APPLICATION FOR KEEN TRANSPORATION AND CRISIS FRAMEWORK

Ms. S. Sylvia Irish[1], Haseena Banu A[2], Janani P[3], Nivetha B[4], Priya Dharshani D[5]

[1]Assistant professor, Panimalar Engineering College, Tamil Nadu, India.

[2,3,4,5] B.Tech, Panimalar Engineering College, Tamil Nadu, India.

---***---

ABSTRACT : *Emergency medical response in India is lagging behind other countries.. To address this issue, an intelligent emergency system based on smart phone technologies helps in building a platform which serves every smart phone user. This application will help the user to get any available ambulance without calling the hospitals to check for the ambulance availability. The app reacts with just one tab on the button and it will send the notification of the accident location via GPRS to control server. Once the request is accepted, the GPS location will be sent to the ambulance driver which will lead to the user location. It also helps to prevent fraud calls and tracks down the culprit who misuse the emergency medical services (EMS) by diverting the service from better needy. If there is heavy traffic in the way to reach the destination, then the communication between the traffic signals and the ambulance driver is established so that the traffic signal can respond to the arrival of the ambulance and works according to it, so it makes a free way for the ambulance. Thus this project will act as a life saver.*

Key Words : Ambulance, Smart phone, Traffic control, Emergency system, GPS.

1.   INTRODUCTION

In current technology, where mostly everything runs on smart phones and applications, the need of quick and efficient services are almost important in every aspects especially when it comes to medical services. Patients are mostly having issues on searching for an ambulance, handling the locations and availability of the limited service in the time of emergency. The lack of such attention and information may lead to several casualties. The question arises when the user have to find ways to check the availability of the ambulance and for the ambulance to find the user's precise location in the quickest time possible. Thus the ambulance drivers must have proper information provided to them so that they won't get lost or find themselves searching for the exact location of the patient. This made the ambulance driver to loss and unable reach to the patient who need immediate medical attention. The main aim is to reduce the time of calling the operator and to request an ambulance, reduce fraud calls and to allow ambulance driver to locate the victim easily by using GPS signal.

2.   PROPOSED SYSTEM

Nowadays on time ambulance services are very important because to save human life even in the remote areas where there is heavy traffic congestion. This system tracks the real time position of the accident spot using GPS as a notification to the control server. The sent information has the GPS location and the injured part. The control server checks for available driver and will assign the path accordingly. The driver will take the responsibility to bring the patient as soon as possible by controlling the traffic signal to reach the destination.

3.   RELATED WORKS

[1] It is one of the novel issues of the world regarding the location of ambulance stations within a given area to cover the maximum amount of demand is studied. In this study, the classic version of location problem is improved using the double coverage models so that two radii(Latitude and Longitude) are considered for covering.

[2] Smartphone application reads the response of the server and retrieves the required information and places it on to Google map client of smart phone device or displays in a listed format depending on the user's preference. A marker is used to pin point the location of retrieved data is knows as Pin. To differentiate between pins that are used for pointing hospitals and ambulances we've used custom pins. It makes easier to understand the difference even to naïve user. This can be done using Google Map API's functionality. There is a set of predefined markers that are made available by Google in their Google Map API. But for user's convenience custom pins are used. That API guideline is also provided in Google Maps documentation.

[3] Over the years, several ambulance location models have been discussed in the literature. Most of these models have been further developed to take more complicated situations into account. However, the existing standard models have never been compared computationally

according to the criteria used in practice. In this paper, we compare several ambulance location models on coverage and response time criteria. In addition to four standard ambulance location models from the literature, we also present two models that focus on average and expected response times. The computational results show that the Maximum Expected Covering Location Problem (MEXCLP) and the Expected Response Time Model (ERTM) perform the best over all considered criteria.

[4] The management of pre hospital logistics is addressed by several researchers. That is due to the big impact that has healthcare around the city development. Thus, optimizing emergency traffic helps to smart cities growth. This paper includes coverage problems existing in literature and addresses the ambulance allocation to cover sectors in Casablanca region of Morocco and minimize the lateness of emergency intervention. Our work proposes a comparison between a heuristic method and an ACO 'Ant Colony Optimization' algorithm. Instances are given by real data of the existing emergency location in Casablanca region. As a result, the ACO hybridized by a guided local search provides a distribution of ambulances at potential waiting site (hospital and fire station), and minimizes the total lateness of emergency intervention. The ACO gives best results than the heuristic.

4. ARCHITECTURE DIAGRAM

Initially, the user needs to register with Google Cloud Messaging (GCM) by sending request to GCM and the main server (XMPP server) register with GCM server. The driver details are stored in the database. First the user can give the notification about the location when there is an accident. With the help of the notification the server can set the destination location and give request to the driver. Once the request is accepted, the GPS location will be sent to the ambulance driver which will lead to the user location. If there is heavy traffic in the way to reach the destination, then the communication between the traffic signals and the ambulance driver is established so that the traffic signal can respond to the arrival of the ambulance and works according to it, so that makes a free way for the ambulance.
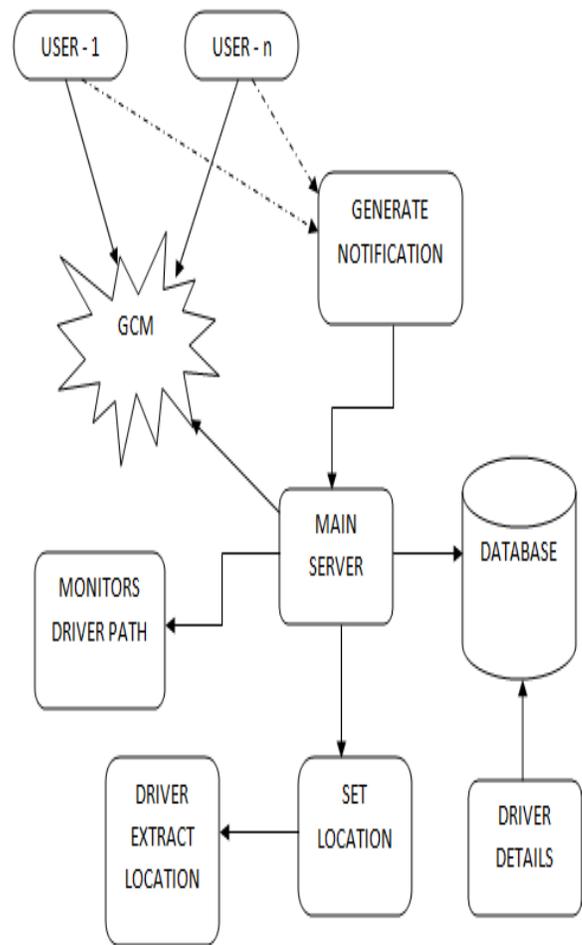

Fig -1: Architecture Diagram.

5. METHODOLOGY

5.1. USER INTERFACE

The aim is to develop Data center for city ITES. City ITES is nothing but Intelligent Transportation and Emergency System related to a particular city. Here we can make transportation in city very effective and efficient with the help of ITES concept. Important need in city is to control traffic and Emergency System in congestion areas. So first we create User Login page for application to avoid sending unwanted request to traffic server.
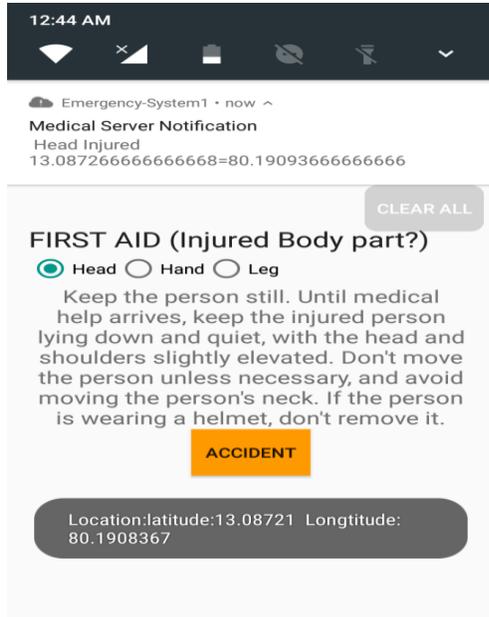
Fig – 2 : Location Sending.

5.2. PATH SETUP

Manifest Google map in our application is used to easily identify the source and destination location (Latitude and Longitude) to handle the emergency situation. Using the GPS Technology, we can get accurate source and destination location to track the route.
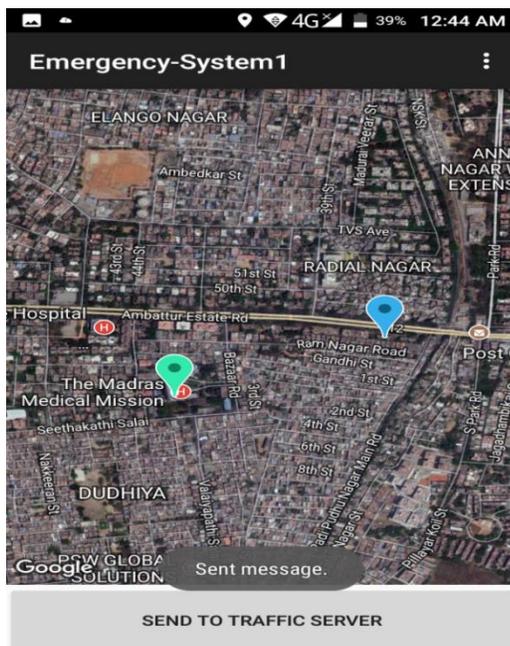

Fig – 3 : Path Setup.

5.3. HANDLING EMERGENCY SITUATION

Public and EMT can directly communicate with traffic signal, and modify the signal from red to green in case of emergency situation. With the support of Google Map and GPS technologies, it will go far beyond than any other multi agent traffic management systems, addressing issues. such as infinite system scalability, an appropriate agent management scheme, reducing the upfront investment and risk for users.

Fig – 4 : Signal Changing.

5.4. ROUTE MONITORING

The control server sends the destination path to the ambulance driver and it is the responsibility of the driver to reach the respective destination. In order to avoid fraud calls and from misusing those emergency services, the control server continuously tracks and monitors the path of the ambulance moves. So this can help the ambulance service to work effectively and efficiently in emergency situations.

6. CONCLUSION

The ambulance is controlled by the control server which furnishes the most scant route to the ambulance and also controls the traffic light according to the ambulance location and thus reaching the hospital safely. The server also determines the location of the accident spot with the help of GPS and thus the server walks through the ambulance to the spot. This scheme is fully automated,

thus it finds the accident location, controls the traffic signal, helping to reach the hospital in time.

7. REFERENCES

[1] R. Church and C. ReVelle, "The maximal covering location problem," Papers in Regional Science, vol. 32, no. 1, pp. 101–118, 1974.

[2] M. Gendreau, G. Laporte, and F. Semet, "Solving an ambulance location model by tabu search," Location Science, vol. 5, no. 2, pp. 75–88, 1997

[3] S. G. Henderson and A. J. Mason, "Ambulance service planning: simulation and data visualisation," in Operations research and health care, Springer US, 2005, pp. 77–102.

[4] G. Zuidhof, "Capacity planning of ambulance services: Statistical anal- ysis, forecasting and staffing," Vrije Universiteit Amsterdam and CWI, Tech. Rep., 2010.

[5] M. Maxwell, M. Restrepo, S. Henderson, and H. Topaloglu, "Approx- imate dynamic programming for ambulance redeployment," INFORMS Journal on Computing, vol. 22, no. 2, pp. 266–281, 2010.

[6] M. Dzator and J. Dzator, "An effective heuristic for the P-median problem with application to ambulance location," Opsearch, vol. 50, no. 1, pp. 60–74, 2013.

[7] C. Parsuvanathan, "Big data and transport modelling: Opportunities and challenges," Int. J. Appl. Eng. Res., vol. 10, no. 17, pp. 38038–38044,Jan. 2015.

[8] G. Xiao, Z. Juan, and C. Zhang, "Travel mode detection based on GPS track data and Bayesian networks," Comput., Environ. Urban Syst., vol. 54, pp. 14–22, Nov.2015.

[9] M. A. Pereira, L. C. Coelho, L. A. Lorena, and L. C. De Souza, "A hybrid method for the Probabilistic Maximal Covering Location–Allocation Problem," Comput. Oper. Res., vol. 57, pp. 51–59, 2015.

[10] T. Feng and H. J. P. Timmermans, "Comparison of advanced imputation algorithms for detection of transportation mode and activity episode using GPS data," Transp. Planning Technol., vol. 39, no. 2, pp. 180–194,2016.

[11] H. Safi, B. Assemi, M. Mesbah, and L. Ferreira, "A trip-detection method for smartphone-assisted travel data collection," in Proc. Transp.Res. Board 95th Annu. Meeting (TRB), 2016, p.19.