

“Smart Ambulance with Smart Traffic Management System”

Mayuri Sehgal¹, Gaurav Sambhe², MeghaKorde³, Mansi Dange⁴, Aadesh Gupta⁵, Vaibhav Kungwani⁶, SwapnilKhadke⁷, BhaveshMulchandani⁸,

1,2, Assistant Prof., Department of Electronics and Telecommunication Engineering, Jhulelal Institute of Technology College of Engineering, Maharashtra, India

3,4,5,6,7,8 Student, Department of Electronics and Telecommunication Engineering, Jhulelal Institute of Technology College of Engineering, Maharashtra, India

ABSTRACT: The main reason behind is increasing population which leads to increased number of vehicles, due to which emergency service like Ambulance get affected. Controlling the traffic becomes major issue when it comes to large intima delays between traffic lights/signals. Due to this, ambulance service which is one of the crucial services, it's get delayed very often. Because of this delay in ambulance service, patient may lose his life and number of these scenarios are increasing day by day. This paper proposes a solution to make such services easily available to those in need. The proposed system clears the traffic congestion by turning all the red lights to blue on the path of the ambulance, hence helping in clearing the traffic and providing way towards its destination.

Keywords: Traffic, Ambulance, IOT, Microcontroller (Arduino MEGA 2560) etc.

INTRODUCTION: The world is developing very high today. Technology is upgrading, every day is evolving and improving efficiency in healthcare sector is one of the most difficult and challenging jobs also with the advent of Industrialization and Urbanization, as the population increases day by day the number of vehicles also increases on the roads and it is very problematic in big cities. Traffic congestion causes many effects on countries transportation. The problem is that, the traffic system is that for every minute the vehicles at the 2-way road will be heavy and the traffic lights shall be changed to each side for some allotted time even if there are no vehicles at particular side, the traffic lights will glow for given fixed time. Due to this, other side vehicles have to wait for the time to complete the process. Also on roads, due to traffic people are unable to provide the freeway to the emergency unit which also becomes the factors of late first aid and due to which one can die on the way to hospital.

This paper aims at reducing traffic congestion and unwanted longtime delays during the traffic light switch over also proposes that how ambulance can easily pass through traffic signals by making use of IOT Module and lastly, how monitoring of the patient will help the doctors to give them necessary treatment with the help of IOT and GSM technologies.

This paper is about monitoring of traffic lights and its controlling by the driver of the ambulance. Basic information of patients is taken. This information is further used to send it to the hospitals for the immediate treatment of patients. Depending upon the situation of patient, the driver sends the direction towards which it wants to travel. Depending upon the command, that particular signal is made blue to provide way to the ambulance and

simultaneously the others are changed to red. By this method, way is provided to the ambulance resulting it to reach the destination in minimum time.

LITERATURE REVIEW: In this paper, the two systems are combined, which are Health monitoring and traffic controlling systems. Both the systems will work Simultaneously. The signals is Manipulated by the driver of the ambulance at the same Time. With the help of GPS navigation system with a congestion Detection module, this system can be improved for the real Time scenario.

The main aim is to design Traffic management system based on IOT and cloud computing. When the Ambulance is arrived near the signal that respective signal light is turned into blue and other will be Red. In case where two Ambulances are exactly at Equal distance from traffic light, in this case the traffic light Receiver will give chance to the transmitter of any one of the Ambulance randomly without considering any fact.

The data that is generated by these Devices can be handled by cloud computing and it can also be Used to send command to those devices to perform a task. The IOT module is used to Establish the communication between the traffic signals and the ambulance so that the traffic signal can respond to the Arrival of the ambulance. This application needs a required bandwidth for the Instantaneous communication between the ambulance and the traffic signal.

PROBLEM STATEMENT: As we differentiate with other countries with proper emergency systems, there is no single emergency system which could play as key in managing medical emergency in India. There is a system to attend the emergencies in the country, 108 is the emergency telephone number for ambulance services in parts of India. A regular problem such a system face is to get the location of the victim to send the help needed. Traffic signals in India has a fixed time period to switch the signals. No changes for emergency vehicles. There is no traffic control unit in ambulance. Whenever ambulance reaches a certain junction with a traffic signal, it has to wait for several minutes until clearance. This may cause many deaths in our country. This project is all about the solutions to this major issue.

IMPLEMENTATION : This system is divided into two parts. First is a software which consists of android application. Second is the hardware of traffic signal implementation.

The first part is an android application. Whenever ambulance reaches to the accident spot the smart ambulance, the driver will feed the patients data in the device and send it to the hospital. This works on the principle of IOT with the help of cloud computing system. The Change in signal occurs by the used of compass and GPS. Android application has four buttons for four directions. Depending on the route, ambulance driver will select appropriate direction and send activate command for that particular signal. Also Ambulance's current location and current direction of movement is send to the server. Here ambulance's location is traced using GPS hardware device. Compass is used for detecting the direction of the movement of ambulance.

Then commands sent by ambulance driver are transmitted to that particular signal and depending on the direction that signal is made blue and rest all other signal are made red. This changing of signal works like an Interrupt at traffic control signal. The signal is changed when status of ambulance is active. As soon as ambulance crosses the signal is sends deactivate command and signal regains its original flow.

The Second part is the hardware of traffic signal. In hardware we have used Arduino mega 2560 (microcontroller) for traffic signal. The LEDs are used for indicating light signal.

HARDWARE COMPONENTS USED:

a. **Microcontroller (Arduino Mega 2560):** The Arduino Mega 2560 is a micro- controller board. It has 54 digital pins of which 15 can be used as PWM outputs and 16 analog inputs, 4 UARTs used for hardware SP (serial port), 16 MHz crystal oscillator, The USB connection, a power jack, ICSP header, and a reset button. It holds everything which needs to support the microcontroller.

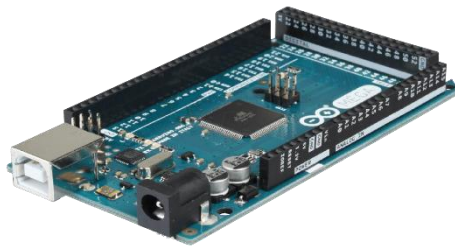


Fig 1.Arduino Mega 2560

b. **LEDs:** LED stands for **light Emitting Diode**. LED lighting products produce more efficiently than incandescent light bulbs. An electrical current passes around a microchip, which illuminates the small light sources, call LEDs and the result is axiomatic light. LEDs are used for signalling according to the traffic condition.



Fig 2. LED

d. **Jumper Wires:** Jumper wires are used to connect the components.



Fig 3. Jumper wires

METHODOLOGY:

Block diagram:-

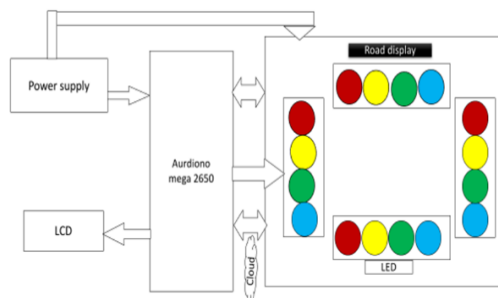


Fig. Block diagram of traffic Management System

Fig. Block diagram of traffic management system

The above block diagram consists of Arduino, LED(Light Emitting Diode), LCD(Liquid Crystal Display), IOT module and power supply. Power supply of 5v is given to Arduino and Road display it is powered it supplies power to LED and LCD. Four types of LED are used RED, YELLOW, BLUE and GREEN. The information of road display is send to the Arduino by using cloud and after checking the priority of vehicle, Arduino powers the BLUE LED of the respective lane for a fixed time. After the fixed time Arduino resumes the normal operation. This process is repeated whenever the emergency vehicles is arriving.

FUTURE SCOPE: This system can be further extended to send the present status of the patient to the hospital once the patient is on the ambulance for the aid. This process would surely need various sensors and wireless networking, sending all the details to the hospital where the patient is to be admitted. The hospital staff can use this medical information for the assistance of the patient immediately.

This technology can be even used for priority vehicles too like fire brigades, police vehicles and etc.

CONCLUSION : The present traffic system in India has fixed timers for the signals to make the traffic manageable on roads at every direction but this on general basis hamper the ones who need medical attention on urgent basis. Our project will answer this question. Our project will directly change the traffic signal light at the time, when an ambulance will be crossing the specified signal. As the process is carried out by the ambulance itself, the process becomes faster and efficient.

This will save many lives as ambulance will be able to reach its destination on time. And real time tracking helps the person who called the ambulance to track the movements of ambulance and call another ambulance if the called ambulance is taking too long to reach. Thus, this project can be a life saver project.

REFERENCES:

- [1] B.JananiSaradha, G.Vijayshri, T.Subha2 UG students “Intelligent Traffic Signal Control System for Ambulance Using RFID and CLOUD”, Second International Conference On Computing and Communications, 2017
- [2] Jay Lohokare, ReshulDani, SumedhSontakke, AmeyaApte,RishabhSahni“Emergency services platform for smart cities”, 2017
- [3] OmkarUdawat, Nikhil Thombare, DevanandChauhan, AkashHadke, DattatrayWaghole “Smart Ambulance System using IoT”, 2017
- [4] S.N.Sivaraj, K.Vigneshwaran, S.Vigneshwarn, M.VishnuPriyan “IoT Ambulance with Automatic Traffic Light Control”, 2017
- [5] Usha.N.S, Aritha. S, Viswathika.S “Make Way for Ambulance Using IOT”, 2017
- [6] Dr.Sarbpreet ,Dr.SomanathTripathy , Dr.Jimson Mathew “Design and Evaluation of an IoT enabled Secure Multiservice Ambulance Tracking System”, 2016
- [7] GargiBeri, PankajGanjare, Amruta Gate, AshwinChannawar, Vijay Gaikwad “Intelligent Ambulance with Traffic Control”, 2016
- [8] Dheeraj Dang, JitinTanwar, SarfarazMasood “A Smart Traffic Solution for High Priority Vehicles”, 2015
- [9] Intelligent Ambulance with Traffic Control (GargiBeri, PankajGanjare, Amruta Gate, AshwinChannawar, Vijay Gaikwad)
- [10] Automated Emergency System in Ambulance to Control Traffic Signals using IoT (Dr. A. Balamurugan, G. Navin Siva Kumar, S. Raj Thilak, P. Selvakumar).