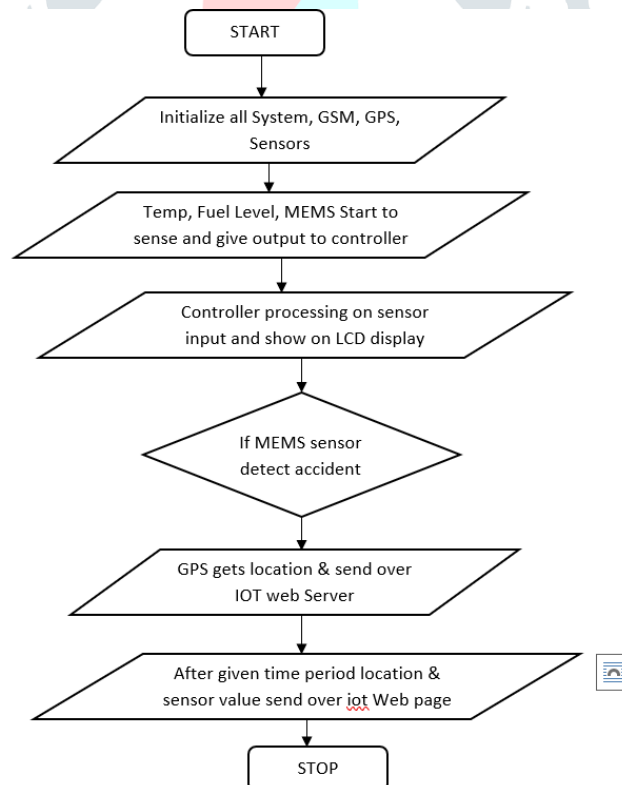


Fig -2: FLOW CHART

Tracking of vehicle is a process in which we track the vehicle location in form of Latitude and Longitude (GPS coordinates). GPS Coordinates are the value of a location. This system is very efficient for outdoor application purpose. This kind of Vehicle Tracking System Project is widely in tracking Cabs/Taxis, stolen vehicles, school/colleges buses etc.

This circuit is designed for tracking the location of vehicles. Most of tracking systems are made by using GPS. This is very simple and cheap. Tracking systems are mostly used by fleet operators for tracking a vehicle location, routing and others. This is a very good method for preventing our vehicles from stolen. This tracking system sends us the geographical Coordinates and by using these coordinates we can track our vehicle position on electronic maps using internet. By using these tracking systems, we can share real time information about transportations. And also, can be share real time information or position bus/taxi/cab with passengers. Means passengers can see the real time of arriving bus/taxi/cab on Mobile.

- Signal Identification and Signal Processing: The Vibration sensor sense the activity of accident and the vehicle information stored in the registered user is immediately transferred to the microcontroller.
- Locating the position of vehicle: The position of vehicle is located using the GPS system. Longitude and Latitude axis of the geographical location is tracked and forwarded to the nearest emergency service.

In our project we used ARM7 LPC2148 microcontroller The LPC2148 ARM Header Board is a Low-Cost Board that can be used to quickly evaluate and demonstrate the capabilities of NXP LPC2148 (ARM7TDMI) microcontroller. The Header board is designed as DIP package with access to all Port pins for external connection. The LPC2148 ARM Header Board consists all basic components required to function the microcontroller. The board is populated with voltage regulators, RTC crystal, Main Crystal and necessary de-coupling capacitors.

III. RESULT

In this Project, we Successfully developed and tested a vehicle tracking system to track a moving or stationary vehicle in real-time. The proposed system uses the help of Assisted GPS in the crowded area to track and locate the transportation vehicle when the Autonomous GPS fails or be highly late. Following images consist of actual photographs of our project prototype model.

Image, I consist of picture of our hardware & image 2 shown LCD display which showing all parameter like engine temp, fuel level as well as status of vehicle ok or not.

Image 3 & 4 having IOT web page at different state of vehicle. When accident detected IOT web page automatically updated and alert msg. shown in red color.

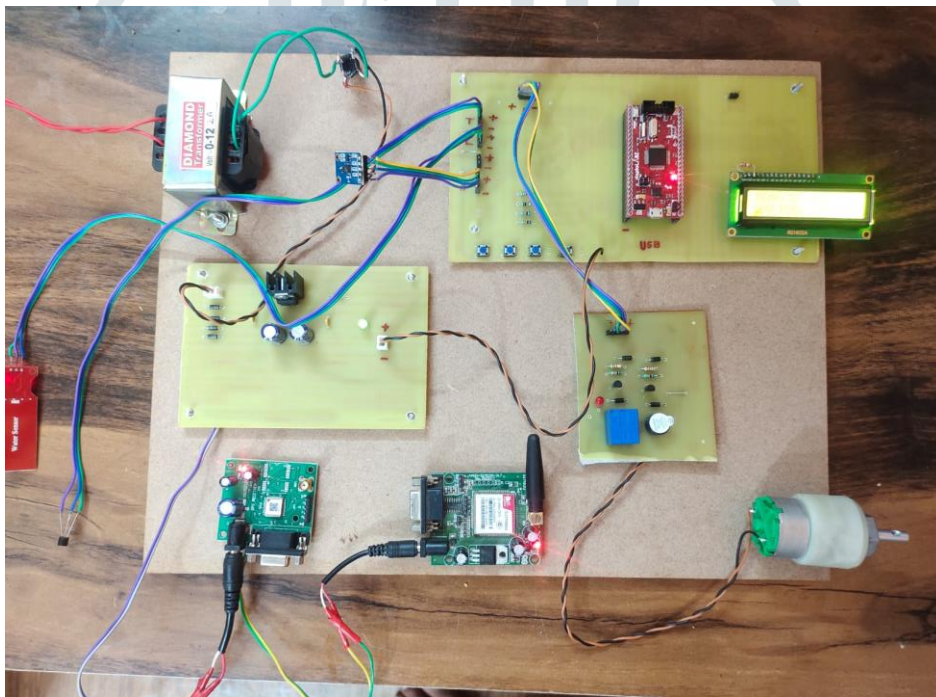


Image 1: Photograph of Actual Hardware



Image 2: Photograph of LCD Display

Image 3 consist of LCD Display. On LCD Display engine temp and Fuel level continuously display. And All parameter ok means no accident detected by MEMS sensor.

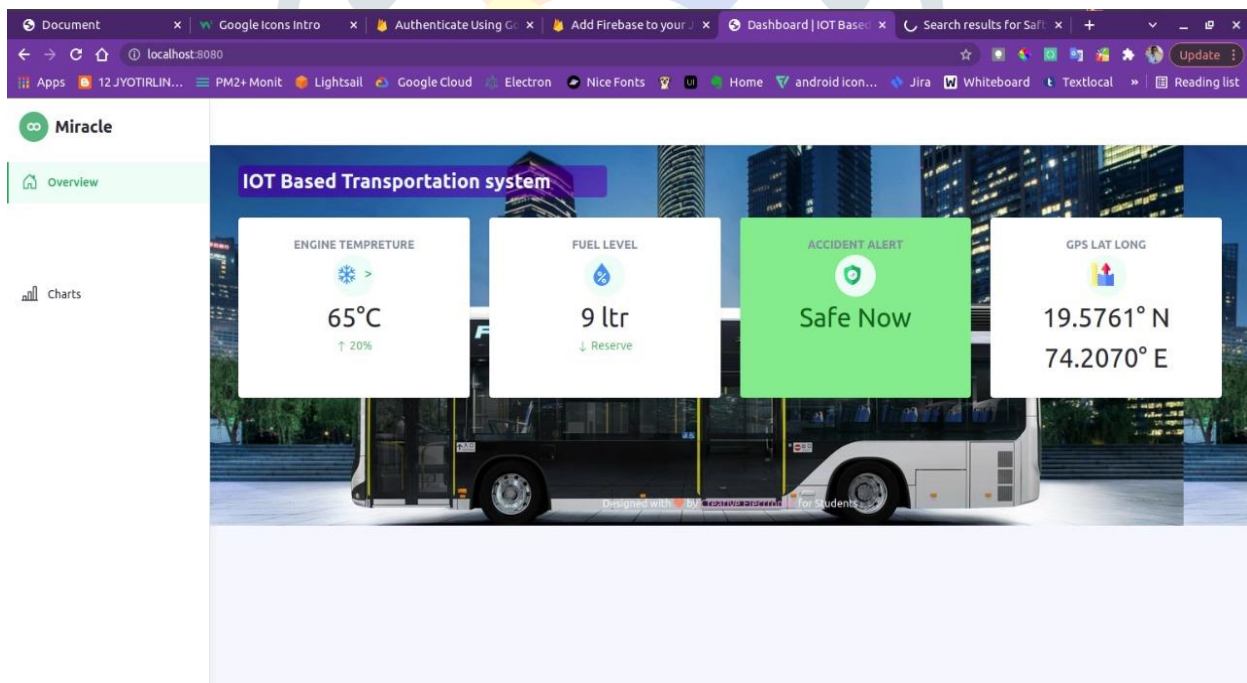


Image 3: IOT Web Page(A)

When MEMS sensor output is normal means no Accident detected then safe now message shown on iot web page.

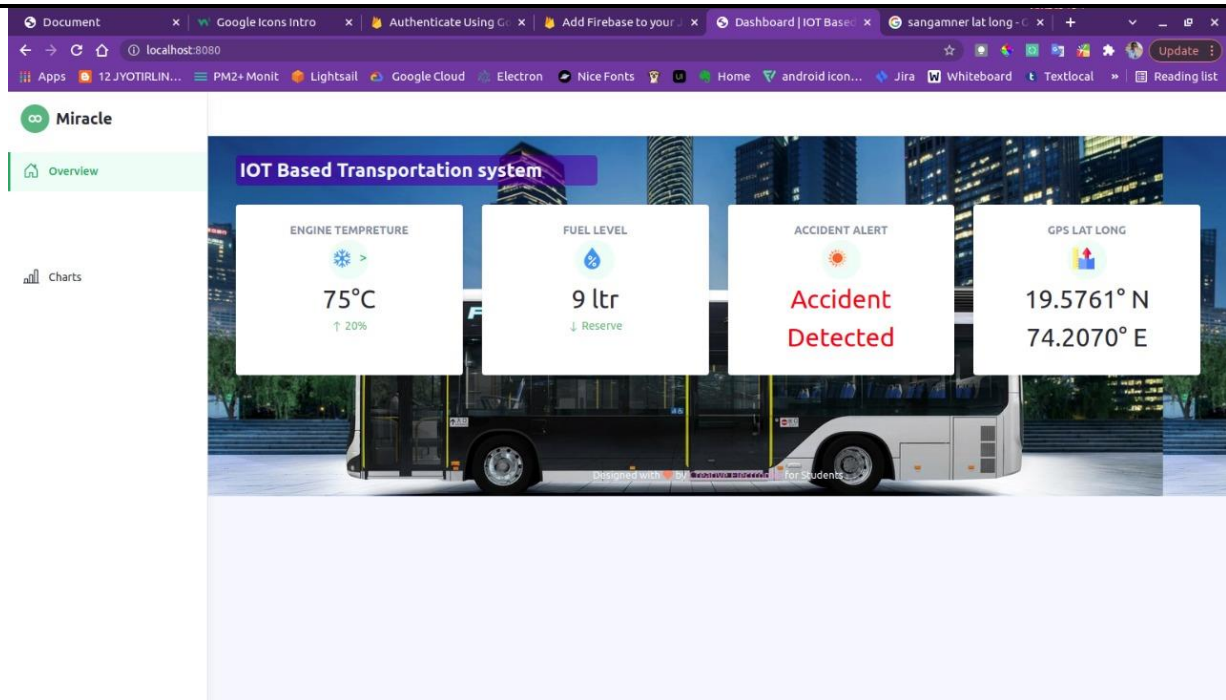


Image 4: IOT Web Page(B)

When accident detected web page display accident alert on it. At same time another sensor parameter also shown on it.

IV. CONCLUSION

The proposed system uses the IoT for vehicle accident detection and alarming the authorities regarding accidents, vehicle tracking using GPS Modem. In this project we have designed IoT based vehicle accident detection and tracking system using GPS Modem. Hence IoT can revolutionize the way the system interacts and respond for the variety of applications especially in case of traffic control.

This design is the system which can detect the accidents in less time and sends the information to the first aid center. This project is user-friendly and reliable. The proposed method is highly beneficial to the automotive industry. In future, data logging and analysis can be implemented to monitor the traffic situations in various regions.

IoT platform (Ubidots) has been used which is a system that can be programmed and consequently customized by outside developers/users. Due to its flexibility, the platform can be adapted to countless needs and niches that the platform's original developers could not have possibly contemplated. The system can validate its operational performance to track a vehicle's location anytime from anywhere

V. ACKNOWLEDGMENT

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