IOT Based Detecting Sensor in Ambulance To Reach Hospital in Wireless Assistance

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***Abstract*— We propose a smart system that aims to minimize the ambulance response time, travel time from patient's location to the hospital, and the waiting time at the hospital. We utilize the road traffic conditions and hospital loading information (collected in real-time basis) to make optimal decisions (which hospital responds to the patient's request and which ambulance it sends, which route the ambulance takes to reach the patient, which hospital the ambulance heads to after picking up the patient, and which route it should take to the selected hospital). The system developed here has sensors to monitor patients' vital parameters and transmits to the hospital server, such that a doctor can know the live condition of the patient.**

Keywords— emergency, Lora transceiver, Monitoring, NodeMCU controller, Temperature sensor, Heart beat sensor, LCD Display.

I. INTRODUCTION

There is a growing demand for smart systems nowadays where provided services can be improved using modern technologies of sensing, communication, high computing performance, signal processing and multimedia. Such technologies can be utilized to improve ambulance and emergency services. In , authors analyzed data for emergency medical service in urban and rural areas in the United States. In many hospitals there was a queue of ambulances with patients waiting outside the hospitals. In some cases, the patients even died before getting any treatment, to overcome such crucial situations we have come out with a new system combining IOT, Sensor system and Embedded Controllers.

II. LITERATURE SURVEY

1. "Smart Ambulance Monitoring using IOT" by K. Vinothini, D. Karthika. A vehicle which is used to transport patients to hospitals is called as ambulance, this ambulance vehicle is equipped with some vital lifesaving equipment's and first aid medicines. With these medicines and equipment's, the patients are given first aid till it reaches the desired hospital. This type of treatment is called EMS. For implementing EMS in ambulance several solutions have been developed for faster means of communication between the equipment's used in ambulance and the doctors.

2. "Emergency Medical Services Response time in Rural, Suburban, and Urban Areas" by H. K. Mell, S. N. Mumma, B. Hiestand. Emergency medical service (EMS) personnel in the United States respond to an estimated 37million 911calls annually providing care to the sick and injured, but the initial link in the chain of survival includes family, friends, and by standers.

3. " Reducing Emergency Services Response Time in Smart Cities: An Advanced Adaptive and Fuzzy Approach" by S. Djahel, N. Smith. We design an advanced adaptive traffic control system that enables faster emergency services response in smart cities while maintaining a minimal increase in congestion level around the route of the emergency vehicle.

III. EXISTING SYSTEM

Before In we proposed smart health technology in ambulance service to minimize the response time (time from receiving the request to the arrival of the ambulance at the patient's location) and to minimize the door-to-needle time which is the sum of the delivery time (from the patient's location to the hospital) and the waiting time (at the hospital). To check patient's heart beat monitoring, temperature monitoring and availability corfirmation button used for hospital. Thus, this information is used to minimize the time between requesting the ambulance service and the start of treatment at the emergency departments at the hospital.

IV. PROPOSED SYSTEM

To detect the hospital where the doctors are available or not by sensors during the travel time on the ambulance and availability of doctor for specified accident case (brain, leg ,heart etc..). If doctor is not available there is without any delay to check anathor hospital ,all details are collects from the ambulance during the travel time. It helps to save the patient life without any time delay. The patients details must be secured. For the input of the lora communication network, eight features are selected. These features depend on the time, ambulance and hospital, number of streets and injured person, type of accident, and age of the patient. With these features, the Ambulance can be decided to select the minimum route to find the nearest hospital.

V. BLOCK DIAGRAM

Fig.1 shows the complete block diagram of the system, Power supply is given to all the required materials in Transmitter side which is fixed in Ambulance. Temperature and heart beat sensor is connected to the Nodemcu controller to measure the patient's parameter. Keypad is fixed to mention whether the patient is at high risk or normal and it is displayed in hospital with the help of data transmission. Lora transmitter is integrated in Ambulance and hospital availability is displayed in LCD which is in Ambulance. Fig. 2 shows the complete block diagram of the system, Power supply is given to all the required materials fixed in hospital. Hospital availability is confirmed using buttons in the kit and it is displayed in ambulance. Patient's criticality and medical parameters are updated in LCD in hospital.

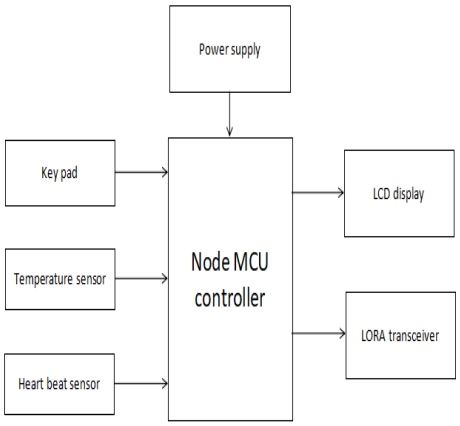

Fig.1 Transmitting Block diagram

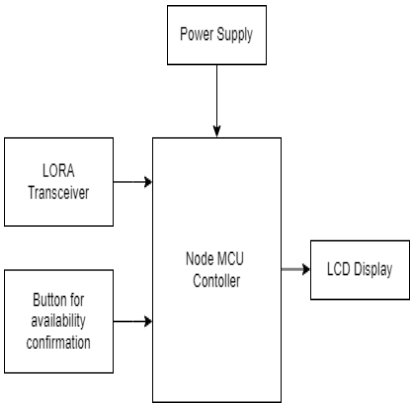

Fig.2 Receiver Block diagram

VI. HARDWARE REQUIREMENTS

A. *NodeMCU*

The Node MCU (Node Microcontroller Unit) is an open source software and hardware development environment that is built around a very inexpensive System-on-a-Chip (SOC) called the ESP8266. The prototyping hardware typically used is a circuit board functioning as a dual in-line package (DIP) which integrates a USB controller with a smaller surface-mounted board containing the MCU and antenna.

B. *Heart beat sensor*

Heart beat sensors are designed to give digital output heart beat when a finger is placed on it. When the heart beat detector starts working, the light emitting detector (LED) blinks simultaneously for every heartbeat. It is used to measure the heart rate i.e., how many times the heart beats (speed).

C. *Temperature sensor*

Temperature sensors work by providing readings via electrical signals. Sensors are composed of two metals that generate an electrical voltage or resistance when a temperature change occurs by measuring the voltage across the diode terminals. When the voltage increases, the

temperature also increases. They deliver information to a system after estimating the object or environment temperature.

D. LORA Transceiver

Data transmitted by an end-node device are received by multiple gateways, which forward the data packets to a centralized network server. Data are then forwarded to application servers. The technology shows high reliability for the moderate load. The long-range communications: up to three miles (five kilometers) in urban areas, and up to 10 miles (15 kilometers) or more in rural areas (line of sight). LORA is a modulation that provides a significantly greater communication range with low bandwidths than other competing wireless data transmission technologies like cellular, Wi-Fi, Bluetooth, or ZigBee.

VII. Conclusion

In this paper we proposed a smart ambulance sys- tem which is shown to significantly improve the ambulance performance metrics. The proposed system utilizes the real-time information about the hospital availability and sense nearest hospital.

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