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A Study on Design of Ambulance Tracking and Route Clearing using GPS, GSM, RFID

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ABSTRACT: The population of vehicles on road has become too much especially in cities. We can encounter traffic throughout the road because of which Ambulance service is one of the major services which gets affected by traffic jams. To smoothen the ambulance movement in traffic we are implementing “Ambulance Tracking and Route Clearing Using GPS, GSM, RFID”. In these we use of an android app that connects both the ambulance and the traffic signal station using GSM network. This system makes use of GPS to track and to get actual location of the Ambulance. The system will also use RFID (radio frequency identification) technology to implement the Intelligent traffic signal control. The basic idea behind the proposed system is, if the Ambulance halts on the way due to a traffic signal, RFID installed at the traffic signal tracks the RFID tagged ambulance and sends the data to the cloud. After the acknowledgment for the user through the mobile app, the particular signal is made Green for some time and after the ambulance passes by, it regains its original flow of sequence of signalling, if this scheme is fully automated, it finds the ambulance spot, controls the traffic lights. This system controls the traffic lights and save the time in emergency periods. Thus it acts as a life saver project.

KEYWORDS: IOT, Android, Google Firebase, GSM Module, Arduino

I. INTRODUCTION

Traffic management on the road has become a biggest severe problem of today's society. Traffic congestion is a major problem in developing cities. Due to increase in urban population and the middle-class number of vehicles also increasing. Congestion will be caused on roads results will be come that slow moving traffic, which increase the time of travel, thu this is one of the major issues in cities like India. Shortage of efficient traffic control and administration has many times lead to loss of lives due to ambulances getting stuck in traffic jams. Unlike developed countries, Indian cities cannot think of having separate lanes for emergency purpose due to shortage of road planning and infrastructure, but if we implement this system one of the disadvantages is that apart from the huge cost, this lane always remains underutilised. It is a static system; static means we are not providing services every time. This lane is not useful every time and it's not an adequate system. Moreover, because of this system the width of road for general use is reduced which cause in traffic congestion and inconvenience. There are so many examples that ambulance got stuck in the traffic load, Ambulance has to wait for some minutes to hours to clear the traffic load. Patient may die because of lack of treatment at proper time. To overcome this hazard and to save many lives. We came with a new idea which provides the functionality of one path clearance i.e. the ambulance going path will be cleared. Consider a situation when there are 4 signal and all 3 signal don't have any vehicle on their road but one signal has huge congestion occur. The basic idea behind the system is ambulance should not halt due to traffic signal. After the acknowledgment for the user through the mobile app, the particular signal is made Green for some time and after the ambulance passes by, it regains its original flow of sequence of signalling. This scheme is fully automated, it finds the ambulance spot, controls the traffic lights. This system controls the traffic lights and save the time in emergency periods. Thus it acts as a life saver project.



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II. RELATED WORK

The framework makes an android application that associates both the emergency vehicle and the movement flag station utilizing cloud arrange. This framework makes utilizes RFID (radio recurrence recognizable proof) innovation to actualize the Intelligent activity flag control. The fundamental thought behind the proposed framework is, if the Ambulance ends in transit because of an activity flag, RFID introduced at the movement flag tracks the RFID labelled emergency vehicle and sends the information to the cloud. After the affirmation for the client through the versatile application, the specific flag is made Green for quite a while and after the emergency vehicle cruises by, it recovers its unique stream of grouping of flagging If, this plan is completely computerized. This framework controls the activity lights and spare the time in crisis periods. Hence it goes about as a lifeline venture.

The fundamental idea driving the paper is to give a smooth stream to the emergency vehicle to achieve the healing facilities in time and consequently limiting the postponement caused by activity clog. The Micro-controller based RFID framework is utilized to modify the movement lights upon its landing in rush hour gridlock light intersection which would spare a lives at basic time. Radio Frequency Identification is minor electronic contraptions that include a little chip and a receiving wire. The little chip is installed with data's about tolerance's status and the rescue vehicle current path. RFID per user situated at the movement flag peruses these data from the RFID locator introduced at the rescue vehicle. To maintain a strategic distance from pointless activity flag transforms, we cross allude the rescue vehicle ebb and flow area and persistence's condition utilizing portable application enrolled by the emergency vehicle driver. If there should be an occurrence of system disappointment, the RFID takes the entire control.

III. PROPOSED SYSTEM

The proposed framework begins by taking its contribution from the client. The client gives the framework circumstance of patient and select wanted way. The framework at that point starts with gathering the facilitate estimations of current area on the chose way and server will change flag to green on the chose way as per circumstance which has send to server, for sending way determination and the circumstance to server, customer has an android based guide API with a UI that give a solid interface to way choice and circumstance affirmation. On alternate hands server will go about as educator to micro-controller. The micro-controller will be introduced at each flag present that is utilized on control the flag post. The chose micro-controller which comes in chose way will get a similar what server has gotten in its database, as indicated by the organize esteem the micro-controller will appraise the area of vehicle and when vehicle comes in predefined scope of the flag the micro-controller will change motion as per circumstance. In the event that the GSM organize is working fine the framework play out its customary routine else framework will work in disconnected mode at that point Radio Frequency Identification (RFID) go about as a reinforcement to the framework. Where RFID sender will be introduced in rescue vehicle and the RFID beneficiary will be introduced close to the movement flag survey. The sender will consistently communicate its radio flag and at whatever point the sender will come in the scope of beneficiary, flag will be consequently made green as a matter of course. Figure below shows block diagram of Ambulance Tracking and Route Clearing.

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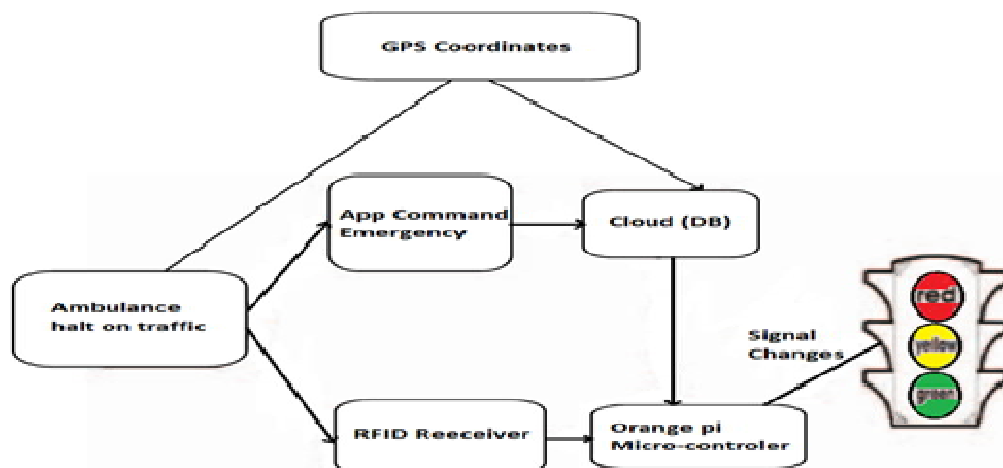


Figure: Block diagram of Ambulance Tracking and Route Clearing

IV. SIMULATION RESULTS

This simulation studies involves managing the traffic signal and controlling the traffic. Firstly Ambulance driver Login in the android app as shown in Figure 1 and then sent its status record as emergency or non-emergency. After this Destination and path selection done as shown in Figure 2. These data are sent to the real-time server(Google Firebase). User authentication and real-time database are managed using Firebase server as shown in Figure 3 and Figure 4. From there data are accessed using micro-controller(Arduino) with proper credential, micro-controller is enabled with GSM module. Micro-controller used to control the traffic signal, if the Ambulance status is emergency the signal made green else it follows regular routine. The RFID module works instead of server failure, that is if the server become offline then RFID receiver will identifies the RFID tag and made the signal green by default.

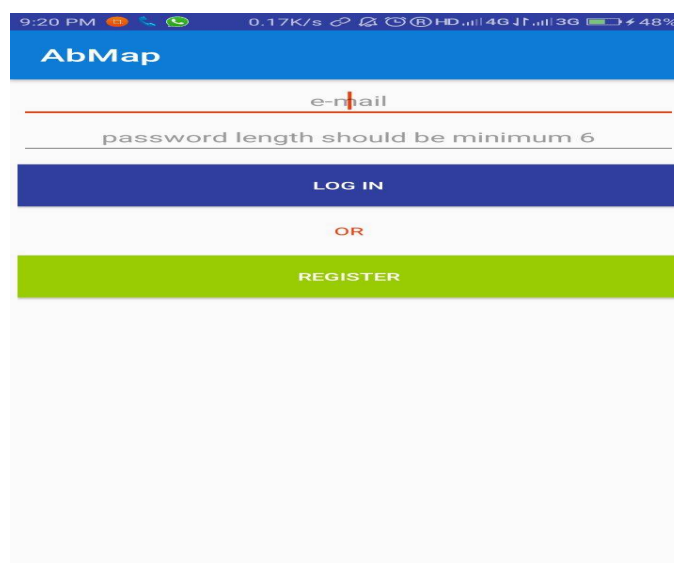


Fig.1



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Fig.2

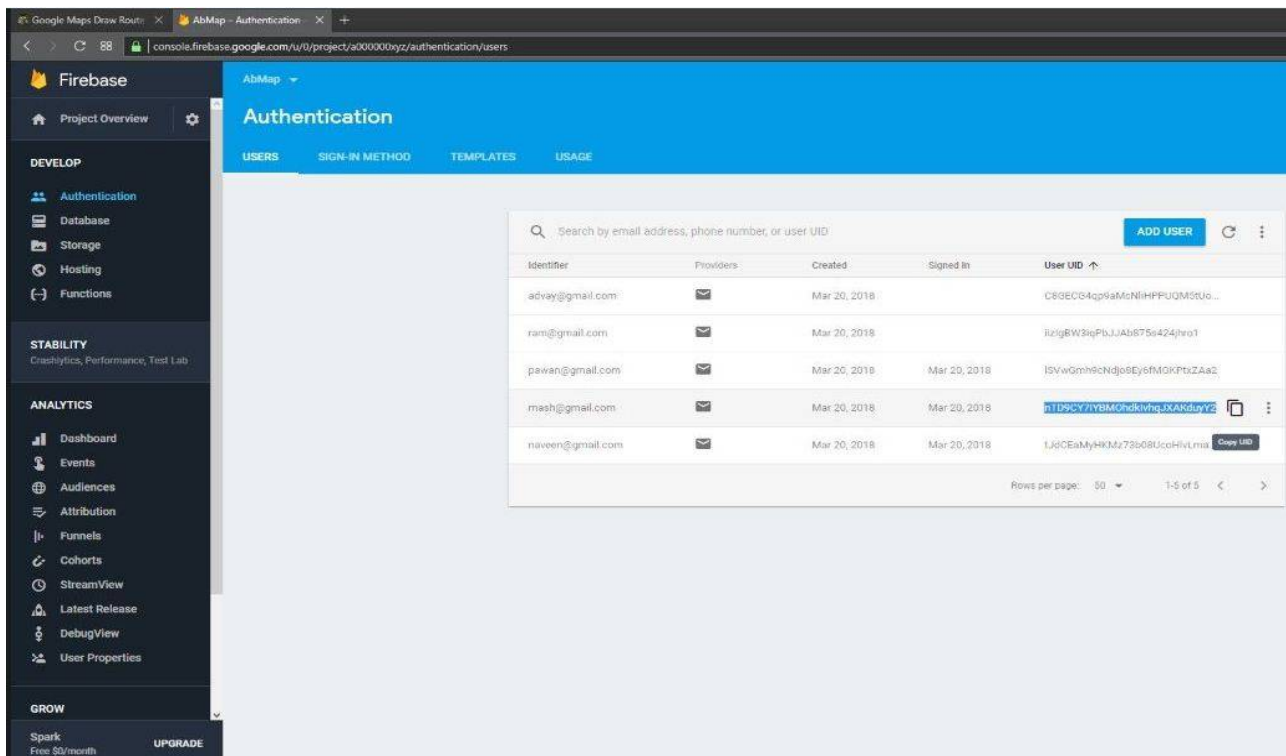


Fig.3

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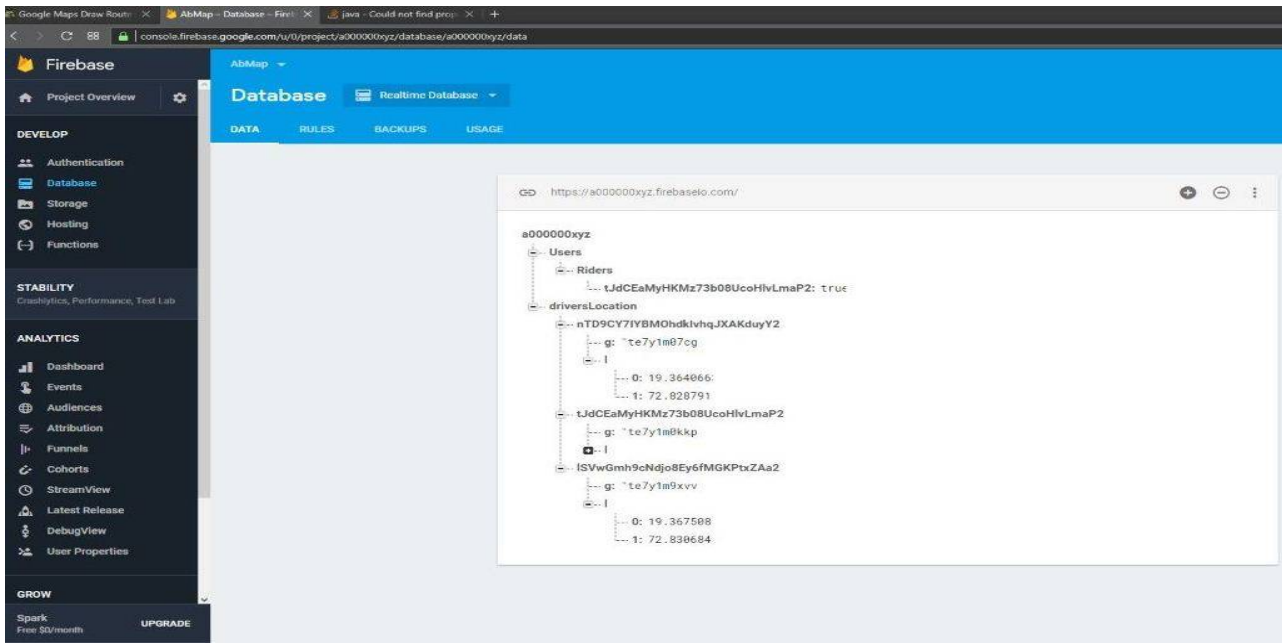


Fig.4

V. CONCLUSION AND FUTURE WORK

The proposed system is used for controlling the traffic signals in favor of ambulances. With this system the ambulance can be maneuvered from the patients spot to the hospital without time lag. The “Ambulance Tracking and Route Clearing using GPS,GSM,RFID” can be proved to be effectual to control not only ambulance but also authoritative vehicles. This system is more accurate with no loss of time. But there may be a delay caused because of GSM.

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