IOT BASED SMART AMBULANCE

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Abstract: The smart ambulance, powered by IoT technology, incorporates a range of sensors and communication devices to create a unified and flexible medical environment. Crucial aspects of this configuration comprise real-time health monitoring sensors for patients and communication systems enabling smooth coordination among hospitals and emergency units. Patient Health Monitoring acts as a framework aimed at improving the standard of medical care during patient transit. Road traffic congestion is a primary cause of ambulance delays. Another goal of this project is to construct an intelligent ambulance that reaches the hospital early and avoids heavy traffic by delivering a notification to the associated traffic authority in case of emergency.

Keywords – **IoT, Real-Time health monitoring, Patient monitoring, Traffic Control**

I. INTRODUCTION

This study is significant because the system described in it can give a solution for controlling traffic, monitoring patient health, and sending status updates to the hospital via IoT protocol. To ensure that the patient receives prompt care, we must examine the aspect of delay in treatment in the hospital. The hospital will only begin treatment preparation after examining the patient's health, therefore this component is equally vital in saving the patient's life. In this system, the ambulance is connected to IoT, transforming it into a smart ambulance capable of monitoring the patient's health status using sensors and forwarding the patient's health status to the hospital over the internet and IoT protocol. It will allow doctors to determine whether the patient's condition is critical or not before they get at the hospital. If the patient's condition is critical, the hospital can make the required arrangements for treatment sooner, allowing the doctor to save the patient's life. Traffic congestion is another major issue. Emergency vehicles such as ambulances, police vans, and fire engines can endanger the lives of numerous people if they are delayed. To address this issue, we developed the Intelligent Ambulance with traffic control system. This project proposes a novel way for improving emergencies in medical services and traffic management. The traffic authorities are responsible for the efficient management of traffic in case of emergencies. They should be aware about the conditions so that they can make necessary arrangements regarding the situations. In case of emergencies the traffic police should clear the road to avoid the congestion during the passage of ambulance. In this proposed system, hospital plays an important role in notifying the traffic authorities in case of emergency transfer case. The hospital notifies the traffic police along with the routes of an ambulance going from one hospital to another in case of emergency transfer cases. This will helps the traffic authorities to proactively avoid the traffic congestion.

II. LITERATURE REVIEW

[1] This paper suggests a way to prevent traffic jams so that emergency vehicles, such as ambulances, can move quickly and smoothly. It consists of a microcontroller-based hardware module that facilitates the ambulance's smooth journey to the intended destination, as well as an application called HPVB (High Priority Vehicle Booking) that allows the user to book an ambulance with only one tap and monitor it using GPS on his/her mobile. This is achieved by putting RFID technology into practice, which would automatically regulate the traffic signals in the ambulance's path and minimizing the time required to reach the destination. This suggested solution automatically manages the traffic signals in the ambulance's path and facilitates user booking and tracking of ambulances via mobile applications

[2] In order to prioritize emergency routes, this article suggests a smart ambulance system. To advance the ambulance infrastructure, a class of intelligent healthcare emergency applications is the solution. Its goal is to make drivers aware of the emergency routes that ambulances take. There are three main applications in the system: one for the server, one for users in emergency situations, and one for paramedics. Managing communications between end-user apps is under the purview of the server. The patient's and the ambulance(s)' locations are the primary features displayed by the user emergency application. Additionally, finding the patient and the right hospital is the purpose of the paramedic application

[3] This system works with a communication system to enhance emergency services for large-scale accidents involving multiple casualties. Obtaining victims' identity data might be challenging when an accident occurs. The suggested system uses a thumb scanner to collect personal and health information from individuals. Personal identification can be preserved throughout a patient's post-accident journey across multiple hospitals. Patients are registered, their data and evolution are saved, and their temporary identity may be changed to their genuine identity if situations allow.

[4] This paper presents a smart ambulance that uses infrared sensors to prevent traffic jams and allow for easy mobility during emergencies. The suggested method helps to clear traffic and provide a route to the ambulance's destination by turning all of the red lights on its path from red to green. The ambulance is registered on the system's network through an associated Android application. The program uses the global positioning system (GPS) to send an emergency command to the traffic signal server along with the direction it has to go in order to reach its destination. Based on the ambulance's position, the closest signal is known. Additionally, that specific signal remains green until the ambulance passes by, and later it regains its original flow of management. By controlling the traffic lights, it functions as a kind of lifesaver project because it saves time throughout emergency by dominant the traffic lights.

PROBLEM STATEMENT

It is difficult to identify significant changes in a patient's condition during transportation because the conventional method does not offer real-time monitoring of patient health data. Manually recording patient health data takes a lot of time and is prone to human mistake, which can result in incorrect medical assessments. Also ambulances may have delays in arriving at their destinations if there is no specific system in place for notifying traffic police, which could be fatal in emergency scenarios. In order to solve all these challenges, the project aims to implement a real-time patient monitoring system with the help of Internet of Things and is to create an intelligent ambulance which can reach the hospital without any delay by providing a notification to the corresponding traffic authority in emergency transfer cases.

III. PROPOSED SYSTEM

In order to build a connected and responsive medical environment, we propose an Internet of Things (IoT) based smart ambulance equipped with a variety of sensors and communication devices. For seamless coordination with hospitals and emergency responders, this system has real-time health monitoring sensors for patients as well as communication system. Additionally, the incorporation of IoT technology makes it easier for hospital staff, ambulance drivers, and others to communicate with one another, guaranteeing efficient coordination and information sharing during the emergency response procedure. Various hospitals can register on our website with all of their contact information, and users can register to get hospital contact information in an emergency. This enables doctors to examine the patient's condition and make necessary arrangements for treatment in advance. Another important problem in India is traffic congestion, which has a big impact on ambulance services. Another goal of this project is to create an intelligent ambulance which

can reach the hospital without any delay by providing a notification to the corresponding traffic authority in emergency transfer cases.
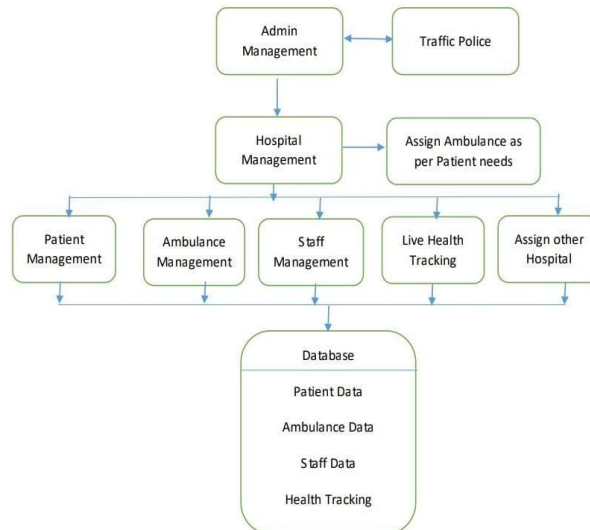

Fig.1 : system architecture

3.1 Admin Management

Admin management is the foundation of IoT based smart ambulance. It is responsible for hospital management, user management, traffic management, data handling and overall control of the system.

3.2 Hospital Management

Responsible for staff management and ambulance management. Facilitates coordination between ambulance services, emergency departments, and other hospital units to ensure efficient patient care and resource utilization.

3.3 User Interface

Provides a simple, user friendly interface for interacting with the services provided by the hospitals. It offers a user-friendly platform for accessing critical information and communicating with hospitals during emergencies.

3.4 Traffic Management

Receiving and analyzing hospital alerts about emergency situations needing ambulances to have priority passage.Taking the necessary steps to ensure that ambulances travel smoothly without any traffic and arrive at their destinations on time.

3.5 Live Health Tracking

With the help of sensors such as heart rate sensors, respiratory rate sensors and temperature sensor, patients' health parameters can be monitored and sent to the hospital database through IoT.

IV. RESULTS AND DISCUSSION

The use of IoT technology in our smart ambulance enabled real-time monitoring of patients in transit. Secure real-time transmission of patient data, including vital signs and medical history, allows medical professionals to better prepare for incoming patients. Integration with traffic control systems enabled our smart ambulance to prioritize and speed up emergency transfers. Our smart ambulance was outfitted with technologies that allow it to check the availability of beds in local hospitals using IoT technology. The use of IoT in ambulance services shows great promise for improving emergency medical response systems. Real-time patient monitoring not only enhances treatment quality while in transit, but it also allows healthcare providers to intervene early.
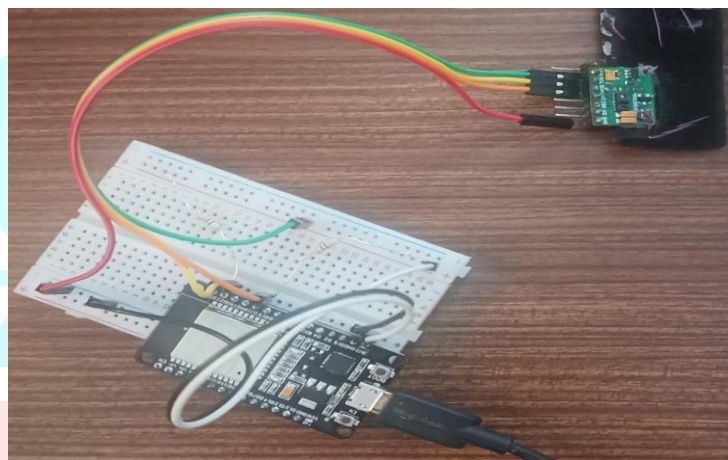
Fig 2.1 : Home Page

Fig 2.2 : Sensor

IV. CONCLUSION

Through the use of sensors, doctor's can remotely monitor patients' vital signs and formulate treatment plans ahead of time by assessing the patient's condition. Traffic congestion can also be avoided by notifying the traffic police in emergency transfer cases. In order to save patients' valuable lives, this project, taken as a whole, significantly contributes to helping patients get to the hospital quickly.

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