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Implementation of IoT in Hassle Free Smart Ambulance Transportation System

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Abstract :- *Internet of Things relates the real world with the world of automation. Automation is vastly used in manufacturing industries. Activities related to our day to day life can also be automated by different means .Here I have focused to solve the problem of ambulance transportation in heavy traffic using IOT based embedded system. Arduino hardware kit along with GSM and GPS module is used to alert the other vehicles about the arrival of ambulance. Embedded system used in ambulance will regularly send its location to the server and the server will send the alarm messages to the vehicles which are moving on its way to hospital or patient and that will be received by the receiver of those vehicles, so that the traffic will be alerted in advance to provide a hassle free movement of ambulance.*

Keywords :- IOT, Automation, Ambulance Transport system, Embedded system, Arduino, GSM, GPS Module

1. INTRODUCTION

Day to day traffic problem is increasing gradually. Separate road for ambulance is one of the solutions for hassle free ambulance transportation but it will be costlier to construct a separate road. Ambulances are having siren but it is not audible to the persons moving after its range due to noise in traffic. In this paper I have thought of a system which will alert the bike riders or heavy vehicle drivers which are within the 1 km radius of ambulance with the help of GPS, internet and some other hardware which will be used in both ambulance and other vehicles so that they will be alerted and will give the road to ambulance.

Ambulance in India Faces a lot of problem in heavy traffic which is observed in our day to day life. A figure showing the ambulance in heavy traffic is shown in Fig.1. In such a traffic the riders near by the ambulance have heard of the siren but due to less time in their hand after siren recognition riders may or may not be able to clear the road on the route of ambulance.

Fig. 1 Ambulance in heavy traffic

The future roads will be able to manage traffic congestion much better than today's networks. It has been imagined that in a span of around 20 to 30 years the existing traffic system would improve to an extent where cars can communicate with each other without any human interaction to control the traffic. Hence travel could be made smoother and safer. Sensors would be fitted in cars and these cars will be placed on the roads. These would monitor traffic and send the information wirelessly to a "central traffic control system," a hub that compiles data to feed back the information to vehicles on the road. For instance if there's lots of traffic, the central traffic control system would be told over WiFi and they in turn react by imposing speed limits that have to be followed by the vehicles in that congestion area. Since millions of money is spent on traffic congestion every year, it has been estimated that, by the implementation of Ambulance smart transportation systems, the life saving percentage will definitely increase.

So a new system is proposed in this paper for hassle free transportation of ambulance in the following manner. Section II describes the technical part of the system i.e. the design of proposed procedure, assumptions and minimum requirements to successfully implement the system. In section III the future scope of this methodology is described. In section IV I have acknowledged the persons or institute behind the scope to prepare this paper. Section V concludes the proposed method.

2. DESIGN PROCEDURE

The allotment message will be transferred by the use of internet and GPS to the vehicles which are satisfying the following conditions:

1) The vehicle is in ignition

2) The vehicle is on the route of ambulance which will be decided by the server with the help of GPS

Following assumptions are taken for practical implementation on this paper :

1) Each vehicle is having GPS and internet receiver

2) ambulance indicator near the speedometer

3) ambulance is also having GPS, Internet facilities

4) and a server which is tracking the location of ambulance and its nearby vehicles

First of all a server must be designed which will collect the information about the location of ambulance, the nearby vehicles so that the allotment message will be sent to those vehicles. The ambulance should continuously send its location to the server. The server will detect all the vehicles which are moving in the route of ambulance. As shown in the figure 2.

Fig. 2 Proposed Method

In the above figure an ambulance is travelling with patient from a place Paribasudeipur to Capital Hospital, Bhubaneswar in Odisha and its route on the Google map is shown. It is sending its location to the server continuously. The server is sending the arrival of ambulance to the nearby vehicles which are moving in that route within the radius of 1km.

The allotment message will be received by the vehicle and will be indicated on the ambulance indicator present on the screen near the speedometer just like turn indicator which will blink continuously. A proposed display unit is shown in figure 3.

Fig. 3 Indicator used for arrival of Ambulance

The system which will be used in this method will be implemented with the help of Arduino hardware , which will control the connection between GSM Module, internet, GPS module and indicator as the block diagram shown in figure 4.

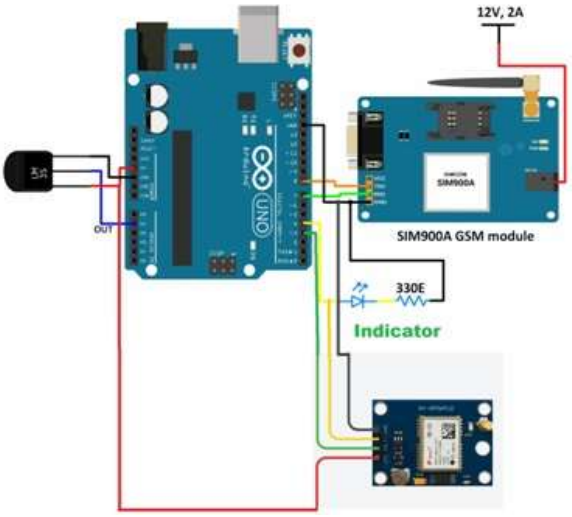

Fig. 4 Arduino interfaced with GPS and GSM

Arduino will receive the allotment signal by the GSM module and it will turn on the ambulance indicator to ert the rider. So that the rider will give the way to ambulance as it is allotted before sufficient time before the arrival of siren from ambulance.

3. FUTURE SCOPE

Practical implementation of this system is possible for hassle free transportation of ambulance. This proposed method will be applicable to all the vehicles. There must be a step taken from government to implement this system in each vehicle. So there must be a collaboration among all the vehicle manufacturing companies to use this system in each vehicle. Traffic police may use such systems to control traffic according to the arrival of ambulance sufficient time before getting the siren sound.

4. ACKNOWLEDGEMENT

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5. CONCLUSION

This paper presents a real time ambulance transportation cum traffic monitoring system to solve t he problem of real time ambulance related traffic controlling and monitoring. The proposed system provides a new way of traffic control by the better utilization of resources. The traffic administration department can use this real time ambulance traffic monitoring information to detect the dangerous situations on the road and thereby react by imposing immediate actions. On the whole IoT will play an important role in ambulance traffic monitoring by

improving the efficiency of traffic safety and to save lives of patients.

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