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IOT Based Alcohol Smocking Detection System for Public Transport

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Abstract - *An alcohol detection system is developed for road transportation safety and Women safety in smart city using Internet of Things (IoT) technology. Two Sensors are set and monitored with the use of a microcontroller. When the first sensor is reached, the developed system transmits the Breathing traces level of the driver and the position coordinates of the vehicle to the central monitoring unit. At the reach of the second Sensor, the IoT-enabled alcohol & Smocking detection system triggers warning light indicator and buzzer sounds. The efficiency of this system is tested to ensure proper functionality. We also add panic button for women safety. The deployment of this system will help in reducing the incidence of drunk driving- related road accidents in smart cities and also helpful for women safety taking point of view from 'Nirbhaya Murder Case'.*

Key Words: *Internet of Things, Road transportation safety, Accident control, Smart city*

1. INTRODUCTION

The project is on IOT based Alcohol and Smocking Detection system for Public Transport such as buses. Public Transports are used on Larger scale for daily Transport to distinct place, so secure and Healthy Environment should be there on Daily basis. Many times we may saw people taking alcohol and smocking inn Prohibited place. Public Transport is one of that places where smocking is strictly Prohibited. Here we have designed a hardware Device using Internet-of-Things over an application in which it works Independently or Non-Independently with coordination of device to the android app. The Device is having 3 major components as Alcohol sensor, Smocking sensor & Panic Button.

1.1 PURPOSE OF THIS PROJECT

The device is setup or installed in public transport.

According to the current status the database will be refreshed. The user can install app from resources. The user can use mobile no and personal details on the app this is secure. The user-id and password for registered account is essential. Feedback feature is also provided. The alcohol and smoke product are highly traceable to the sensors. Buzzer alarm is there to alert other passengers in the public transport. Data is refreshed at each time interval, so current status in the bus can be obtained. Panic button facility is given from the women safety point of view. It Is easy and convenient to use. Authorities related to the transport and security are added in the system.

It is easy to setup the device in any section on Public Transport Can be used in other vehicles and workstations also. Highly capable storage (cloud) is used. Application is having better user interface.

1.2 ABOUT ANDROID APP

We have designed an android app in which hardware is integrated by medium of Internet. The app is having 3 phases as User, Bus Authority & Police help. User can register themselves by using id and password. Also, they can leave a feedback and report the complaint too.

2. ABOUT SYSTEM

2.1 Existing System

In the existing system, alcohol detectors are not proposed in any of the public transport, along with there is no any kind of Smoke detectors in the bus, hence there is a chance for anyone to drink and drive. Traffic police uses alcohol detectors to avoid drunk and drive system. Also, women safety is not maintained properly.

2.2 Proposed System

In this project, we are going to introduce alcohol sensors, micro controller, LCD display, Relay for controller and electromagnetic button to provide an automatic safety system for Public system.

3. FLOW OF THE SYSTEM

The sensors are installed at near the driver's Seat for Detection. Similarly, Smocking Detection sensor is installed at the passengers seating Arrangement Panic Button Facility is provided at Women's Seat which is reserved as soon as when user login into the app by using user-id and password, the current detail information of alcohol and smoke level is provided while user enters bus details. Alcohol and Smoke traces are found at Driver Area or Passenger Area, A buzzer is generated and Notification is sent at Centralized Server. And the Current status is updated on app.

If panic button is Pressed, A Notification is sent to the server and server notifies the regarding authority that there is unusual situation. All the notification Processing is performed over using IOT and Processed using Database. At the end user is Log outed from the application.

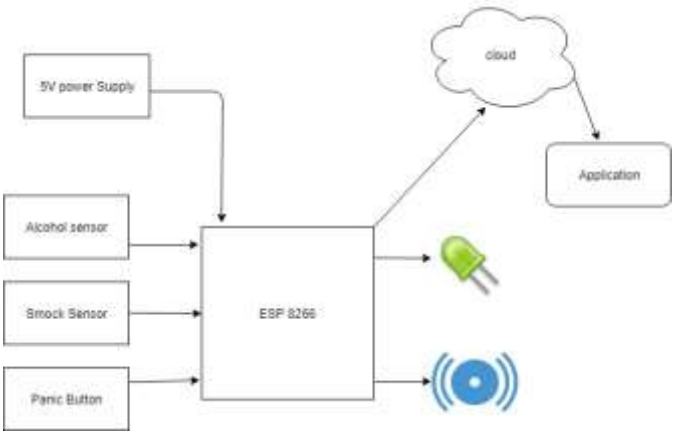

Chart -3.1: Block diagram

4. HARDWARE DESCRIPTION

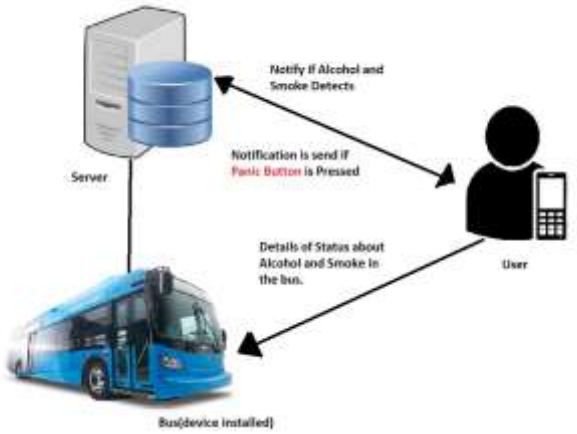

Fig -4.1: Architecture of System

1. ESP-8266 microcontroller (Arduino)

The very low price and the fact that there were very few external components on the module, which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation.

2. Node MCU

NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits.

3. Sensors

1. Alcohol Sensor- MQ3

This module is made using Alcohol Gas Sensor MQ3. It is a low-cost semiconductor sensor which can detect the presence of alcohol gases at concentrations from 0.05 mg/L to 10 mg/L. The sensitive material used for this sensor is SnO2, whose conductivity is lower in clean air.

2. Smoke Sensor- REES52 MQ2

The MQ series of gas sensors use a small heater inside with an electro-chemical sensor. They are sensitive for a range of gasses and are used indoors at room temperature. The output is an analog signal and can be read with an analog input of the Arduino.

4. LED

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. This effect is called electroluminescence.

5. Buzzer

6. Electromagnetic Switch

It is stainless steel switch which efficient to use.

7. Connecting wires

Connecting wires allows an electrical current to travel from one point on a circuit to another because electricity needs a medium through which it can move. Most of the connecting wires are made up of copper or aluminum.

5. FUNCTIONALITIES

- **Registration**

First user has to register itself by using mobile number and creating user id and password into the mobile app. By this user is now able to access the details of particular bus. There are 3 faces of users:

  - 1.User Face
  - 2.Bus Higher Authorities

- **Login**

After successful registration user is log in-ed into app and can track the status also feedback field is given there so they can report for any change if needed.

- Request for Details

In application, in the "Track" menu enter the bus number and required details.

- **Get details of Alcohol and Smoke Traces**

Here through sensor the detection mechanism is performed, if alcohol or smoke is detected then the notification will be sent to the server.

- **Update the Details in App**

The details in the application cloud is updated user is able to see the refreshed content in the app

- **Panic button Mechanism**

The panic buttons are aimed at helping passengers to get immediate police assistance or help during emergencies. If panic button is pressed then the input signal from the device is sent to the server using connectivity.

- **Refresh the details**

The details are updated on the cloud storage by time interval.

- **Logout**

If session is completed then user can Logout from application.

6. APPLICATIONS

- Can be installed at any place in the Bus.
- This project can be used in various organizations to detect alcohol & smoke consumption of employees.
- Panic Button facility is available all the time.
- Sensors used are capable.
- Database is having Efficient storage.
- Application is user friendly

7. RESULT

Fig 7.1 When Alcohol traces are found

The sensors detected the alcohol consumption and LED is being lightened.

Fig 7.2 Actual circuit.

8. CONCLUSION

The main unit of this project is associate "Alcohol sensor"," Smoke Sensor", & "Panic button". If the person within automobile has consumed alcohol & smoke then it's detected by the sensing element. sensing element provides this signal to a comparator IC. The output of comparator is connected to the microcontroller. The microcontroller is integrated with a Cloud database which send quick notification to the respected Authority. Integrating options of all the hardware parts used are developed in it. Presence of each module has been reasoned out and placed fastidiously, therefore conducive to the simplest operating of the unit. This Device can be located at any place in the bus. Hence it is compatible.

9. FUTURE SCOPE

The further scope can be added as Geo fencing can be implemented to the device to get actual status of the bus. The Camera can be added to the device for capturing drunker or smoker image and Reporting it to the Police. On more feature can be added as quick help admin for the women safety in the app.

ACKNOWLEDGEMENT

The authors can acknowledge any person/authorities in this section. This is not mandatory.

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