WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

IOT Alert System

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ABSTRACT-

This project implements an IoT alert system utilizing alcohol and smoke sensors for detecting hazardous situations. The system is integrated with Blynk, a mobile app platform, for real-time notifications. When the sensors detect alcohol or smoke presence, the system triggers an alert through the Blynk app, notifying users immediately. This setup enhances safety measures by providing timely warnings in environments prone to alcohol consumption or smoke exposure.

Keywords—- IOT, Alcohol Sensor, Smoke Sensor, Blynk App, Buzzer, Real time and date

1. Introduction:-

The Internet of Things (IoT) has revolutionized numerous industries by enabling the seamless integration of physical devices with the digital world. One area where IoT holds immense potential is in enhancing safety and security, particularly in the realm of accident detection and prevention. In this project, we propose an IoT-based alert system designed to detect accidents, monitor alcohol consumption, and identify smoke presence in real-time. The system utilizes various sensors and a mobile application to promptly alert relevant parties and mitigate potential hazards.

Accident Detection:-Accidents on roads or in industrial settings can lead to devastating consequences if not addressed promptly. Our IoT alert system incorporates accelerometer and gyroscope sensors to detect sudden changes in velocity or orientation, indicative of potential accidents. These sensors continuously monitor the movement patterns of vehicles or equipment and trigger alerts in the event of abrupt deviations from the norm. Additionally, GPS technology enables precise location tracking, facilitating rapid response from emergency services or relevant authorities.

Alcohol and Smoke Sensing:-Alcohol consumption and smoking are significant risk factors contributing to accidents and safety hazards in various environments. To address this, our system integrates alcohol and smoke sensors capable of detecting the presence of these substances in the surrounding atmosphere. The alcohol sensor employs semiconductor technology to analyze the alcohol vapor concentration, while the smoke sensor utilizes optical detection mechanisms to identify the presence of smoke particles. Real-time data from these sensors are transmitted to the central IoT platform for analysis and triggering of appropriate alerts.

Blink Mobile Application:-The Blink mobile application serves as the user interface for interacting with the IoT alert system. Through the app, users can receive instant notifications regarding detected accidents, alcohol consumption, or smoke presence. The intuitive interface provides detailed information such as the location of the incident, severity level, and recommended actions. Additionally, users can configure personalized alert settings, view historical data, and access emergency contact information directly from the app.

2. Methodology:-

For accident detection, use sensors like accelerometers or gyroscopes to detect sudden movements or impacts. Integrate alcohol and smoke sensors to detect the presence of alcohol and smoke in the environment. Connect these sensors to a microcontroller board like Arduino or Node MCU

Sensor Integration:- Write code to read data from the sensors connected to the Node MCU. Implement algorithms to analyse sensor data and trigger alerts when thresholds are exceeded (e.g., high alcohol levels or sudden impact indicative of an accident).

Connectivity:- Use Wi-Fi or Bluetooth modules to enable communication between the Node MCU and the mobile app.

Mobile App Development :- Develop a mobile app (iOS/Android) using a platform like React Native or Flutter. Implement features for receiving real-time alerts from the IoT device. Design an intuitive user interface to display alerts and provide options for contacting emergency services or predefined contacts.

Alert Notifications :- Configure the mobile app to receive push notifications whenever the IoT device detects an accident, alcohol, or smoke. Include options for the user to acknowledge or dismiss alerts.Test the entire system to ensure proper functionality and reliability. Deploy the IoT device in the desired location, ensuring all sensors are calibrated and functioning correctly.

User Education :- Provide user documentation or instructions on how to use the system effectively. Educate users on the significance of different alerts and appropriate actions to take in each situation

- GPS Methodology:-

The Global Positioning System (GPS) methodology involves three main components: satellites, ground stations, and receivers.

Satellites: The GPS constellation consists of approximately 24 satellites orbiting the Earth. These satellites continuously broadcast signals containing their precise location and the current time.

Ground stations: These stations, located around the world, monitor and control the GPS satellites. They ensure accurate timing and update satellite positions as needed.

Receivers: GPS receivers, commonly found in smartphones, cars, and other devices, receive signals from multiple satellites simultaneously. By calculating the time it takes for the signals to reach the receiver, along with the satellites' known positions, the receiver can determine its own location on Earth through a process called trilateration.

Overall, GPS relies on a network of satellites, ground stations, and receivers to provide accurate positioning information anywhere on Earth.

- Blynk Cloud App:-

The methodology for developing a Blynk cloud app typically involves these steps:

Define Requirements: Clearly define the features and functionalities you want in your Blynk cloud app, including user interface design, device interactions, data visualization, etc.

Setup Blynk Account: Create an account on the Blynk platform and obtain necessary credentials and authentication tokens.

Choose Hardware: Select compatible hardware (microcontrollers, sensors, actuators) that can communicate with the Blynk platform.

Install Blynk Library: Integrate the Blynk library into your development environment (Arduino IDE, Raspberry Pi, etc.) to enable communication between your hardware and the Blynk cloud.

Develop Code: Write the code to connect your hardware to the Blynk cloud using the Blynk library. This includes setting up Wi-Fi or Ethernet connections, defining data streams, and handling user interactions.

Configure Blynk App: Design the user interface of your app using the Blynk app builder. Add widgets such as buttons, sliders, graphs, etc., and configure them to interact with your hardware.

Test and Debug: Test your Blynk cloud app thoroughly to ensure that it functions correctly. Debug any issues that arise during testing.

Deploy: Once testing is successful, deploy your Blynk cloud app for use by yourself or others. Make any necessary adjustments based on user feedback or further testing.

Monitor and Maintain: Regularly monitor the performance of your Blynk cloud app and make updates or improvements as needed. This may include adding new features, optimizing code, or addressing security concerns.

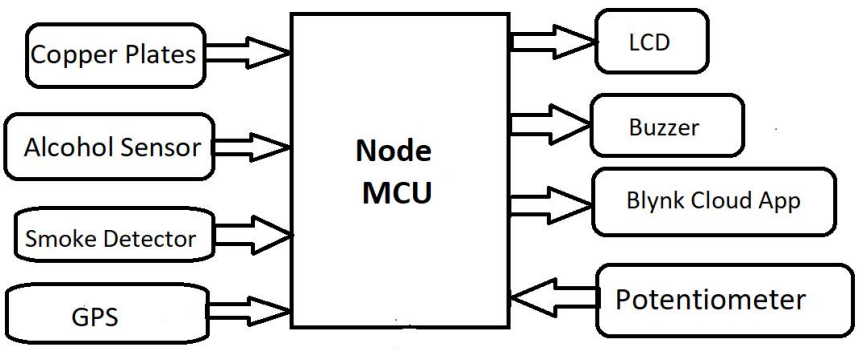

Fig.1 Block Diagram of IOT Alert System

It process use for in vehicles which is used in highway trucks and other transport vehicles etc.

3.About Design and Components:-

- **Node MCU:-**

NodeMCU is an open-source firmware and development kit for the ESP8266 WiFi module. It allows for easy programming and prototyping of IoT (Internet of Things) projects using the Lua scripting language or the Arduino IDE. NodeMCU provides a simple platform for building WiFi-enabled devices and is widely used in DIY electronics projects and IoT applications**.**

- **GPS:-**

GPS (Global Positioning System) information refers to data provided by a GPS receiver that includes the device's geographical coordinates (latitude and longitude), altitude, speed, and sometimes heading direction. This information is obtained by receiving signals from satellites orbiting the Earth and can be used for various applications, including navigation, tracking, mapping, and location-based services. GPS data is utilized in numerous industries, including transportation, logistics, outdoor recreation, and emergency services.

- **Buzzer:-**

Buzzer is an electromechanical device that produces a buzzing or beeping sound when an electrical current passes through it. It typically consists of a coil of wire and a vibrating armature or diaphragm that creates sound vibrations. Buzzer information includes details about its operating voltage, current consumption, frequency of sound output, and mounting requirements. Buzzer can be used in various applications such as alarms, timers, notifications, and user feedback systems.

- **Alcohol Sensor:-**

Using an alcohol sensor for accident detection involves integrating a sensor capable of detecting alcohol levels with a monitoring system, such as in vehicles or wearable devices. When the sensor detects alcohol, it could trigger alerts or actions to prevent accidents, like disabling a vehicle's ignition or sending notifications to emergency contacts. These systems are often used to deter drunk driving and improve safety on the roads.

- **Smoke Sensor:-**

Integrating a smoke sensor for accident detection involves incorporating a sensor capable of detecting smoke or fire into a monitoring system. These sensors can be used in various settings, such as homes, vehicles, or industrial environments, to detect potential hazards early and trigger appropriate responses, such as sounding alarms, activating sprinkler systems, or sending alerts to emergency services or users' smartphones. They play a crucial role in fire prevention and safety.

Fig 2. All Component Implementation model

4. Result and Discussion:-

The overall result of this project is an application that provides help to people who require help but can't ask for it. With the help of the application, their request for help is sent at the time of the accident with their location which helps emergency services provide support as early and effective as possible. All this is done with only the sensors available at low cost.

Also it helps to reduce the accident ratio by given the all over tracking record to the owner of the vehicle. It helps to follow the traffic rules for example no drink and drive. No smoking and control the over speeding. this project helps in the form of various factor to the society.

To track the vehicle path or any sensor activation record this system provides the dashboard on computer also on the mobile phones of authorized users. As given below dashbord

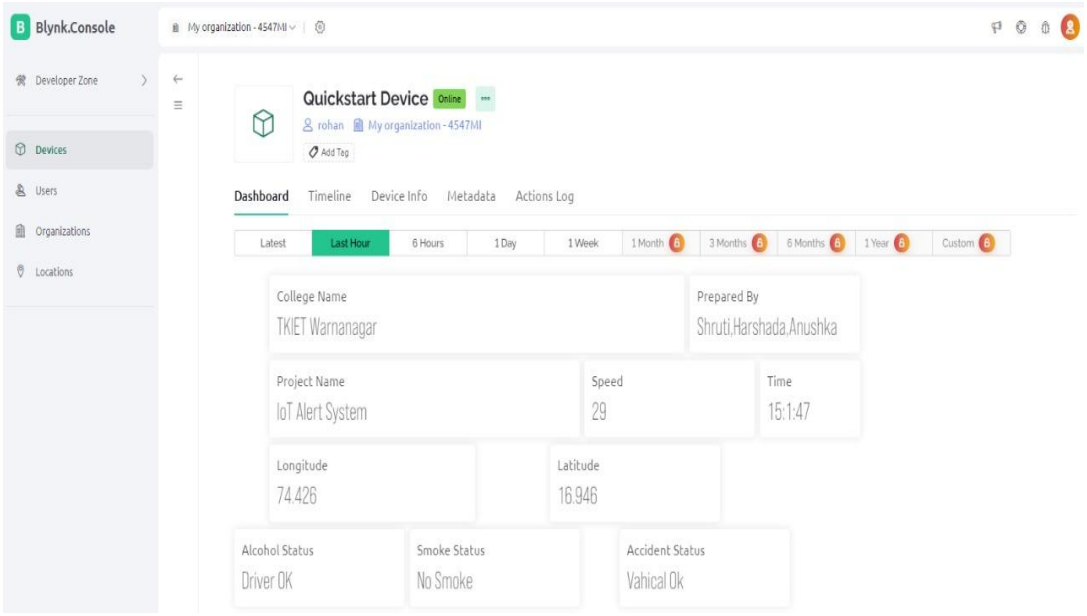

Fig. Dashboard image

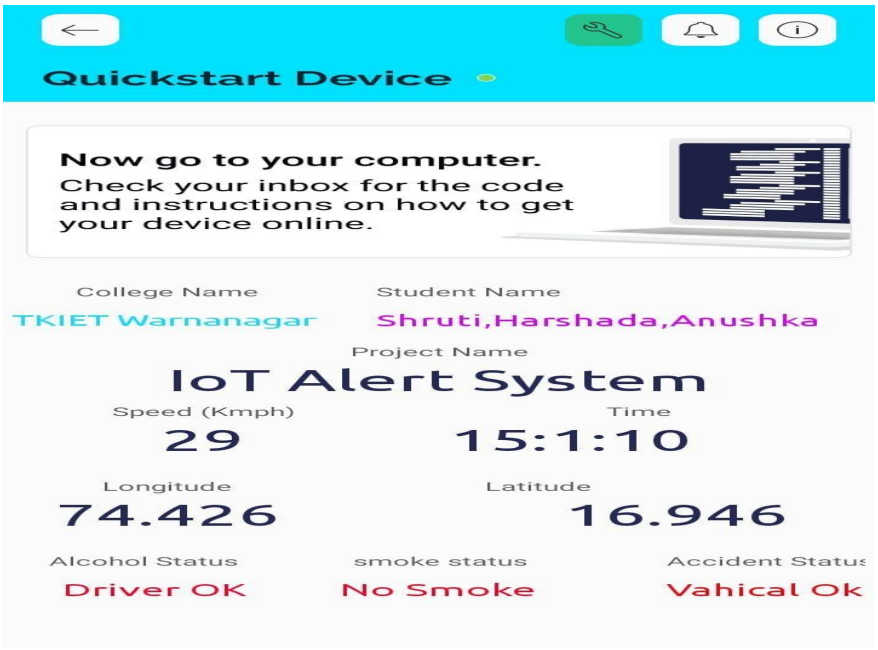

Fig .Dashboard Image

5. Conclusion:-

In conclusion, our IoT-based alert system offers a comprehensive solution for accident detection and safety monitoring in various environments. By leveraging advanced sensors and mobile technology, we aim to enhance situational awareness, minimize response times, and ultimately prevent potential accidents and hazards. The integration of real-time data analysis and intelligent alert mechanisms underscores the system's effectiveness in ensuring the safety and well-being of individuals and communities. Through continued innovation and refinement, we envision our IoT alert system playing a pivotal role in fostering a safer and more secure future.

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