VEHICLE SPEED DETECTION AND ACCIDENT RESCUE SYSTEM

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***Abstract*:** Road accidents have increased lately and so there needs to be a system that can help us to reduce accidents. So our proposed system does not need any human inception. The speed of the vehicle is detected by the potentiometer. If the person exceeds speed limit of 60 then the person gets alert with the help of BUZZER . If the person ignores the buzzer and exceeds the speed limit of 70 then along with the buzzer a notification will be raised through an e-mail mentioning the fine raised by government in the E-Challan. Accidents might occur because of over speed and also accidents might happen at any speed. If any accident happens then alert will be sent to the respective person we choose. To detect the accident there is ADXL335 Accelerometer sensor present in this rescue system. It detects irregular tilts of the vehicle. So, the emergency help team can immediately trace the location and action can be taken immediately.

***Index Terms* - Alert, ADXL335 Accelerometer, Arduino, Blynk Application, Buzzer, NodeMCU.**

I. INTRODUCTION

The rapid rise of technology and infrastructure has made our lives easier. The high demand of automobiles has also increased the traffic hazards and road accidents. Accidents are occurring because of over speeding, drunken driving, distractions to driver, red light jumping and so on. Mainly road accidents are due to over speeding. Higher the speed greater the risk. Although all highways have signboards indicating the speed limit no one tends to follow them.

Vehicle speed detection is a prototype which alerts the person if vehicle exceeds speed limit. The unique feature of this prototype is that it not only detects the over speed but also when accident happens to the vehicle it sends the vehicle position to the rescue team which is traced by the GPS so that immediate action can take place to save the person. LCD is also placed to the vehicle so that person can see the alerts if not able to hear the buzzer sound.

II. EXISTING SYSTEM

Currently vehicle speed detection is based on the use of Radar to find the speed of the moving vehicles. Lidar (called LIDAR, LiDAR, and LADAR) is a surveying method that measures distance to a target by illuminating the target with laser light and measuring the reflected light with a sensor when used for speed or distance measurement, laser devices are also known by the name LIDAR (an acronym for Light Detection and Ranging) technology. Speed measuring lasers are also sometimes referred to as a laser speed measurement device (LSMD). LIDAR devices are often used in high traffic areas, since the laser beam can easily focus on individual vehicles, allowing pinpoint accuracy. The officer can accurately measure the speed of a vehicle, even in heavy traffic. The system initially estimates the time needed by particular vehicle for moving from starting point to the destination. Depending on this data, the Smart Vehicle Over speeding Detector estimates the vehicle's speed by Speed App using Radar. This data is collected and after that send through the IoT technology wirelessly.

Fig 1: Existing System

III. PROPOSED SYSTEM

As traffic police cannot monitor the vehicles continuously our proposed system does not need human inception. It deals with mainly two things. First to control the speed of the vehicle. If the person exceeds speed of 60 then person gets alert with the help of buzzer and speed is displayed on the LCD screen of vehicle. If person ignores this buzzer and exceeds speed limitof75 then person gets buzzer and email mentioning the fine raised by government due to over speed. The message will be displayed on LCD also. Secondly if any accident happens the ADXL335 Accelerometer sensor senses irrelevant position(TILT) of the vehicle and sends alert message to the rescue team. The vehicle location is traced with the help of GPS. It is more efficient when compared to the existing system and accident victim does not depend upon the mercy of other people to reach hospital.
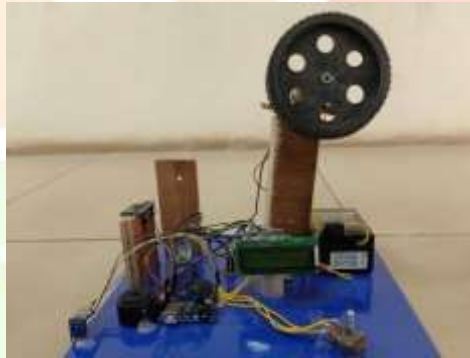

Fig 2:Proposed System

IV. IMPLEMENTATION

The battery is used for supplying the power to arduino, nodemcu, buzzer and potentiometer. The speed is given as input to the arduino and as a result the wheel runs as a output of the arduino. So when the person exceeds speed 60 the alert is given with the help of buzzer to the person. If the person ignores buzzer and exceeds the speed limit of 75 then person get a notification to email mentioning the fine raised by government and also gets alert like buzzer. Lcd is used for showing the notifications on the vehicle. Due to overspeeding accident may happen. The irrelevant position of vehicle is sensed by the MEMS Accelerometer and the the vehicle details is sent to the rescue team so that the accident victim does not depend on mercy of other people. If the person does not exceed speed limit then peron gets a message like "Good speed Maintaining". NodeMCU gives information to the user and the speed of the vehicle which is shown in blynk app and also it is displayed on LCD which is placed to vehicle.
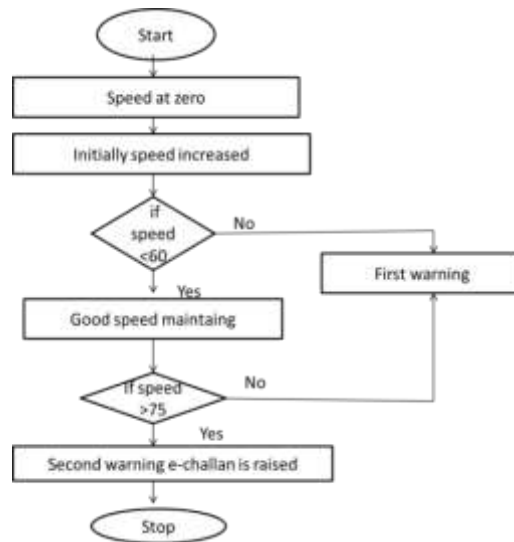
Fig 3: Flow Chart for speed detection

V. HARDWARE REQUIREMENTS

5.1 ARDUINO Board:

Arduino is a tool for making computers that can sense and control more of the physical world than your desktop computer. It's an open-source physical computing platform based on a simple microcontroller board, and a development environment for writing software for the board. Arduino can be used to develop interactive objects, taking inputs from a variety of switches or sensors, and controlling a variety of lights, motors, and other physical outputs.

Fig 4: Arduino UNO

5.2 NODEMCU:

NODEMCUIS AN OPEN-SOURCE FIRMWARE AND DEVELOPMENT KIT THAT HELPS YOU TO PROTOTYPE OR BUILDIOTPRODUCTS. IT INCLUDES FIRMWARE THAT RUNS ON THE ESP8266 WI-FI SOCFROM ESPRESSIF SYSTEMS, AND HARDWARE WHICH IS BASED ON THE ESP-12 MODULE. THE FIRMWARE USES THE LUASCRIPTINGLANGUAGE. IT IS BASED ON THE ELUA PROJECT AND BUILT ON THE ESPRESSIFNON-OS SDK FOR ESP8266.

Fig 5: NodeMCU

5.3 BATTERY:

The nine-volt battery is a common size of battery that was introduced for the early transistor radios. It has a rectangular prism shape with rounded edges and a polarized snap connector at the top.

Fig 6: Battery

5.4 ADXL335 ACCELEROMETER:

ADXL335 IS ACCELEROMETER SENSOR WHICH WORKS ON THE PRINCIPLE OF PIEZOELECTRIC EFFECT. . WHENEVER WE WILL TILT THE SENSOR THE BALL IS SUPPOSED TO MOVE IN THAT DIRECTION BECAUSE OF GRAVITATIONAL FORCE. THE WALLS ARE MADE OF PIEZOELECTRIC ELEMENTS. ADXL335 IS A TRIPLE AXIS ACCELEROMETER.IT WILL GIVE 3 VALUES IN OUTPUT.

Fig 7: ADXL Accelerometer

5.5 DC MOTOR:

The basic principle of the DC motor is a device which converts DC energy into mechanical energy. When the current carrying armature is connected to the supply end though commentator segment, brushes are placed within the North South Poles of permanent or electromagnets.

Fig 8: DC Motor

5.6 SWITCH:

A switch may refer to one of many different things. For example, it may refer to part of the physical circuit components that control the flow of signals. It can be a button or lever to turn a device on or off.

Fig 9: Switch

5.7 POTENTIOMETER:

The rotary type potentiometer are used mainly for obtaining adjustable supply voltage to a part of electronic circuits and electrical circuits. The volume controller of a radio transistor is a popular example of a rotary potentiometer where the rotary knob of the potentiometer controls the supply to the amplifier.

Fig 10: Potentiometer

5.8 LCD:

It is a flat panel display or other electronically modulated optical device that uses light modulating properties of liquid crystals combined with polarizers

Fig 11: LCD

5.9 GPS:

Gps use a constellation of satellites and ground stations to compute position and time almost any where on earth. It can be placed anywhere to detect the position and time

Fig 12: GPS Module

VI.   SOFTWARE REQUIREMENTS

6.1 Arduino Software:

The Arduino Integrated Development Environment is a cross platform application that is written in functions from c and c++. It is used to write and upload programs to arduino compatible boards, but also other vendor development boards. It is an open source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and kits for building digital devices. Its products are licensed under the GNU Lesser General Public License permitting the manufacturing of arduino boards and software distribution. It runs on Windows, Mac OS X, and Linux. The environment is written in java and based on processing and other open source software. This software can be used with any other arduino board.

Fig 13: Arduino Software

6.2 Blynk App:

Blynkis a platform with iOS and Android apps to control Arduino, Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets. It's really simple to set everything up and you'll start tinkering in less than 5 mins. Blynk is not tied to some specific board or shield. Instead, it's supporting hardware of your choice. Whether your Arduino or Raspberry Pi is linked to the Internet over Wi-Fi, Ethernet or this new ESP8266 chip, Blynk will get you online and ready for the Internet of Your Things. . It can control hardware remotely, it can display sensor data, and it can store data, visualize it and do many other cool things. There are three major components in the platform: Blynk App: – It allows you to create amazing interfaces for your projects using various widgets which are provided. Blynk Server: – It is responsible for all the communications between the smart phone and hardware.

Fig 14: Blynk App Operation

VII.   RESULTS

This is the prototype of our project. To initiate the system the switch should be on. When it is on the power is supplied to the arduino, nodeMCU and dc motor, LCD and buzzer. When we increase the speed with the help of potentiometer it is given as input to the arduino and wheel rotates with the help of motor. When the person exceeds the alert is given with the help of buzzer and it is also displayed on LCD. We can see the message on the screen like "Welcome To Accident speed Detection" on the LCD.

NodeMCU gives information about the speed and warnings in the blynk app. The test environment is arduino. If person exceeds speed 60 then we get a message like "First warning" on the blynk app.

Fig 15: Buzzer which activates on first warning

Fig 16: First Warning

If the person exceeds that speed and goes beyond 75 then we get a secon warning and also a email mentioning the fine raised by the government. It is also displayed on the LCD Screen and alert is given with the help of buzzer which is fixed to the vehicle and the warning is displayed on the blynk app.

Fig 17: Fine raised show on LCD

```
TERMINAL
244
SPEED : 61
1010 1017 1018
FIRST WARNING
AP31 4007
325
SPEED : 81
1010 1017 1017
SECOND WARNING CHALLAN RAISED :250Rs/-
AP31 4007
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Fig 18: Second Warning

If any irrelevant position like max tilt is sensed by the ADXL Accelerometer accident may happen then it sends the vehicle location to the rescue team. Alert can also be seen on the blynk app. We get a message like "Tilt Accident Detection" on the blynk app. NodeMCU is responsible for getting all these information .

```
SPEED : 31
979 983 984
TILT ACCDIENT DETECTION
912345678
LONG: 17° 41' 12.5340'' N, DMS Long  83°
13' 6.5388'' E
GOOD SPEED MAINTAINING
AP31 4007
125
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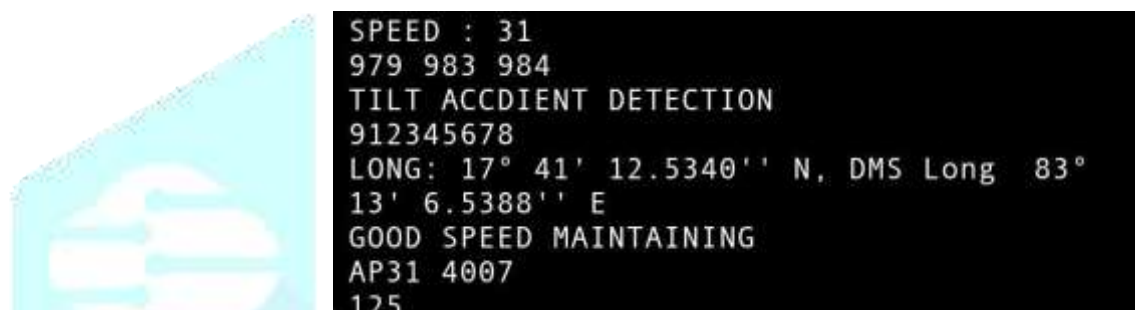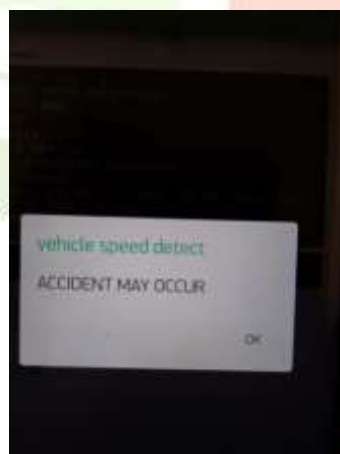
Fig 19: Tilt Accident Detection

Fig 20: Alert shown in Blynk App

VIII. CONCLUSION

In this fast growing world people wanted to make sure that their work has to be done more fast and easily. So they are violating the traffic rules and are becoming responsible for the road accidents. So we developed a automatic detection of over speed and accident rescue system. The main advantages when compared to the existing system is Reduces Accidents because it max prevents the person to exceed the speed. Accident victim does not depend on others because when any accident happens it automatically sends message to the rescue team.

XII.   FUTURE SCOPE

For furture work it is suggested to generate a automatic E-challan instead of fine mentioned to the email. If the system can be interference with hospital database at the time of emergency the accident person vehicle number and person details can be sent to the hospital. As it is all connected to the network the future scope should be to work this system even in poor network.

REFERENCES

1. Wang Wei, Fang Hanbo , ―Traffic accident automatic detection and remote alarm device‖, Proceedings of IEEE International Conference on Electric Information and Control Engineering, pages: 910-913,2011.

2. "DetectionofOver Speeding VehiclesonHighways",InternationalJournalofComputer Science and Mobile Computing vol.4 Issue.4,April-2015,pg.613-619.

3. "Advanced Vehicle Over Speed Detection and Billing System (AVODABS)", International Confernece on Green Engineering and Technologies, VijinP, SuhailBasheer V, Shaab MonPK, Sabin MK , 2015 IEEETrans

4. ManishaRuikar, National statistics of road traffic accidents in India, Journal of Orthopedics, Traumatology and Rehabilitation , 23 Sep.2014, vol. 6, issue 1, pp. 1-6.

5.Mr.S.Iyyappan and Mr.V.Nandagopal , ‖Accident Detection and Ambulance Rescue with Intelligent Traffic Light System‖, published in International Journal of Advanced Technology and Engineering Research,2013.

6. www.wikipedia.com

7. www.slideshare.net