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IoT based accident detection and prevention system with android application

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ABSTRACT

A system of accident detection and prevention powered by IoT (Internet of Things) The method helps in detecting and preventing vehicular accidents with immediate intimation and information like real-time tracking of the vehicle to closed ones, vehicular speed met. The device is connected over the cloud to use its basic functionalities of storage and perform historical analysis. Vital information's that help over as an aid at the red-zone is passed over to the nearest police stations, hospitals, highway authorities, etc. Information is instantaneously notified and shared to the closed ones of the victim using the cloud services and mobile application at the time of the accident to avoid delay of information and aid and

Keywords— Internet of Things, Accident detection, Accident prevention, Bluetooth low energy, Cloud storage, Cloud services, Android application

1. INTRODUCTION TO INTERNET OF THINGS

IoT "Internet of Things" nowadays play a crucial role in our day to day schedule. The electronic and the device that is connected to the digital environment is increasing more than 15 billion, in equals of 2 devices per person. Suitable examples for the IoT is "SMARTPHONES", the smartest devices are developed with programmable and remote controlled appliances. Future growth in the Internet of Things basically from every sector of the economy like a commercial, industrial, health care and public safety. [1]

Since all the devices are connected to the network and capable of performing fewer analytical operations "Internet of Things" provides a vast gateway that is, it is the extension of connectivity network and robust analytical techniques. [2]

2. RELATED WORK

The smart IOT accident detector helps in the field of transportation aid. The technology that helps to detect an accident and communicate with other following transportation mobility's, to prevent from further accidents at the time of an event and intimate the seriousness of the aid to the closed ones using the [3].The BLE device first scans for an event to occur, when an event occurs, the sensor reads for the vibration met during the accident and send the data to the microcontroller board ESP32. When the vibration reaches its threshold value, the scanning mode of the BLE board changes to advertising the data, that an accident has occurred in the surrounding zone. The information collected during the accident is been sent to the closest police stations, hospitals and closed ones for immediate aid for the victim met with an accident using an SMS and mobile application.

The author has designed an IOT device that can help out as an aid during the accident. The closed ones can track over the status of the vehicle whether an accident occurs or not, along with the tracking functionality of vehicle and speed during the travel. The data is stored over the cloud to connect over the application remotely and gather historical data.

The vibration sensor 801S helps to read the vibration met during the accident and decides to change the mode of BLE from scanning to advertising the information about the accident based on the threshold value.

The buzzer fixed the scanning BLE communicates with the advertising BLE notifies the following transportation mobility in the surrounding about the accident.

The device is to connect to a GPS module that tracks over the vehicle with its current latitude and longitude coordinates and map it using the cloud services, this module also helps to track over the speed during the travel and at the time of accident met. This data is shared over to the closest police stations, hospitals and closed ones [4].

The data Collected from the device is Stored over the cloud using an API channel of Ubidots and acts as a database to connect the device to the mobile application. These data can be used for analysis and prediction of accident-prone zone [5].

The mobile application acts as a primitive aid for the victim to notify about the event. Since these information's are private and cannot be shared all over, it can be only accessed by users with permission to view these data [6].

Here the accident detector [7] provides a dedicated firebase cloud to transfer more vital data between closed ones. The coordinates of every device are stored under firebase and Ubidots.

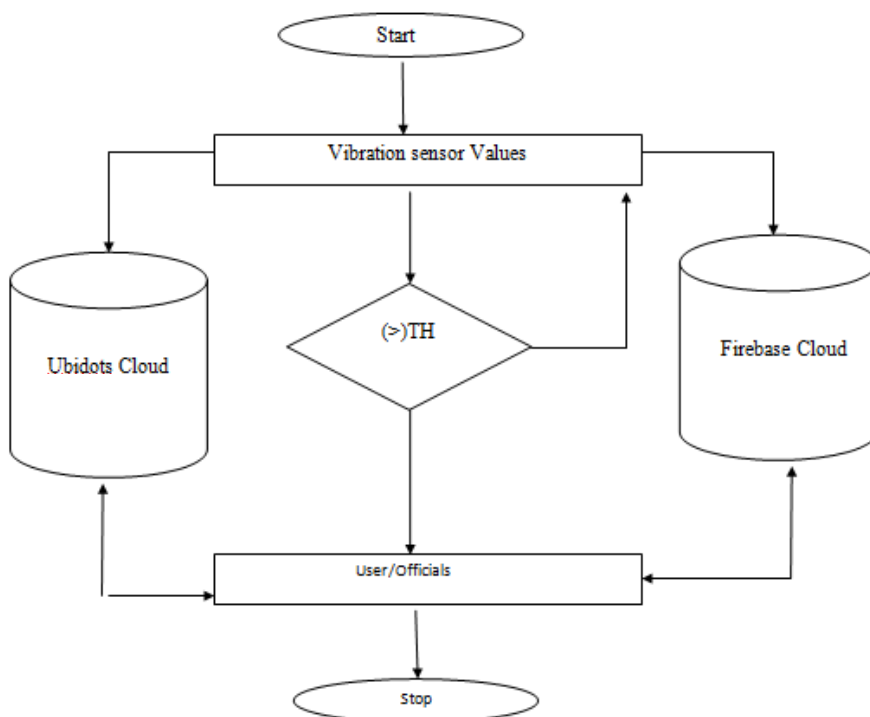


Fig. 1: Flow graph of Accident detection and prevention

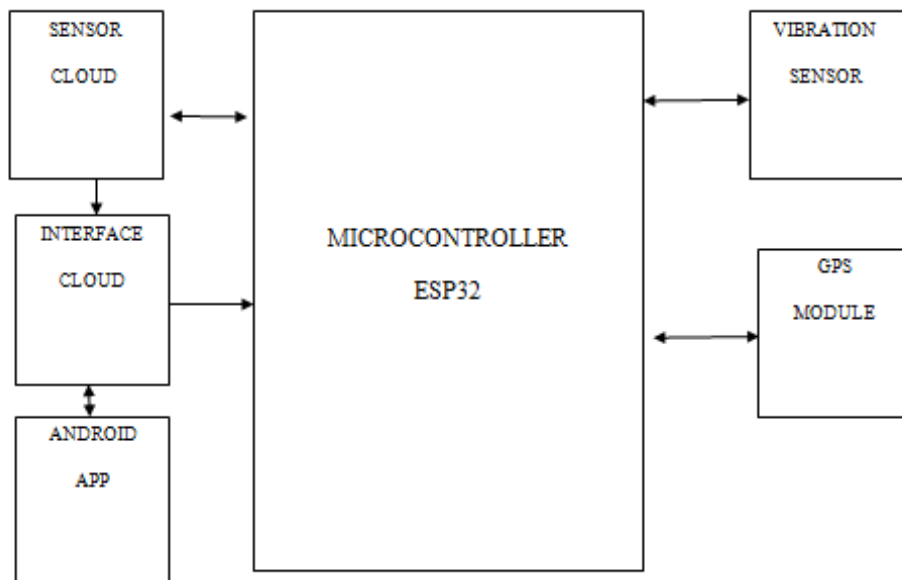


Fig. 1: Block Diagram of accident detection and prevention

3. CONCLUSION

A device for accident detection and prevention, combining IoT (Internet of Things) based system, the device helps to detect an accident and prevent accidents from following transportation mobilities. During the accident, the device communicates with the surrounding mobility's and alert them with the buzzer about the event. The device reads for a threshold value from the vibration sensor and acts according to the situation. The device turns its mode from scanning to advertising to alert other vehicles. The GPS tracks over the vehicle location and speed. The information collected during the accident is sent to the nearest police stations, hospitals and closed ones. This information are stored over the cloud to access it through mobile application the mobile application gives information like the status of the vehicle whether an accident has occurred or not, the live location of the vehicle and speed. Since these personal data are to be highly secured, these data can only be viewed by the users with access over the data through the mobile app. Thus this helps in the detection and prevention of the accident to reduce the higher impact during the accident.

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