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INTELLIGENT VEHICLE ACCIDENT DETECTION SYSTEM USING IOT

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ABSTRACT

With an increase in population, there is increase in the number of accidents that happen every day. Due to which many deaths have taken place. 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 can solve these problems by detecting the accidents and messaging the emergency numbers so that the immediate action can be taken. This system will have a sensor so that the accident can be detected.

Keywords— Arduino, Car accident, Internet of Things (IOT), Sensor

I INTRODUCTION

Road accident is most unwanted thing to happen to a road user, though they happen quite often. Nowadays there is an increase in the accidents that happen in the world. These accidents contribute to the severe accidents that happen everyday and thus people's lives are on stake. Around 15.7% of total deaths in India are due to these accidents. Out of all the developing nations, India has been listed with a higher number of accidents. Every day around 1,250 accidents takes place and 30% of them results in deaths.

According to the survey, highest number of accidents occur due to over speeding and drunken driving. The moment accidents occur, the life of all the passengers are at stake. The prominent reason for the loss of lives during an accident is the unavailability of immediate help. Thus every second during an accident is very crucial. Therefore an immediate help should be provided to the passengers.

In this world of technology, we can use it as a life savior. Internet of Things (IOT) is the heart of technologies. Its applications are can make our lives way better. However, IOT can be considered incomplete without the use of sensors. We are focusing the valuable lives of people which can be saved by implementing this technology.

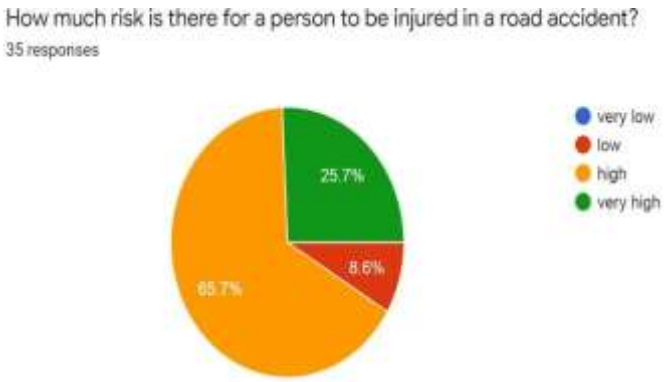
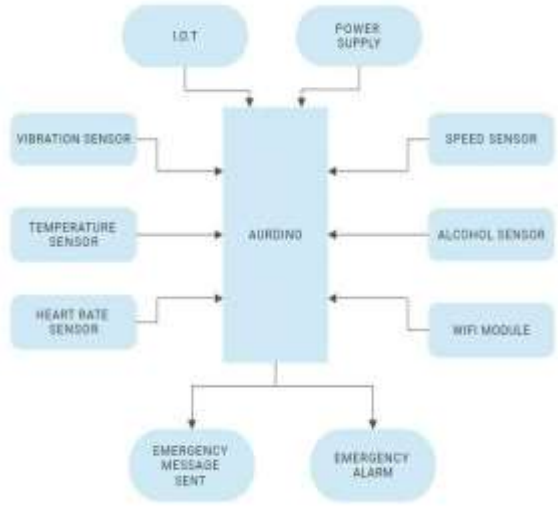


Fig. 1 survey

II PROPOSED FRAMEWORK

In the above Figure 1 we can see that the risk for a person to be injured in a road accident is high/very high. In most of the

cases the injured person is not taken to the hospital in time and thus he/she may lose their life. The system is expected to solve the problem by incorporating more features with the above discussed functionalities, this system can resolve most of the accident scenarios by detecting accidents on time and triggering immediate help from emergency services without wasting any time. Moreover,
the driver's health is being tracked by heart rate sensor (embedded in seatbelt) , temperature detection, speed of the car and sudden decreased in the fuel, all these serves as the added advantage. If implemented with proper planning and resources, this framework could serve to be a great help to the society. Hence, there is need of such systems that could save the lives involved with accidents.



III PROPOSED ARCHITECTURE & METHODOLOGY

The significance of this methodology is to address the gaps in the previous literature and contribute to the existing work on this project. As shown in Figure 3, this can be achieved by adding more functionalities and framework into this. We will be implementing this system with the help of IOT. Arduino is main unit for project to detect the accident and alert the driver. When any accident occurs, the Arduino will collect the data through the sensors and immediately send the information through IOT in the cloud server. The vibration sensors will give two types of results, low and high. During an accident, the vibration sensor will consider it as high and it will be detected. The sensors will also track the heart rate of the driver which will be placed in the seat belt of the driver. The speed of the car will be tracked by the sensor thus alarming about the over speeding and the alcohol tracker will be used to measure the amount of alcohol consumed while driving. Temperature will be detected by the sensors which will make sure the accident hasn't occurred. During an accident, sometimes there is a sudden discharge in the fuel. A tracker will be used to have an eye for the decreasion in the fuel. This system is a combination of all the possible sensor of modules which includes both hardware and software and can be very useful in the vehicles.

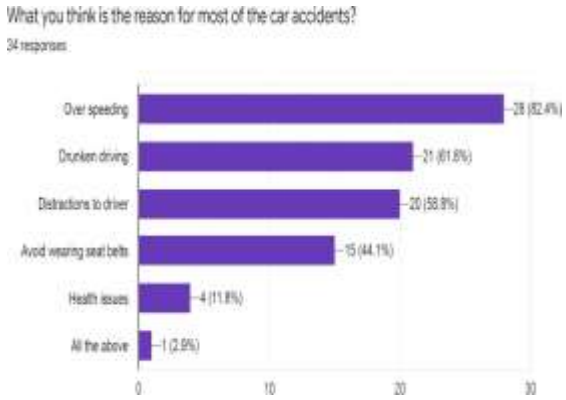


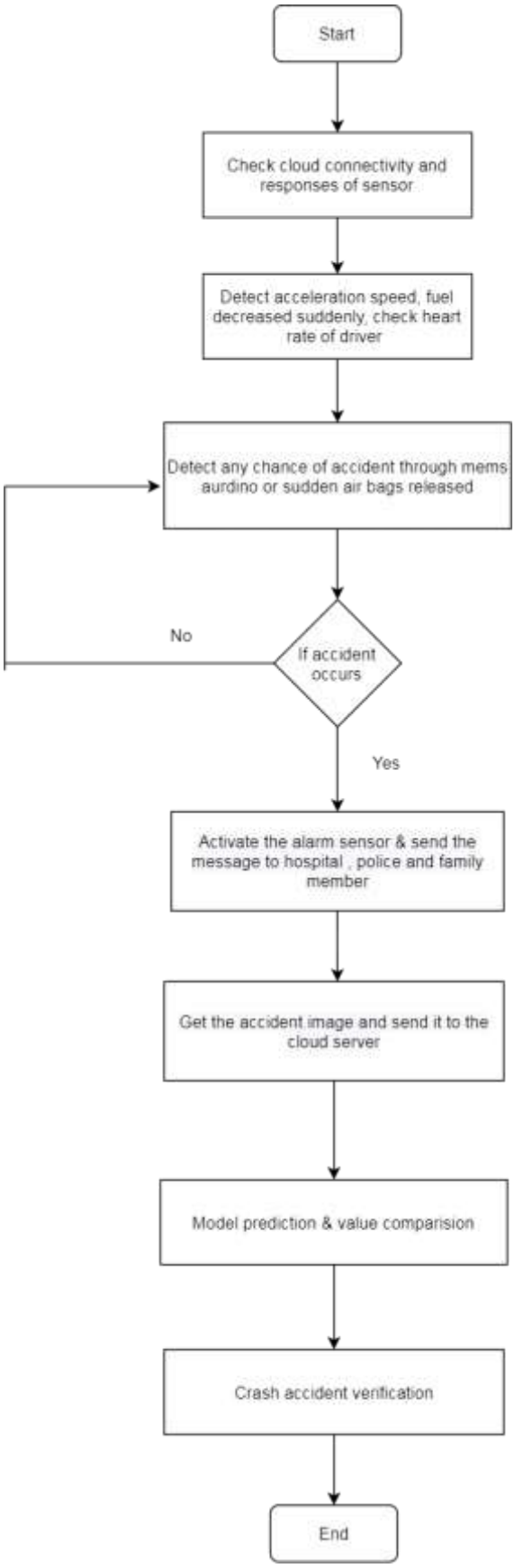
Fig. 3 Survey

IV FIELD SURVEY

According to survey shown in Figure 3, it has been seen that the higher number of accidents are caused due to over speeding and drunken driving. Faster vehicles are more prone to accident than the slower one,a vehicle moving on high speed will have greater impact during the crash and hence will cause more injuries. The ability to judge the forthcoming events also gets reduced while driving at faster speed which causes error in judgment and finally a crash.
Alcohol reduces concentration. It decreases reaction time of a human body. The road accidents can lead to the loss of human life. India is one of the leading countries in road vehicle accident. Many times public hesitate to help the injured person thinking they

might get called for police inquiry. In India there are many regions which are very far away from the hospitals and in such cases the injured person might not get the treatment at the correct time. It has been seen that the injured person is not given the necessary treatment at the right time and it is also difficult to contact their family members about it. There are also some health issues that even the driver is unaware of. For instance, increase in heart rate and blood pressure. Thus, the problem we are focusing on is how to minimize the time required for an injured person to get the proper treatment and to detect the accident before it reaches to the final stage, also inform their family members for the same.

FLOWCHART



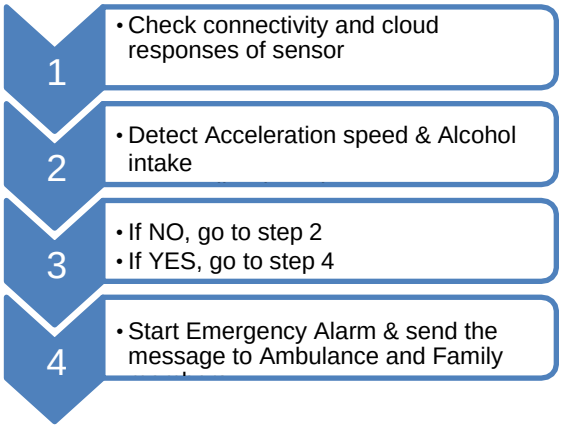


Fig. 4- steps of implementation

V RESULT

As shown in the design/objective of Figure 4, it will be followed for the execution of the project. Using IOT, the responses will be checked and if the alcohol level / speed of the vehicle / level of vibrations / heart rate or the temperature is not at a particular level then the emergency alarm will be on. If any accident has occurred then the message will be sent immediately to the server and the required authorities. Accidents are surely undesirable but can occur any time any where, using this system we can minimize the number of deaths caused due to road accidents. Family members can reach the hospital by the emergency message sent to them. This system is a cost effective and real time feasible. By using this system we can surely reduce the number of accidents as well as the number of deaths which takes place due to the road accidents. The mechanism will be very useful for the society to minimize the number of accidents and providing the emergency services as soon as it has occurred.

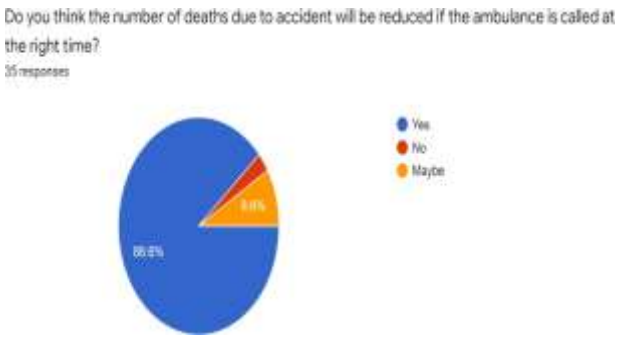


Fig. 5 – Survey

VI FUTURE SCOPE

The future of this system is expected to be very bright. With the increase in number of accidents happening everyday, this might be a great way to save lives of people and decrease the accidents as much as possible. With implementation and regular hardwork this can be improved and can be made more advance.

VII CONCLUSION

As shown in figure 5 the survey says that the number of deaths due to accident will be reduced if the ambulance is called on time. Accident is an unplanned event and sometimes it can lead to undesirable consequences. Though we cannot stop an accident but we can surely can some precautions like not to over speed, not to drink and drive and following all the guidelines. Wearing seat belts have been brought under law after proven studies that it reduce the severity of injury during accidents. Wearing seat belts doubles the chances of survival in a serious accident. Many people in India don't take the traffic rules seriously and tend to outrun them. If we follow them seriously and take the necessary measures then surely the rate of accidents in India will be reduced. The system used here can be used for avoiding accidents as well as notifying concerned authorities by providing them the exact location. Especially in India where accidents are at a very high rate. By this system we can surely reduce number of accidents scenarios by detecting the accidents on time and asking for immediate help to save lives. If implemented with proper planning, designing and resources, this could serve as a great help to the society.

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