ISSN No:-2456-2165

# Survey Paper on Analysis of Ambulance Tracking System

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**Abstract:- Ambulance is the lifesaver during many of the emergency cases. The present ambulance routing routing strategy is not effective because the ambulances are present in the base location(Hospitals, toll gate, etc.) and when the request is made, they move to the patient's place gives the first aid and move them to the hospital. This paper property on the different strategies proposed to make the ambulances to work more efficiently and also discusses about traffic clearance.**

***Keywords:-*** *Ambulance, GPS Based Tracking, Restful API, RFID, Density Based Clustering, Intelligent Accident Detection.*

## I. INTRODUCTION

Ambulance is the lifesaver during many of the emergency cases. Accidents occur non-linearly due to increase in population and the rising traffic congestion and from the same place many requests are made. The accidents occur non-sequentially because sometimes many requests arise from the same place. Usually for all type of emergencies, the toll free number is availed to seek emergency. The government has introduced 108 in order to rescue people who in need. Some hospitals have their own toll free numbers for emergency. The ambulance will be placed in its base location, say hospitals or toll gates. They will stand still until getting notified of any accident. When the person is in emergency a call to the toll free number is made. The call is received by the dispatch division. Receiving the call, the delegate officer will be informing it to the ambulance driver while the caller will be put on a telephone call with the EMT and the doctor accessible. Now the ambulance with the help of GPS location finds a sooner way rushing to the victim's place. To cut it short, this can be explained as,

- Call: When a person is in need of emergency he/she makes a call to the toll free number (varies to each hospitals) is then answered by the trained communication officers who connect the caller to the dispatch division.
- Connect: The dispatch officer immediately looks for the ambulances nearest to the patients place and contact the driver and location coordinates are send to drivers.
- Care: Through GPS tracking the precise location of the patient are grasped and rushed to the nearest hospitals as soon as possible and save the victim's life possibly.

The most popular and available service used so far is EMT as mentioned before , that provides pre-hospital care for the patient on the way. Now in order to rush to the hospital quickly, RFID tag will be helpful in traffic clearance. Microcontroller based RFID system helps in altering the traffic lights upon the ambulance arrival at traffic light junction and would help the ambulance in rushing the patient to the hospital at critical time. This paper will analyze and contrast the different techniques suggested for ambulance tracking.

## II. DIFFERENT AMBULANCE TRACKING STRATEGIES

*A.GPS based tracking:*

A GPS-based vehicle tracking framework is used for navigation that will determine where the ambulance is and where it has been. The framework uses geographic position and time data from the Worldwide Positioning Satellites. It takes the latitudes and longitudes coordinates of the location from the Google map and display them in the internet connected devices that will instruct in which path it has to travel in order to reach the victim's place earlier.

GSM module (Global systems for mobile communication) is an architecture used by a mobile device or a modem that helps in communication. It also uses SIM card that works in its specified network range and it can be paired with Bluetooth devices as well.

*B. Traffic clearance using RFID&CLOUD:*

Radio Frequency Identification (RFID) is a little electronic device that include of a little chip and a radio wire. It is used for tracking and identification purpose. It sends radio waves passing information to the traffic signals, paving a way for the ambulance to not stop on its way to the hospital. The radio wire sense the respective ambulance and modifies the per user RFID to get the vehicle's identification number. The ID is then stored in the database. After the confirmation from the server, the traffic signal is cleared for the ambulance.

ISSN No:-2456-2165

*C. Routing based clustering:*

In density based clustering, given a set of points which focus on grouping the closely packed points together (nearby neighbors) while the neighbor points (nearest neighbors but a little far away) are considered as outliers. The clusters are made on the basis of maximum accidental prone areas according to the user given radius.The number of ambulances available are checked with it and placed such that each cluster holds an ambulance. If there is less number of ambulances, the user radius is increased. The outliers will also be holding an ambulance apart from the clusters.

*D. Ambulance tracking using Restful API:*

Rest FUL Web service is a service that is being offered by one electronic gadget to another electronic gadget, to help connecting with each other by means of the WWW .It uses HTTP request and helps in web communications .Using APIs, the calls between applications are overseen through Web services. This application helps the client to follow the close-by rescue vehicle for emergency reason, for example, accidents or any emergency like pregnant cases with the aim that patients can be taken to the hospital as quickly as time permits and their life can be spared. The client checks the nearby ambulance books it with the goal that the patient can be taken to the hospital.

*E. RF module:*

It provides wireless communication where two or more devices can connect by transmitting radio waves. The RF module helps in controlling the traffic light signals in the path of the ambulance. It helps the ambulance to not stop because of any traffic jams and help it to move fast.

## III. LITERATURE SURVEY

- [1] The framework structured uses GPS location and GSM module. It tracks the present area of an ambulance with the assistance of GPS module. It detects the patient's parameters like body temperature, beat rate and so on by thermostat sensors, GSR sensors. It shows the present area of the ambulance also, the patient's parameters on the LCD show just as it sends a similar data to the portable present in the clinic by means of GSM module. This framework additionally sends the position of the ambulance to the traffic signal to control the traffic. Traffic signal will naturally control the traffic to clear the way of the ambulance. Traffic signal transforms into red for those ways with the exception of the way onto which an ambulance is passing.

- [2] RFID device is used to modify and clear the signal. It has a tiny chip and an antenna. The chip comprises patience's status and the ambulance current location .The RFID reader placed at the traffic signal reads these Information from the RFID device installed at the ambulance. The signal will be changed to green soon as the server can recognize the ambulance paving the way for the ambulance to move rather than getting stucked up in the traffic. The RFID reader which contains the vehicle's information is associated with the microcontroller. If suppose the RFID reader fails to read, as soon as the ambulance driver sends the "BLOCKED" information, the server helps in changing the red signal without any confirmation. Current location is detected utilizing GPS introduced in the mobile.

- [3] Based on the experiment, the accidental prone areas are grouped into clusters. The ambulances are placed in the clusters analyzing the request over the period of time. Apart from clusters, ambulances are placed in outliers as well. It was observed that among all the other clustering techniques that was proposed, Density Based Algorithm reduces the average distance travelled by an ambulance comparatively. The ambulances are kept at a place so the distance covered by the ambulance can be reduced so that the patient can have more chances to be alive. Each cluster is given an ambulance so that they can arrive even more quickly.

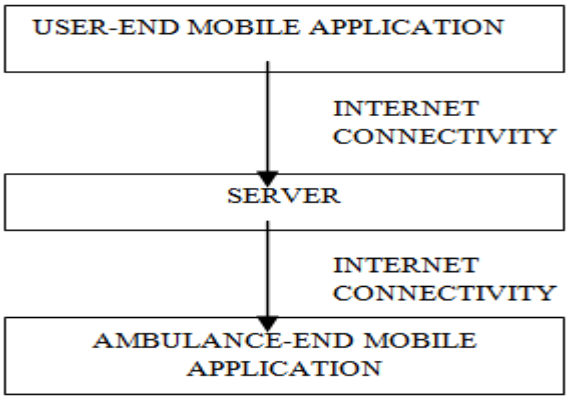


Fig 1:- Architecture Diagram of Mobile Application

- [4] In the proposed work, the client will be able to track the nearby ambulance for emergency in order to the the patient to the hospital as soon as possible. It will show the available ambulances to the user. The web based application will use Google map to compare the GPS coordinates to send the nearest ambulance the targeted place. User checks the nearby place. Once the ambulance arrive to the patient's location the ambulance information and its location is considered and the nearby hospital will be shown is shown so that the patient can be taken. Apart from calling the nearby ambulance the user will also be able to see the nearby hospitals, clinics and medical stores located in that particular area.

- [5] It would consists of GPS and GSM module that will be placed in the respected vehicle which as soon as the accident occurs, it will send the location of the victim's place to the main server which will inform an ambulance from a nearest hospital to rush to the spot. Using RF module there will also be a control in the flow of traffic. This will help the ambulance to reach the hospital quickly. There will also be a patient monitoring system that sends the health parameters of the patient [1] to the hospital even before the ambulance reaches.

ISSN No:-2456-2165

| Author | Year | Approach | Description |
|---|---|---|---|
| Shivali Walvekar and Kinjal More | 2016 | GPS based tracking and health parameter detection. | It displays the current location of ambulances and patient's health parameter on the LCD display and sends that information to the hospital |
| B.Janani Saradha,G.Vijayshri T.Subha | 2017 | RFID & cloud approach | The RFID tag helps in controlling the flow of traffic by changing the traffic lights |
| Chennakesava Reddy Kamireddy, Bingisateesh, Keshavamurthy | 2016 | Density-based clustering | It groups the major accidental areas into clusters and assign an ambulance to each of them ,thereby reducing the average distance travelled by the ambulance |
| CS Vikas and Ashok Immanuel | 2017 | Restful API | It's a web based application that shows the nearest ambulances, clinic and pharmacies to the user. |
| Bhandari Prachi, Dalvi Kasturi and Chopade Priyanka | 2014 | Intelligent accident detection and RF communication | The sensors placed in the vehicles helps in automatic accident detection and inform it the ambulance |

Table 1:- Comparison Table

## IV. CONCLUSION

The main aim of this paper is to identify different approaches to ambulance tracking system. The GPS based tracking, RFID device, Density based clustering technique, RESTful API and intelligent accident detection concludes the various techniques to be implied to make the ambulance reach the patient's place and rush them to the hospital immediately.

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